Adapting capital projects frameworks to suit new energy investments

Oil & Gas energy transition series

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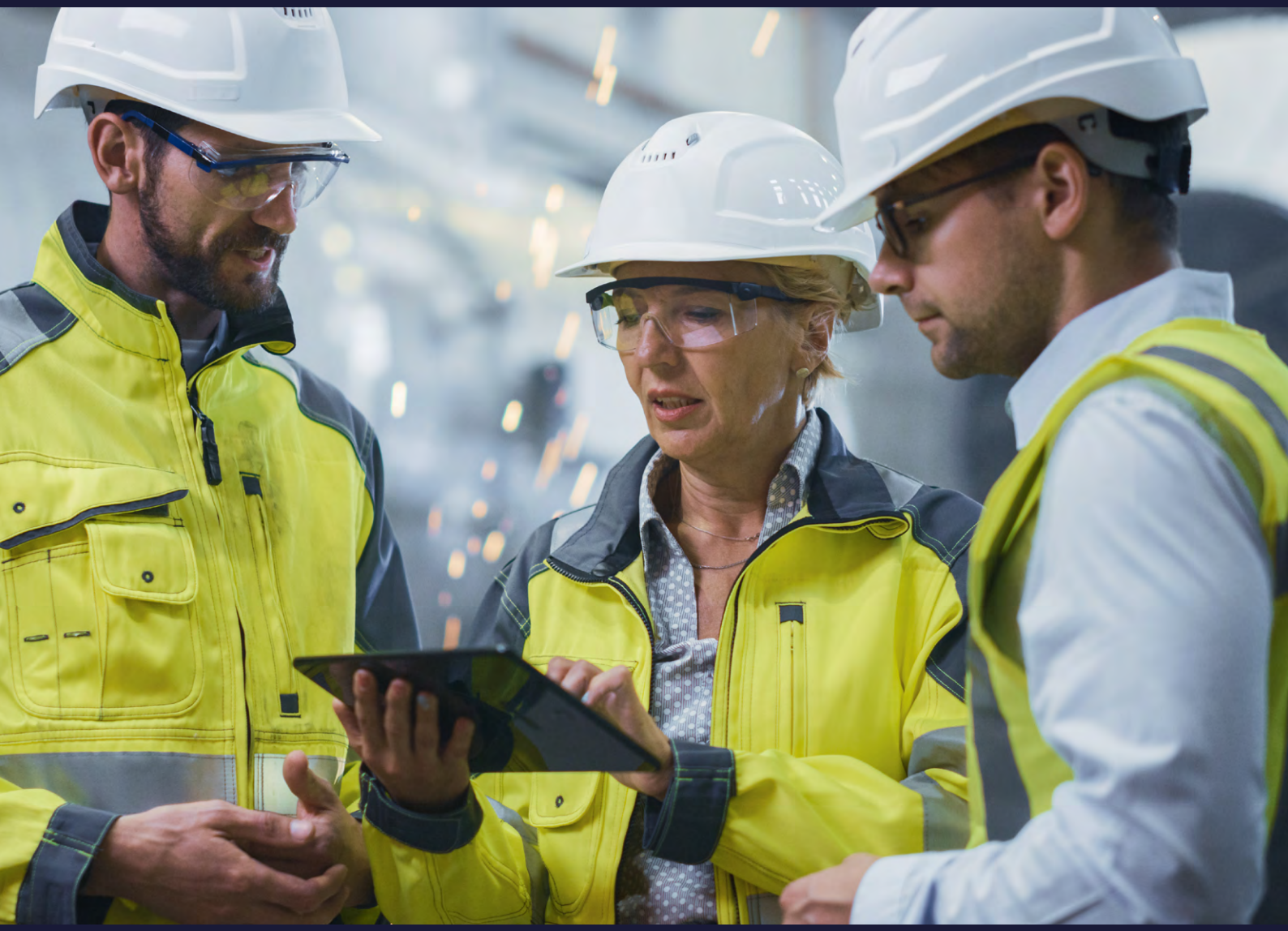
The oil and gas industry has thrived for decades on engineering capability, in a culture built around risk aversion and careful stewardship of capital. The next chapter will be different—never have oil and gas companies faced so many competing priorities and challenges threatening their ongoing sustainability.



Capital projects will underpin oil and gas companies' portfolio

Achieving net zero by 2050 will require the complete transformation of the global energy system. The International Energy Agency predicts to deliver on COP21 commitments, renewable energy will become the fastest-growing primary energy source globally.

As a strategic response, and with the added impetus of political, social and shareholder pressure to transform into diversified energy companies, most oil and gas companies have formulated an explicit renewable energy strategy, which broadly, adopts investment into a mix of the following three avenues:

- zero emission assets achieved mostly achieved through portfolio divestment
- lower emissions - high energy assets, some of which are known to produce three times less carbon than legacy assets
- carbon recovery, whether onshore or offshore.

