Project efficiency in oil and gas
Several factors are impacting the current and future expectations for capital projects in oil and gas:

- **Low oil price** – Brent price averaging between $30 and $50/bbl, down from the $115 mark in mid-2014. The long-term fundamentals of the industry and the emergence of shale suggests price volatility will continue for some time and is unlikely to return to previous highs.

- **Projects on hold** – CAPEX reductions of $235bn relative to pre-crash levels due to commercial unviability at current oil price (Wood Mackenzie), and significant projects stalled in development pipelines either awaiting final investment decision (FID) or deferred.

- **Demand for improvements** in delivery performance as a result of continued project cost and schedule overruns (average cost overrun of 59%).

Perception of inefficiency across the industry – there has been a significant decline in performance relative to other industries both in ways of working and standardization of components (55% decrease in productivity in North Sea).
What does this mean for the delivery of large capital projects?

Why does any of this matter

An industry conundrum — Many of the projects the industry plans to build, or is already building, cost too much to be commercially viable unless oil prices rise considerably. At the same time, the market and investors expect oil companies to grow, or at least maintain production levels meaning that, regardless of oil price, new projects will need to continue to be built.

As a result, projects need to be far more successful at meeting budget and schedule targets; budgets which will likely be significantly lower than prior to the oil price crash, but in many cases with the same teams and technology available for project development and execution.

Oil price challenges increase protectionism and reduce cooperation — Oil price volatility has increased the pressure on project teams trying to deliver to budget. Concurrently these teams have increased pressure on already strained relationships with their supplier base and particularly the EPCs. This pressure combined with a long history of poor project performance continues to erode trust and (as a result of extreme market pressure) has resulted in increasingly adversarial relationships between operators and EPCs. In these circumstances, efficiency opportunities are rarely surfaced by the EPC for fear of scope reduction (and the resultant loss in profits).

Incentives to be inefficient — Compounding this, the very nature of many EPC contracts (particularly cost reimbursable agreements) unintentionally incentivise inefficiency and proliferation of manhours. EPCs are now struggling to balance the need to maintain profit margins, compete with new market entrants and maintain and build client relationships.

The challenge and options — Oil companies will need to either shrink production as projects are decommissioned and not replaced, or (more preferably for shareholders and global supply) find a way to execute their project development pipeline for significantly lower cost.

The good news — There is room for efficiency to be driven into the industry. In fact, research suggests that the industry has declined in efficiency by 55%, while other industries have increased in efficiency by more than 50%. This decline in efficiency coincided with the rising oil price and is linked to increased complexity and decreased standardization; 134% more company specifications; 394% growth in LCI-related work; 168% increase in safety man-hours.
Where does inefficiency exist on projects?

1. **Rework**
   - Redesign, replanning, recheck, remeasure, recalibrate, etc., not utilizing existing standards or reinventing the wheel

2. **Waiting**
   - For data, decisions, approvals, test results, signature, etc. waiting for resources to become available, waiting for others to complete tasks

3. **Overprocessing**
   - Too much detail too early, overload of information, cc and bcc mails, detailed meetings, overengineering

4. **Transportation and handovers**
   - Handover of tasks, documents, jobs, projects etc., between departments, companies, persons etc.

5. **Overproduction**
   - Delivering features that are not really needed, unnecessary drawings, documentation not needed

6. **Movement**
   - Poor office space, disturbances, many managers, delays, last-minute work, looking for information, resources etc.

7. **Inventory**
   - Incomplete tasks, backlog requiring coordination, prioritization, planning etc., excess documentation, unimportant information
Most of the efficiency opportunities we see on projects relate to what people do and the way work is completed across the project organization.

Inefficiencies and waste manifest themselves throughout the capital project and operational life of contracts – leading to an overall value erosion.

People and parties tend to interpret things differently, e.g., how to drive a process or follow up on contractual terms – always in their own favor.

Lack of collaboration leads to inefficient handovers and disputes.

Suppliers tend to add a margin when estimating the resources needed for a task, leading to higher estimated costs than what can actually be obtained.

### Consequences of project inefficiencies

<table>
<thead>
<tr>
<th>Causes of project inefficiency</th>
<th>Knowledge gap</th>
<th>Lack of modularization and reuse</th>
<th>Focus on resource rather than process system optimization</th>
<th>Many handovers and long loopbacks</th>
<th>Lack of common view and synchronization</th>
<th>Lack of short interval control</th>
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<td>Not investing enough upfront in studies and leveraging lessons learned</td>
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<td>Making decisions based on wishful thinking and assumptions</td>
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<td>Lack of common incentives, collaboration, discipline, overview and synchronization across vendors, work packs and teams in the project</td>
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<td>Too large milestones combined with intangible and invisible milestones</td>
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<td>No short interval control of real progress and risks, assumptions, issues and dependencies at team level</td>
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<td>Drives loops, rework and overproduction</td>
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Where to target efficiency initiatives?

Inefficiency covers the full workings of most projects, but can be classified under three areas of scope and control.

- Internal operator organizational processes – Siloed working, duplication of effort throughout design process (multiple, almost identical drawings), inability to stop design and development process despite inevitable change coming, meaning that time is wasted.
- Operator directed EPC activities – Complex, nonstandard specifications, lack of capability delaying sign-off, poor definition of scope (and insufficient capability) leads to late changes, drive to reduce costs (with little strategy) actually increases complexity and time spent (cost increases).
- Internal EPC organisational processes – Equivalent inefficiency as in operator organization.

