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ASSET ABANDONMENT IN UPSTREAM OIL

A GROWING THREAT TO THE SECTOR

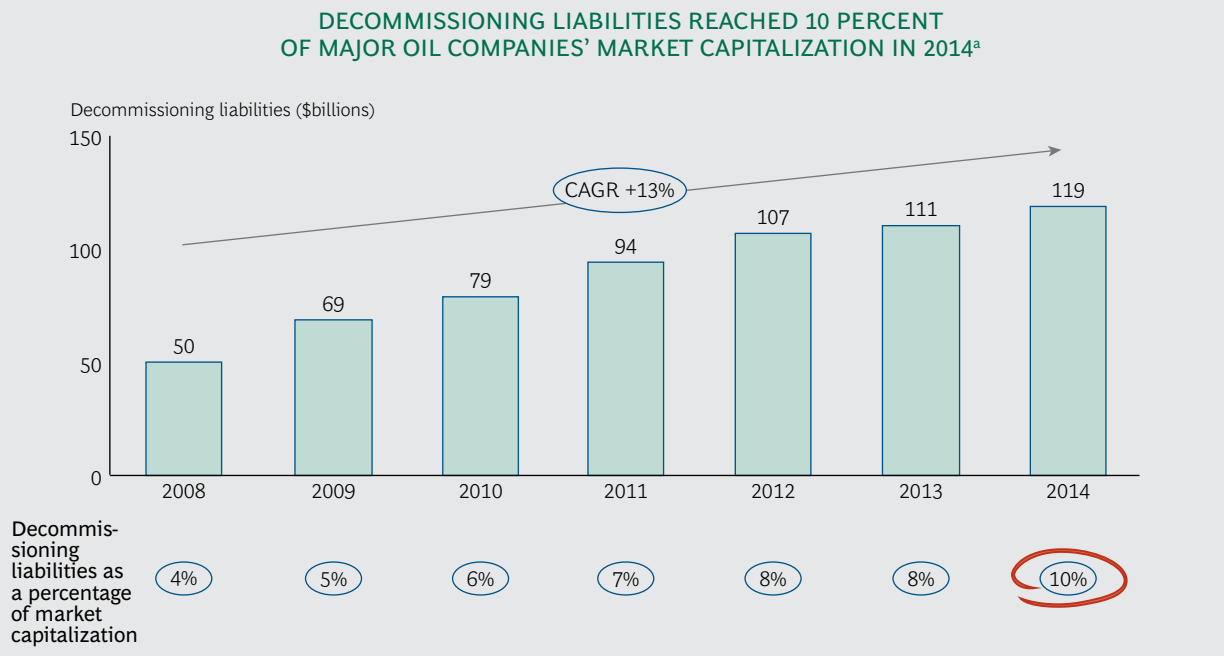
By Francois Bardi, Iván Martén, Oleg Mikhailov, and Henning Streubel

Ongoing weakness in oil prices—crude prices remain roughly 50 percent below where they stood in mid-2014—continues to weigh heavily on the economics of upstream oil, reflected in the growing number of wells (including still-productive ones) being abandoned by large upstream players. This surge in asset abandonment exceeds historical norms and represents a growing threat to the upstream sector. Indeed, reported asset-retirement obligations, or decommissioning liabilities, for the industry's major companies had risen to 10 percent of their combined market capitalization by the end of 2014. (See Exhibit 1.) The companies' true liabilities as of that date may, in fact, have been far greater, as many industry experts believe that this percentage significantly understated the actual decommissioning costs facing these businesses. And the companies' liabilities continue to rise.

Upstream companies are ill-prepared for asset retirement at the current rate and scale. And the situation will get worse before it gets better. In fact, we project that by 2020, an additional 1,500 offshore assets (which are far more expensive to decommission than onshore ones and represent the bulk of companies' decommissioning liabilities) currently in operation will be retired, with most of the decommissioning concentrated in four areas: the Gulf of Mexico, the North Sea, Southeast Asia, and West Africa. Decommissioning spending on offshore assets will rise in concert, with annual spending reaching as high as $9.7 billion in 2018, compared with $1.2 billion in 2014. (See Exhibit 2.)