They have also built dedicated renewable energy teams or businesses within their organisations and earmarked capital spending to implement decisions made as part of the above investment mix, across wind, solar, hydrogen, ammonia, and carbon capture utilisation and storage (CCUS) assets —amongst other new energy source options.

In this context, capital spending by oil and gas companies continues to grow. Data analysed by the Oil & Gas Journal indicated the Majors alone upped their capital expenditure from a plateau around the USD90bn mark in 2020 and 2021 to USD119.7bn in 2023, and according to GlobalData, the industry sentiment is investment will rise or stay on par in 2024.

> "The oil & gas industry must strike a delicate balance between three competing tensions: ensuring supply, at an affordable price point, and in a sustainable way. I have no doubt that like always, it will rise to the challenge and be a constructive part of the energy transition solution."

RAFAEL CHAVES SANTOS
Member of dss+ Impact Advisory Board, prev. IBP Brazil, Petrobras, OGCI

Examples of new energy projects driven by Majors include:

Aramco's Jafurah unconventional gas field project is expected to play a key role in its energy transition, helping the company make progress towards its net-zero ambitions. Aramco expects the overall lifecycle investment to exceed $100bn.

Engie Brasil Energia SA commenced the construction works on the 846-MW Serra do Assurua wind complex project in September 2023. The renewable energy complex will require an investment of BRL 6 billion (USD 1.2bn/EUR 1.1bn). It will feature 24 wind farms with a total of 188 turbines. The project also includes a 28-km transmission line.

Gentari Sdn Bhd, the clean energy platform of Malaysian state-owned oil and gas company **Petronas** acquired Wirsol Energy, a leading player in solar and energy storage in Australia with 422 MW in operating capacity and 765 MW of projects under development.

Perenco was awarded a licence to conduct an offshore CCS project in the North Sea in August 2023, which it intends to conduct with a local technical partner. Set to begin operation by 2029, it is slated to inject more than 40 mn tonnes per year (mtpa) of CO_2 into the Leman field over the anticipated 40-year period of the project.

Shell expects sustainable aviation fuel (SAF) to be delivered from its under-construction 820,000 mt/year biofuels plant in Rotterdam from 2025.

New energy capex projects diverge from the typical

The industry knows the time taken from project completion to full rate production has a large impact on the profitability of a project. Sensitivity analysis by the Independent Project Analysis Inc. (IPA) also shows for most projects, ramp-up time has a larger impact on the Internal Rate of Return (IRR) than schedule and cost variations do.

The industry has become well aware of existing capital project issues: companies have found it difficult to apply their project frameworks and best practices consistently on traditional projects.

Voluminous project implementation manuals and company standards are not well understood, kept up to date, or consistently applied on projects. Employees now expect IT platforms to support them, rather than having to read management system documents and work out how to apply these to projects. This is a significant knowledge management challenge as over time companies' management systems have grown dysfunctional and incomprehensible.

Capital projects with a new energy focus bring another level of complexity to oil and gas leaders. Their success also hinges on an additional key criterion: the effective application of new technologies and processes. This has been hampered by two confluent factors:

1. project teams experienced in the legacy side of the business tend to have little direct knowledge of each specific new energy technology and operating environment, and
2. frameworks used successfully on traditional projects do not take into account the specificities of new energy technologies.

The alternative: Taking a user-centric approach

Oil & gas companies must adopt a more user-centric and agile way of codifying and communicating project processes to overcome these challenges. Large companies have a wide range of capital projects ranging from mega-projects to small sustaining ones – across both traditional and new energy investments.

Whilst all these projects generally fall under an overarching company project framework, very different implementation methodologies are needed. Fit-for-purpose implementation methodologies must be developed for the different categories of projects and codified in a way that is easy to understand and apply.

Instead of relying on traditional project implementation manuals, a more successful alternative involves codifying a company's requirements into project process maps in an interactive workflow platform which provides an easier way of managing knowledge, communicating the steps and requirements of a robust project delivery process in an easily digestible way. Steps in the project process maps are linked to company standards, guidelines, and templates, and include good-practice examples of deliverables. The role of central functions for the various phases of projects is also clearly delineated.

This centralises knowledge management for project implementation, makes it easier for project teams and sponsors to understand requirements, and improves assurance via automated approval workflow and compliance reporting of key steps.

Template process maps can be customised to the unique requirements of individual projects, creating fit-for-purpose roadmap and detailed implementation plan. This means a higher likelihood of application of best practices across:

- Front end loading
- Assurance and governance
- Early involvement of SMEs and Functions
- Gating
- Operational readiness
- Technology assessment and selection

Whilst project management expertise is still an essential ingredient, template process maps give project teams a roadmap to "follow the bouncing ball" to implement projects and ensure more consistent project outcomes. Automated approval workflows and compliance reporting gives executives oversight of key project steps.

