Powering the future
EY capital and infrastructure services for power and utilities organizations
The pressure to perform

Overspending and delays threaten performance

Investment in the power sector will be more than US$7.2t — including investment on construction and the decommissioning of assets up to 2025 — encompassing nuclear, conventional and renewable generation, transmission and distribution.

This massive and urgent requirement for new infrastructure has been created by a “perfect storm” of factors including:

1. Environmental challenges: countries need to diversify their energy mix with low carbon technologies, the share of which is forecast to rise from 30% in 2014 to 46% by 2040.1
2. Population growth: the global population is forecast to grow to 9.2 billion by 2040,3 mostly in non-OECD countries where an increasing, aspirational middle class is pushing up energy demand.
3. World GDP growth: GDP (in real terms) is forecast to grow to US$136.7t in 2040, an increase of 83% from 2015,5 the pace, we have seen a strong link between GDP growth and electricity demand.

Infrastructure is vital to support the economies, communities and prosperity of the future, with serious consequences for world economic development should it fail to be developed.

But large capital projects are increasingly challenging because of their size, scope and unprecedented complexity. Many of them are failing to fulfil their potential due to problems in financing, delivering the assets and managing them over the longer term to drive the return on investment.

Deliverability is therefore being challenged as new assets are built and operated, with projects requiring new capabilities that did not exist in a pre-digital era. Projects are also being executed at a time of reduced access to capital and increased need for transparency around risks.

There is an urgent need for a fresh approach to secure the success of tomorrow’s infrastructure. Power and utility organizations need smarter financing strategies, a holistic view of control and risk, and a joined-up approach to data and digital technology — along with better collaboration, significant cultural shifts and the ability to import lessons from other industries.

There is a pressing need to develop strategies to mitigate the issues identified and to address the underlying root causes. Organizations need to improve their ability to drive the best return on investment, while also handling significant risks.

Financeability

Organizations struggle to structure financial and commercial deals, achieve an investment-grade credit rating and secure investment on acceptable terms.

Deliverability

An EY benchmark study of the world’s power and utility infrastructure “megaprojects” reveals they are, on average, delivered 35% over budget and two years behind schedule, which erodes the business case.

Asset management

Infrastructure businesses often have poor asset information leading to suboptimal asset maintenance, operations and lost value.

Underpinning these visible issues are a number of significant causes. The infrastructure iceberg illustrates the complex mix of internal factors that combine to create tough challenges for many infrastructure projects.

5Spotlight on power and utility megaprojects — formulas for success, DT, 2016.
6EY analysis, 2016.
Key questions for your business

While every infrastructure project is unique, the goals remain the same: finishing safely, on time, on budget, and running the asset to achieve planned returns. Here are five key questions that decision-makers should be asking to give the best chance of achieving these goals as they plan, analyze, execute and operate utility assets.

1. How can we be confident that our project sponsors have fully identified risks to the business case and project viability?

   - With tough competition for scarce investment resources, projects that are seen to have lower costs and shorter construction periods may well look more attractive than costlier alternatives. This can lead project sponsors to produce dangerously inaccurate estimates. To avoid this, make sure you are applying leading practices:
     - Are sponsors incentivized on the final delivery outcome of the project—not just on the financial investment decision (FID)?
     - Are you confident that you have a reliable method to confirm cost and performance for each level of the project team?
     - Can you be sure the approach to your project is aligned, consistent and in line with P&U industry governance team?
     - Do you know what “good” looks like?
     - Do you have a formal process to capture and share valuable lessons?
     - When it comes to leading practice in the sector, do you know what “good” looks like?
   - Your project is more likely to avoid overruns and stay on course if you invest time and effort in building the foundations of delivery structure in the pre-FID stage. But, for many reasons, P&U organizations don’t always do this. Are you confident that you have:
     - A fully tested execution plan, encompassing all capabilities needed for successful delivery?
     - A mature design, limiting risk of late changes?
     - Collaborative design platforms to support design integrity, constructability and efficiency in operations?
     - A comprehensive delivery and contracting strategy?
     - Early investment in strong project leadership and skills necessary for delivery?
     - Do you have good current awareness of lessons from infrastructure projects outside P&U?

2. How can we make sufficient upfront investment to limit common problems that cause time and budget overruns?

   - Optimism bias and inadequate risk assessment can cause big problems across the asset life cycle. However, recent advances in digital technology can enable P&U organizations to create a centrally connected, aggregated reporting system that forecasts performance for each level of the project team.
     - A digitized, connected, aggregated reporting system across all project performance areas that forecasts performance for each level of the project team?
     - Required reporting of all CPIs across all contracts, with remedies for non-performance?
     - Collaborative data gathering tools that collect data in real time, dashboard reporting to turn this into insight visible to the entire project governance team?

3. How do we confirm all critical performance indicators (CPIs) are visible throughout project reporting?

   - Organizations are often good at capturing operational lessons, where it is relatively straightforward to learn from one year to the next. But the learning cycle around large capital projects can be a decade or more—individuals may only ever work on one large project in their lifetime, and it is unlikely that one person will see the whole process. Is your organization set up to learn the most important lessons and pass down knowledge from one project to another?
   - Do you have a formal process to capture and share valuable lessons?

4. How can we be sure that the business case is sufficiently robust—not just to get through FID, but to deliver on time and on budget?

