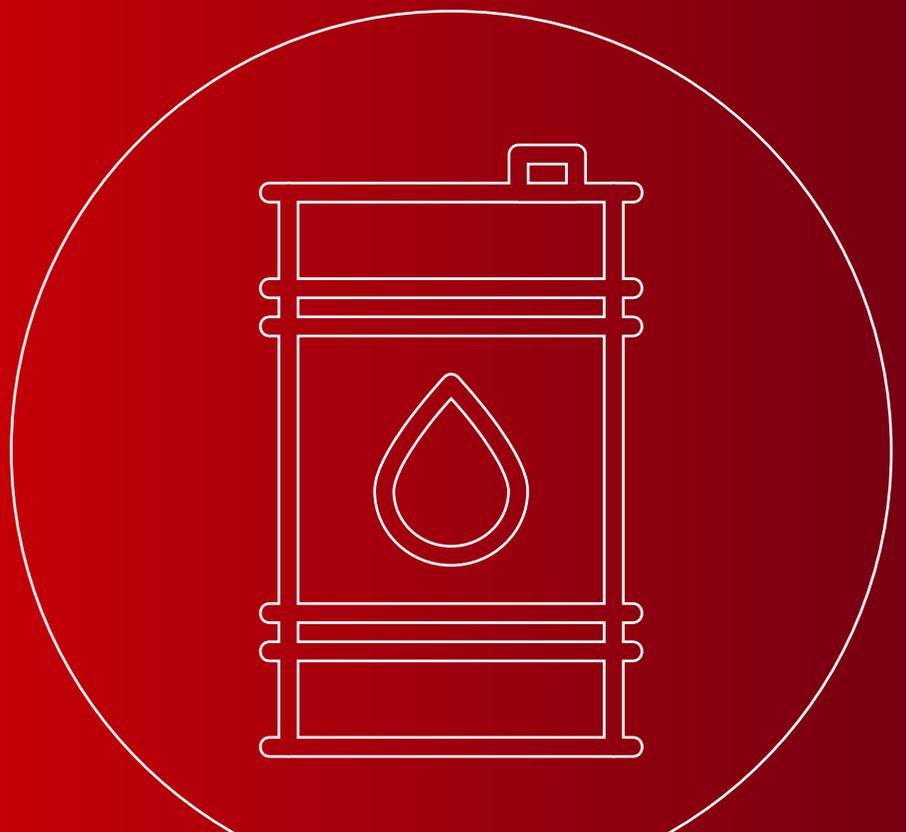


NATIONAL OIL
COMPANIES
IN THE THIRD
PETROLEUM ERA:

**THE
UNAVOID
ABLE
CHANGE**

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Endowed with vast, highly valuable and in-demand resources, National Oil Companies (NOCs) have enjoyed unparalleled success and profitability for decades. But with the energy industry undergoing a spectacular and historic transformation, the days of easier money are quickly coming to an end. NOCs must undergo a radical change if they hope to remain competitive in the emerging energy landscape.



CHANGE IS HERE— AND MORE IS COMING

The energy industry today looks nothing like it did five years ago—and much more change is in store in the years ahead. NOCs are caught in the teeth of the storm, with three developments in particular set to threaten their business and, possibly, their very existence.

The margin squeeze

Despite their privileged access to oil reserves, NOCs' profitability—and the return they generate for their host country's government—has fallen from as much as 30 percent to around 10 percent or less in the past five years.¹ In fact, the return on investment for some NOCs does not even offset the cost of capital. Two factors are largely to blame: the drop in oil prices during the past five years, and the NOCs' failure to transform in response.

The oil snub

This margin squeeze is emerging at a bad time for NOCs because peak oil demand is on the horizon. According to Accenture Strategy analysis conducted as part of a World Energy Council study,² oil demand is expected to top out between 2030 and 2040 at 95 to 105 MBD—which is only 10 percent to 15 percent higher than today's rate. Dampening demand is due to a combination of factors, including more competitive alternative energy sources, greater efficiency in transportation, increased global pressure to combat climate change and control greenhouse gas emissions, and slowing growth in gas-hungry economies such as China.

Exacerbating the demand slowdown is the commercial development of un conventionals, which has forced NOCs to shift from defending a market price for oil to defending a market share of the global oil output. In a battle for market share, and in a world in which global 1P reserves cover oil demand for the next 45 years, marginal asset classes are at risk of remaining stranded by the advent of production from reserves of asset classes with low break-even prices. A competition to reduce break-even costs on marginal asset classes will materialize in the coming years.

