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Rediscovering the art of exploration

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Practical steps to establishing a high-performance exploration organization

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Executive summary

In recent years, small independent oil and gas companies have made an increasing proportion of new exploration discoveries, particularly in frontier areas. Meanwhile, at the largest oil companies, a focus on short-term financial results has taken precedence over exploration for new reserves, endangering long-term performance. To return to past performance levels and reassert their historical leading position in exploration and new discoveries, supermajors — and other large companies that have not enjoyed recent exploration success — need to emulate some of the cultural elements that are characteristic of the most successful small companies. Though the largest companies cannot fully replicate the informal culture of smaller rivals, there are some practical steps they can take to instill or enhance the exploration-minded cultural attributes that lead to more discoveries.

Losing the exploration edge

The six integrated supermajors — oil companies that once dominated oil and gas exploration; namely, BP, Chevron, ConocoPhillips, ExxonMobil, Royal Dutch Shell, and Total — are falling behind in the search for new deposits. Instead, small independent companies that place a premium on exploration are taking the lead. Together, these smaller organizations were responsible for an estimated two-thirds of all significant oil and gas discoveries made by private-sector companies in 2010 and 2011.

As exploration becomes more difficult and competitive, larger companies are relying more heavily on acquisitions and unconventional sources such as oil sands and shale formations to bolster reserves. But a number of independents are showing that there are still plenty of conventional deposits to be found. These smaller companies are not just mustering the technical components but the less tangible aspects of exploration; they have developed corporate cultures that reinforce the disciplined decision making that is necessary to pursue high-risk plays in both frontier and established regions. The smaller companies have, in effect, rediscovered the art of exploration that the supermajors left behind.

Supermajors will need better exploration results to control their own fate in an increasingly competitive industry. If they're finding less oil, it will be increasingly more difficult to replenish their reserves. And they won't necessarily be able to count on cutting deals for access to new reserves if they miss the first wave of discovery. Shell discovered this firsthand in 2012 when its acquisition bid for a share of emerging assets in East Africa was rebuffed in the light of higher bids from an Asian national oil company.

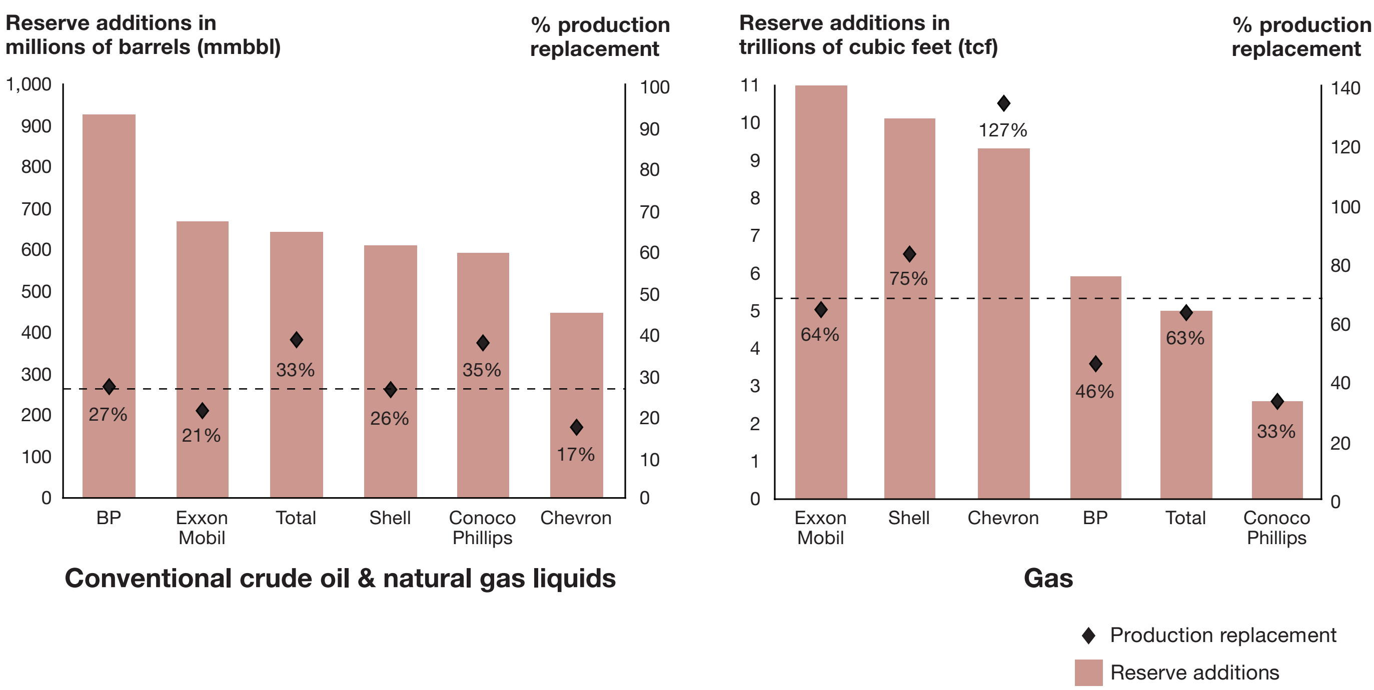
Sustained improvement, however, requires removing internal impediments to exploration success. Too often, supermajors elevate quarterly profits and risk management above the essential mission of finding new oil and gas. They need to adjust their priorities to create a culture that prizes exploration along with appropriate financial discipline. The supermajors need to rediscover the art of exploration that they have lost.

