

# Business Pulse

Exploring dual perspectives on the top 10 risks and opportunities in 2013 and beyond

Oil and gas report



# Contents

Introduction	1
Executive summary	2
Ernst & Young risk and opportunity radar	7
Interaction with governments and regulatory bodies: rich rewards for engagement and transparency	8
Core business focus and counterparty risk management: covering your bases	18
The pace of technological change: staying ahead of the game	28
Emerging challenges	36
Methodology	40
Appendix: risks and opportunities below the radar	43



# Introduction

How can you be confident your company is well placed to meet the risks and challenges currently on the horizon? And how can you know that opportunities aren't passing you by? This report will help you answer both of these questions. It explores the top 10 risks and opportunities in the global oil and gas sector in 2013 and looking ahead to 2015.

Forecasting the future is risky, but businesses that fail to look forward will almost certainly be left behind in an increasingly competitive, globalized world. This report takes the pulse of current thinking, insights and expectations from industry executives and Ernst & Young specialists. The results are an industry overview of the top 10 risks and opportunities. Every oil and gas company will, of course, have their own individual risk and opportunity profile depending on their portfolio and the nature of their business. Companies may also classify, name and cluster risks and opportunities on a different basis than has been used in this report. However, companies can use the discussion of the risks and opportunities and the risk/opportunity radar to assist in the process of defining and ranking their individual company priorities. The results can be used as a benchmark for your business and can feed into strategic decision-making.

The top 10 lists are based on the opinions of our interviewees. Each top 10 ranked risk and opportunity was then discussed with relevant specialists to gather the insights and perspectives on which this report is based.

The research shows, unsurprisingly, that health, safety and the environment (HSE), regulatory compliance, price volatility and the increasing challenge associated with accessing reserves and markets take the top spots. A new entrant to the top 10 this year is IT security, specifically the threat to companies' operations – or indeed, country and region-wide energy infrastructure – by cyber attacks or cyber theft of their intellectual property.

With regard to opportunities, rising emerging market demand is this year's number one, rising three places since our 2011 report. With the continued growth of the world's emerging economies, energy demand in these countries will also rise rapidly, and the opportunity for oil and gas companies to take advantage of this is immense. The opportunity list saw many new entrants this year, including new infrastructure to gain access to or to connect resources and markets, safety and risk management used as a partnership enabler, and new or expanded markets for natural gas.

This year, we have chosen to present the results and rankings differently. You will find the top 10 rankings as in the past, but for the main sections of the report, we have clustered together those risks and opportunities with clear links and discussed these as a combined narrative. In so doing, we have identified three clusters, or themes, into which the top 10 risks and opportunities fall: interaction with governments and regulatory bodies; core business focus and counterparty risk management; and the pace of technological change. These clusters of risks and opportunities are previewed in the executive summary, to give an overview and a dual perspective on the themes contained within them.

The purpose of this report is to provoke discussion and debate about how your company is meeting today's and tomorrow's challenges and opportunities. Are the items on the global lists similar to those you are monitoring? Are they your top 10?

Finally, we would like to extend our thanks to all our survey participants who took the time to share their thoughts and experiences with us. We look forward to discussing further the implications of these survey findings with our clients, regulators and governments, as well as analysts and universities.

# Executive sum



# Summary



## **Compliance merges with HSE**

Health, safety and the environment remain on top of the oil and gas industry's agenda, reflecting a climate of zero tolerance for accidents both within the industry and within the stakeholder community. These areas have always been the top priority for the industry in their own right. Regulation is also increasing in HSE, as well as with regard to bribery, corruption, financial reporting and transparency, creating a strong linkage between HSE and regulatory compliance. This combined area of risk is likely to remain at number one for the foreseeable future.

## **Global change feeds industry thinking**

New risks this year include IT security, as companies realize they need to do more to protect against data theft and skilful and tenacious cyber attacks. Another risk now warranting its own discrete category is increasing project scale and complexity. As mega-projects become more common, the industry's record for delivering on time and on budget is under increasing scrutiny.

Rapid-growth markets are increasingly being seen as the primary drivers of the world's economic recovery and, therefore, of growth in energy demand. Accordingly, rising emerging market demand has risen three places to rank as the greatest opportunity for 2013.

There are a number of new entrants to the opportunity list, such as new infrastructure to gain access to, or to connect, resources and markets. This opportunity reflects the increasing need for connectivity between remote supply and the demand centers where it is needed. Safety and risk management used as a partnership enabler is another new entrant. There are significant opportunities for companies to identify and include all relevant safety and risk management eventualities in third-party contracts and then proactively manage these terms, as opposed to just reacting to their consequences.



The results of the survey are detailed below with the respondents' views on the current risk and opportunity landscape in 2013 and looking ahead to 2015. A description of the methodology, the geographic makeup of the participants and the organizations that they represent can be found on pages 40 to 42 of this report.

As mentioned in the introduction, the risk and opportunity landscape can change very quickly and will vary significantly from company to company. The current and future ranking is, therefore, indicative and should be used as guidance only.

<b>Risk ranking</b>	<b>2013</b>	<b>2015</b>	<b>Opportunity ranking</b>	<b>2013</b>	<b>2015</b>
The risk of a health, safety or environmental incident, and in ensuring regulatory compliance	1	1	Rising emerging market demand	1	1
Price volatility; managing long-term investment with the potential for extreme price volatility	2	2	Investing in innovation and R&D	2	2
Access to reserves or markets	3	3	Frontier acreage	3	3
Cost escalation and inflation	4	6	Focused recruitment, training and retention programs	4	4
Uncertain energy policy	5	5	New infrastructure to gain access to, or to connect, resources and markets	5	5
Worsening fiscal terms	6	4	Safety and risk management used as a partnership enabler	6	7
Human capital deficit (e.g., skills shortages, aging workforce)	7	7	New or expanded markets for natural gas	7	6
Competition from new technologies and new sources (e.g., alternative fuels)	8	8	Acquisitions or alliances to gain new capabilities or access to resources or markets	8	8
IT security	9	10	Additional corporate social responsibility (CSR) and corporate sustainability measures and transparency	9	9
Increasing project scale and complexity	10	9	Strategic divestitures	10	10



## Ernst & Young risk and opportunities radars: risks and opportunities at a glance

To give you a snapshot of the sector's top 10 risks and opportunities, we have created two "radar" diagrams (see page 7) showing the most significant risks and opportunities at the center of the radar.

### Three key themes

The sector's most significant risks and opportunities fall into three key themes:

- ▶ Interaction with governments and regulatory bodies
- ▶ Core business focus and counterparty risk management
- ▶ The pace of technological change

This report explores these themes, considering the risks and opportunities related to each.

### Interaction with governments and regulatory bodies

#### Rich rewards for engagement and transparency

Supply chains in the oil and gas sector are increasingly interconnected. Managing them against a backdrop of multiple governments with different and changing policies and regulations is challenging enough. The industry is also moving quickly into new geographical and technical areas. These create new challenges for governments, and short time frames in which to make critical decisions that have some very profound, long-term implications for oil and gas companies.

Regulatory compliance is a challenge in any industry, but the circumstances of many oil and gas companies – a lot of which are compelled to operate in a wide variety of regulatory environments – make it a unique discipline. New methods of extraction, such as hydraulic fracturing, present risks to regulators who are unsure of the wider impact of their large-scale use.