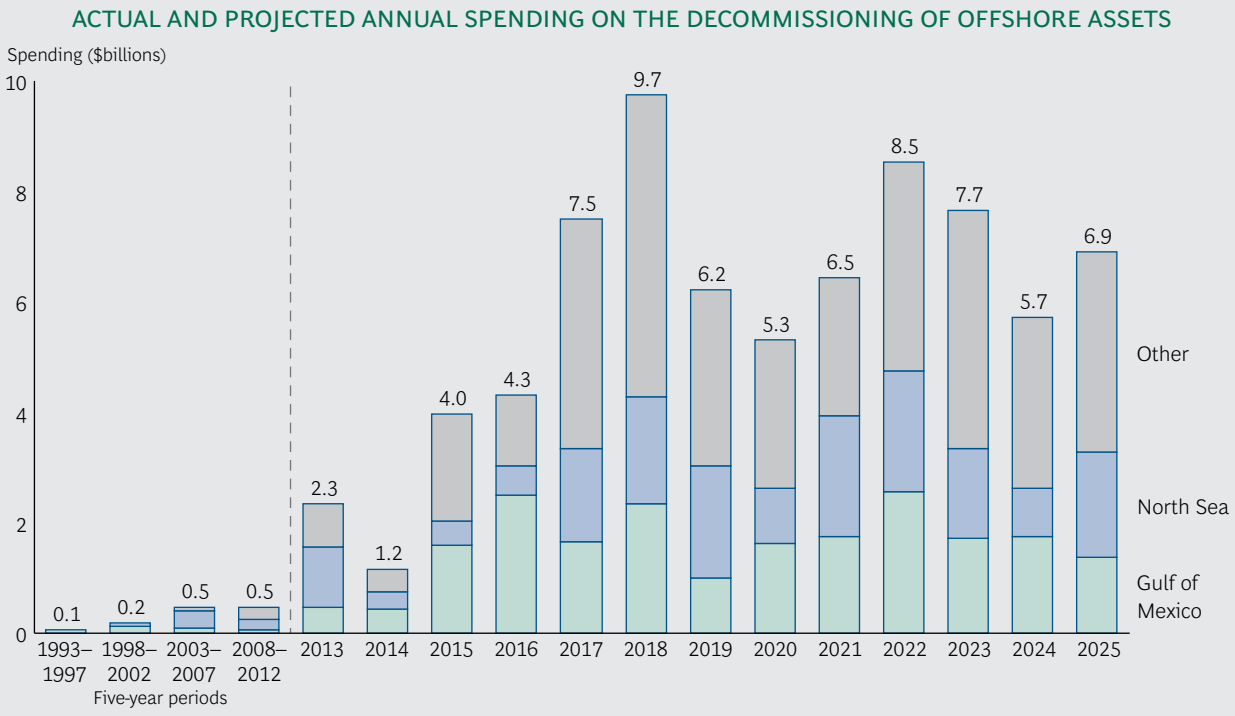
For upstream oil companies, there are no quick fixes. However, in this article, the seventh in a series on oil price volatility and its implications for the energy landscape, we present some clear actions that individual businesses can take to strengthen their financial position in the face of increasing asset abandonment. In addition, we discuss measures that governments should consider that could help mitigate the situation's potential financial risks to the public.

EXHIBIT 1 | Abandonment Is Becoming a Significant Issue for Upstream Companies Worldwide



Sources: Company annual reports; IHS Herold; BCG analysis.
Note: CAGR = compound annual growth rate. The percentages are rounded to the nearest whole number.
[a]Companies include BP, Chevron, Eni, ExxonMobil, Petrobras, Royal Dutch Shell, Statoil, and Total.