Recent data shows the weakness in reserve replacement at supermajors. Although their overall reserve replacement ratios appear healthy at an average 120 percent during the past four years, most of the growth came through acquisitions and revised estimates for existing reserves made possible by technological advances. Companies' filings with the SEC disclose that oil reserve replacement through extensions and new discoveries (first-time bookings of proven reserves, which are the most consistent, albeit not exact, measure of exploration success) averaged only 27 percent. As a result, proven reserves of conventional oil and natural gas liquids at the supermajors have dropped by almost 5 billion barrels since 2008.

Supermajors have done somewhat better in natural gas, with an average replacement ratio of 68 percent, thanks to shale gas and the first-time booking of older discoveries that recently became commercially viable (*see Exhibit 1*).

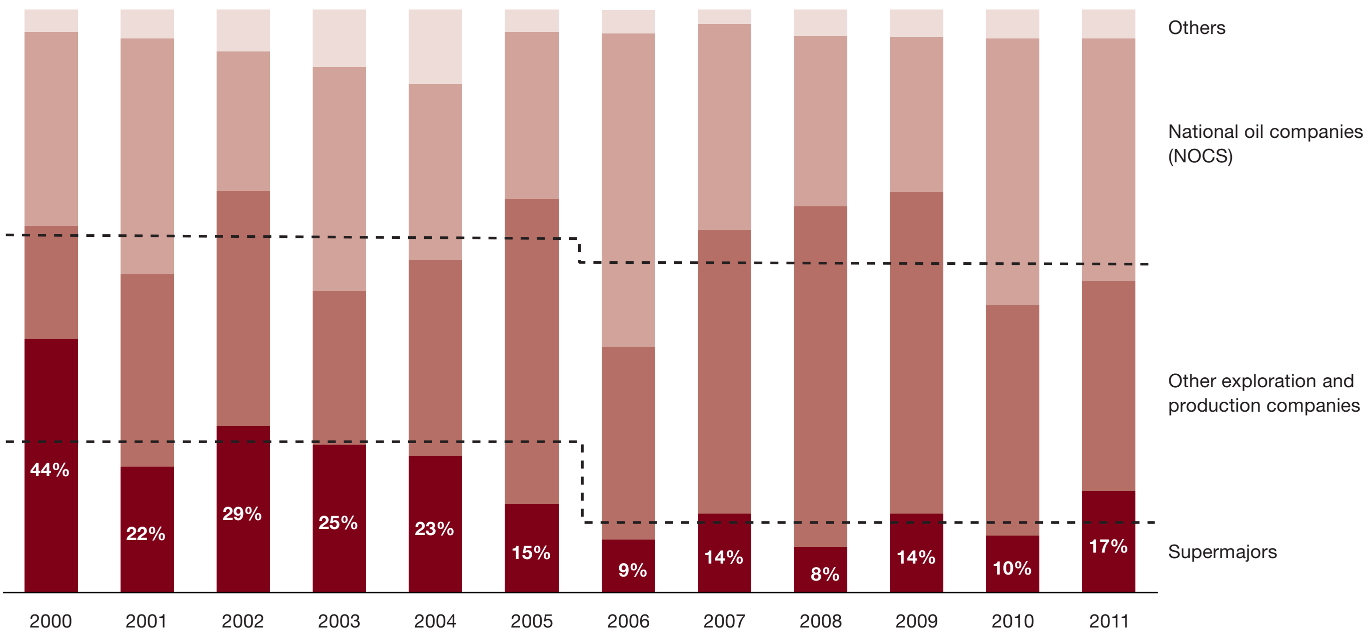
Exhibit 1

Proven reserve additions and replacement ratios through extensions and discoveries, 2008–11



Source: Companies' annual reports and SEC filings; Strategy& analysis

Exhibit 2
Share of discovered global oil and gas volumes by company type, 2000–11



Source: Strategy&

The poor reserve replacement trends reflect supermajors' declining share of new discoveries. Their portion of new resource volumes discovered between 2006 and 2011 plunged to an average of 12 percent from 26 percent in the previous five years. During the same time period, supermajors' share of total exploration spending fell less dramatically — from 28 percent to 22 percent — a clear sign that their declining share of new discoveries stems at least in part from deteriorating exploration performance (*see Exhibit 2*).

