

# A Strategic Approach for Managing Oil and Gas Assets

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The global oil market is experiencing a structural shift. Faced with a rapid price decline, large oil-producing countries had decided to protect their market share, with the hopes of permanently removing expensive supply from the market. Meanwhile, the ability of the US shale oil producers to respond quickly to positive price signals puts downward pressure on prices. On the demand side, advances in renewable technology and the continued effort to curb consumption of fossil fuel conspire to inhibit long-run growth.<sup>1</sup> These factors suggest that the current down-cycle may continue for an extended period of time or even invoke another down-cycle.

For managing large projects (e.g., discovering and developing new hydrocarbon resources, or building major pipelines), oil and gas companies employ a rigorous stage-gate process. The concept of “front-end loading” is an accepted way to maximize value creation by ensuring quality decision-making in the early stage of a project.<sup>2</sup> Accordingly, companies give a great level of attention to defining and designing the right development concept, before the final investment decision (FID).

The ability to acquire and deliver large projects is a traditional source of competitive advantage for oil and gas companies. However, multiple challenges threaten this business model.

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- *Dearth of large project opportunities:* Newly discovered resources are smaller in size, more geologically complicated to develop, and more difficult to access due to geopolitical tension and the nationalization of resources by national oil companies.
- *Vulnerability to “boom and bust” cycles:* With high commodity prices, companies move projects rapidly through FID, driving up costs and pressuring profit margins. With low prices, capital becomes scarce, and operators are forced to cut back on exploration and delay FID, reducing near-term opportunities and delaying the ramp-up of new activities once prices rebound.
- *Uncertainty on the long-term value of an asset:* Because asset values are closely tied to commodity prices, it is unclear when an oil and gas company should be purchasing assets, selling them, or taking a wait-and-see approach.
- *Emergence of unconventional and mature assets:* FID is only the beginning. Complicated operation requires strategic decisions to be made during the execution and operation stages of projects (e.g., learning and cost reduction, managing large drilling programs, advanced recovery technologies, and water and materials handling).

With these companies’ traditional business model in jeopardy, how will they create value for their shareholders? The answer lies in the companies’ biggest possession—the very hydrocarbon-producing assets that they already operate. Companies need to take a strategic view in managing their producing assets. This management requires making high-quality decisions throughout an asset’s life cycle, regardless of the commodity-price cycle.

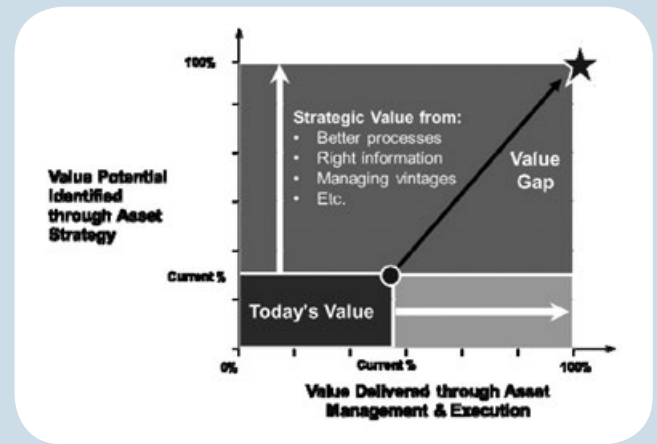
## NEED FOR STRATEGIC ASSET MANAGEMENT

A strategic framework is crucial when thinking about improvements to existing assets (e.g., production optimization, maintenance scheduling, asset replacement, de-bottlenecking, and other areas). Merriam-Webster defines an “asset” as “a valuable person or thing.”<sup>3</sup> Identifying the full value potential requires the development of a robust strategy. Realizing the full value potential (**Exhibit 1**) requires execution of the strategy through strategic management of the assets.<sup>4</sup> A good framework will create significant value regardless of the commodity-price environment.