Gaining approval from individual jurisdictions to develop reserves requires an appreciation of the specific circumstances involved in each case. Companies must take into account the competing interests and priorities of governments, which all have political or economic imperatives to consider. A positive public image can help in this regard; companies must ensure that governments will want to be seen doing business with them.

### Core business focus and counterparty risk management

#### Covering your bases

With the inherent complexity and capital-intensive nature of the oil and gas industry, joint ventures are commonplace, as are multiple, complex supplier relationships. These partnerships are generally fruitful, but carry a number of intrinsic risks.

The reliance on joint venture and contracting partners has been pulled into sharp focus by the 2010 Gulf of Mexico spill. The incident demonstrated the considerable financial and reputational risk to which all parties are exposed. With high numbers of joint ventures and third-party service providers, the issue of partner and contractor assessment and management has now moved up the agenda for all leading oil companies and investors. Non-operated joint venture stakeholdings are a particular concern, as they tend to combine a limited ability to influence and control day-to-day operations with considerable exposure should things go wrong.

Companies are thinking hard about their core business focus, and many are recognizing that they cannot be present in all countries in all activities. With opportunities outweighing the capital and skilled resources that most companies are able to invest, they have to be clear about where their organization's core competencies lie and where they can achieve the greatest returns. This is having a dramatic restructuring effect on the global energy landscape and on how companies manage their own risk and limit their exposure to partners' risk.

## The pace of technological change

### Staying ahead of the game

For the oil and gas industry, technological change primarily concerns new ways of accessing and distributing natural resources. There are significant opportunities for oil and gas companies looking to utilize new technology to identify and extract hydrocarbon resources and to lower their supply chain costs. However, for companies looking to develop or take advantage of new technologies, significant investment is required to develop and maintain an up-to-date understanding of industry trends. Additionally, companies need to assess the potential benefits for their business of technological developments across a broad range of other industries.

Elsewhere, technological change means a greater role for IT and management and control systems within the industry. While the benefits are apparent, the risks and costs are also substantial.

At a time when major capital investment decisions need to be made over a 20- to 30-year horizon, the industry faces the difficult task of trying to predict not only how technology will impact and drive our future energy consumption and supply, but how it will change day-to-day operations, drive cost savings and enable new sources of energy to be commercialized.

## Emerging challenges

While taking the pulse of the oil and gas landscape in 2013, our research has identified the importance of keeping up with technological progress. Although the challenges oil and gas companies face over the next decade are uncertain, as a consequence, we have identified three additional areas in which current trends could present both risk and opportunity to companies in this time frame.

The first is access to finance and capital market constraints. Oil and gas developments are becoming increasingly challenging, complex and expensive. Consequently, the risks associated with raising capital are likely to intensify.

The second challenge is the trend toward increasingly tight local content requirements. Should this trend continue, it will have implications across a range of issues, including labor costs and the ability to deliver projects on challenging time schedules.

The third area is catastrophic environmental events. Should these become increasingly common or inextricably linked to CO<sub>2</sub> emissions, then the argument for immediate action to reduce CO<sub>2</sub> emissions will become not just about affordability, but necessity.



# Ernst & Young risk and opportunity radar

The risk and opportunity radar is a device that allows us to present a snapshot of the top 10 risks and opportunities for global businesses.

The risks and opportunities at the center of the radar are those that we feel are the most impactful for major organizations worldwide. Arrows indicate the extent to which the risk or opportunity is likely to increase, decrease or remain the same between now and 2015.

The radar is divided into four sections, corresponding to Ernst & Young's *Growing Beyond* model. The sections are:

- ▶ Customer reach: maximizing the potential market opportunity for products and services
- ▶ Operational agility: improving organizations' ability to deliver effectively in a fast-changing market
- ▶ Cost competitiveness: sustaining the economic viability of organizations
- ▶ Stakeholder confidence: allowing companies to build stronger relationships with their stakeholders

## Top 10 risks



## Top 10 opportunities



2013 ranking and expected 2015 ranking: ▲ Up in 2015, ● Same in 2015, ▼ Less in 2015

# Interaction with governments and regulatory bodies

Rich rewards for engagement and transparency



Risks



Opportunities



The risks and opportunities shown in our radars above have clear links and have been brought together into a combined narrative under the heading “interaction with governments and regulatory bodies.”

The risks and opportunities in this chapter predominantly appear in the **customer reach** and **stakeholder confidence** sections of our radars (see page 7). This reflects the challenge of increasingly interconnected supply chains needing to be managed against a backdrop of multiple governments and regulations, and the expansion of the industry into new geographies. Worsening fiscal terms appears in **cost competitiveness**, but there are also clear links to government and regulatory policy within this risk.

## The risk of a health, safety or environmental incident, and in ensuring regulatory compliance

Table 1  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
The risk of a health, safety or environmental incident, and in ensuring regulatory compliance	5	1	1

### Safety tops agendas

In our view, and that of the survey respondents, HSE is unquestionably the number one hazard for oil and gas companies, and this was confirmed by our experts' ranking. The need to protect employees, local communities and minimize environmental impact is always paramount, with any perceived negligence in this area penalized heavily by both regulators (who hand out enormous fines) and the wider public (whose perception of the organization responsible can be irreparably damaged).

Of course, such penalties are not the only concerns for oil and gas organizations in this area. Safety and environmental health are of paramount importance in their own right. As Eyvind Aven of Statoil explains: "Even though a safety catastrophe has a very low probability, it is always on Statoil's risk map, and we continuously assess the main contributors to this risk, which can change over time. Safety is always on top of management meeting agendas, where we discuss appropriate actions to mitigate the risk."

The recent tragic events at the In Amenas gas plant in Algeria, which occurred after our survey was completed, highlight the risk of a terrorist attack that oil, gas and service companies face and could be regarded as falling within the safety element of this risk category. However, it is fundamentally different from the operational safety issues historically included within this category and will need a different industry response. Given the scale of the In Amenas incident and the terrible loss of life, this risk is so significant that it could warrant a risk category of its own in the future. It also highlights how quickly the risk landscape and priorities can change in response to new events.

Following on from the attack, host governments and companies have been quick to look at the lessons to be learnt from the incident and identify what measures can be taken to better protect personnel and property in all geographies.

### Regulators to the fore

Regulators have responded to heightened risk perceptions across HSE, finance and ethical areas by tightening rules and codes considerably over the course of the last decade. The industry has always looked to deliver leading performance in these areas – seen as critical in their own right and as essential components of companies' "license to operate." Increasingly, there are regulatory compliance issues in all of these areas, and tangible consequences and penalties for non-compliance.

Ernst & Young's David Harrison observes that: "Health and safety have long been the industry's number one priority. Increasingly, in addition to the industry's goal to eliminate accidents, there is a broader zero tolerance among stakeholders for accidents and regulatory non-compliance." Indeed, as the CFO of a large US independent adds: "After the oil spill in the Gulf of Mexico, environmental, health and safety risks have come under much greater scrutiny." Commercial factors are also key drivers of this risk. These include compliance in financial and ethical areas and the increases in multibillion dollar fines from regulators and litigation claims from shareholders and stakeholders, resulting from lapses.

### Local rules have local meanings

This changing environment has placed a large burden on the compliance teams of oil and gas companies, who must have an intimate knowledge of regulation in each of the geographies in which they operate. The fact that regulators have to understand and interpret what are often highly technical, complicated processes may contribute to regional variations in both the regulations and in the interpretation of those regulations.