Furthermore, significant new discoveries by supermajors are largely confined to established heartlands such as the Australian North West Shelf and the U.S. Gulf of Mexico, while independents lead the way in frontier basins from South America to the eastern Mediterranean (*see Exhibit 3, next page*). Companies such as Tullow (based in the United Kingdom) and Anadarko Petroleum (based in the United States) have been responsible for basin-opening discoveries around the world, while Repsol (in South America) and Statoil (in the Nordic region) have been at the forefront of other new discoveries. Tellingly, supermajors have been underrepresented in new discoveries in some established heartlands, such as the North Sea, where smaller independents continue to make material discoveries. One recent example is the Lundin-led Johan Sverdrup discovery in Norway in 2010.

The diminished presence of super-majors on the frontiers of exploration, and in testing higher-risk plays in established areas, reflects in part a conscious decision to manage financial and other risks. But supermajors are starting to recognize the need to improve their returns on the US$17 billion they spend annually on exploration. This has led to such initiatives as Shell's alliance with the exploration-minded independent Tullow; the push by ExxonMobil, Chevron, and Total to secure more lucrative exploration deals in Iraq's politically contentious Kurdistan region; and moves by Shell and others into high-exposure exploration in the Arctic (*see "Shell and Tullow: A Strategic Exploration Alliance," next page*).

Exhibit 3
Significant private-sector oil and gas discoveries, 2010–11

Source: Strategy& analysis

Shell and Tullow: A strategic exploration alliance

In January 2012, Royal Dutch Shell and Tullow Oil formed a partnership to pursue and evaluate transformational geological plays in undeveloped frontier basins around the Atlantic margin.

Tullow's track record of identifying new exploration plays includes opening new basins and making significant discoveries in French Guiana, Ghana, Kenya, and Uganda. Shell farmed into the Tullow French Guiana license in 2009 and took a 33 percent stake in the 2011 Zaedyus discovery.

According to Tullow's public statement of full year results for 2011, "This partnership combines the knowledge base and specialist capabilities of both companies to allow more effective de-risking in areas with the potential to deliver exceptional results." Shell brings deepwater capability and capital to the alliance, while Tullow brings expertise in frontier exploration.

As Reuters reported in January 2012 ("Shell Seeks Tullow's Help to Boost Oil Production," by Tom Bergin), the deal could give Shell "a short cut to its effort to boost discoveries, by tapping into Tullow's expertise and a culture that encourages exploration risk-taking."

The importance of culture

Sustained exploration success requires many capabilities and characteristics, including world-class geoscience skills, the ability to operate in difficult environments, strong business development networks, and the financial discipline to manage risks effectively. But organizational culture is the factor that we hear cited most often in our work with companies that consistently outperform in exploration. They say that self-reinforcing patterns of beliefs, thoughts, and behaviors contribute more significantly to their success than any particular technology or technique.

For example, one of the most successful global exploration companies identifies entrepreneurship, teamwork, open communication, and respect for geoscience as key drivers of growth. This company also stresses flexibility and a willingness to learn and adapt to new situations as they arise.

Every company's unique culture is reflected in three key domains:

- *People:* the company's workers and their capabilities, the value it places on them, and the motivational tools it uses to align these resources;

- *Processes:* formal and informal decision rights, and the flows of information within an organization; and

- *Organizational structure:* the company's formal structure, its hierarchies, and the division of responsibility between its central and local operations.

Successful exploration companies generally place a high value on geoscience talent. They often link rewards to the performance of the whole company or exploration group, rather than individual accomplishments. Processes such as the evaluation of risk are usually simple, widely understood, and consistently applied. Open discussions of successes and failures facilitate sharing of best practices and ensure that lessons learned from exploration ventures are disseminated across the organization and inform future actions. Exploration companies often adopt flat organizational structures that give geoscience teams open access to senior management, and balance local action with centrally driven strategy and objectives.

At smaller companies, exploration decisions are often made through direct communication among small groups of empowered individuals. At supermajors, by contrast, the organization's size dictates that processes drive these decisions. Smaller companies also measure success in a different way than larger enterprises do. The share price of an independent exploration specialist might double or triple on the back of a big new discovery, but the market value of a supermajor rises and falls with quarter-to-quarter financial performance.

The need to meet Wall Street's expectations consistently can lead larger companies to favor lower-risk exploration plays over higher-risk, higher-reward projects in frontier basins. Interestingly, the company most admired for capital discipline and project-delivery skills — ExxonMobil — has the weakest exploration record of the supermajors in recent years, based on an estimate of resource volume additions. This suggests that an overemphasis on capital discipline can cause underexposure to lucrative new plays in frontier basins.