Yet developing a sound asset management strategy is in itself challenging, often because it is difficult to clearly determine the value of an individual asset. The key reasons behind this lack of clarity are twofold: (1) it is unclear how an organization defines value and (2) the interconnectedness between assets is so complicated that the value of a set of assets (for example, the gathering and compression infrastructure of a natural gas field) is difficult to disaggregate to the asset level.

A good asset management strategy overcomes these barriers by being clear about value—the “North Star” for high-quality decision-making—and by determining, to the appropriate level, how assets deliver value to the organization. Moreover, a strategy that

**Exhibit 1. Why Should Asset Management Be Strategic?**

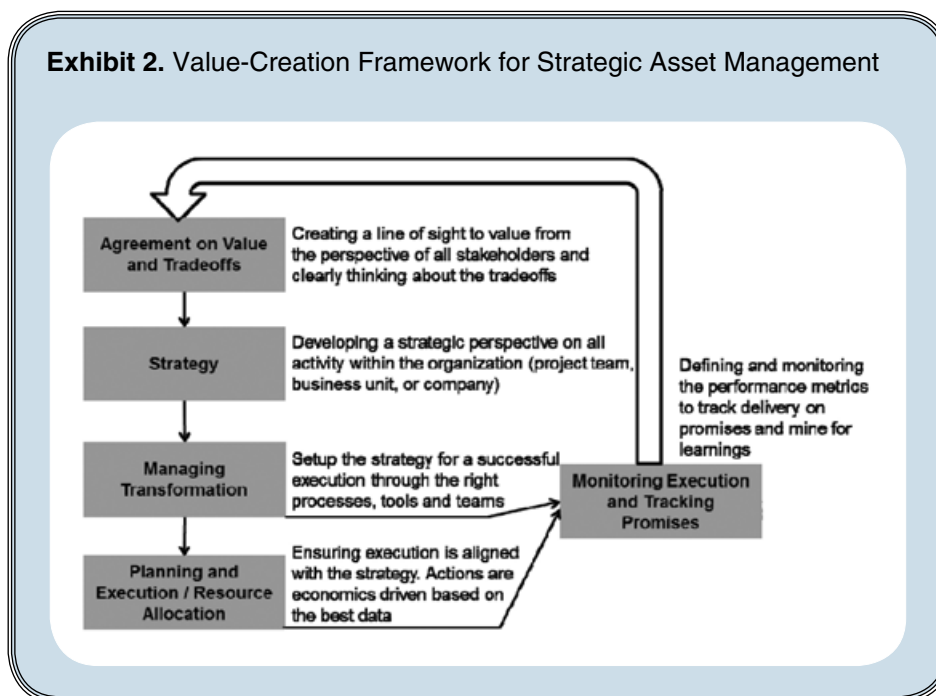


does not take into account how it should be executed is incomplete. Just as good execution with a poor strategy leaves value on the table, so does a good strategy with poor execution. We want a strategy that enables us to close the value gap (**Exhibit 1**).

A good framework for strategic asset management (SAM) meets the following criteria (see also **Exhibit 2**):

- It creates a “line of sight” to value that takes into account all stakeholders’ perspectives and clearly weighs the trade-offs.

**Exhibit 2. Value-Creation Framework for Strategic Asset Management**



- The chosen strategy meets the six elements of decision quality<sup>3</sup> and develops a strategic perspective at all levels of the organization—project team, business unit, or corporation:
  - i. A decision frame that structures the decision in the context most relevant to our needs
  - ii. Creative alternatives that allow us to make a selection among viable and distinct choices
  - iii. Relevant and reliable information upon which to base our decision, incorporating the inherent uncertainty
  - iv. An understanding of potential consequences of each alternative with metrics based on our values
  - v. Sound reasoning and analysis that allows us to draw meaningful conclusions and choose the best alternative
  - vi. An effective decision project leader to achieve alignment and commitment to best action
- The transition to the chosen asset management strategy is positioned for execution success with the appropriate people, processes, and tools.
- Those who will execute the strategy make decisions that are consistent and aligned with value.
- The process has a built-in system for feedback and learning by defining and monitoring performance metrics.