The good news is that, overall, regulatory variability may be diminishing as a risk. Regulators have a heightened awareness of regulation in other geographies and of the need for global convergence in the requirements that they place on companies. Some rapid-growth markets have recently implemented regulatory frameworks similar to those in mature markets, as part of their effort to attract investment.



“Regulations have been introduced in areas that couldn’t possibly have been predicted 10 years ago, which makes it difficult to assess the outlook for the future.”

**Doug Johnston**, Ernst & Young, UK

The bad news is that there is a related and developing risk in this area – the uncertainty that now surrounds the way in which regulations are interpreted and enforced. As Ernst & Young’s Doug Johnston illustrates: “Companies base their decisions as to how they are going to operate on both internal standards and their understanding of regulations. But the local regulator may use a different interpretation of the same regulation, which results in a completely different set of expectations. As a consequence, the company operating in that area may be fined for non-compliance.”

Eyvind Aven of Statoil says his company worries about such “misaligned interpretation” which, in severe cases, can result in legal proceedings. The risk is magnified, because Statoil has operations in countries that score poorly in corruption indices such as Transparency International’s Corruption Perceptions Index. This specific risk is likely to remain very important over the next few years, as jurisdictions adopt what are, in many cases, quite sophisticated regulations, but do not always have the capability and experience to enforce them consistently and transparently.

### Social licensing matters

In some locations, the picture is further complicated by populist sentiment against oil and gas companies, which can lead to pressure on regulators to crack down on any perceived or actual breaches of regulation. Local populations often view such companies with suspicion, due to the frequently negative media coverage of the industry as a whole. As Doug Johnston points out: “Companies operating in environmentally and socially sensitive environments may need to deal with significant non-governmental organization (NGO) backlashes, and being able to demonstrate a strong track record and a willingness to listen to others’ perspectives will be important in building stakeholder support and a social license to operate.”

### Partners share reputations

Counterparty risk presents a further area of difficulty. To what extent is it appropriate to “manage the performance of your local partners to ensure high ethical standards of operation? Where liability is evenly shared, and working cultures and practices differ, whose responsibility is it to ensure compliance with appropriate regulation? Increasingly, regulators are looking to the oil and gas operators to manage this risk, with the Foreign

Corrupt Practices Act and the UK Bribery Act placing the onus on resource holders to manage the bribery and corruption risk throughout the supply chain.

Statoil’s Eyvind Aven says his company is particularly concerned about fraud and corruption in relation to third-party risk. Oil and gas companies frequently operate in a number of countries that rank poorly on corruption indices, which makes these considerations critical when companies are looking to choose local partners and suppliers. In addition to ensuring that appropriate internal due diligence requirements are met, Statoil conducts anti-corruption training for partners, when necessary, to reduce the risk of incidents.

For companies negotiating these regulatory minefields, scenario analysis can be helpful. As Doug Johnston continues: “It is possible to see regulatory patterns in more established markets; typically, regulators in other markets will start to debate regulations that have been introduced elsewhere.” He adds that a scenario-based approach will help organizations assess their risk profile in this area. He also notes that the rate of technological change can cause significant disruption for companies looking to predict the course of future regulation: “Regulations have been introduced in areas that couldn’t possibly have been predicted 10 years ago, which makes it difficult to assess the outlook for the future.”

### Access to reserves or markets

Table 2  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
Access to reserves or markets	1	3	3

### Navigating host country relationships

One of the reasons that regional variations in regulatory priorities is a huge concern for oil and gas companies is that some of the most challenging geographies contain reserves that will be needed to satisfy the world’s growing demand for energy. This risk is also driven by some countries’ desire for a greater share of the oil wealth, as well as increasingly restrictive local content

laws that result in further risk of non-compliance or sub-optimal developments. As Ernst & Young's David Harrison notes: "Resource-holding governments are making use of production sharing agreements (PSAs) for more technically challenging projects, but also service agreements for more straightforward projects. This practice creates issues around the booking of reserves for oil companies – a major performance measure and indicator to shareholders of future value – and restricts their returns."

This risk has fallen in relative importance since our last report – explained partly by some countries (e.g., Russia, Algeria and Ecuador) revising their terms to entice back foreign investors who had departed following manifestations of resource nationalism. However, our experts expect it to maintain its significance between now and 2015, expanding to encompass new frontiers. As Ernst & Young's John Avaldsnes explains: "There are more and more players chasing more and more difficult volumes." Statoil's Eyvind Aven agrees: "Competition for reserves is increasing every year, and so will this risk in the future."

The biggest issue for companies, in terms of access, concerns their relationship with host countries. Companies can mitigate risk in this area by adopting an open approach and maintaining the lines of communication. As Ernst & Young's Dale Nijoka explains: "A lot of governments, particularly in Africa, don't have as much experience in negotiating oil and gas contracts as some of the major IOCs and NOCs. The most successful companies are the ones that work with governments; the ones that make sure that the governments understand what it is they think they have found, or want to find."

As a consequence, partnerships between local governments and IOCs are often more visible and transparent than they have been in the past. Access to reserves is not the only motivation for such partnerships; other benefits include building technological expertise, improving social infrastructure and providing additional job training. As Ernst & Young's Tim Teuscher notes: "All of those things are now considered increasingly important for the IOCs. Rather than simply focusing on reserves, a more complete approach is being taken." Such partnerships are mutually beneficial, but each side must recognize that these ventures need careful management and may require compromise.

## Frontier acreage

Table 3  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
Frontier acreage	1	3	3

## New technologies open new reserves

With increasing global energy demand and declining production from many mature oil and gas fields, there is an increased level of exploration activity in existing basins and an increased focus on enhanced oil recovery. In addition to these opportunities, companies are increasingly looking to access new types of reserves that were previously inaccessible for technological, cost or climate-related reasons. The oil and gas industry continues to push the technical boundaries of exploration and development possibilities, effectively deferring the concept of peak oil. For many organizations, frontier acreage offers the only answer to improving reserve-replacement ratios.

With the continuing search for new sources of oil and gas, there are now plans to explore and extract hydrocarbon reserves in the Arctic. Offshore oil development in Alaska has experienced setbacks, despite its considerable promise. Yet the potential benefits for companies succeeding in this area are immense. From a technological standpoint, IOCs are clearly best placed to develop such reserves; they are already focusing on challenging technical environments such as deepwater and Arctic exploration, gas-to-liquids technology, floating liquefied natural gas (LNG) and unconventional. The key components of the frontier acreage opportunity are:

- ▶ The Arctic – the area north of the Arctic Circle is thought to contain 13% of the world's undiscovered oil and 30% of its undiscovered natural gas.
- ▶ Ultra deepwater – another new area the industry is moving into as it develops new capabilities and solutions to the problems of extreme pressure, temperature and harsh climate. For those that master this challenge, the rewards are considerable and will represent a major competitive advantage.

“Competition for reserves is increasing every year, and so will this risk in the future.”

**Eyvind Aven**, Statoil, Norway

- ▶ Shale oil and gas – another technical frontier. In addition to mastering the technical challenges of interpreting seismic data and hydraulic fracturing, companies will face new challenges in managing onshore operations and interaction with local communities.

