

IPANewsletter



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Sustainability Priorities Defined by Carbon Working Group

Cheryl Burgess, IPA Staff Writer

The IPA-led Carbon Working Group (CWG) has reached a pivotal point, with strong interest from companies from diverse sectors, who have broad priorities in sustainability performance improvement. The most recent CWG meeting, held on January 27, 2022, had the dual purpose of (1) presenting the new CWG framework to progress the low-carbon and sustainability agenda of all IPA clients and (2) discussing the priorities and aligning on key strategies and tactics to progress this effort.

The CWG Approach Going Forward

To progress the diverse topics and sector-specific needs in a structured manner, the CWG will use a three-tiered approach with the main CWG prioritizing the areas to work on, technical sections defining individual topics to progress within those broad areas, and individual topics being progressed as joint-industry efforts:

- The main CWG will comprise all companies from all sectors and meet twice a year to set the high-level agenda and align on the priority areas.
- This main CWG will identify the sections that will meet regularly throughout the year (every 8-10 weeks) to shape, define, and progress individual topics identified by members of that particular section. The sections will be open to all companies from all sectors; companies can choose which sections to join based on their strategic priorities.
- Multiple individual topics will then be progressed using IPA's unique intellectual property (IP) development model.



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



Independent Project Analysis, Inc. is the preeminent organization for quantitative analysis of capital project effectiveness worldwide. At IPA, we identify Best Practices to drive successful project outcomes.
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To identify the sections to be formed, IPA used the results of two separate surveys it conducted in the weeks leading up to the meeting. These surveys had common questions to identify the sustainability priorities of the different clients, and highlight their key challenges and gaps. Based on the survey responses, and one-on-one follow-up conversations with the companies, IPA identified six major sections:

1. GHG performance assessment
2. Low carbon scope selection/abatement curves
3. Electrification
4. Circularity performance
5. Carbon capture utilization and storage (CCUS)
6. New technology commercialization

Meetings for the first four sections will kick off in March. The sections will identify and frame specific individual topics to pursue. They will define existing gaps, align on the metrics and frameworks needed to address the gaps, determine what data to collect to develop IP, and provide the data in one-on-one engagements. IPA will lead the IP development and work with industry SMEs to create the tools and frameworks to help decision makers in the industry improve their low-carbon and sustainability performance.

To address the concerns of the CCUS section, the fifth section identified above, IPA has been working with several clients to shape a multi-client research study to establish baseline cost and schedule metrics for CCUS projects globally. This study kicked off in February. A separate section to specifically address risk mitigation and performance improvement for long-term subsurface CO₂ storage projects will be set up in Q3 2022.

Finally, the last topic, new technology commercialization, cuts across all the other sections and will be addressed as we shape and progress those sections. IPA has extensive expertise and has completed several research studies in the areas of new technology learning curves, commercialization Best Practices, and innovation management in capital projects, and will use the knowledge to help address issues in all sections.

How To Get Involved

The January meeting ended with a highlight of the next steps and action items. IPA will ask the meeting participants to indicate their section preferences so that section meetings can begin in mid-March. Further, IPA will follow up with member companies to understand their particular challenges, priorities, and current approaches. For more information on joining the CWG, **contact Adi Akheramka at aakheramka@ipaglobal.com**.

About the CWG

The CWG was launched in 2020 after an IPA survey of E&P companies revealed a gap between corporate public positions and the companies' actual on-the-ground project readiness. IPA found different levels of maturity among the companies, as well as different standards, definitions, and practices to measure performance. The CWG fulfilled the need for a collective approach to move the industry's low carbon and sustainability

agenda forward. From the founding group of seven mostly E&P companies, the group has grown to include more than 35 member companies from diverse sectors. The goal of the working group is to develop practical, relevant, and effective frameworks to benchmark and improve the companies' low-carbon performance and sustainability practices.

CWG accomplishments to date include developing:

- Standard GHG Emissions Breakdown Structure for hydrocarbon producing (E&P) projects that is also applicable to refining, chemicals, and minerals projects
- A robust project-level database of GHG emissions profiles and related practices for hydrocarbon production (E&P)
- A framework to evaluate GHG estimate maturity and practices to measure project team readiness to meet low-carbon targets
- Benchmarking capabilities for Total Scope 1 emissions and for venting, flaring, and fugitives (VFF) for hydrocarbon producing projects
- Cost-capacity benchmarking capabilities for all components of a CCUS project—amine-based capture, compression/dehydration, pipeline transport, injection
- The Storage Complexity Index (SCI) to evaluate a reservoir's complexity for long-term subsurface CO2 storage projects (saline aquifers, depleted oil, depleted gas)



Andras Marton
Named Integrated
Energy Practice Director

Andras Marton has joined fellow Integrated Energy Practice Director Carlos Tapia in overseeing this important and expanding IPA division. In his new role, Marton will focus on onshore project sectors, while Tapia will oversee the offshore and nuclear sectors. Marton's new duties will include engaging 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 assist in steering IPA's energy transformation initiative, helping integrated energy companies, nationally owned oil operators, and independents deliver competitive new business opportunities.

