

# IPANewsletter

IPA

## Creating a Capital Project Evaluation Roadmap

The challenges of understanding and getting ahead of capital project risks are familiar to all project teams. For decades, Independent Project Analysis (IPA), Inc., has partnered with project teams in assessing and mitigating uncertainties threatening capital project effectiveness. In more recent years, IPA has developed robust capabilities rooted in quantitative analysis to address project risk earlier in the project development process. However, client project teams are unfamiliar with how and when IPA's capital project data and knowledge can be fed into the process. Now there is a way to get everyone on the same page.

Through a new approach, IPA works with clients to create an entire project engagement roadmap for individual projects from the start of the scope development/select phase of the work process (Front-End Loading [FEL] 2) all the way through project closeout. The roadmap sets out a series of workshops during which project leaders, together with a team of IPA analysts, sit down together to review delivery concepts, examine cost metrics and models, and identify gaps known to drive capital effectiveness deterioration. The workshops are held before the end of FEL 2. This gives project teams

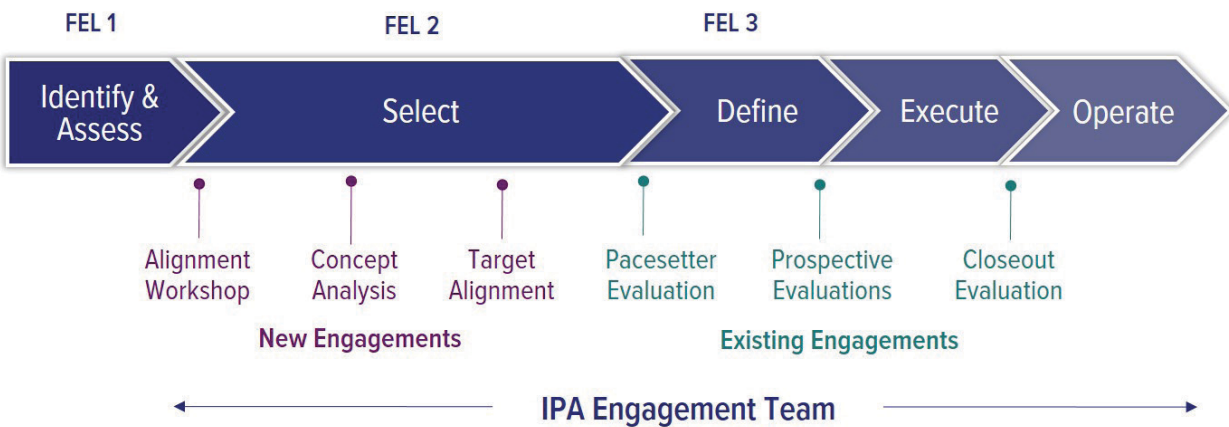


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**Independent Project Analysis, Inc.** is the preeminent organization for quantitative analysis of capital project effectiveness worldwide. At IPA, we identify Best Practices to drive successful project outcomes.  
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## IPA ENGAGEMENT MAP THROUGH FEL 2 TO PROJECT CLOSEOUT



enough time to resolve issues raised by IPA prior to the project's pacesetter evaluation. *Pacesetters* are used by many of IPA's clients to establish competitive targets on a project before it passes into the more costly FEL 3 *define* phase. Recent early engagement cost analyses conducted by IPA have identified capital cost reductions of up to 20 percent.

The standard project evaluation roadmap entails the following work sessions, but additional sessions may be appropriate based on a client's expectations:

**Alignment Workshop:** A short time after a project enters FEL 2, the project team and IPA analysts meet for a half-day to full-day workshop to discuss the alignment of the project's business and project team objectives, identify risks (and value adding opportunities if they exist), and develop an IPA engagement schedule. As stated earlier, a complete project engagement roadmap is produced from the outset so project leaders can plan accordingly.

**Concept Analysis:** The intent of a Concept Analysis workshop is for the IPA analysts and project team leaders to pore over the project data exclusive to IPA (thanks to its proprietary database of 20,000+ capital projects)

that can help the team compare and validate their concept and capacity choices for their project against industry norms. Such topics range from the best contracting strategies to the pros and cons of pursuing a new technology and the benefits and risks of design standardization and execution. This workshop is best done in the middle of FEL 2.