EXHIBIT 2 | Decommissioning Spending Is Soaring



Sources: Infield Systems; Rystad Energy; BCG analysis.

A Smoothly Operating Process—Until Now

Larger upstream companies typically divest aging assets well before the assets reach the end of their productive lifetimes. It is a well-established process. As assets mature, companies continually gauge the value of the assets' remaining reserves vis-à-vis the cost of additional investments (such as investments in new drills or enhanced recovery technologies) that are necessary to boost or maintain production. The companies make keep-or-sell decisions on the basis of the economics. Larger upstream companies also continually monitor the value of their assets' reserves to make sure that it remains significantly higher than the cost of decommissioning those assets. Such ongoing assessments ensure that the assets always have value to a potential buyer.

When larger upstream players eventually do divest assets, they typically sell them to independent operators. These companies, through specialization, are able to operate the assets at a lower cost. These players also invest considerable capital in boosting the assets' incremental production. As a result of these factors, independents typically generate better cash flow from the assets than the larger players did, at least initially. After a few years, however, as the assets' returns diminish beyond a certain point, independents, in turn, divest the assets to smaller, more speculative specialist companies, often selling the assets in package deals. These specialists, such as Energy XXI, Fieldwood Energy, W&T Offshore, and Stone Energy, divide the assets into two categories: cash flow positive and cash flow negative. For the former, the companies seek to exploit opportunities to boost incremental production. For the latter, they strive to dispose of the assets quickly and at a low cost.

The rights to operate mature assets are generally transferred through this chain several times before they are ultimately abandoned. In the Gulf of Mexico, for example, assets typically transfer hands three or four times. But the number can be higher. Assets in the West Delta block 80 field (located off the coast of Louisiana) that were originally owned by Phillips Petroleum, for example, were sold in succession to Newfield Exploration, Hess, SPN Resources, Dynamic Offshore Resources, SandRidge Energy, and, finally, Fieldwood Energy, for a total of six transactions.[1]

This divestiture model has worked largely seamlessly for an extended period. The majority of abandonment activities have been performed by specialists; most larger companies and independents have acquired little experience abandoning assets, since these players have rarely held onto their assets to the point of abandonment. But with increasing numbers of assets now cash flow negative due to the fall in oil prices, asset divestment (or, more accurately, *profitable* asset divestment) is no longer a ready option for larger players, and the companies are being forced to abandon a greater percentage of their assets themselves.

A Sector Unprepared for Large-Scale Abandonment

Larger upstream players are unprepared for asset abandonment of this scale on several important fronts. First, the industry has not developed a standardized procedure for abandonment. (See "Killing the Complexity Monster in E&P: Eight Critical Actions for Upstream Oil and Gas Companies," BCG article, January 2015.) Practices vary widely, with some companies doing far more than regulations require and others doing the bare minimum. Some offshore operators employ the minimum number of isolation barriers (in the U.S., for example, regulators require two isolation plugs), for instance, while other operators use up to seven plugs. This variability in approach means that some companies are spending far more on abandonment than is necessary.

Second, larger upstream players, including both operators and oilfield-services companies, have underinvested in the development of new technologies dedicated to abandonment. In fact, most abandonment jobs are still largely performed with the same tools that are used for drilling and completion. This underinvestment in abandonment-specific technologies raises up-

stream companies' costs, as well as the time it takes to abandon a well, unnecessarily. The U.S. abandonment market, for example, remains dominated by the use of relatively low-technology solutions, such as workover rigs and lift boats. The North Sea market is still in its infancy and has yet to attract significant investment. (Of note, however, the UK government has recognized the challenge and recently formed the Oil and Gas Authority in an effort to structure an industry response.)