#### **ASSET MANAGEMENT EXAMPLE: MAXIMIZING VALUE FROM MATURE UPSTREAM ASSET**

An upstream company's main producing asset is one of the oldest onshore fields in its country.

Its operation relies on enhanced oil recovery technologies that require handling large volumes of water for either injecting into a reservoir (light oil) or generating steam (heavy oil). The light oil reservoir produces natural gas that is either sold or burned to produce steam to support the heavy oil operation. Facilities to separate and treat these by-products are at their maximum capacity and require capital investment to support continuing operation. The company sees an opportunity to extract more oil from its light oil reservoir with the combination of tighter well-spacing and advanced technologies that target oil-bearing zones.

The company starts out by determining the well-spacing strategy for its light oil field. It

constructs several different well-spacing options and assesses uncertainties in incremental oil response for each spacing option. It then chooses the optimal well-spacing option by balancing the value created through total incremental recovery against total required capital.

The company follows a similar process in determining optimal water-injection schemes, by considering multiple injection alternatives and assessing uncertainties in incremental oil response. Next, the company tackles water and gas facilities investment decisions, considering multiple options in location, processing technology, and capacity to process by-products from oil operations. The company also analyzes less productive edges of the reservoir, which creates a backlog of drilling locations as a function of oil-price movement and availability of capital.

Finally, the company integrates the models it will use for each analysis. This integrated model gives the company a view, at the entire asset level, of the total capital requirement to execute various projects as well as their impact on existing water and gas facilities. It also gives insight into the prioritization of projects by ranking the capital productivity of all investment opportunities within the asset.

The company continues to improve on the integrated asset model. After the initial year of implementation, the company adds any new projects identified within the asset and updates existing project models based on lessons learned from operation. The company subjects new projects to the same rigor as existing projects, explicitly defining and evaluating each new project. Before making a commitment for large capital investment, the company designs and implements pilot programs to simulate the full-scale project development.

The company includes these pilot programs in the integrated asset model, which forces the company to quantify the value of information from the pilot program in relation to the full-scale development. Over time, the company transforms the integrated asset model into a decision support system that supports not only midterm capital investment decisions (e.g., infill drilling, new recovery technologies, and facilities investment) but also short-term investment decisions (e.g., well replacement and marginal area drilling) and the annual capital budgeting process. This procedure creates a company culture where (1)

the true value of any project is the difference between the value of the entire asset with and without the implementation of that project and (2) every asset-related decision or reporting has to go through the integrated model.

Using the SAM framework, the company achieves an unprecedented level of ultimate recovery from the 100-plus-year-old asset. The company trains and retains staff familiar with the technical and soft sides of maintaining the system, providing a critical continuity to ensure the longevity of the system. Over time, company leadership changes multiple times and new projects and knowledge drive considerable changes to the content of the integrated model. Despite these organizational vicissitudes, the integrated decision support system actively supports decisions at the asset level and corporate level even 20 years after its inception. See **Exhibit 3**.

The company's success with the SAM framework offers multiple lessons. First, the

company realizes opportunities within its main asset (discovered hydrocarbon resources and shared facilities), and studies, implements, and monitors countless technical programs to dramatically improve the recovery factor of the asset. Second, strong organizational support reinforces the success of the technical programs.

The company pursues opportunities to create additional value from the asset, works through the full cycle from analysis to execution, and constantly monitors implications at the entire asset level. The company clearly understands how the change in capital investment will affect the value of the asset and is able to adapt itself to changes in the external environment such as oil prices and capital cost escalation. Finally, the company finds that full implementation of the SAM value-creation framework is a multiyear effort—progress is incremental and steady, as