**Target Alignment:** Shortly after the project concept and scope are selected, a Target Alignment Workshop is scheduled to evaluate competitiveness and identify potential gaps, after controlling for the relevant technical, regional, and market characteristics. As part of this effort, the early cost and schedule targets are analyzed and benchmarked relative to similar concepts in Industry.

**IPA Engagement Teams:** Another important aspect of IPA's early engagement approach is establishing a standing team of IPA analysts assigned to the project. This *IPA engagement team* follows the project through its life cycle. Each team comprises a senior lead analyst and select IPA experts in functional areas, such as cost engineering and organizations and teams. The engagement team approach provides continuity in the analysis of projects,

which means the IPA engagement team members are already up to speed on any new developments. They also do not have to relearn the client's project system processes or familiarize themselves with the project business drivers.

Project risks manifest soon after the business hands over an opportunity to a project team. Project teams should be certain they have a strong support structure and dependable partner for following capital project delivery Best Practices. Through early engagement, IPA can be proactive in helping a company's capital project leadership mitigate risks known to weaken capital project development and execution performance.

To learn more about IPA's capital projects early engagement team approach, contact Jason Walker, Principal Deputy Director of Research for IPA, at [jwalker@ipaglobal.com](mailto:jwalker@ipaglobal.com).

—By Geoff Emeigh, *IPA Staff Writer*

# IPA Newsletter

Independent Project Analysis, Inc.  
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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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## IPA Taps Rolando Gächter to Lead Middle East Client Development

IPA has named Rolando Gächter as Director of Middle East Development, a new leadership position responsible for spearheading the development of deeper understanding of the capital projects environment in the Middle East and to support its clients in the region.



**Rolando Gächter**

Gächter has over two decades' of experience working with IPA clients worldwide to enhance the value generated from their capital project systems. Gächter has led many large-scale project

system and individual capital project evaluations for state-owned companies and independent operators in the Middle East. As the manager of IPA's E&P practice in Europe, the Middle East, and Africa (EMEA) for several years, Gächter possesses in-depth knowledge of the capital projects environment and the engineering, procurement, and contracting (EPC) issues facing owner-operators in the Middle East. Specializing in energy and minerals extraction projects, Gächter's experience extends to evaluations of more than 100 major capital projects worldwide in the oil and gas and mining sectors.

After serving as the main point of contact for IPA's E&P industry clients in the EMEA region from 2011 to 2015, Gächter moved on to lead IPA's Asia-Pacific operations, managing offices in Singapore and Melbourne, Australia. He returned to the EMEA region in late 2018.

Gächter assumes his new assignment as IPA's Middle East Director of Development immediately, based out of IPA's Reading, UK office.

"IPA is a long-established and trusted partner of many major owner companies in the Middle East," IPA Chief Operating Officer Elizabeth Sanborn said. "The appointment of Rolando to this position represents IPA's deepening commitment to capital project evaluation and research excellence in this important region."

Gächter said he looks forward to strengthening existing partnerships and creating new relationships between IPA and capital projects sponsors large and small. "Companies, in addition to recognizing the benefits of continually measuring capital project performance, are also more aware of the importance of strengthening their projects organizations and teams, and ensuring their site-based projects are using capital effectively," he said.



## How to Avoid Surprises in Capital Cost and Early Production Performance on North America LNG Projects

Motivated by abundant regional natural gas production that has altered the global energy landscape, independent energy companies and venture groups are rushing to enter the liquid natural gas (LNG) production and export business in North America. These entities are investing billions of dollars on complex megaprojects to design and construct LNG plants and export terminals across the region. The U.S. Energy Information Administration, in a January 2019 report, forecasts substantial LNG export growth in North America over the next 30 years.

Independent Project Analysis (IPA), Inc., has evaluated the development, execution, and production performance of dozens of LNG capital projects,

both in North America and globally. Notably, IPA's research shows that new LNG trains struggle to achieve planned production capacity for many months after startup. These early production shortfalls threaten a company's ability to meet near-term contractual commitments for LNG deliveries. The risk of missing early production targets may be under appreciated by fit-for-purpose entities formed to take advantage of the North America natural gas marketplace. By their nature, many of these energy independents lack mature project organizations and competencies of resources for delivering complex megaprojects. Even for major energy companies with established capital project systems, organizations, and teams, delivering a megaproject

like an LNG plant is fraught with risk. IPA finds that, globally, over 53 percent of LNG projects fail to meet business objectives.