However, while the improvement opportunity spans all three areas (and despite the relative influence of EPC performance on project success and costs), most improvement efforts we see in the market are targeted at process improvement within operator organisations, a relatively small influence on total project cost.

This means that the opportunity to collaboratively improve EPC (and through them, overall project) performance and reduce cost is frequently overlooked and, therefore, the majority of the total process efficiency opportunity goes unchallenged and unrealized.
How to engage the “total” project organization to drive out inefficiency?

To realize the full range of improvement opportunities clients must engage with the key project stakeholders (EPC and major suppliers) outside of their own project organization to not only seek binary headcount reductions, but also to identify longer term process improvement opportunities.

Critical in this engagement is an effort to improve existing relationships between the operator and EPCs (so that trust is developed and a true “one team” mentality is garnered) and to overcome the negative effect of the current contract mechanisms (in driving inefficiency), by incentivising EPCs to seek out and adopt efficiency opportunities — despite potential reductions in man-hours.

Equally, there is a need for operator teams to recognize the impact of their behavior (in sometimes excessive management of the EPC; man marking; initiating late changes; delaying contractor decisions and adding in additional process and QA steps) on EPC efficiency, man-hours and therefore project cost.

In initiating process improvement initiatives across operator and EPC relationship it is important to recognize the default position of each party, the ingrained mistrust and scepticism which exists, but also the mechanism by which each party can be incentivised:

- Default operator Position – Need to deliver project to schedule and budgetary targets. Incentive to change: Project cost reduction.
- Default EPC Position – Maintain (what are relatively slim) total profits. Incentive to change: Maintain or increase total profit and profit margin, increase competitive position relative to peers and new market entrants.
What does the (more efficient) future look like?

A workable approach with huge potential impact

In any situation where you have two parties under pressure, with much to lose and a strained relationship, an unbiased, honest and educated intermediary can be key to maintaining or improving the relationship. Similarly here, a workable model to identify and eliminate inefficiency is to have an independent third party positioned between client and contractor operating as an intermediary, working with both parties to identify, quantify, implement and verify savings opportunities ... before administering the sharing of realized savings between both parties along pre-agreed terms.

EY has experience of operating on behalf of the operator, the EPC, or both to identify, verify and implement efficiency opportunities using our extensive Performance Improvement experience. However, approaching efficiency opportunities in an isolated context, for one party rather than the project as a whole, will not realize the full potential of efficiency savings.

Instead, the area EY’s expertise and independent position is best applied is in the interaction (between EPC and operator) and the internal systems of the EPC on the project – helping them increase efficiency and reduce contract size, whilst maintaining overall profits.
**Realized benefits**

**Shared benefit between client and contractor**
The value of savings are visible and valuable to both sides, meaning both are incentivised to drive efficiency.

**Trust in value of savings**
Both parties can trust in the value of savings due to strict and transparent governance and approvals process.

**Self-funding**
The cost of the third party could be funded through project savings, potentially, with sufficient Due Diligence, partially as risk reward.

**Opportunity to progress projects currently on hold**
Alongside other initiatives, the efficiency savings generated here could accelerate the development of some projects currently on hold.

**Competitive advantage**
EPC’s able to demonstrate an ability to make these savings, or to work alongside a third party to drive inefficiency out of projects could rapidly become a competitive advantage.

**Better working relationships**
The model and the transparency it provides helps enhance the working relationship between client and contractor.

**Project teams retain focus**
Third party responsible for driving savings meaning that project teams (whilst involved in the initiative) can focus their time on project development and execution.
To make sure continued value is retained long after we’ve gone, we embed the following principles into our projects to align key stakeholders and empower project teams to drive efficiency.

1. Define a clear improvement agenda
   - Align stakeholders on how we work with improvement in the project
   - Target what matters in the current phase — address and solve key issues and risks
   - Build upon existing initiatives

2. Empower project management
   - Integrate teams
   - Strengthen visual management
   - Strengthen stakeholder engagement
   - Confirm structured identification and prioritization of issues and risks

3. Support teams to solve their issues
   - Remove roadblocks up front
   - Tackle issues across different organizations
   - Run structured A3 processes to solve root causes

4. Capture results and spread knowledge
   - Drive a relentless focus on benefit realization
   - Confirm a structured involvement of base organization to capture learnings across projects
Better outcomes

Efficiency gains

On capital project process improvement initiatives we have seen +40% improvements in efficiency and reduced cost (reduced development time on drawings, increased on time delivery, reduced backlog hours etc.).

Greater impact

However, if implemented across an entire project (including the EPC organization) collectively these initiatives could have a significantly larger impact, both in terms of cost, but also schedule and working relationship between the operators and the EPC’s, ultimately leading to stronger, more consistent project delivery performance.

Increased collaboration

Investment in and prioritization of these initiatives is gradually increasing in prevalence across the industry, with a growing recognition of the impact greater collaboration across the project team can have. Indeed we’ve recently seen operators seeking to reduce engineering man-hours by as much as 50% through a combination of standardization and whole project process efficiency.

Full integration

It is our view that over time there will be increased collaboration between key parties involved in projects to jointly (due to better and joint incentivization, increased digitization and transparency of performance management) seek out improved performance, eventually leading to shared profit pools and fully integrated, equal project teams becoming the norm.
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