Many companies seeking access to frontier acreage will adopt a first mover strategy, building longer-term partnerships with the relevant governments and regulators. Others will wait until the potential is established and the risks have been clearly identified, and are either fully or partially mitigated. Both are valid strategies, depending on a company's strategic aims and risk appetite.

Simultaneously, the importance of regulatory oversight of frontier acreage will increase. In the wake of the Gulf of Mexico oil spill, regulators have become increasingly demanding in their checks on oil and gas companies operating in new areas and using new techniques. NGO campaigns and pressure from environmental groups have a degree of influence over policy-makers in all jurisdictions, and this has increased over the last two years.

## Uncertain energy policy

Table 4  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
Uncertain energy policy	2	5	5

## Energy policies will always change

As noted above, front-of-mind risks for most oil and gas organizations center on their ability to operate and succeed in a variety of areas and under a wide range of regulatory principles. Breaches in this area can be crippling in the short term, but companies are just as vulnerable to long-term developments in energy policy. Misunderstanding, for example, the underlying principles of a government's policy on unconventional energy can lead to miscalculations that may become very expensive over the often decades-long investment period of a typical project. Government policies on unconventional resource exploration and development will evolve as the industry matures and individual countries weigh the balance between potential risks and rewards in determining their energy policies.

In 2011, our *Turn risks and opportunities into results* report combined energy policy and regulatory compliance into one risk. In this year's report, the two have been split. The longer-term nature and impact of energy policy may help to explain why this individual risk has moved down the list in 2013.

What is certain, as Ernst & Young's David Harrison puts it, is that: "The peak oil theory that predominated a few years ago is being replaced by the view that hydrocarbons are still plentiful, but they are becoming increasingly complex to find and develop, often remote from markets and expensive to commercialize." As noted earlier, the policy debate has consequently broadened from concerns over future supply to include concerns over the likely shape of future demand and how that may be influenced by government energy policy.

There is uncertainty in many geographies regarding future government policy in relation to:

- ▶ Unconventional resources
- ▶ Nuclear energy
- ▶ Renewable and hydrocarbon subsidies
- ▶ Emissions and carbon regulation
- ▶ Approval for major oil and gas infrastructure projects
- ▶ Exploration and development of the Arctic
- ▶ Resource nationalism – how governments will allow their resources to be commercialized and by whom

Governments will either provide incentives or disincentives for oil and gas companies to operate and produce in certain regions; these are generally financial - driving the ability of such companies to make investments. Companies across the world are looking for policy stability but, as Ernst & Young's Dale Nijoka predicts: "That is not going to happen. Governments will always be looking at how they can get a bigger take from the oil and gas companies operating there." In the province of Alberta, Canada – as one senior executive tells us – a decision to pass a sliding scale royalty in response to "the oil companies getting too rich" made drilling uneconomic and, with the departure of oil companies and the associated services, increased local unemployment rates.

NOCs in particular face challenges related to retail fuel price controls by their governments. One risk manager at an Asia-based NOC explained how the company was expected, by the local government, to subsidize its oil and gas supply to its customers. Helping to fund these kinds of subsidies can have a significant impact on companies, reducing the availability of funding for other activities and necessitating stringent cost control over operations and projects. Elsewhere, price control reform efforts have been slow and have met with strong popular opposition, particularly in the Middle East and North Africa region.

From the perspective of the United States, Ernst & Young's Marcela Donadio summarizes: "The issue continues to be whether energy policy will follow a track where it fundamentally focuses on the supply side (increasing supplies of fossil fuel-generated energy) or if the approach taken will deal with the demand side (including efficiency measures, electric vehicles and technological innovation)." What is not emphasized enough, says a CFO of a large US independent, is that "a long-term stable energy policy would go a long way toward stabilizing both energy prices and availability."

In the United States, the debate centers around energy independence, which has been a policy objective for four decades. Technological advancements (specifically, horizontal drilling and hydraulic fracturing) have allowed some progress in this area, with domestic natural gas production increasing by over 25% in the last five years, according to the International Energy Agency (IEA). A second term for President Obama has increased the probability of demand-side measures, although the focus is likely to remain primarily on the supply side.

Elsewhere in the world, there is much uncertainty around government policy toward energy. In Argentina, public opinion remains in favor of the expropriation from Repsol of a 51% stake in national oil company YPF. In other geographies, there are different challenges. In Brazil, for example, the risk is not a lack of clarity in the intent of the regulation, but lack of clarity in how the regulation will be applied and implemented.

This risk is likely to remain in the top five until 2015. In the face of current uncertainty about policy, companies are adopting a portfolio approach to their business, looking to ensure that they are not over reliant on one market or one energy source.

## Worsening fiscal terms

Table 5  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
Worsening fiscal terms	4	6	4

## Uncertain fiscal outlook for oil and gas

Previously within this cluster, we have emphasized the importance of an accurate, objective picture of the macroenvironment. Governments' fiscal terms are a key variable for oil and gas companies, directly affecting their ability to generate profit.

The global economic and geopolitical environments are the primary drivers for this risk, with many countries owing very high levels of sovereign debt. A stable fiscal regime is a critical factor for oil and gas companies.

Investment decisions are made on the expectation of certain rates of taxation, and changes to those rates can undermine the economics of projects and limit future investment in affected geographies.

In Ernst & Young's Alexey Kondrashov's words: "On the one hand, there is fiscal pressure in many regions, as governments are looking to increase tax revenues to help address national debt and budget deficit issues either through legislative change or more aggressive tax collection activity. On the other hand there are a number of generally more mature provinces that are seeking to maximize production of their remaining reserves and as a result are using tax incentives to encourage investment in more marginal or challenging projects, such as the Russian Arctic or shale gas in the UK, together with eliminating any barriers for new entrants, e.g., introduction of decommissioning relief deeds in the UK. In addition, we have seen a number of new counties coming on to the oil and gas map recently, e.g., Lebanon, Cyprus,





“Taxation and royalties are certainly increasing, as oil companies are seen as a good source of income for governments that are otherwise starved.”

Jeffrey Butrico, OMV, Austria

Ukraine, and as these countries develop their fiscal terms, they will need to strike the right balance between raising tax revenues and encouraging investment.”

Jeffrey Butrico of OMV spells out the main threats to his company: “Taxation and royalties are certainly increasing, as oil companies are seen as a good source of income for governments that are otherwise starved.” He continues: “Whatever governments can do to oil companies is probably going to earn them votes.” Another interviewee agrees: “The oil and gas industry is always a big target because we make a lot of money; the industry’s tax entitlements are always at risk. The [US] government calls it an entitlement because that makes it easier for them to take it away.”

Worsening fiscal terms is a major consideration across other emerging economies. In Nigeria, for example, the Petroleum Industry Bill (PIB) would increase the Government’s take from 61% to an estimated 72%. For upstream operators, this could undermine the viability of some offshore prospects. Eyvind Aven of Statoil notes that: “This may have a huge impact on the value of the projects there, including Statoil’s.”

For companies dealing with this risk, maintaining open lines of communication with governments is very important, as OMV’s Jeffrey Butrico explains: “You have to foster the best relations you can and make them understand that profitable business is not a negative thing. Governments cannot squeeze too hard.” “What people don’t always understand,” adds another US-based executive, “is that the cash the industry earns is re-invested; every dollar goes back in the ground. We are not putting the profit in our pockets and walking away, which is the general perception of the public.” The benefits, as well as the perceived downsides, of oil and gas exploration and production must be communicated to all stakeholders.