Energy independents investing in North America are likely sponsoring a one-and-done project team for their LNG plant project. However, their project team still should be empowered to follow Best Practices that promote capital stewardship—i.e., capital effectiveness—during the development and execution of capital projects. Among these Best Practices are validating project cost estimates and staffing a functionally integrated project team. But such Best Practices are difficult to follow without guidance. For instance, like their industry peers, independents with their sights set on entering the North American LNG market need actual regional project cost data to validate cost estimates and provide lenders and other stakeholders a reliable project cost range. It is not uncommon for companies to rely on LNG plant and terminal construction

cost information provided by contractors with experience on past projects. This is not independent project cost information that owner companies should use to validate their own project estimates. Under certain contracting arrangements, conflicts of interest may arise.

#### **How IPA Can Help Improve LNG**

**Project Outcomes.** IPA provides capital project assessment and research services that independent energy groups can use to validate cost information and apply lessons learned from previous LNG projects to increase the likelihood that their new plant's LNG production ramp-up expectations are realized. IPA can also help leanly staffed groups identify functional expertise and staffing weaknesses that, if resolved, can increase project performance outcomes. Here are a few ways in which IPA can help.

**Cost Metric Validation**—contained in IPA's database of detailed cost

information from more than 20,000 capital projects are cost data from more than 50 LNG plants in North America and around the world. IPA possesses cost-capacity models, office and field labor productivity metrics, and other information that can be used to validate project costs and ensure contractor bids are appropriate.

**Readiness Reviews and Ramp-Up Observations**—one reason projects fail to achieve their operational performance targets, such as LNG plant production capacity targets, is the lack of production readiness. As previously mentioned, IPA has conducted research that shows problematic ramp-up profiles for greenfield LNG projects that should give investors pause. A Production Readiness Assessment provides company leaders and project leaders with critical project status insights. Effective implementation of production readiness practices can improve the transition to operations and maintain project value. IPA

can measure whether important production readiness practices have been completed before LNG trains are operational.

**Staffing Analysis**—without a project organization or project management organization to turn to for support, knowing whether the right number and mix of project professionals are on board to support effective project execution will be difficult. IPA has conducted team staffing assessments of LNG projects to ensure owner company personnel can effectively oversee contractor work during construction. Staffing benchmarks have also been created, allowing a company to compare its staffing arrangement with arrangements used on other similar LNG projects.

**The Race to Market.** As of late January 2019, construction had started on 5 of 10 LNG export terminals approved by the U.S. Federal Energy Regulatory Commission. The commission has received proposals from companies to build over a dozen more export terminals, almost exclusively along the U.S. Gulf Coast. Some of those proposals are expected to be approved in 2019. The field of LNG producers may soon get crowded. Independents owe it to their stakeholders to ensure their projects are on track to spend capital effectively and achieve LNG production targets to establish their position in the marketplace as fast as possible.

To learn more about how IPA can help owner companies investing in LNG plants and terminals in North America, please contact Phyllis Kulkarni, IPA's *Regional Director of North America*, at [pkulkarni@ipaglobal.com](mailto:pkulkarni@ipaglobal.com).



# Capital Project Industry Leaders Assemble in Northern Virginia for IBC 2019



Independent Project Analysis (IPA), Inc. hosted the **Industry Benchmarking Consortium (IBC)** 2019, March 18 to 21, in Leesburg, Virginia. The IBC is an annual gathering of the world's leading chemicals, refining, mining, pulp and paper, pharmaceuticals, consumer products, and infrastructure companies that spend tens and hundreds of millions of dollars on capital projects. Companies belonging to the IBC are dedicated to the continuous improvement of their capital project systems and, therefore, regularly benchmark many of their capital projects and site-based systems to measure their performance.

At each annual gathering, IBC member company delegates receive exclusive insights into how their company's capital project system and project outcomes stack up against industry peers concerning safety, cost, schedule, and operational performance. IBC member company representatives also attend breakout sessions; IPA analysts work with delegates to assess the strengths and weaknesses of their company's project system and map out a plan for improvement.

The following new research was presented at IBC 2019. An IBC steering committee provides input for most research topics.

**Where Has All the Value Gone? Re-examining Value Engineering:** This study takes an in-depth look at the practice of Value Engineering relative to its cousin practice, cost-cutting, to seek to understand the characteristics that drive value improvement. The study examines the components of a good Value Engineering exercise and offers criteria for rating Value Engineering exercises.