Third, larger upstream companies lack the capabilities necessary to abandon assets effectively and efficiently. Although abandonment projects are relatively small in scope, with costs ranging from $10 million to $100 million, the projects are complex and multidisciplinary, requiring subsurface, well, facilities, structural and pipeline engineering, and project management specialists. These projects also require specific experience: technical challenges related to late-life assets (some of which might not have produced for years) are very different from those related to greenfield or even brownfield projects. However, upstream companies often struggle to find the necessary internal talent, as most engineers with relevant backgrounds direct their careers toward megaprojects that are highly visible internally or toward the operations of large new assets. In larger upstream companies, abandonment projects are often considered a thankless job.

Compounding matters for larger upstream companies is the fact that these challenges come amid a time of stiffening regulations related to abandonment. Regulations have tightened materially following the Deepwater Horizon oil spill in the Gulf of Mexico in 2010. The Bureau of Safety and Environmental Enforcement (BSEE), for example, established its Idle Iron policy, which requires companies to abandon wells and decommission structures that have not been used in five years.[2] Regulators have also woken up to the potential financial impact of large decommissioning campaigns (for example, those that are taking place in the UK's North Sea) on government receipts and on national oil companies' profits (for example, Brazil's Petrobras) and are taking steps to preempt and mitigate the effects. In the U.S., the Bureau of Ocean Energy Management (BOEM) and BSEE are working in tandem to establish financial responsibility among operators for decommissioning assets that are no longer productive and to ensure that an operator's bankruptcy does not lead to orphaned wells or to liability that boomerangs to the previous owner. BOEM is actively working with operators and drafting a new Notice to Lessees and Operators to clarify what will be required to demonstrate sufficient financial strength to perform abandonment obligations; BSEE is working to establish greater clarity in plugging and abandonment liability.

Eight Actions for Upstream Companies

Working jointly with operators and oilfield-services companies, The Boston Consulting Group has identified a number of actions that industry players can take to strengthen their financial position in the face of rising asset abandonment. The actions fall into three categories: program design and management, planning and execution, and contracting. We calculate that these actions, taken collectively, can reduce abandonment-related costs by as much as 40 percent. (See Exhibit 3.)

Program Design and Management. By creating a practical approach to asset abandonment, companies can reduce their costs by 5 percent.

- *Engineer pragmatic risk-based standards for abandonment.* This will entail building dedicated internal organizational capabilities, as abandonment and decommissioning activities are significantly different from other well- and facilities-engineering practices.

- *Design an optimized plan for fulfilling health, environment, and safety (HES) requirements.* Ensure that the HES standards employed for each project are fit for purpose. For example, avoid using company drilling and completion

EXHIBIT 3 | Abandonment Costs Can Be Reduced by Up to 40 Percent Through Eight Actions

CATEGORIES	POTENTIAL COST REDUCTION (%)	ACTIONS	EXAMPLES OF ACTIONS
Program design and management	5	Engineer pragmatic risk-based standards Design an optimized plan for fulfilling HES requirements	• Establish abandonment standards and HES requirements that are fit for purpose • Build dedicated internal capabilities • Ensure adequate on-site supervision of contractors
Planning and execution	15	Optimize planning through site diagnosis Build a queue of work Standardize execution Capture execution synergies	• Perform site diagnostics ahead of project execution • Employ long-term planning • Attach greatest priority to routine wells with lower abandonment costs • Standardize procedures and communications tools • Integrate decommissioning, rejuvenation, and workover activities • Share tools and equipment between maintenance and decommissioning campaigns
Contracting	20	Optimize contract terms Carefully select contractors	• Request contractor liability for downtime • Negotiate performance-based agreements • Pursue long-term agreements • Retain best-performing crews

Source: BCG analysis.
Note: HES = health, environment, and safety.

standards, which are relatively rigorous, for well abandonment in cases where the reservoir has been depressurized and the risk is significantly lower. Additionally, ensure that the processes will be effective and lead to measurable reductions in HES risk and that there will be appropriate on-site supervision of contractors. Finally, consider using procedures employed by contractors, as contractors have developed significant experience in plugging wells and abandoning assets.