Marton most recently served as IPA's Manager of the Fuels Manufacturing and Transportation business area, developing business plans and maintaining client relationships for companies in these industries.



Carbon Capture Utilization and Storage (CCUS) Project Performance Norms

IPA is soon launching a cross-industry research study to establish capital cost and schedule norms for CCUS projects. For companies not yet involved, there is still time to join!

- Owner companies that participate in the study will gain access to essential CCUS project cost metrics and insights to directly inform and improve early decision-making for CCUS projects
- Those who join from the start will have the opportunity to directly influence the study scope as part of the steering committee

How to Join the Study

Owner companies interested in joining should **contact Adi Akheramka at aakheramka@ipaglobal.com** to request more information.



IPA TrueCost

Come see why operators are making the switch

Live Demo + Q&A
April 6, 2022
9 a.m. EST

REGISTER TODAY »

TrueCost Helps Operators Quickly Find and Benchmark Oil & Gas Opportunities

IPA has launched TrueCost, a new software application to help oil & gas operators quickly assess the expected value, development cost, and duration of potential exploration and production (E&P) opportunities. Unlike other upstream data tools, TrueCost provides access to validated cost and schedule data for real projects in IPA's database, rather than unreliable publicly sourced data.

With IPA's unmatched industry data at their fingertips, oil & gas operators can quickly and accurately:

- Identify where the optimal opportunities are located
- Understand how attractive an opportunity is based on its expected value, cost, and duration
- Compare portfolio performance against competitors

"IPA's TrueCost software application is a comprehensive cost and schedule tool underpinned by real project data collected from the source, normalized by IPA, and designed for project professionals," said Jason Walker, IPA Deputy Director of Research. "TrueCost is sure to streamline decision making by providing accessible and reliable data when it matters most."

Real Data Directly From Project Teams

Many companies waste valuable time and resources collecting publicly sourced data to use for evaluating potential exploration and production (E&P) opportunities. TrueCost eliminates this time-consuming process by providing access to real cost and schedule data from 2,000+ real E&P projects in IPA's proprietary capital projects database.

All Data Carefully Validated and Normalized

Collecting public data is not just time-consuming, but also the incomplete, non-normalized nature of these data sources makes them unreliable. All cost and schedule data contained in TrueCost are validated by IPA project analysts and carefully normalized by our team of economists to account for currencies and inflation.

Accurate Results in Real-Time

TrueCost is easy to use and generates accurate results in 30 seconds or less. After selecting up to 15 pre-defined filters (concept type, region/country, hydrocarbon type, water depth, etc.), TrueCost displays cost and schedule metrics for real projects that meet the selected criteria, enabling direct, apples-to-apples comparisons between opportunities and/or portfolios.

E&P operators interested in learning more about TrueCost are encouraged to **contact Jason Walker at jwalker@ipaglobal.com**.

In Offshore Wind Auctions, CAPEX Knowledge Pays Off Big Time

Nekkhil Mishra, IPA Director, EMEA

Jon Walker, IPA Senior Research Analyst

Offshore wind power, a key pillar of the energy transition, faces significant uncertainty in project capital cost development. The tremendous innovations seen in offshore wind (turbine sizes increasing, cost of manufacturing dropping, etc.) have allowed this sector to slash the cost of power generation. However, predicting the capital expenditures, or CAPEX, of projects in this sector provides some challenges, especially when it comes to offshore wind auctions.

Offshore wind auctions, the point at which an opportunity becomes a project, are conducted when bidders face excessive uncertainties related to project economics. In placing their bids, owners need to consider the viability of an offshore wind farm within a complex matrix of trade-offs, including CAPEX, project operations, clustering benefits, offtake agreements, project capacity factors, financing, and gaining market share and/or strategic value. What makes these trade-offs more difficult is that the maturity of the information is lacking at this point of commitment and the risk and uncertainty the project team is dealing with tends to be nontraditional (e.g., external or shaping).