**Measuring Engineering Progress:** This study looks into the techniques and tools Industry uses to measure engineering progress as a component of the overall project controls strategy. The goal of this phase of the study is to provide a comprehensive summary of the available methods for measuring the engineering progress of capital projects based on actual data from industry projects and project systems.

**The Efficacy of Unusual Contracting Approaches:** Prior IPA studies have examined the effectiveness of the primary strategies owners employ to contract for

engineering, procurement, and construction (EPC) services: EPC lump-sum, EPC-reimbursable, EPCm (engineering, procurement and construction management), and various mixed strategies. In this study, we examine some forms of contracting that are not used frequently, including functional specification competitions and not-to-exceed contracts, to understand whether we are missing something useful and important.

**Is There a Business Case for Project Data in the Process Industries?:** There is no doubt that the capability to gather, clean, store, and access project data will be a competitive advantage for Industry moving forward. This IBC study is a collection of interviews with IBC member companies that includes the successes and difficulties encountered when trying to centralize data produced by projects.

**Assessing Your Site's Health: Perception Is Reality:** Over the last 5 years, IPA has collected data from site personnel about their perceptions of site processes, project development, and culture and behaviors. Insights from the surveys have been useful to augment the results of site benchmarking assessments by validating findings of the assessment and by helping to identify underlying issues that may have gone otherwise undetected. This study seeks to further investigate the importance of the perceptions of site personnel as they relate to site performance and means of better diagnosing and prioritizing site improvement opportunities.

The site perceptions study was featured on the final day of the IBC. The final day is traditionally dedicated to all things relating to site-based capital projects. Site-based project metrics and company performance outcomes are reviewed. IBC member companies' interest in site-based and sustaining projects has increased over the last several years as these capital projects consume larger portions of annual capital expenditures.

For more information about IBC, please contact *IPA Consortia Membership Director* Andrew Griffith at [agriffith@ipaglobal.com](mailto:agriffith@ipaglobal.com).

# Call for Participants: Cost and Schedule Benchmarks for Renewable Energy Projects

Independent power producers (IPPs) achieve their expected profit by building assets on-time and on-budget with the expected level of operating costs. They can improve their profits by building those assets cheaper and faster.

Recently, IPPs have turned to IPA for an unvarnished examination of current cost and schedule competitiveness of renewable energy projects. These companies and IPA invite other developers of renewable projects to join a multi-client study that, upon completion, will provide performance benchmarks for wind and solar power generation projects. Specifically, IPA will use data from completed projects provided directly from developers to provide cost and schedule benchmarks for onshore wind, offshore wind, and photovoltaic solar projects. The results of this study will allow participants to understand how competitive their investments are relative to other industry players and will provide insights into how to improve performance.

By participating, companies receive individualized reports including the following renewable energy capital project information: cost benchmarks (\$/MW) compared with Industry and Class A performance (Figure 1); cost component benchmarks for equipment, installation, and the rest of the plant; cost benchmarks by region; schedule duration benchmarks, measured from tender to power steady state (Figure 2).

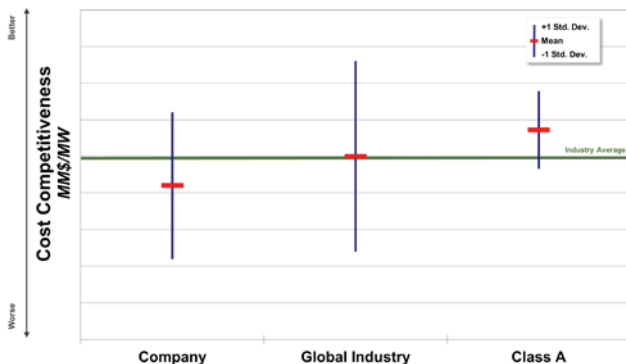
Many companies, including large integrated energy companies, are diversifying their power generation portfolios, recognizing the demand for and benefits of delivering clean energy. However, the dearth of reliable renewable energy project data complicates capital investment authorization decision-making. Developers



should not be in the dark about renewable energy project cost and schedule competitiveness. The results of this study will allow participants to understand current trends in performance and the relative competitiveness of their investments.