Companies must also be vigilant in this area. As Statoil’s Eyvind Aven explains: “We regularly assess the probability of changes being made to the extent of government take in the countries in which we are active.” Companies must have a clear understanding of likely scenarios across all jurisdictions in which they operate.

## Rising emerging market demand

Table 6  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
Rising emerging market demand	4	1	1

## Rapid-growth markets are thirsty for fossil fuels

The breadth and scale of the risks highlighted in this report paint a picture of the oil and gas industry as a perilous place in which to operate. Yet the strength of rapid-growth markets, even amid the backdrop of the recent global economic downturn, has provided ample reward for those able to thrive in this environment. For oil and gas companies, the prize for successful negotiation and interaction with government and regulatory bodies is access to some of the world’s most dynamic economies.

Rapid-growth markets have been, in recent years, the engine room of the world’s economic growth. As our global *Business Pulse* report noted, with anemic growth in mature markets, the world is looking to new markets for expansion opportunities. Despite a relative slowdown in China compared with growth rates in the preceding decade, the IMF expects growth of 5%-6% across emerging economies over the next two years. This compares with just 1%-2% in developed economies. Indeed, over the last three years, rapid-growth market rates have consistently remained a full four percentage points higher than those in mature markets.

With the continued growth of the world’s emerging economies, energy demand will also rise rapidly, and the opportunity for oil and gas companies to benefit from this is immense. Furthermore, the majority of this growth is likely to be fossil fuel based; despite renewable energy growing as a proportion of the world’s total energy mix, fossil fuel demand will grow considerably in absolute terms in emerging markets.

Natural gas is likely to grow in importance over the next few years, with Asia and Africa both seeing major increases in demand (see Opportunity 7: New or expanded markets for natural gas). Natural gas is seen as a replacement for coal, as it is cleaner, and also as a replacement for nuclear, which is being phased out in some countries following the 2011 Fukushima Daiichi nuclear power plant accident.

In all major rapid-growth markets, the rise of the middle class and increasing urbanization are significant drivers for a dramatic increase in energy demand in the years ahead. Therefore, the level of demand for energy-related infrastructure will continue to grow, and oil and gas companies should be thoroughly prepared for negotiations with host governments on this subject.

Companies wishing to leverage this opportunity must accurately assess the global situation. Scenario planning and frequent monitoring can help with this; organizations with the ability to adapt to rapid changes in forecasts will have a big advantage. As discussed in this year's global *Business Pulse* report, increased activity in new, unfamiliar markets – particularly relevant to oil and gas – may mean increased exposure to political shocks, though the record shows these shocks are not limited to rapid-growth markets alone.

## Additional CSR and corporate sustainability measures

Table 7 Ranking from 2011 to 2015			
Opportunity	2011 ranking	2013 ranking	2015 expected ranking
Additional CSR and corporate sustainability measures	–	9	9

## Transparency creates trust

For oil and gas companies, the other risks and opportunities are key in the cost-benefit analysis associated with each investment. For governments, an additional factor must be taken into consideration: whether or not the oil and gas company in question is perceived favorably by stakeholders. Governments and regulators alike need reassurance that the activities of oil and gas companies in their country are a net benefit to their economy and society. Similarly, concerned citizens of societies in proximity to the operations of oil and gas companies need to know that their health, safety and livelihoods will not be unduly affected by their presence. There is a real opportunity for oil and gas companies to demonstrate to both audiences the value that they bring to local economies.

As Ernst & Young's Doug Johnston notes: "The best way to counteract criticism about what you are doing in a particular region is to demonstrate the value that you are bringing in terms of employment, skills, supply chain development and capabilities to those local economies. Companies need to develop a more appropriate set of measures that enable them to communicate this more effectively to local host governments, stakeholder groups and the market." It is clear that many oil and gas companies can do a better job of communicating some of the benefits they are able to bring.

The fundamental issue is one of trust. Many are distrustful of oil and gas companies, either due to past experiences or a wider public perception that they are negligent on safety and environmental issues. To counteract this, companies must be transparent. The more transparent an organization is about its performance, and particularly some of its performance failures, the more willing stakeholders are to engage with that company.

The industry is actively looking at ways of assuaging public concerns about hydraulic fracturing, for example, through greater public disclosure of the chemicals used in the process. Another example comes from the CFO of a large US independent who says that his company "tries to take hydraulic fracturing away from being an emotional issue and make it a fact-based discussion." Furthermore, the creation of the Marine Well Containment Company shows that oil companies are willing to pool expertise to provide solutions to key industry risks; in this case, containment services for a potential deepwater well control incident.

There must also be a visible plan of action for performance improvements; if stakeholders can access and understand this plan, a level of mutual understanding can be achieved.

There is a clear risk with an entirely transparent approach. With a policy of full disclosure, there is an implicit assumption that the people being invited to observe a company's decision-making process or the management of its operations will have a clear, objective understanding of the economic and social costs and benefits of a certain course of action.



“The best way to counteract criticism about what you are doing in a particular region is to demonstrate the value that you are bringing in terms of employment, skills, supply chain development and capabilities to those local economies.”

**Doug Johnston**, Ernst & Young, UK

## What it all means for businesses

### **Open engagement – the key to success**

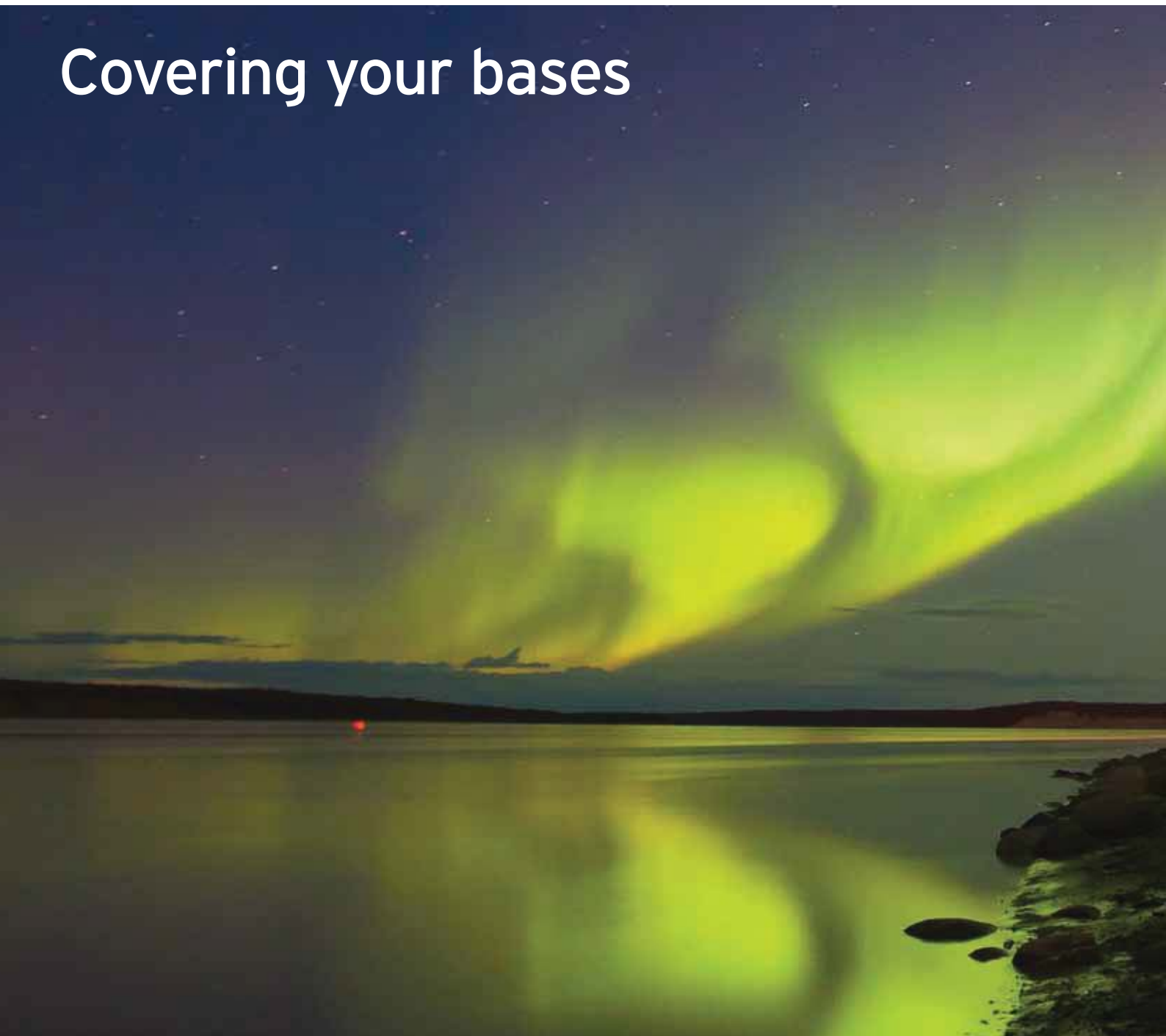
For oil and gas companies to understand government directives fully – whether in the field of regulation, access, policy or fiscal terms – they need a clear, unbiased picture of the trends and inclinations of the government in question, as well as their implications for future policy decisions.