   - Most projects frequently operate in organizational silos, which obstructs effective integration and can cause big problems across the asset life cycle. However, recent advances in digital technology can enable P&U organizations to create a centrally available, virtual digital model of the asset around which the whole team can collaborate. Does your project have:
     - A fully tested execution plan, encompassing all capabilities needed for successful delivery?
     - A comprehensive delivery and contracting strategy?
     - Early investment in strong project leadership and skills necessary for delivery?
     - Do you have sufficient upfront investment to limit common problems that cause time and budget overruns?
     - Do you have good current awareness of lessons from infrastructure projects outside P&U?

5. How can we apply key lessons from other successful complex projects?

   - Your project has:
     - A fully tested execution plan, encompassing all capabilities needed for successful delivery?
     - A comprehensive delivery and contracting strategy?
     - Early investment in strong project leadership and skills necessary for delivery?
     - Do you have good current awareness of lessons from infrastructure projects outside P&U?
Here’s where EY can help

To secure the best financing arrangements and deliver projects in line with the business case, it is vital to invest more in developing and aligning the foundations of delivery structure in the early phase of the project, when most of the cost drivers are being determined.

Drawing on our deep sector experience, industry-leading methodologies and insight, we can help you to develop the right strategic approach, raise funding, control projects, manage quality and risk, enhance efficiency and accountability and build data management and digital capabilities.

Here’s how.

EY P&U asset life cycle

Policy and regulation

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EY has experience helping P&U organizations across the entire asset life cycle. Our unique data-rich and risk-informed process can help clients develop, procure, finance, construct, commission, operate, maintain and decommission assets to maximum value.

EY’s decision-support tools are at the heart of how we can help P&U organizations. They all focus on providing actionable, timely insight for decision-making, and are geared to appropriately structuring projects, and helping them deliver on budget, on time and ultimately deliver improved returns.

EY can add significant value to power and utility infrastructure projects across all key stages of the asset life cycle:

- Concept and pre-feasibility
- Development and planning
- Design, procure and set up
- Construct and commission
- Operate and maintain
- Decommission and exit
EY supports the complete infrastructure life cycle

**Issue**
- Insufficient understanding of governing regulations, policy, national strategy and market conditions leads to inadequate assessment of project feasibility and risk.
- Response
  - Rapid assessment of project options
  - Stakeholder agreement and understanding around project goals and defined outcomes
  - Thorough investigation of factors influencing the business case
  - In-depth assessment of regional and country regulation and policy
  - In-depth benchmarking, market studies, project modeling and scenario planning
- Outcome
  - Selection of the top option. Clients are either enabled to mandate a project with greater certainty or stop working on a project if not viable.
  - Projects are both financeable and deliverable, attracting investors on better terms. Alternatively, organization stops working on the project if not viable.
- Examples
  - Provided impact study in the Middle East to assess viability of a new technology power project
  - Developed detailed and enabling strategic decision advising for a power project in the Middle East
  - Reviewed detailed project and approach for a PJM infrastructure project in the US, resulting in investment credit rating
  - Assessed project success leading to changes pre-build, confirm against risk profile and better infrastructure credit rating
  - Strategic advice for new nuclear build, providing organizational structure and integrated management systems
  - Supported power generation client in the US by providing a cross sector approach
  - Assessed project success leading to changes pre-build, confirm against risk profile and better infrastructure credit rating

**Concept and pre-feasibility**
- Projects are developed because they are not structured with the target investor market in mind from the outset.

**Feasibility and planning**
- Insufficient insight into the design phase and delivery strategy before P3O looks to delays in the arscene of range and design changes, delay and cost increases of the delivery phase.

**Design, procure and set up**
- Insufficient insight into the design phase and delivery strategy before P3O looks to delays in the arscene of range and design changes, delay and cost increases of the delivery phase.
- Fast-track project management needs to ensure that quality issues are addressed in the design and planning phase.

**Construction and commission**
- Projects have independent and actionable and timely insight into performance and interventions where required.

**Operate and maintain**
- Improved allocation of capital and operating expenditure, delivering a greater ROCE while balancing risk and performance levels.

**Decommission and exit**
- Decommissioning strategy and executive plans are optimally structured.

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- Decommissioning strategy and executive plans are optimally structured.
Capital and infrastructure:
Infrastructure builds economies, communities and prosperity. EY is committed to supporting the P&U industry in building a better working world.

The global EY network has over 4,000 power and utilities professionals across 180 countries. We mobilize our teams fast, allocating them to projects in the right place, at the right time, without delay. For more information on how we can help you, talk to your regular EY contact or get in touch with one of our capital and infrastructure contacts.

A new energy world requires a new approach to major energy infrastructure programs. EY uses the power of information, insight and innovation to overcome existing and emerging challenges around securing financing for these projects, assisting in on-time and on-budget delivery and help managing assets to provide returns on investment. EY global teams draw upon deep sector experience and industry-leading methodologies to support you throughout the asset life cycle and help your project succeed.

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In a world of uncertainty, changing regulatory frameworks and environmental challenges, utility companies need to maintain a secure and reliable supply, while anticipating change and reacting to it quickly. EY's Global Power & Utilities Sector brings together a worldwide team of professionals to help you succeed – a team with deep technical experience in providing assurance, tax, transaction and advisory services. The Sector team works to anticipate market trends, identify their implications and develop points of view on relevant sector issues. Ultimately, this team enables us to help you meet your goals and compete more effectively.

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