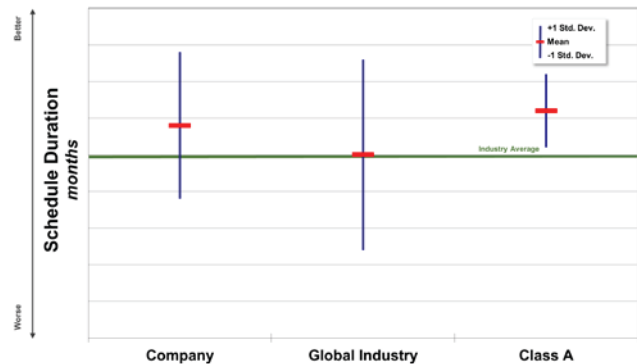
It is IPA's unique competence to gather, normalize, and analyze capital project data and provide senior executives the data-based insights necessary to maximize returns from capital projects. This competence has been demonstrated over the past 30 years to Fortune 500 oil and gas, refining, chemicals, life sciences, mining, and infrastructure clients. We collect, clean, normalize, and analyze data provided directly from owner clients to provide accurate and meaningful insight into capital effectiveness. This study seeks to employ our expertise on this segment of industrial projects.

For more information, contact Alireza Amyari, *IPA Advanced Associate Project Analyst*, at [aamyari@ipaglobal.com](mailto:aamyari@ipaglobal.com).



\*Total installed cost based on common definition normalized for time and location

**Figure 1:** Cost Benchmarks  
Cost\* per Megawatt (\$/MW)



**Figure 2:** Schedule Benchmarks for Typical Project  
Duration from Tender to Power Steady State



## New IPA Institute Course: **Best Practices for Short-Cycle & Sustaining Projects in the Energy and E&P Sectors**

Smaller projects are now a critical part of energy and exploration and production (E&P) company portfolios for cash flow management. Traditional long-horizon oil and gas investments in new assets are facing increasing competition from these smaller projects, often short-cycle and sustaining capital investments in existing assets. Investments in renewables, short-cycle, and green capital projects also are alternatives to major *long-horizon* investments.

Although short-cycle and sustaining capital projects are not new to the sector, they have historically been neglected at the expense of major projects. IPA research has linked inconsistent practices and weak management support to significant overspend and delays on short-cycle and sustaining capital projects. With oil prices remaining low, the affordability of delivering new assets and maintaining existing assets will be vital for companies to thrive in the new energy market landscape. Several firms are now putting increased focus on short-cycle and sustaining capital portfolios to improve their performance.

The IPA Institute has put together a 2-day course to maximize the performance of short-cycle and sustaining capital investments. The course explores the pillars of short-cycle and sustaining capital projects, portfolios, and

organizational delivery, including the current state and Best Practices for handling: (1) asset and business planning, (2) project and portfolio categorization, (3) work process, (4) organization, and (5) tools.

This course is designed for asset/investment portfolio leaders, business functions who oversee sustaining capital portfolios, project leaders, and business/finance analysts and controls professionals working on oil and gas sustaining capital projects, unconventional, shale short-cycle projects, and renewables.

### **Why the IPA Institute?**

The IPA Institute is the training and education division of IPA, the world's leading advisory firm on capital projects. IPA Institute 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.

For more information, please contact Andrew Griffith, *Director, Consortia Membership and the IPA Institute*, at [agriffith@ipaglobal.com](mailto:agriffith@ipaglobal.com).



# Call for Participants: Airport Capital Project Best Practices and Performance Trends

Airports around the world spend tremendous amounts of capital on improvement projects. These projects range from small passenger terminal site upgrades to megaprojects, like the construction of new runways that can run well over \$1 billion. However, the competitiveness of the capital spent on airport projects is relatively unknown.

According to an October 2018 International Air Transport Association report, it is estimated that about \$1.5 trillion will be spent globally on airport infrastructure by 2030. As a result, there is growing interest on the part of airport owners and operators with complex capital project portfolios to understand how their capital project delivery systems compare with one another in terms of cost and schedule outcomes.

In September 2018, Independent Project Analysis (IPA) hosted the inaugural Airport Project Benchmarking and Research Forum. Representatives of eight airports and airport groups met to discuss how to measure airport performance and improve capital projects. A decision was made at the end of the consortium to launch a multi-client study to determine what practices drive successful airport projects. As such, IPA and the consortium are extending an invitation to participate in the study to airport groups that were not part of the inaugural consortium.