**Exhibit 3. Milestones—Mature Asset Base**

Year	Major Strategic Asset Management (SAM) Milestones Achieved for an Upstream Company With Mature Asset Base	Elements of SAM Value-Creation Framework Implemented				
		Values/Tra de-offs	Strategy	Transform-ation	Execution/ Allocation	Monitoring
Years 1–3	Several project-level decision analyses performed; asset strategy team established to take ownership of SAM; leadership started seeing the value of SAM at project level					
Year 4	Major water and gas facilities decision analysis performed to capture the interplay of multiple projects within the asset; first integrated entire asset-level model built; project-level strategy recommendation executed					
Years 5–7	Dedicated staff to support SAM hired and trained; annual planning process and portfolio update process started integration; the culture of analyzing every decision at the entire asset level established					
Years 7–10	Process survives company leadership change; annual planning and asset portfolio update process completely integrated; advanced monitoring of asset performance (e.g., Look Back) implemented					
		Addressed		Fully Implemented		

each milestone accomplished requires success from previous steps.

Full implementation of the SAM value-creation framework is a multiyear effort.

### SAM EXAMPLE: CAPTURING THE FULL VALUE OF MIDSTREAM ASSET

An integrated oil and gas company owns a producing gas field, as well as the gathering and compression (G&C) infrastructure that connects the field to nearby transmission pipelines.

Several midstream companies approach the company, inquiring about its appetite to sell the G&C assets and enter into a take-or-pay contract that guarantees volumes and cash flows. The company engages an investment bank that sets a price for the G&C asset based on the tariffs the purchaser would charge back to the company. There is evidence that there are bidders willing to accept that price.

However, there is concern among members of the company's business unit that manages the field about the effect the sale would have on various stakeholders, including local community relations and worker safety. The company is not sure whether to offer the recommended selling price, much less how to assign a value to the various stakeholder risks. They choose to take a SAM approach in valuing their G&C asset.

Through a structured dialogue, the company establishes a connection between increases in the various stakeholder risks and is able to assign dollar values to them. For example, good local stakeholder relations give the company its "license to operate" in the community. Selling the assets to a third party could put these good community relations at risk. In extreme cases, it could end in litigation that shuts down the field—a small probability of a huge loss of value. The investment bank's analysis

does not include the sources of G&C asset value associated with these stakeholders.

In addition, the investment bank's valuation fails to consider the synergy between the G&C and upstream assets. Such interdependencies are an important source of value created only when joining two or more assets together. For example, G&C uptime performance and control of maintenance scheduling have direct effects on the company's ability to generate revenue from the upstream asset.

When identifying the sources of value of the G&C asset under the SAM framework, the company must consider its current asset management plans. In this case, specific plans are already in place for reducing operations and maintenance costs. Keeping the G&C assets will allow the company to realize this saving. Finally, through interviews with internal stakeholders, it becomes clear that there is a significant opportunity to sell excess G&C capacity to other producers who are interested in takeaway capacity for increased production from their nearby fields.

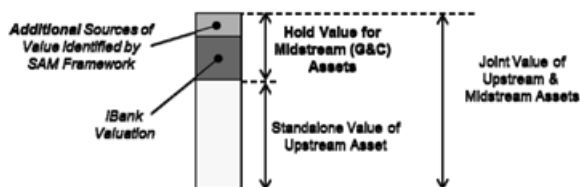
Selling the G&C assets means giving up the aforementioned sources of value; thus, the company rightly considers them when setting its hold value—the minimum price it is willing to accept. The hold value of the G&C assets is the sum of all of the sources of value of the upstream and midstream asset together minus the sum of all of the standalone sources of value of the upstream asset (**Exhibit 4**). Under the SAM framework, the hold value increases by 30 percent over the investment bank's recommended valuation.

Accepting the investment bank's price would have resulted in the loss of significant value.