These conditions lead to increased risks and a greater chance of the auction's winning bid far exceeding the asset's actual worth, a tendency known as the winner's curse. Having a clear understanding of what drives a particular project's realistic CAPEX at the time of auction—and what exact future efficiencies in specific scopes can be gained and how—is essential to avoiding this trap and is the focus of current IPA research.

Developing a Reliable Offshore Wind Auction Bid

Wind auctions often take place when projects have low maturity, which brings a high risk of cost overruns. In the absence of information, developers must bet on future efficiency gains and equipment negotiations, which may not materialize as planned. While some recent auctions have been structured with frameworks that are more conducive to strategic bidding, they can still lead to a business model in which the winning bid in an auction does not correspond with the project's intrinsic value to the shareholders.

To develop an accurate bid, owners need to build their own estimates from the bottom up using various quotations such as wind turbine agreements and contractor quotations. Key factors such as uptime history, cost of financing, local content requirements, and pricing need to be considered. In addition, innovations that lead to improved CAPEX should be considered to develop bids that win.

Owners struggle to balance the fear of missing out with the need to create shareholder value with their projects,



Cost & Schedule Benchmarks for Offshore Wind Projects

IPA is launching a multi-client study to establish cost and schedule benchmarks for both recently completed and ongoing offshore wind projects. The companies that participate in this study will gain insights into how their projects' cost and schedule performance and estimates compare to the competition, and how to set competitive, yet achievable, targets for future investments.

For asset owners, project developers, and capital investors, remaining competitive in this environment requires decision making based on reliable industry data rather than incomplete, non-normalized public data.

How to Join the Study

Participating in this first phase of the study is free of charge, but companies are required to provide data to receive the benchmarks. **Contact Nekkhil Mishra at nmishra@ipaglobal.com** to express interest in joining.

and we suspect there is a large cost to price differential with bids not reflecting actual estimate costs in recent auctions. It is important for owners to know in this environment where specific CAPEX efficiencies can be gained and in what way they may be achieved, so owners are not left holding the bag.

The Main Drivers of Offshore Wind CAPEX: What We Know So Far

Considering this complex scenario, IPA has developed a number of benchmarking tools for the offshore wind industry that can help owner companies properly diagnose where they stand in regard to CAPEX, where project delivery might be improved, and where they can gain efficiencies post auction. One key model in our suite of offshore wind services looks at the drivers of total cost of an offshore wind project with the goal of helping owners to define the right bids and ensure they are picking the right projects.

Most readers will not be surprised to hear that the biggest driver of offshore wind cost is the nominal installed capacity. Offshore wind parks tend to be standardized in what they install (turbines, array cables, etc.) and hence the total capacity can very quickly give owners a realistic understanding of total cost (after adjusting for inflation and innovation).

Moreover, it is not just about the power generated—the number and capacity of the turbines installed to reach these capacities also drive CAPEX. Larger capacity turbines entail less extensive foundations and lower BoP costs are needed for equivalent capacity, helping to drive down the cost per MW of foundations, installation, and operation. Larger turbines have larger rotor diameters as well, increasing energy production per MW installed.