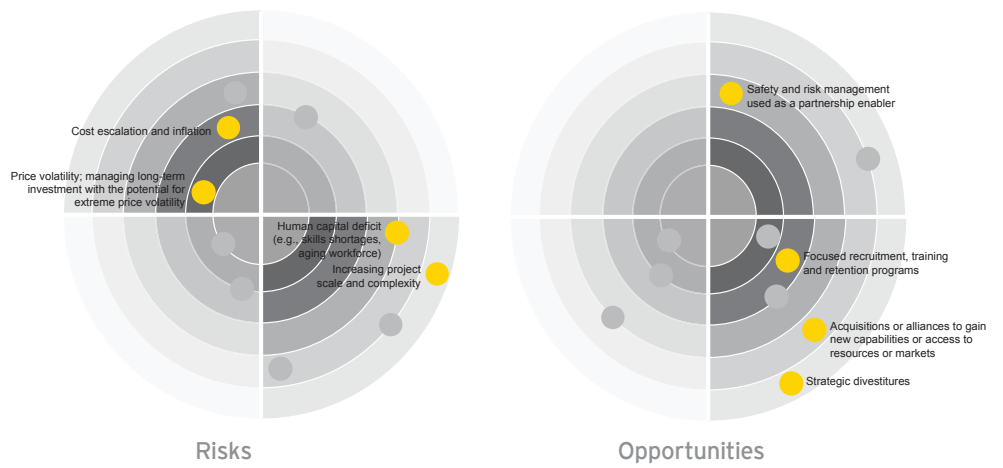
Companies that are both fully aware of their capabilities in this area and trusted by all stakeholders will have the most success in their interactions with governments and regulatory bodies. The prize will be two-fold: access to rapidly growing markets across the world, and the fuel with which to feed their increasing energy demand.



# Core business focus and counterparty risk management

Covering your bases





The risks and opportunities shown in our radars above have clear links and have been brought together into a combined narrative under the heading “core business focus and counterparty risk management.”

The risks and opportunities in this chapter predominantly appear in the **cost competitiveness** and **operational agility** sections of our radars (see page 7). This reflects the move by companies to focus on core competencies, to keep costs down and improve operational efficiency. Closely linked to this is a desire by industry players to ensure an appropriate balancing of the inherent risks and liabilities within the upstream and downstream supply chains. In an industry that is heavily reliant on joint ventures and on multiple service providers, this is an area of increasing focus. Safety and risk management appears in **stakeholder confidence**. In a complex supply chain, companies are increasingly being held accountable for their contractor and venture partner safety and risk performance, and so there is a clear linkage to counterparty risk.

## Price volatility; managing long-term investment with the potential for extreme price volatility

Table 8  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
Price volatility; managing long-term investment with the potential for extreme price volatility	9	2	2

### Price and expectations shape strategy

The long-term nature of investments in the oil and gas sector means that risks associated with price volatility are considerable. Large global disparities in gas prices and the long-term uncertainty over oil prices have helped raise this risk into the top three. The recent volatility in Henry Hub<sup>1</sup> prices in the United States, where prices hit a low of US\$2 per MMBtu<sup>2</sup> – down from US\$13 per MMBtu five years ago – is due primarily to the rapid increase in shale gas production made possible by hydraulic fracturing. As one senior executive notes: “The current natural gas resource base [in the United States] is three times what it was five to seven years ago. That will keep a ceiling on prices, unless US LNG export picks up.” Energy companies also face major disparity in prices between the United States, Europe and Asia. Price distortions between regions, due to inherent supply chain constraints, can create arbitrage opportunities. However, investment strategies based around higher Asia Pacific gas differentials may prove unsustainable, particularly if North America and East Africa begin exporting LNG in the next few years.

According to Jeffrey Butrico, Head of Corporate Risk Management and Insurance at OMV: “You will always see this risk in the top three. We will always be subject to price risk, particularly given that the oil market does not trade on fundamentals; very often, it trades on political tensions or other speculative elements.”

As Jeffrey indicates, price volatility is among the most clear and high-profile risks faced by oil and gas companies. Commodity prices are intimately linked to a company’s fortunes in this sector. Ernst & Young’s Tim Teuscher estimates that “70% of the risk in an oil or gas company’s business is price volatility on both a macro and micro basis. What they decide to do looks very different at US\$120 per barrel than it does at US\$50 per barrel.” Another expert participant, a CFO of a large US independent, agrees: “the oil and gas industry is a commodity business and stocks rise and fall as commodity prices rise and fall. For example, last year, our company had to write off a significant portion of our reserves in Canada because of low natural gas prices.”

This risk also has a major effect on relations with counterparties; ensuring open lines of communication with contractors and joint venture partners is difficult enough in an environment of stable prices. Volatility makes such relationships particularly perilous. As Jeffrey Butrico of OMV points out: “This has an enormous impact on our organization, to the extent that everything in our strategy has a different outcome according to the price of commodities.”

Oil prices have been relatively stable, averaging above US\$100 per barrel for Brent in the past two years. Transportation capacity constraints in the United States have resulted in a widening of the differential between Brent and West Texas Intermediate (WTI) over this period. However, imports of light oil into the United States may be displaced by increased volumes of domestically produced oil from unconventional sources. This could lead to a narrowing of the differential between WTI and other light crudes. The rapid expansion in tight oil production in the US is helping reshape the global oil production outlook. The United States will be the main contributor to the forecast increase in non-OPEC oil supply over the next 10 years. Investment in Canada’s oil sands and the ramp-up of production from Iraq, along with the gradual development of Brazil’s pre-salt reserves, will ensure that markets remain well supplied in the next few years. This should help to moderate oil prices, although instability in the Middle East and the political divisions that remain in Egypt and Libya will lead to some price volatility.