The shift in the IOC/NOC balance

With peak demand for oil likely 15 to 25 years away, there's more oil in the world than will ever get consumed—meaning NOCs are replete with a resource that effectively becomes worthless if not used soon. Concurrently, innovation-driven International Oil Companies (IOCs) have become masters at exploiting complex asset classes at lower costs. IOCs have reduced structural costs by over 40 percent in unconventional plays by extensively leveraging innovative field and business technologies. This has made them far less reliant on NOCs for access to reserves. Many NOCs still have cost-advantaged resources, but they have not been able to harness the full potential of these resources.



NOCs have far greater exposure to the upstream business than IOCs, which leaves them highly vulnerable during commodity price down cycles

DEFINING AND BUILDING A NEW NOC

The scenario NOCs face is a perfect storm that can mean only one thing: NOCs urgently need change—a Third Petroleum Era—if they hope to remain viable, profitable entities in the coming years (Figure 1).

Key to this change are the answers to two fundamental questions:

- 1) Where to play** in the energy ecosystem?
- 2) How to win** on an expanded world stage of actors?

	Traditional NOC	New NOC
Investment approach	 Few, large, long	 Many, small, short
Project focus	 Specialized	 Standardized
Operating model	 Singular	 Tailored
Commercial priorities	 Capital	 Margin
Management focus	 Control	 Navigation & insight
Monetization approach	 Commodity	 Customer engagement

Figure 1: A New Petroleum Era for NOCs

Where to play

As stewards of national resources, NOCs will need to harness the maximum potential of the hydrocarbons they have access to. At the same time, they will have to look beyond those resources to remain competitive. This means reshaping their energy portfolio along four lines.

1. National hydrocarbon assets to focus on. NOCs need a deeper understanding of the economic potential and positioning of these resources on the global supply curve, as well as the capital velocity equation—i.e., which smaller, shorter-cycle assets can yield greater flexibility and quicker returns than large, monolithic undertakings.

2. International assets, if any, to pursue. NOCs could look to international assets for economic reasons, but only if the NOC has an undisputed production advantage that makes the return on international assets exceed whatever handicap the NOC faces at home.

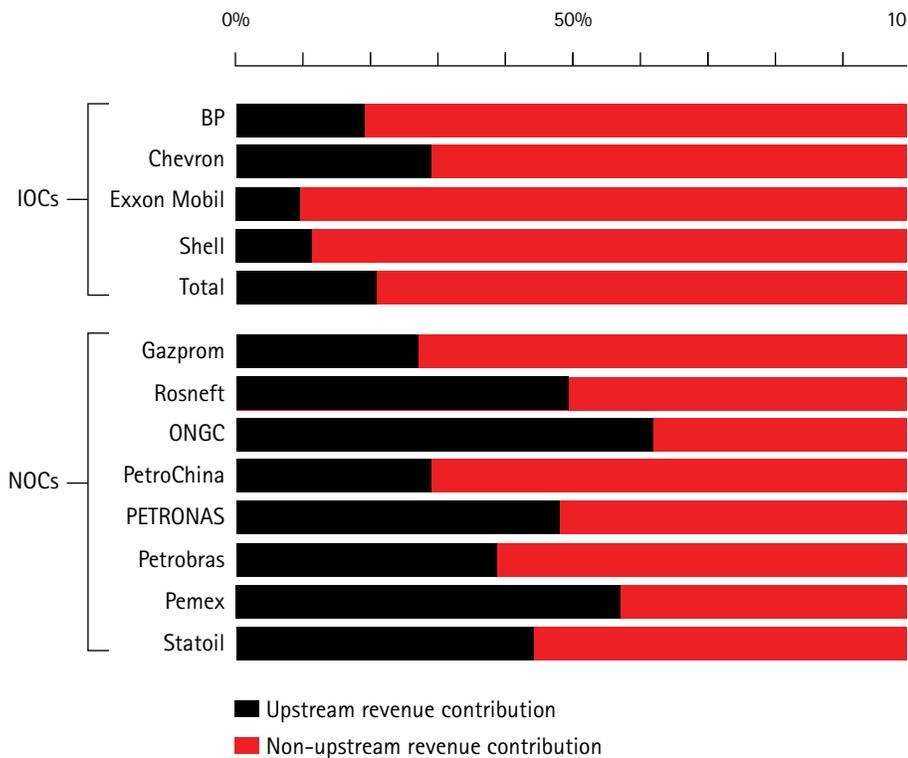
3. Diversification from upstream further into the oil and gas value chain. NOCs have far greater exposure to the upstream business than IOCs, which leaves them highly vulnerable during commodity price down cycles (Figure 2). In the latest downturn, refining and midstream businesses posted healthy margins. Most NOCs currently don't take advantage of this opportunity as much as the majors do to build more balance into their portfolios.