The Model Improves as We Add More Explanatory Variables

Hypothetical model example: Wind Park Total Cost Model

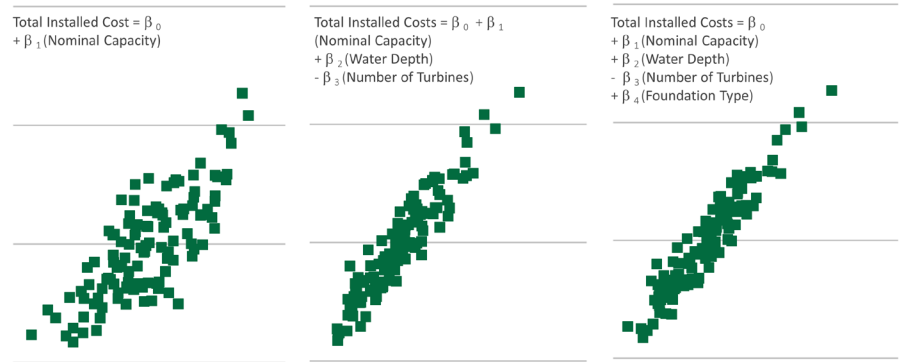


Figure 1

IPA Modeling Methodology

Benchmark Reflects Industry Average and Distribution

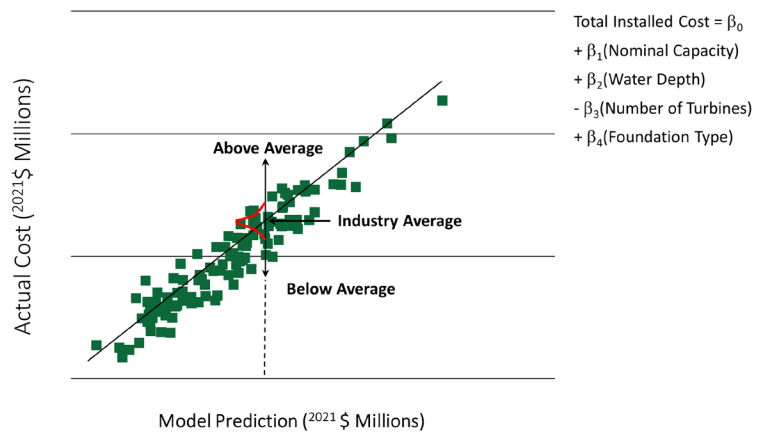


Figure 2

Finally, we find that the foundation type affects offshore wind project CAPEX. The majority of offshore wind projects in operation used monopiles for foundations. To date, monopiles have shown to be the least expensive method of installation because they are reliable and quick to install and fabricate. Attachments and connections have also improved since the early days. However, as the industry moves into deeper water—as we have seen with the recent ScotWind auction—floating technology will play a major role going forward. Floating

wind turbines are still in their initial deployment phase and future cost decreases will be heavily dependent on materials use and serial production.

To determine the CAPEX drivers in offshore wind projects built to date, IPA uses multivariate regression models. These models allow us to explain more of the variance for a specific project with higher accuracy as we add each of the variables above. As shown in the sequence of graphs in **Figure 1**, the model's predicted cost becomes more closely aligned with the actual cost as additional factors are considered.

Adding water depth and the number of turbines, for example, to the nominal capacity improves the accuracy greatly; adding foundation type to these three factors improves it even further.

Now that we have the model built and tested, we can give a total cost benchmark for projects with a specific feature set. IPA uses this methodology to give owners a quantitative measure of a project's total cost relative to industry projects with similar characteristics. (See **Figure 2**.)

The Evolving Offshore Wind Industry

As the offshore wind industry evolves, it faces numerous challenges. In addition to supply chain disruptions, this sector is now facing uncertainty in the execution phases (design and construction), as well as soaring logistics and materials cost escalation.

IPA research into the drivers of offshore wind power outcomes to date has not uncovered much variance around nominal capacity or location factors. However, most completed projects have been close to shore and in similar geographies. As projects go into deeper waters, further from shore, and with more challenging seabed and metocean conditions, we expect CAPEX variance to increase. Projects in deeper water require foundations that are more complex and more expensive, with higher installation costs.

Further complicating this scenario is recent inflation in key areas such as steel and logistics, tight supplier markets for turbines and HVDC cables, local content requirements, and increased demand for appropriate vessels. OEMs are distressed from inflationary pressures and logistic challenges. For example, wind turbine manufacturer Siemens Gamesa recently made changes to

leadership after issuing a series of profit warnings, which signals a path to upward forces on turbine costs. Contracting and commercial models are also changing, with OEMs now less inclined to take on construction and subcontractor risk, leading to a greater need for proper contract and package interface planning by owners. And, as previously mentioned, the supply chain headwinds also seem to be accumulating.

IPA's Role in the Path Forward

IPA's sole focus over the last 30+ years has been to help our clients spend their capital better to maximize capital efficiency. Our work with wind industry clients is no different in this regard. Understanding CAPEX has become increasingly important for projects to meet the returns promised to the shareholders at the bid stage. To help improve wind sector capital efficiency, IPA continues to gain a better understanding of value drivers, cost levels, and risks that offshore wind project owners face during

construction. As discussed, this uncertainty is especially true at the point of placing a bid, when other factors that affect a project's viability are still nebulous. We therefore would like to gain a deeper look at the other inputs to levelized cost of energy (LCOE), such as fixed and variable operations and maintenance (O&M) costs, capital costs, wind resource assessments, and assumed utilization rates.

Benchmarking LCOE as a factor for decision making is our goal for the Offshore Wind Cost & Schedule Benchmarking study we are launching this year. Greater understanding of real, verified project data helps owners identify opportunities for capital cost optimization toward the reduction of the LCOE and to set competitive—yet realistic and achievable—targets.

Contact Nekkhlil Mishra at nmishra@ipaglobal.com for more information on IPA's offshore wind capabilities.



IPA President and CEO Edward Merrow Featured in *WindEurope* Interview

“We have already developed a number of benchmarking tools for the wind industry that can help owner companies know where they stand and what aspects of their project delivery can be improved.”