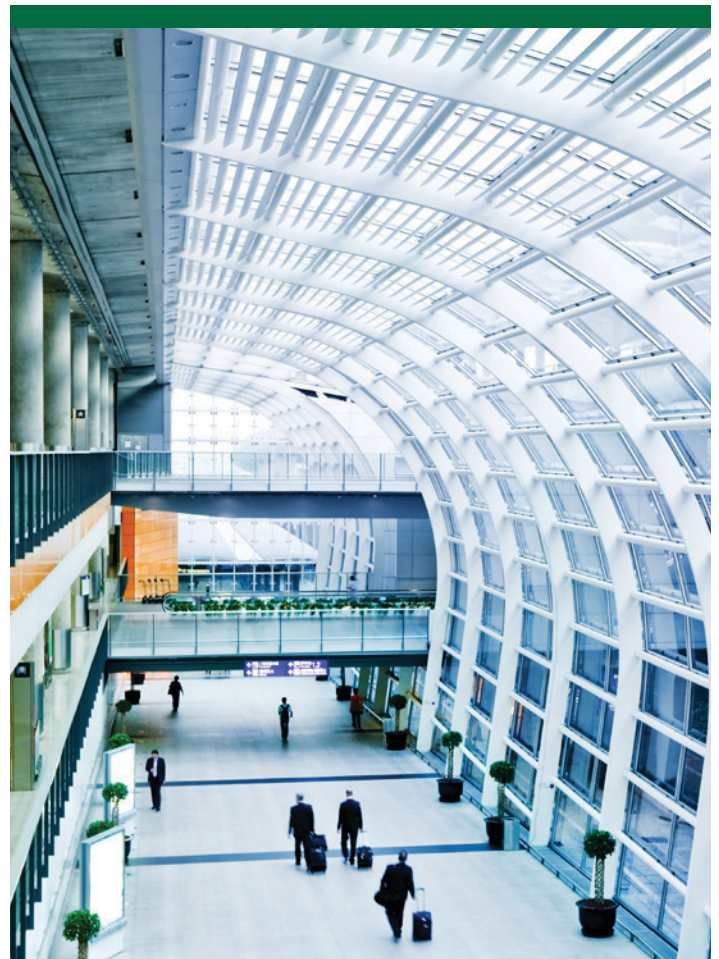
Study participants are required to provide data on 10 or more recently completed projects at their respective airports. The intended airport project scope categories include runways, car parks, baggage systems, and concession refurbishments. Via the collection of the project cost, schedule, and practice data, airport industry leaders will gain increased visibility into the competitiveness of their airport capital investments. Specifically, the study aims to:

- Develop scope-specific models to provide cost and schedule outcome metrics (i.e., predictability and competitive performance) for the Airport Industry
- Measure project practices, comprising the planning and execution activities that mitigate risks and promote consistent and competitive outcomes
- Identify the key measurable components specific to an airport project definition phase that can be linked to project success

- Determine the unique characteristics of airport project organizations
- Measure construction productivity differences between airports and other construction projects

The deliverable from this study is a report that summarizes the Airport Industry's overall state in terms of cost and schedule performance and project success drivers. This will serve as the starting point for measuring airport industry performance over time. All data will be reported at an aggregated level to describe the current state of the industry.

For more information, please contact Melissa Matthews, *IPA Airport Capital Improvement Manager*, at [mmatthews@ipaglobal.com](mailto:mmatthews@ipaglobal.com).





## IPA Analysts, Industry Scholar Address Need for Chinese SOE Post-Project Appraisals in Published Journal Article

A new journal article lays out how China's commercial-oriented state-owned enterprises (SOEs) can improve the effectiveness of their capital investments.

In the January-April 2019 issue of *The Journal of Modern Project Management*, IPA's Senior Consultant Christina K. Yip, Advanced Associate Analyst Pei Hsing Seow, and Swinburne University of Technology's Industry Fellow William Young write that Chinese government reforms are forcing Chinese SOE managers to pay greater attention to capital investment efficiency and competitiveness. According to the authors, "An essential approach to improving capital competitiveness is capturing learnings from capital investments to feed back into the project system. This forms the basis of continuous improvement, to enhance the system's capability in asset creation and management."