Planning and Execution. By developing the right strategy and following through, operators can lower their asset-abandonment costs by up to 15 percent.

- *Optimize abandonment planning by performing up-front site diagnostics.* Assess the site to ensure that only the right tools, equipment, vessels, and expertise are mobilized.
- *Build a queue of work.* Develop comprehensive and robust multiyear abandonment plans in order to optimize route, mobilization, and demobilization costs. Attach higher priority to routine wells with lower abandonment costs than to technically challenging interventions in order to most efficiently reduce the number of idle wells.
- *Standardize execution.* Develop standardized work procedures and tools that facilitate communication in order to maximize the efficiency and effectiveness of execution.
- *Capture execution synergies.* Integrate decommissioning, rejuvenation, and workover activities to create execution synergies and maximize asset utilization. Share tools, equipment, and crews among well work and decommissioning campaigns.

Contracting. By better managing contracting procedures, companies can decrease their costs by another 20 percent.

- *Optimize contract terms.* Write contracts for late-life well workover and abandonment as a single scope in order to optimize asset cash flow and maximize execution synergies. Request contractor

liability for mechanical downtime—contractors should maintain their equipment at their own costs. Simplify contract terms to ensure bills are only for necessary equipment. Negotiate performance-based contracts to reward efficiency. Pursue long-term agreements to realize volume discounts.

- *Carefully select contractors.* Seek long-term agreements to foster efficient execution. Retain crews that are high performers to further improve efficiency while maintaining HES performance.

Considerations for Governments

The pending large-scale abandonment of upstream late-life assets poses clear financial risks to the industry. It also poses financial risk, in the form of decreasing government revenues, to the public. As oil-production levels fall, so, too, will receipts from taxes and royalties. Government revenues will also be negatively affected by rising tax deductions related to upstream companies' abandonment activities.

This risk to the public necessitates a response by governments. To date, government action has been largely confined to regulatory measures aimed at establishing operators' financial responsibility and ensuring that they have sufficient resources to decommission assets, as well as at the timely abandonment of assets. Governments should also, however, consider the strategic value of developed assets, both to the industry and to the public, in formulating policies. Many assets that are currently candidates for decommissioning have components, such as pipelines and platform facilities, that remain functional and could be deployed to reduce the operating costs of existing fields and the development costs of new production. Encouraging the industry to utilize these components in this manner could offer benefits to both the industry and the public. Further, governments should consider structuring tax policy in a manner that encourages the extraction of most of the reserves remaining in late-life assets in order to maximize related government revenues from taxes and royalties.

Persistent weakness in oil prices is triggering a surge in asset abandonment in the upstream oil sector, one for which large upstream players are poorly prepared. The potential financial risk to these companies, as well as to the public, is sizable. There are, however, a variety of actions these companies have at their disposal—spanning program design and management, planning and execution, and contracting—that can reduce the risk significantly. Governments should consider taking action as well. By being proactive now, companies and governments can do much to successfully navigate this uniquely challenging environment.

Notes

1. Bureau of Ocean Energy Management database.
2. The BSEE's Idle Iron directive was issued in October 2010.

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This is the seventh in a series of articles exploring issues associated with changing oil prices. The previous articles are "Lower, And More Volatile, Oil Prices: What They Mean and How to Respond" (January 2015), "Killing the Complexity Monster in E&P: Eight Critical Actions for Upstream Oil and Gas Companies" (January 2015), "Low Oil Prices Are Challenging Natural-Gas Markets" (March 2015), "Two Sides of the Coin: The Impact of Low Oil Prices on Downstream Oil" (June 2015), "A Golden Period for Asset-Backed Trading: Time to Reconsider Oil Supply and Marketing" (July 2015), and "Brent Crude Oil: A Benchmark in Decline?" (September 2015).