Read the full interview at windeurope.org

IBC 2022 Addresses Carbon Management & Sustainability, Supply Chain Issues, and More



Cheryl Burgess, IPA Staff Writer

IPA is once again set to present new quantitative research studies focused on improving the development and execution of capital projects at the 2022 annual meeting of the Industry Benchmarking Consortium (IBC 2022). The ongoing COVID-19 pandemic has led to a third year of hosting the event as a series of virtual meetings exclusive to employees of IBC member companies, a format that enables broad participation across the member companies.

IBC 2022 will kick off on March 22, with IPA Founder and President Ed Merrow delivering the keynote address. In addition to webinars featuring new industry research study presentations, the virtual IBC 2022 event includes industrial sector breakout sessions and project performance competitiveness briefings for large and site & sustaining capital projects. The webinar event schedule runs from the end of March through the beginning of May. Each IBC session is delivered live twice to accommodate all time zones. The 1-hour webinars will be recorded and available to all member companies.

Highlights of this year's IBC include:

Industry Trends

IPA Chief Operating Officer Elizabeth Sanborn will outline the current state of capital projects, including how the COVID-19 pandemic has affected project development and execution over the past two years. This annual study analyzes the most recent set of capital projects to provide an understanding of current industry trends in context with historical industry performance. The overall industry performance provides context for the performance outcomes of individual IBC member company projects.

IPA Benchmarking and the Energy Transition

The process industries have embarked in earnest on the road to reducing greenhouse gas (GHG) emissions and creating a more sustainable future. In early 2019, IPA started the process of developing benchmarking methodologies for GHG emissions from projects, GHG mitigation measures (such as electrification), and low and zero carbon energy technologies (such as wind and solar). We have also started working with chemical companies on efforts to develop circular production and use processes. In this webinar, IPA President and Founder Ed Merrow discusses IPA's strategy



toward decarbonization and our progress in making the benchmarking of the transition a reality.

Sustainability Trends in Capital Projects

The heavy industrial sectors are currently undergoing a fundamental shift in their core KPIs. Sustainability-related elements—emissions, water, waste, and circularity—have now become a key strategic consideration in capital project selection, development, and execution. IPA conducted a survey of companies in the petroleum refining, chemicals manufacturing, and processing sectors to understand current industry practices, and identify the key trends and challenges in sustainability performance. The goal for this session is to share the results of this industry survey and progress the discussion to standardize sustainability performance assessment and improvement in capital projects.

Research Study: Constructability Review Metric

Constructability Reviews are the most used Value Improving Practice. On average, about 60 percent of capital projects use this practice to drive better construction effectiveness. This study updates past IBC studies that evaluated industry practices for conducting Constructability Reviews, drawing from data collected since 2018 to propose Best Practices and a detailed measurement for the application of this practice.

Research Study: Knowledge Management Practices in Capital Projects

A common belief is that a well-designed and maintained knowledge management (KM) system can save project teams time and even teach them how to avoid costly mistakes. In this IBC study, Arkadii Lebedinskii explores the state of KM across IBC member companies. The study summarizes KM practices used to handle tools and software platforms for KM elements such as document libraries, lessons learned databases, team collaboration platforms, expertise management systems, and search engines. This is a new area of focus for IPA research and we expect to leverage the findings for continued research into KM practices and the benefits to capital project systems.

Supply Chain Risk to Capital Projects

The COVID-19 pandemic has resulted in a confluence of forces causing significant disruption to global supply chains for raw materials, intermediates, and finished goods. Dysfunctional (or non-functioning) global supply chains have similarly affected the world of capital projects. This presentation introduces the problem of supply chain risks to capital project outcomes; provides illustrations of the nature, root causes, and effects of supply chain issues experienced by capital projects; and presents a preliminary framework for understanding supply chain risks to capital project execution success.

Research Study: What Makes a Good Project Execution Plan

Of the elements measured in IPA's Front-End Loading Index, Project Execution Planning (PEP) is the component most often lagging Best Practice. In review of thousands of project PEPs over the years, IPA has observed that a good many are simply copies or templates and include very little project-specific planning. However, this isn't true for all. Therefore, the objective of this study is to understand and quantify the differentiating factors at the detailed planning level (e.g., construction) that are proven to effectively mitigate risk.

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.



Sustaining Capital Allocation and Expenditure Benchmarks for Chemicals Projects

IPA is launching a multi-client research study to determine the average sustaining capital allocation and expenditure for chemical production sites and operating units. Participating owner companies will receive the following deliverables, which can be used to competitively plan future sustaining capital allocation and expenditure:

- Sustaining capital benchmarks based on the operating units and sites included in the study
- A detailed understanding of how your company's metrics compare to the industry benchmarks

How to Join the Study

Owner companies interested in joining the study should **contact Natalia Zwart** at nzwart@ipaglobal.com.