The tried-and-true practice of conducting lessons learned evaluations would go a long way toward strengthening the cost and schedule competitiveness of future projects, achieving the aims of the Chinese government reforms. But corporate framework and culture obstacles stand in the way of managers wanting their SOEs to benefit

from retrospective reviews. Such reviews are not new to projects in China. In fact, they have been used before to evaluate national projects. "However, to date, Chinese SOEs do not appear to have actually gained benefits from lessons learned evaluations. Capital projects executed by Chinese SOEs are less predictable, incurring significant cost and schedule overruns compared to global industry competitors," the article says.

The authors outline how Chinese SOE managers can leverage post-project appraisals to promote capital investment competitiveness. They go on to say: "If Chinese SOE managers are to improve, then they need to be supported by their leaders in developing a new business culture recognizing that change and improvement can actually occur without destroying or even eroding harmony, or other aspects of Chinese culture. In fact, thoughtfully implementing such improvement measures can align with Chinese cultural values."

The article, "Post-Project Appraisals to Improve Capital Investment Performance of Chinese State-Owned Enterprises," is available for purchase at: <https://www.journalmodernpm.com/>

## PUBLIC COURSES

Visit [www.ipaglobal.com/events](http://www.ipaglobal.com/events) to view details and register

### APRIL

9-11 Complex Projects: Concepts, Strategies, and Practices for Success  
*Houston, Texas*

### MAY

8-9 Project Management Best Practices  
*São Paulo, Brazil*

14-15 Best Practices for Site-Based Projects  
*Perth, Australia*

### JUNE

4-5 Project Management Best Practices  
*Seattle, Washington*

25-26 Best Practices for Site-Based Projects  
*Frankfurt, Germany*

26-27 Project Management Best Practices  
*Lima, Peru*

### AUGUST

21-22 Best Practices for Site-Based Projects  
*Salvador, Brazil*

### SEPTEMBER

17-18 Project Management Best Practices  
*Arlington, Virginia*

24-25 Best Practices for Site-Based Projects  
*The Hague, Netherlands*

25-26 Project Management, Cost Estimating, Planning, and Controls Best Practices  
*Rio de Janeiro, Brazil*

### OCTOBER

8-9 Best Practices for Site-Based Projects  
*New Orleans, Louisiana*

8-9 Complex Projects: Concepts, Strategies, and Practices for Success  
*Perth, Australia*

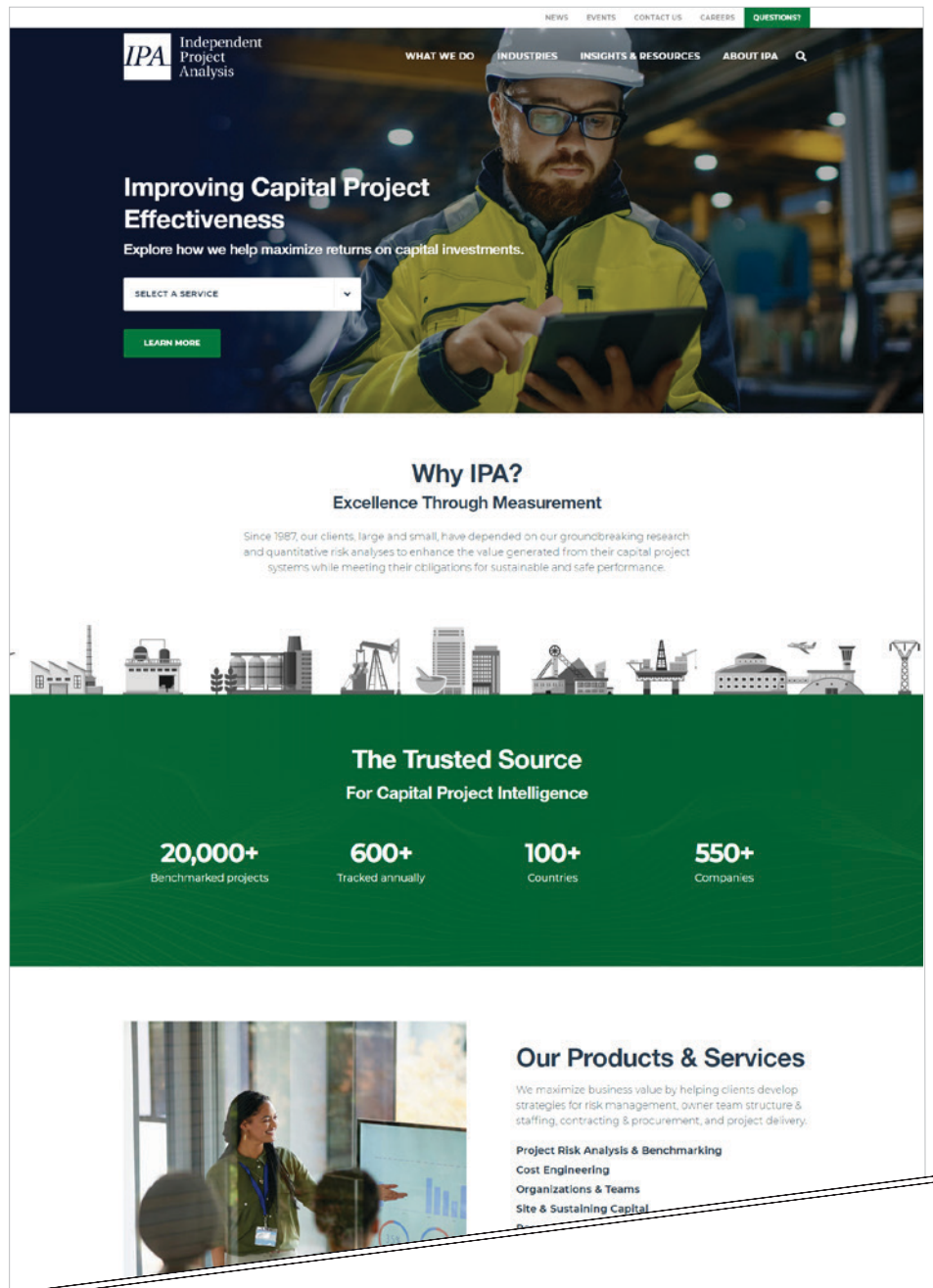
22-23 Gatekeeping for Capital Project Governance  
*Shanghai, China*