Continued high oil prices drive further technological change as unconventional and alternative sources become increasingly viable for development. As Ernst & Young’s Dale Nijoka points

<sup>1</sup> The Henry Hub is a distribution hub on the natural gas pipeline system. Due to its importance, it lends its name to the pricing point for natural gas futures contracts.

<sup>2</sup> Million British Thermal Unit (MMBtu)



“We will always be subject to price risk, particularly given that the oil market does not trade on fundamentals; very often, it trades on political tensions or other speculative elements.”

**Jeffrey Butrico**, OMV, Austria

out: “Short-term volatility is a given and is here to stay, as is US\$100 oil in the long-term.” In this environment, development of alternative sources could threaten to reduce demand for, or replace, hydrocarbon energy (see Risk 8: Competition from new technologies and new sources).

Political uncertainties are a constant threat to the oil and gas market, in some cases creating large price spikes that turn the industry’s supply and demand projections on their heads. Governments of oil-producing countries often have price targets in mind when deciding their fiscal policy. For this reason, it is important that the industry engages with host governments to align expectations and ensure that the impact of, and appropriate response to, any price volatility is known in advance. Particularly high prices may result in unanticipated government actions such as windfall profits taxes.

Mitigation differs considerably between oil and gas majors and smaller companies. Majors do not need to hedge against this risk to the same extent, as their cash reserves are large enough to ride the waves of short-term market volatility. Though strategy may evolve as the long-term forecasts change, more tactical or day-to-day adjustments are not necessary for most oil and gas majors.

For smaller companies and independents, it is a different story. Jeffrey Butrico gives an overview of the picture from OMV’s perspective: “We have a level of capital investment compared with our cash flows, such that we need to consider some sort of hedging of this risk. We have hedged in the last couple of years and, as a result of the very bullish oil market, the economic result of these hedges was to actually send money out of the company.” There is clearly a risk and a trade-off associated with hedging; companies lose opportunities even as they combat risks. It is up to individual organizations to decide whether or not they are willing to reduce the upside to protect themselves from downside risk.

Furthermore, the optimal solution is different for oil and for gas prices. As Tim Teuscher explains: “The oil industry is very much a global industry. If you are not getting a price in one area, you can put your oil on a ship and get a better price in another area. With natural gas, this isn’t the case; it’s a very local industry because

it has to be transported by pipelines. Until we get some very significant additional LNG capacity, it is going to remain a regional or subregional market.” The differing degrees of product mobility in these markets mean that different solutions are required to optimize risk management.

## Cost escalation and inflation

Table 11  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
Cost escalation and inflation	–	4	6

## Control from the core

Volatile commodity prices are not the only means by which financial planning can be upset. While revenues can fluctuate, so can costs. The cost of both exploration and production can increase at any time, often with limited opportunities to pass those increases on to customers. Reasons can range from unforeseen increases in overheads or the cost of commodity inputs, such as steel, to unexpected technical problems, beyond the control of individual companies. The current high level of activity across the industry suggests that cost inflation will be a challenge in markets with high work backlogs. The greatest challenges will be in countries such as Australia, Norway, Brazil and Canada, where the pace of activity has resulted in some capacity shortages. Cost inflation will also be an increasing concern in countries such as Colombia and Angola, where the next phases of exploration activity are planned.

Given the long-term nature of the partnerships forged by investment opportunities, the risk of cost escalation has been, and will always be, very important for counterparty risk within the industry. Additionally, the more the industry moves toward difficult environments, the greater the need for advanced technology and so the greater the risk of cost escalation. The combination of resource nationalism and the continuing depletion of existing fields is driving companies, particularly oil and gas majors, to new frontiers. The era of cheap, easy oil may be over, and increasing levels of capital investment will consequently be needed to continue to meet the world’s energy needs.



Uncertainty over cost is a hazard for any business but is particularly significant for the oil and gas sector. All oil and gas companies absorb an uncertain level of cost when they access acreage but, as companies begin to explore in more technologically challenging locations (both environmentally and geologically), the cost of locating, assessing and then developing the resources they contain is inevitably greater.

Ernst & Young’s John Avaldsnes elaborates: “The initial cost today of drilling a deep offshore well is much higher than a well onshore. Due to the cost of a drillship and the complexity of remote, deepwater wells, the cost of the well is massively more expensive than it was a few years ago. Even before you drill the well, you know you have to take on a lot of upfront costs, in itself a difficult game for a number of mid-size and small players.” As established fields move beyond full maturity, the industry is moving toward more challenging and remote environments. Reserves in remote environments are only made accessible by the use of cutting edge technology and major capital expenditure in infrastructure and the connecting supply chain, thereby increasing the risk of cost escalation.

Among oil and gas companies worldwide, key mitigation measures for this risk involve the use of initial framework agreements with expert subcontractors involved with drilling, well design and well execution, before work begins. Purchasing power can be leveraged through an effective procurement and supply chain management process along with standard contractual terms. The standard contractual terms should clearly identify and regulate areas of counterparty risk. These areas should also form part of the ongoing contractor reporting and management processes.

These help to standardize the overall process, which in turn can begin to standardize costs. This has been an ongoing process over the last few years, as oil and gas majors have sought to control their initial costs when developing a field. With today’s standardization of most subsea development, this is a promising model for deepwater and activity.

To mitigate against both counterparty risk and escalating costs, a focus on core competence expertise is necessary, within both companies and individual teams. Cost control can be achieved with a focus on developing processes around the use of new technology. Anything beyond this central core can be outsourced or co-sourced as necessary.

According to Ernst & Young’s John Avaldsnes: “Focusing on process optimization of the supply chain is also crucial; in terms of operations, put anything you can onshore rather than offshore and focus on getting the most out of concepts for integrated operations (IO). IO will be a game-changer for the industry going forward and an important element in keeping operational expenditure down.” Small, flexible organizations with specific and clearly defined core competencies are best placed to mitigate this, despite the inherent counterparty risk this entails. With the prevalence of operations in deepwater environments, as well as previously underexplored locations such as the Arctic, cost escalation is likely to become considerably worse over this report’s two-year outlook.

## Strategic divestitures

Table 12  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
Strategic divestitures	–	10	10

## Strategic specialization unlocks value

Companies are increasingly recognizing that one way of keeping costs down and simultaneously improving operational efficiency is to focus on core competencies and, consequently, strategic divestitures of non-core businesses.

Organizations realize that they cannot be present in all activities and in all countries, and they must specialize on a core competence in order to stay ahead of the game. An integrated value chain is no longer seen by some as the ultimate objective. As Ernst & Young’s John Avaldsnes illustrates: “Companies have very clear goals for what they want to do and where they want to go. Statoil is a good example of this – it is now executing a very clear exploration strategy (with a focus on large discovery, high-impact wells) and a clear acquisition strategy (with a focus on unconventional). Furthermore, it has decided to transition out of its retail business, which is a clear, strategic restructuring of its value chain.”





“Ensure that you really understand the implications for all the stakeholders of the divestment process to avoid surprises along the way.”