Supermajors and others seeking to improve their exploration performance can't fully adopt the ways of smaller, nimbler independents. But they can create their own versions of the cultural attributes that foster exploration success.

In particular, don't overlook the informal, interactive elements of organizational culture. Senior leaders should signal the importance of behaviors that support exploration — such as cross-disciplinary teaming, entrepreneurship, and open communication. Highlight people who exhibit these qualities. These are critical steps in spreading throughout your organization the cultural qualities essential to successful exploration.

Nine steps to better exploration performance

No single method guarantees successful exploration for every company. Each must choose an approach that's coherent with its unique culture, strategy, risk tolerance, and broader operating principles. For example, a company that practices strict capital discipline in other parts of its business can't play fast and loose in exploration.

Therefore, we do not recommend that big companies try to emulate the less formal culture of successful smaller explorers. Rather, we suggest nine practical steps that will help any company improve exploration performance. Three of these steps focus on people, three are devoted to changing processes, and three relate to organizational structure.

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People

1. *Review exploration capabilities.* Top geoscientists once flocked to larger companies, but those with real basin-specific expertise now gravitate toward independents that give more freedom and status to explorers with proven track records.

   The first step to improving your exploration capabilities is assessing your talent. Do you have great explorers with records of significant discoveries, or just highly skilled technical specialists? Benchmark the caliber of your staff against respected competitors; this may highlight areas to be addressed, and you may need to reevaluate current staff value propositions.

2. *Challenge conventional wisdom.* Successful explorers tend to ask the "what-if" questions that lead to important discoveries a company might otherwise miss. Industry history is full of examples of supermajors writing off potential exploration sites later shown to contain significant resources by companies with less technical sophistication but more willingness to seek out and test anomalies.

You can start challenging conventional wisdom by finding the root causes of missed discoveries from the past. Form independent teams to reevaluate areas that were passed over, and refocus your peer reviews to address this question: “What if we had made a different decision?”

3. *Review and align rewards.* Defuse internal competition for funding that can lead to a suboptimal portfolio. Many smaller exploration companies avoid this problem by creating “shared success” schemes that encourage collaboration across units. Make sure your rewards systems and performance contracts align the incentives of all units with corporate goals and encourage everyone to pursue the best exploration results for the company as a whole.

Processes

4. *Revisit investment criteria.* During the past decade, larger companies have chased short-term financial results at the expense of longer-term value creation. Their investment criteria for exploration prospects often reflect this tendency. Many recent discoveries by independent companies were known to supermajors prior to drilling but did not meet their criteria for financial risk and reward.

   This has led to an excess of caution at big oil companies. If you are a leader at one of these companies, reconsider your investment criteria, without compromising the capital discipline that’s a hallmark of successful explorers. Model your portfolio under a range of different investment criteria to determine how you might have changed previous decisions to pursue or pass up an exploration project.

5. *Amend materiality thresholds.* The supermajors’ focus on the biggest exploration prospects may preclude them from investing in commercially attractive properties. Some are reexamining materiality thresholds, and joining forces with companies better able to identify and secure less material but attractive opportunities that may develop over time into material business opportunities.

6. *Streamline approvals.* Despite their unbeatable capabilities in large-scale, complex development projects, supermajors can miss out on opportunities when they get bogged down in multistage approval processes. Smaller companies, on the other hand, can make investment farm-in decisions less than a week after learning of an opportunity. With this in mind, review your approval processes and look for ways to streamline the way decisions are made without losing the necessary technical discipline.

Organizational structure

7. *Rebalance central and local roles.* Centralization and standardization, though essential to capital discipline at large companies, can impede your ability to respond to changing local conditions, network with local players, and tap local deal flows. Look at changing the level of relative decision rights for corporate headquarters and local operating units around the world.

8. *Align exploration and business development.* At the most successful small independent exploration companies, teams in the field work closely with business development units so they can move quickly to seize opportunities. Larger companies need the same level of coordination between the groups that spot opportunities and those responsible for securing exploration rights.

9. *Rationalize your portfolio.* Supermajors often devote too much of their exploration budgets to "legacy assets," for reasons unrelated to discovery potential. (For example, they may target some investments to meet the expectations of host governments.) As a supermajor leader, you need to refocus your portfolios based primarily on the quality of exploration opportunities.

Conclusion

Supermajors and other large companies can’t afford to cede leadership in exploration performance to smaller rivals. A strong exploration capability is essential to replenishing reserves and bolstering long-term profitability and growth. Companies that want to find more oil and gas should build a culture that values exploration at least as highly as other corporate activities. Though the art of exploration may be as simple as “having exploration decisions made by experienced explorers on the basis of subsurface considerations,” as one successful oil and gas executive puts it, the nine practical steps to better exploration performance — and the efforts to support those steps by changing behaviors and influencing the culture — will help any company win its fair share of future discoveries.

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