Projects and the Pandemic: Disruption and Adaptation

Jason Walker, IPA Principal Deputy Director of Research

As the COVID-19 pandemic first started to take hold in early 2020, IPA started collecting data to record its effect on capital projects and the companies that do them. IPA sent out its first survey in March 2020 and has since issued seven more, with the latest in September 2021. These surveys track four areas of response to the pandemic: effects on internal project system operations, supply chain disruptions, portfolio implications, and mitigation strategies. More than 60 companies from all industrial sectors including E&P, chemicals, power, and pharma responded to the most recent survey, which collected data from hundreds of project professionals.

Overall, IPA found that:

- Even as owner WFH productivity appears to be improving, anecdotal signs suggest that it is not as good as reported. Current perceptions of at home productivity may be colored by a recency bias—that is, the situation may appear better compared with the early days of the pandemic rather than compared with pre-pandemic times.
- The supply chain has not fully recovered, and significant delays are still common across all areas.
- Engineering delays are now the norm; these delays are growing and EVCs are not functioning at high levels.
- Construction labor in the United States and Europe appears to be stable, with skilled labor generally available and with reasonable productivity. However, the labor workforce outside of U.S. and European markets is still struggling.
- Finally, the pandemic has accelerated the shift toward renewables, low carbon, and digitalization.

As we look to the future, the longevity of supply chain disruptions is the big unknown. Supply chains have not rebounded as hoped and the situation in Asia is more dire than it first appeared. Shortening and simplifying project supply chains should be a first order of business in 2022.

Read the full article at www.ipaglobal.com for full details on the findings.



Achieving Speed to Market When It Counts

In many industries, speed to market is more important than cost. In the last 2 years, several companies have developed and executed capital projects under immense pressure to meet customer needs for safety equipment and pharmaceuticals.

IPA evaluated three recent projects that were schedule-driven to respond to the COVID-19 pandemic by providing safety equipment or pharmaceuticals. While fast tracking projects in planning and execution always increases risks, all three projects had actual execution durations that were 40 to 50 percent faster than average—achieving their primary goal of speed and outperforming their peers in this area. What accounts for their success?

Practices That Allowed Speed to Market:

Strong alignment between business and project teams

with a clear understanding of project priorities: IPA has long found that projects with confused priorities do not achieve low cost or fast schedule. Those that target fast schedule are able to accomplish it—often with the trade-off of higher costs. It isn't that cost must be traded for schedule—but that schedule must be the clear priority and that potential trade-offs must be defined and agreed on. These three teams all had a clear vision of what the project was trying to achieve and were aligned with business on their goals.

Stable team: Team member turnover hinders speed because it takes time to get the new team member up to speed and sometimes agreements made have to be renegotiated. New team members may also want to make changes. One of the projects did have project manager turnover—but it occurred early in the project's lifecycle and the new project manager was experienced, which was an asset.

Experienced team members: The companies that executed these projects put their most experienced team members on them (A-team). When choosing the team members, they considered the experience team members had with projects of similar size, complexity, processes, and technology.

Leveraging existing design: One area that often gets shortchanged in fast-tracked projects is definition. These projects often have very short definition periods and definition is typically highly overlapped with subsequent phases to shorten cycle time as much as possible. Leveraging existing design can make it possible to expedite the definition period without suffering some of the associated penalties. One case study project was able



to use the design from similar projects the company was executing in other locations. This project also benefited from costs and lessons learned being shared across the like projects.

Procuring equipment far in advance: Having equipment and materials available when they are needed is key to a fast cycle time and having a standardized design facilitates this. Current supply chain delays have made this even more critical. One case study project started procurement even before the team was formed; this was possible because the project had a standardized design. This project had one piece of equipment arrive late because it was ordered late after a scope change. This late change highlights the risk of ordering early—if scope or specifications change, the equipment or materials procured may not be the ones needed.

Use of sub-projects: One case study project divided the scope into sub-projects that could be advanced independently. This strategy not only allowed the sub-projects to move ahead without waiting for one large package but it also allowed for good controls in execution because the smaller scopes were easier to manage.

The Bottom Line

The above mentioned practices allowed all three projects to install what was planned with greatly accelerated schedules. However, one case study project built a facility that is now sitting idle because the market changed, a factor outside the team's control. This is the chance that businesses take.