4. Potential participation in the new energy system. With alternative energy types and business models poised to assume a greater role in the overall energy sector, NOCs will need to at least consider the question of whether they should play beyond hydrocarbons. The ultimate decision should hinge on how NOCs can maximize the value per energy molecule. For some, that could be purely from a hydrocarbon basis, while for others, it may require participation in the extended energy ecosystem that could include non-hydrocarbons as well as digital applications. The shift may also be driven by national policies focused on reducing the host country's carbon emissions.



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Revenue distribution for IOCs versus NOCs % contribution of upstream operations to total revenue



Source: Accenture Strategy

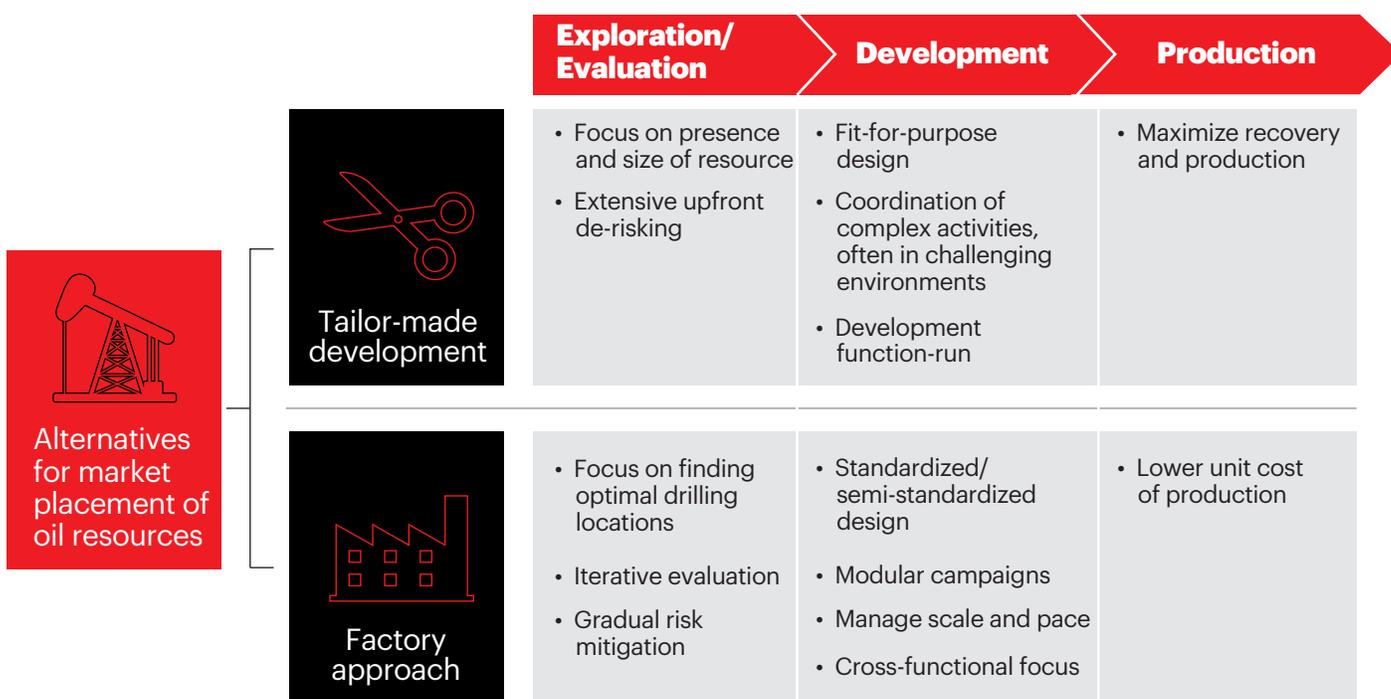
Figure 2: NOCs are less integrated across the E&P value chain than IOCs and, thus, are more exposed to upstream margin squeeze