### FINAL THOUGHTS


Asset portfolios that are resilient to disruptive events like broad swings in commodity prices will become an increasingly important competitive advantage for oil and gas companies. This article gives an asset management framework for gaining—and keeping—that advantage. Ultimately, success in asset management requires a comprehensive understanding of value-creation opportunities of assets within a company's portfolio while avoiding common pitfalls (**Exhibit 5**). A successful asset management strategy will equip a company for an extended downturn by realizing the full value of its current portfolio of assets, while readying

**Exhibit 4. Additional Value**



## Exhibit 5. Pitfalls

Common Pitfall	Consequence	Elements of Possible Solution
<p><b>Disconnect between strategy development and asset management:</b> Strategy development and asset management actions are kept separate, without a feedback loop for learning</p>	<ul style="list-style-type: none"> <li>• Strategy recommendation is not implemented at asset level as originally intended</li> <li>• Value created at asset level not measured and suboptimal</li> <li>• Repeat of strategy exercise for no benefit</li> </ul>	<ul style="list-style-type: none"> <li>• Establish a specific procedure to monitor implementation of strategy recommendation</li> <li>• Measure value created at asset level</li> <li>• Reflect learnings from assets in strategy development</li> </ul>
<p><b>Bias toward big external opportunities:</b> Companies look for material opportunities outside of its assets, ignoring opportunities that already exist within its assets</p>	<ul style="list-style-type: none"> <li>• Resources diverted to search and integration of external opportunities</li> <li>• Misses in-house, more cost-efficient opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Spend a balanced amount of effort in identifying opportunities within and outside of its assets</li> <li>• Use a consistent metric in comparing external and internal opportunities</li> </ul>
<p><b>Ignoring synergies among assets:</b> In-house assets (or investment opportunities) are evaluated on a stand-alone basis only, ignoring interdependencies with other assets</p>	<ul style="list-style-type: none"> <li>• Asset is undervalued, leading to premature disposition or closure</li> <li>• Option value is ignored, as are alternatives that leverage it</li> <li>• Internal stakeholders do not support decision</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate the entire portfolio of assets with and without the asset—the difference is the asset's true value.</li> <li>• Consider uncertainties explicitly in valuation, which often leads to the identification of new alternatives</li> <li>• Engage stakeholders in the process of valuing the synergy between assets and their shared risks.</li> </ul>
<p><b>Checking the box:</b> Poorly understood and mandatory internal process exists in-house. Process is followed without truly understanding the objectives. Templates are filled without being checked for quality.</p>	<ul style="list-style-type: none"> <li>• Meaningless analysis is generated, not contributing to insights</li> <li>• False assurance of quality in investment decision</li> <li>• Complexity of analysis built in wrong places</li> </ul>	<ul style="list-style-type: none"> <li>• Involve people with significant experience to lead the process</li> <li>• Learn to adapt process to fit for purpose</li> <li>• Scale analysis complexity to meet the needs</li> </ul>
<p><b>Lack of institutionalization:</b> Ensuring quality in asset management is not supported by broader organization. Asset management remains as activity specific to a certain department.</p>	<ul style="list-style-type: none"> <li>• Asset management becomes a one-time effort</li> <li>• Success is vulnerable to the departure of a few key people</li> <li>• Systematic asset management does not survive senior leadership change</li> <li>• Reinventing wheel</li> </ul>	<ul style="list-style-type: none"> <li>• Broaden staff with exposure to the process and define clear roles for them (e.g., lead, analyst, participant)</li> <li>• Ensure support from senior management</li> <li>• Invest in training and continuous learning</li> </ul>
<p><b>Conflation of market value with hold value:</b> When valuing an asset—the “value” is seen as what the market will bear, rather than what it is worth to the organization</p>	<ul style="list-style-type: none"> <li>• Selling of assets for prices lower than the value of retaining the asset within the portfolio.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate the entire portfolio of assets with and without the asset—the difference is the asset's true value.</li> </ul>
<p><b>Failure to value an asset's performance:</b> Decisions are made without considering the value of a relevant asset (regardless of who owns it)</p>	<ul style="list-style-type: none"> <li>• The value of the asset portfolio is limited by a constraint that should be addressed.</li> <li>• Investments are diverted to assets that have little bearing on portfolio value.</li> </ul>	<ul style="list-style-type: none"> <li>• Have a clear understanding of a portfolio's value</li> <li>• Understand synergies and the relationships between the assets that make up a portfolio</li> <li>• Prioritize portfolio investments by bang for the buck.</li> </ul>

the company to seize investment opportunities when prices rebound. 

### NOTES

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