Contact Yinyan Zhao at yzhao@ipaglobal.com for more information on achieving speed to market.

Developing a Scalable Project System

The Problem

An IPA client was concerned about its recent large projects going off the rails. One project—an extreme example of this trend—overran its authorized budget by more than 75 percent on a facility that only operates at 30 percent of its nameplate capacity. Looking more carefully at its projects, the client discovered that most projects met their budgets and schedules but that their very large projects were often considered failures.

The company's objective in engaging IPA was to improve the cost and schedule performance of its projects with a focus on scaling the work process from small to large projects.

What IPA Did

Our work with this client began with a review of the client's engineering guidelines (project manual) to assess how well they aligned with Best Practices. The goal was to highlight opportunities to enhance the guidelines and to develop a scalable work process that ensures maturity of engineering and quality of cost and schedule estimates in a way that makes sense across their small to very large and complex projects.

The existing project system includes documents and standards for engineering from project definition through execution. The current process is "one size fits all" with three definition phases. It mostly focuses on technical elements, with some standard operating procedures and a deliverables checklist for the end of each phase. While generally aligned with Industry standard stage-gating, FEL 1 (the business planning phase) is not described in the project manual. And, although FEL 3 (preauthorization

definition and planning) requirements are mostly aligned with Best Practices, the work process has some major gaps in FEL 2 (scoping and conceptual design) around scope closure and preliminary project execution planning in support of early cost and schedule estimates.

IPA offered recommendations to shore up the work process with key recommendations to strengthen FEL 2 and to better link engineering deliverables with business case development to generate a holistic picture at each decision gate.

Moreover, in assessing the client's work process, we uncovered major organizational constraints that would inhibit the company's ability to gain advantages from a strong process. These constraints manifest in lack of clear roles and accountabilities between the business unit and engineering function in the early stages of project development and weak project manager authority through the project lifecycle.

The company assigns a project lead from the business unit who acts as

liaison to the business, thereby limiting direct project manager interaction with the business and the project manager's oversight of business-based functional input on the project. The weak project manager position hinders the ability to drive the use of the engineering work process, which is often bypassed by the business because of schedule pressure. Schedule pressure leads to poor definition and incomplete market data.

The organizational constraints—and the resulting weaknesses in project definition and planning—exist across all project sizes. These suboptimal drivers are accommodated and managed for smaller and less complex projects, but lead to unpredictable cost and late schedule for the larger and more complex projects.

We recommended that the client implement a scalable project system because it was their larger projects that were problematic so they needed some way to separate them out and treat them differently. The key was a fit-for-purpose approach based on the level of project risk. Project team roles and



accountabilities, activities, deliverables, and assurance requirements all would be tailored depending on this risk.

An overview of the classification process is shown in **Figure 3**.

IPA led a series of workshops with the client to develop action plans and next steps to implement the recommendations. For example, based on IPA's recommendation to strengthen the project management organization to ensure compliance with (and to gain the advantages of) the strengthened process, IPA worked with the company to define leadership roles and responsibilities through the project lifecycle.

Proposed Classification Process

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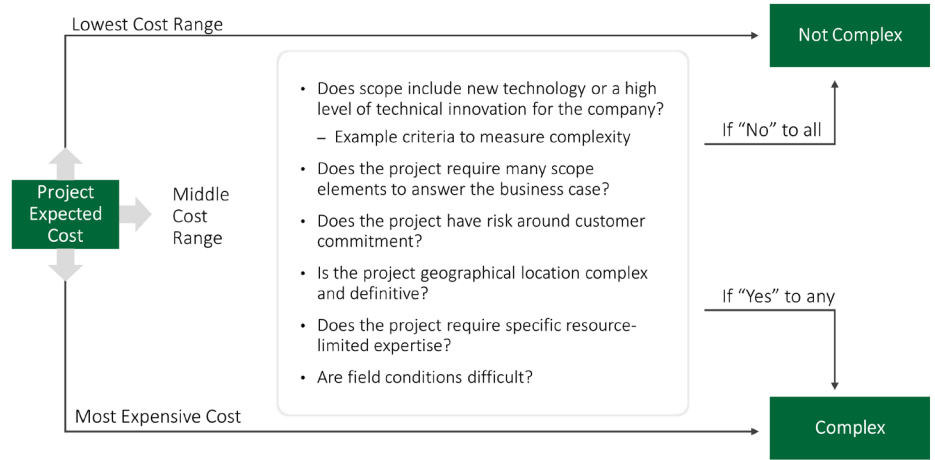


Figure 3

IPA Capital Solutions

Developing and Implementing Solutions for Capital Project Systems



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.