Some essentials must remain

Adapting capital expenditure projects for a new energy world does not imply total change. Some fundamentals must remain, including the following.

Risk management stays front and centre: Although project risks will likely materialise in traditional ways (eg. cost and schedule overruns, commissioning delays, operational underperformance), new technology projects have much greater levels of uncertainty due to reliance on new technology. Risk needs to be part of the in-flight assurance process, with upfront work to understand project uncertainties and build in the right controls supported by regular risk reviews to continually re-assess both the robustness of the risk profile and the effectiveness of controls.

Building in-flight assurance: Project assurance on deliverables has traditionally been undertaken at the end of each phase prior to key decisions. This is no longer adequate due to the complex nature of mega projects and the rapid speed of emerging risks. A change to "in-flight" assurance is needed. Just like car assembly lines complete a QA at each station, key project activities require in-flight assurance to guarantee a successful outcome for key activities, rather than waiting until the end of the phase to assure these activities. These requirements can be built into project process maps.

Actively involving corporate functions: Functions such as Finance, Commercial, Sustainability, Safety & Environment, Compliance, Marketing and others are likely to have standards and procedures impacting capital projects, but the steps needed to apply these are often overlooked or mis-understood, leading to delays and inefficiencies later on, including at commissioning stage. A simple process mapping process, from early phases where key project decisions are made, would alleviate these issues, and strengthen a one-team approach to high investment projects.

Codifying sustainability and ESG in project processes: Oil & gas organisations are not only required to meet various ESG related legislation, but are also integrating broader sustainability concepts in their strategies. Most publish their goals and targets in these areas. From a capex project point of view, often lacking are defined processes to adopt and support the implementation of these targets and KPIs as part of the project definition and roll-out. Sustainability and ESG issues considerations must be integrated in the early phases of projects when framing reviews are held. Project concept selection can be greatly influenced by these issues and work needs to be done in early project phases to quantify Sustainability and ESG considerations for the project, with these requirements subsequently built into project process maps.

As an example, teams have become increasingly aware of the need to integrate energy considerations right from the start of construction.

Preference given to contractors based on the use of low emission vehicles, equipment, materials and construction methodologies for instance positively impact energy consumption and scope 1 emissions.

The payoff is considerable

The diversification of traditional oil and gas companies into energy companies, dovetailing traditional activities with investment into new areas of operations geared towards a transitioned world, is critical to achieving COP commitments and building a trustworthy narrative on the industry's positive contribution to climate change.

The effective management of renewables and CCS capital projects will make or break this outcome. Adopting a user centric approach is critical to **driving successful project delivery and de-risking decarbonization and new energy commitments**.

Additional benefits include:

Improved capital effectiveness: Benchmarking (Ref: IPA Inc.) shows that improving front end loading of projects can improve the capital effectiveness by over 10%.

Greater predictability of outcomes: predictability of schedule, cost, and quality of projects is improved by following a well-defined project process that incorporates good practices. Greater visibility of conformance is gained through automated approvals and compliance reporting built into the project platform.

Reduced time to ramp up: The duration between project completion and reaching full-rate production significantly influences the project's profitability. Sensitivity analysis indicates that the ramp-up time has a more substantial impact on the Internal Rate of Return (IRR) compared to variations in schedule and costs for the majority of projects. This challenge is particularly pronounced in "New Energy" projects introducing novel technologies to the Oil and Gas industry. To address this, the incorporation of technology development, screening & selection, and operational readiness steps into a well-defined project process, inclusive of governance and assurance, can effectively mitigate these issues.

In summary ...

The capital effectiveness of asset developments can be maximised through interactive workflow platforms, used to house a one stop shop of project process workflows and examples of best practice along with links to relevant standards and management system documents.

A consistent, standardised and scalable approach promotes a shared understanding and adherence to a common project delivery process. This enhances project performance, mitigates risks and optimises the value generated from projects.

5 actions Oil & Gas Leaders should take now:

1. Ask yourself whether your current project framework and systems are delivering the results you need and are future proofed.
2. Review your current project categorisation guidance: does it reflect the range of projects that have to be delivered successfully to achieve your growth strategy?
3. Decide which different types of template project processes are needed to implement the portfolio e.g. Mega-project process, Infill drilling project process, and Sustaining capital project process.
4. Map the steps in each phase of these project processes, involving support functions and linked to management system guidance. This will likely require cleansing of the management system documents. Encode this in an interactive platform that incorporates continuous improvement.
5. Launch and communicate by providing support, training and coaching to individual projects.

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