### NOVEMBER

12-13 Practices for Site-Based Projects  
*Santiago, Chile*

# IPA Launches Revamped Website

IPA is excited to announce a newly redesigned company website! Officially launched in February 2019, the new site delivers vast improvements in both design and navigation. The Insights & Resources page is a key addition to the navigation experience. This centralized hub of information makes it easy for visitors to find IPA research highlights, events, announcements, newsletters, webinars, and more. Additionally, contact forms are prevalent throughout the site, making it easier to connect with IPA to discuss your project and/or project system needs. Have you visited the new IPA website yet? Check it out at [www.ipaglobal.com](http://www.ipaglobal.com)!



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# IPA Events and Presentations

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## COAA Best Practices Conference

May 7-8, 2019  
Edmonton, Canada

Phyllis Kulkarni, IPA's Director, North America, will address attendees at the Construction Owners Association of Alberta (COAA) 2019 Best Practices Conference. Project safety, productivity, and the increasing influence of digitization are among the conference's major themes.

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## OPTIMIZE 2019 Conference

May 14-15, 2019  
Houston, Texas

Edward Merrow, IPA's President and CEO, will be speaking at AspenTech's OPTIMIZE 2019 conference. The event focuses on approaches to harnessing "the combined power of artificial intelligence, machine learning, and advanced analytics within leading-edge asset optimization software" to optimize asset performance in complex industrial environments. Merrow will give a talk at a breakout session about project risk as part of a track about "Risk Identification, Quantification, and Reduction." He will also participate in a panel discussion on the future of capital project estimating and how digitalization will lower risk and improve estimates.

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## Upstream Cost Engineering Committee (UCEC)

June 13, 2019  
The Woodlands, Texas

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

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## Risk and Uncertainty Forum

June 18-19, 2019  
Aberdeen City, United Kingdom

Neeraj Nandurikar, IPA's Director, Energy Practice, will serve as the co-chair of AAPG's Risk and Uncertainty Forum. This forum aims to bring together industry professionals, academics, and independent researchers to discuss benchmarking and improving industry's approach to risk and uncertainties in exploration, appraisal, development, and production. The format of the forum is designed to provide an interactive and integrated learning and sharing environment.

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## Cost Engineering Committee (CEC)

September 24-25, 2019  
McLean, Virginia

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 IBC Director Andrew Griffith at [agriffith@ipaglobal.com](mailto:agriffith@ipaglobal.com) for more information.

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## Upstream Industry Benchmarking Consortium (UIBC)

November 18-20, 2019  
Lansdowne, Virginia

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.

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