We apply the principles of change management to our work to ensure our clients realize the full benefit to achieve maximum value from capital project investment. The results of the IPA Capital Solutions-client partnership are practical and tailored project system solutions, driven by IPA's data-based knowledge, measurement, and diagnosis of work processes, organizations, and governance and gatekeeping approaches.

Project Work Processes

Optimize your work process to drive business results

Organizational Structure

Enhance your project organization's infrastructure

Project Governance

Upgrade your investment decision-making process

Contact Us

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IPA Institute Opens Back Up for In-Person Training

Company-Specific and Public In-Person Training Now Available

The IPA Institute has announced the return of in-person training for 2022 after delivering online training exclusively since 2020. The decision to reintroduce face-to-face training comes amid decreasing COVID-19 infection rates and easing of restrictions in many parts of the world. Given the success of the IPA Institute’s online training, we will now provide a mix of both face-to-face and online training options throughout the year.

Company-Specific In-Person Training

IPA Institute In-House Training has long been a cost-effective way for companies to address gaps in project development and execution work processes, management practices, and/or governance structures. Due to the pandemic’s effects on project portfolios, many organizations are now in a position where they need to advance the project planning knowledge and skills of their teams. Some of the challenges organizations are facing today include:

- Increasing project activity after repeated delays over the last 2 years
- Inexperienced staff with a need to boost project management knowledge and capabilities
- Strategic shifts in project types, particularly new energy projects

Therefore, we are prioritizing face-to-face training for companies who are facing these challenges—as well as others—and are comfortable holding IPA Institute-led training at their facilities. Visit www.ipaglobal.com to browse the holistic and granular-level courses currently available for in-person delivery.

Public In-Person Training Options

Individuals looking to advance their own professional development have two options for face-to-face IPA Institute training this year. Project professionals seeking key practices for sustaining capital, site-based, and maintenance projects can attend our Best Practices for Site & Sustaining Capital Projects course taking place June 7 to 8 in New Orleans, Louisiana, USA. Project professionals seeking key practices for mid-size to large manufacturing projects can attend our Project Management Best Practices course in London, United Kingdom on September 19 to 20. View the in-person training course schedule on page 15.

Virtual Training Options

As noted above, the IPA Institute is continuing to offer virtual training in both company-specific and public settings. Visit the In-House Training page to browse our current offerings. View the virtual training course schedule on page 15.

IPA Institute 2022 Course Schedule

**THE IPA
INSTITUTE**

Advancing Project Knowledge

Course	Dates	Times	Language	Fee	Click to Register
IN-PERSON COURSES					
Best Practices for Site-Based Projects*	June 7 & 8 New Orleans, LA	8 a.m. to 5 p.m. (U.S. Central Time)	English	\$1,500 USD	REGISTER
Project Management Best Practices*	September 19 & 20 London, UK	9 a.m. to 5 p.m. (Greenwich Mean Time)	English	\$1,500 USD	REGISTER
VIRTUAL COURSES					
Project Stakeholder Alignment Through Successful BEAM Implementation	March 23, 2022	10 a.m. to 1 p.m. (E. South America Time)	Spanish	\$300 USD	REGISTER
Project Stakeholder Alignment Through Successful BEAM Implementation	April 13, 2022	9 a.m. to 12 p.m. (E. South America Time)	Portuguese	\$300 USD	REGISTER
Capital Project Execution Excellence and Project Controls	April 19 & 21, 2022	9 a.m. to 11 a.m. (U.S. Eastern time)	English	\$400 USD	REGISTER
Project Management Best Practices*	April 25–29, 2022	10 a.m. to 1 p.m. (E. South America Time)	Spanish	\$1,200 USD	REGISTER
Gatekeeping for Capital Project Governance	May 3–5, 2022	9 a.m. to 11 a.m. (U.S. Eastern Time)	English	\$600 USD	REGISTER
Project Management Best Practices*	May 9–13, 2022	9 a.m. to 12 p.m. (E. South America Time)	Portuguese	\$1,200 USD	REGISTER
Best Practices for Site-Based Projects*	May 16–20, 2022	9 a.m. to 12 p.m. (U.S. Eastern Time)	English	\$1,200 USD	REGISTER

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

Contact us at ipainstitute@ipaglobal.com to discuss your training objectives.

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.

IPA Events and Presentations

Industry Benchmarking Consortium

March 22 to May 11, 2022
Virtual Meetings

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) Conference

June 2022
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 2022
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.

Upstream Industry Benchmarking Consortium (UIBC)

November 2022
Details to Be Announced

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