How to win

With its portfolio options sorted, an NOC must do what it needs to do to be successful:

- Move from a slow, centralized behemoth to a quick and nimble decentralized collection of specialized units
- Develop many, small, short lifespan fields, instead of a few, large, long assets
- Focus on margin and cash management rather than capital and asset productivity
- Replace the complex tailored approach to large projects with a standardized flexible model adapted to smaller ventures
- Embrace digital disruption and integrate new technological ecosystems at the core of its operations

For example, in an era of peak oil demand, survival will require NOCs to sharpen their approach to production to maintain market share and profitability. For currently producing profitable fields, this means optimizing production through aggressive cost and reservoir management initiatives and investment in EOR/IOR (Enhanced/Improved Oil Recovery) technologies to maximize reserve recovery. For undeveloped but potentially profitable fields, it means determining when to pursue a factory approach versus bespoke developments (Figure 3). Smaller and simpler fields are prime candidates for the former, in which standardization in reservoir engineering, well design and production facilities generates a lower CAPEX per barrel—boosting profitability. The tradeoff of a lower recovery factor is of little concern in a world awash with oil. Bespoke is useful for large, highly complex fields (such as Orinoco and Kashagan), where a tailored approach is necessary to maximize the recovery factor and guarantee the investment’s profitability.



Source: Accenture Strategy

Figure 3: Factory versus bespoke approach to production

For other asset classes—such as deepwater, extra-heavy oil and unconventional—NOCs should pursue alternatives in which they become non-operating partners—such as joint ventures with specialized operators, service providers or financial institutions—to develop available resources at the lowest break-even cost.

NOCs also must embrace the key elements that define a modern, competitive and profitable business. At the core of this effort is defining a reinvigorated operating model that supports the new portfolio—the NOC’s assets and role in the energy value chain. An NOC may be very successful as a hydrocarbon producer, but it will need new technologies, skills, organization structure, and business processes and systems to excel as a diversified energy company.

Finally, NOCs should consider how they interact with other entities in the broader energy ecosystem. They will need to shift from their traditional arms-length, transactional arrangements. Much like the strategy used to transform the automotive industry, they need to focus on minimizing cost and building more collaborative relationships. By jointly defining objectives concerned more with unit costs and productivity rather than absolute costs, collaboration can help NOCs establish a firm footing in the energy ecosystem.

Collaboration also can help NOCs leverage other companies’ technology and workflows they desperately need to improve performance—either through cost reduction or productivity gains. This can be in traditional upstream developments such as deepwater to reduce costs or accelerate recovery; in digitizing the oilfields to streamline operations; or in taking part in the new energy system, such as developing smart grids and enhancing customer interaction in market-facing roles such as fuels marketing and power delivery.



In an era of peak oil demand, survival will require NOCs to sharpen their approach to production to maintain market share and profitability

CHANGE IS DIFFICULT BUT UNAVOIDABLE

The writing is on the wall: with peak oil demand on the horizon, NOCs need to map out their futures and how they will change to survive.

The good news is that some players have already taken initial steps, and their experiences can be instructive for other NOCs. For example, some have sought an injection of private money, as Ecopetrol and Petrobras have done and Aramco hopes to do with its proposed IPO. And some—such as Aramco with chemicals and Pemex with co-generation—have expanded into other areas of the energy value chain. Other NOCs, such as those in Kuwait, Mexico, Colombia and Brazil, have decommissioned assets to focus on their strengths. And still others have seen a change of operatorship status in certain countries—notably, Pemex’s farming out shallow-water fields, the open association with Petrobras in the presalt, and the Iraq and Ecuador service contracts.

These highly visible measures are steps in the right direction. However, much more difficult changes lie ahead that touch the core of the NOC’s operating model: a performance-oriented culture with the right incentives, streamlined organizations and the use of business technologies to boost efficiencies. That’s when the really hard work begins.

With the right positioning, NOCs have the intellectual capital and resources to succeed, returning to the headier days of higher returns on capital and contribution to their national economies. But they, and their host governments, must grasp the sense of urgency for change to compete and thrive in a dramatically different energy landscape. Avoiding change is not an option.

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¹ IHS, Accenture Strategy Energy analysis

² “World Energy Scenarios 2016: The Grand Transition,”

<https://www.accenture.com/us-en/insight-world-energy-scenarios-exploring-grand-transition>

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