**Andy Brogan**, Ernst & Young, UK

Allister Wilson, Ernst & Young's Oil & Gas Global Assurance Leader, commented, “In addition to the focus on core competence, companies may also consider reviewing the risk profile of their portfolio, with a view to re-assessing their investment in high risk and low reward businesses.”

For the oil and gas industry, with increasing sophistication and complexity comes a realization that the advantages and drawbacks to being active across the sector do not always combine favorably. John Avaldsnes continues: “The new model within the industry is that you have more pure upstream, midstream and downstream players. Many NOCs get into downstream because it will gain them access to consumers and technology and market development. NOCs may have very different political and commercial drivers to grow the business. Their core model may be to build on downstream.” By contrast, some IOCs have totally or partially divested downstream assets.

For companies looking to divest, Ernst & Young's Andy Brogan has clear advice: “Before you start divestment processes, ensure that what you are seeking to divest is properly separated from the current business, both financially and operationally. Ensure that you really understand the implications for all the stakeholders of the divestment process to avoid surprises along the way.” In a capital-constrained environment, organizations are far better off focusing on core competencies to unlock shareholder value.

## Increasing project scale and complexity

Risk	2011 ranking	2013 ranking	2015 expected ranking
Increasing project scale and complexity	–	10	9

## Projects need skills

The scale and complexity of major development projects represents an increasing risk for oil and gas companies, with a significant proportion experiencing cost overruns and delays. Former Schlumberger CEO Andrew Gould commented in June 2012 “And, while not wishing to embarrass any of my customers, I would add that many greenfield projects suffer significant

cost overruns. Indeed, as a general rule, 30% of such projects experience budget overruns of 50%.”<sup>3</sup>

This may be partially due to uncontrollable factors, such as commodity price rises, but in many cases, it is due to controllable factors. Increasingly, these projects require specialized expertise. As a consequence, we are seeing a growing trend toward partnerships between oil and gas companies and organizations with these specific skills. However, this approach to capital project execution can also aggravate particular counterparty risks.

As with many other risks and opportunities within this theme, companies that focus specifically on their core competences will be best placed to adapt to the increasingly massive and complex projects undertaken by the industry. According to Gerard Gallagher of Ernst & Young: “A key risk here for oil and gas organizations is the deficit in both capability and capacity in capital investment projects. Companies need to look at their delivery models, assess their core competences and consider outsourcing the rest.” Despite the counterparty risks involved with bringing in third parties to oversee large projects, this is often a necessary step.

Finding the right balance between planning and execution is often tricky in such circumstances. Gerard Gallagher continues: “More time spent upfront in the planning phase will lower the execution risks, but too much time planning may lead to delays. However, crucial decisions made during a hasty planning phase will be very difficult to reverse later on in the project’s execution phase.” The companies that excel in this area will strike an effective balance between the two.

To add to risks in this area, many large-scale capital projects were commissioned when oil prices were higher. Consequently, certain project economics are not as strong as they were and will be harder to sell. Investors will look for more certainty, and cost overruns and delays may not be compensated for by rising oil and gas prices. Gas projects are currently particularly vulnerable, with uncertainty over the future of gas prices in key geographies.

We expect this risk to become more crucial for oil and gas organizations over the next two years.

3 <http://uk.reuters.com/article/2011/06/02/schlumberger-clientcosts-idUKNO211573620110602>

## Human capital deficit (e.g., skills shortages, aging workforce)

Table 14  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
Human capital deficit (e.g., skills shortages, aging workforce)	6	7	7

### Skills in short supply ...

As in many other growth markets, oil and gas suffers from a shortage of skilled and experienced workers. Increasingly complex and challenging projects require more specialized expertise. When combined with intensified global competition and the scale of the investment required in the industry over the next few years, this challenge will remain significant over the three-year time frame of this report. The majority of executives we spoke to endorse this risk, including a CFO of a large US independent, who says: "This is one of my company's big risks; the industry is small and we are all competing for the same talent pool and there is not enough to go around."

With an aging industry workforce, oil and gas companies are seeing an increasing number of their highly skilled workforces retiring. Tim Teuscher at Ernst & Young calls it the "hiring doughnut." He explains: "From about 1980 through to the 1990s, nobody was hired in Houston. Somebody who was 22 years old in 1980 is now 55, so there is a hole in the workforce; there are very few workers between the ages of about 45 and 55. Those in their mid-50s are likely to have a fair amount of pension benefit accrued and stock value accumulated, and could check out any time."

The increasing prevalence of national content laws further heightens this challenge. Such regulation may prevent countries with sufficient skilled personnel from providing talent to those with skills shortfalls. Brazil, for instance, currently has one of the highest local content requirements and, as Ernst & Young's Marcela Donadio notes, "does not have the human capital in place ... yet a substantial amount of activity is required with respect to both finding resources and building the relevant infrastructure."

### ... while demand spreads

Across the industry, the "crew change" challenge is exacerbated by the fact that companies – old and new players, IOCs and NOCs alike – are engaging in more and more complex operations and are gradually shifting their focus away from conventionals to unconventional (where the talent pool is even smaller). The talent shortfall in this area centers on the fact that the expertise required is becoming increasingly technical.

Ernst & Young's Stephanie Phizackerley notes that in such situations: "Those companies that can get the most innovative people will sustain and build their competitive advantage, while those that can't will suffer in comparison. Further, as the sector develops technologically, and as people need to find new sources of hydrocarbons or other fuels and go into new and sometimes hostile environments, companies that can recruit, retain and mobilize innovative people will be able to sustain their competitive advantage." As competition increases, access to experienced talent diminishes further.

Of course, this risk is not new, and our industry experts note that companies have already taken extensive measures to mitigate it. Yet, as the risk becomes more acute, hiring and development needs to take place more quickly, and more creatively, than it has in the past. Ernst & Young's Tim Teuscher suggests that "[companies should] make use of non-traditional hiring and development, as opposed to the one-to-one apprentice model that might have worked in the past. Companies now have to deploy some sort of rotational program that includes international assignments to get somebody ready to take on a leadership role." Companies with strong talent management in place will be the most competitive (see Opportunity 4: focused recruitment, training and retention programs).

A solution for many oil and gas organizations will simply be to invest heavily in training programs. The in-house development of talent is a costly and time-consuming process, but is wholly necessary in the absence of graduates with the necessary skills and expertise. The need for companies to invest in their own training programs is becoming increasingly acute.

In-house development of talent will go some way to filling the skills gap. Yet companies face some uncertainty around which unconventional or alternative fuel is the best bet and, consequently, which talent pool to develop. Until enough graduates develop the required skills and experience to become



“[Companies should] make use of non-traditional hiring and development, as opposed to the one-to-one apprentice model that might have worked in the past.”

**Tim Teuscher**, Ernst & Young, US

viable replacements for experienced hands, acquisitions will remain an attractive mitigation option.

A clear strategy for talent acquisition and retention is fundamental to success in this area, as is process standardization and automation that embeds high-level skills within an organization’s operational procedures.

## Focused recruitment, training and retention programs

Table 15  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
Focused recruitment, training and retention programs	–	4	4

## Talent leads

As noted above, companies that prove the most successful at attracting and retaining the best talent will enjoy a competitive advantage. Specific benefits include the speed at which they are able to enter new markets and the pace at which they can generate return on investments. As the risk of a human capital deficit intensifies, so will the rewards of getting it right. Whether in terms of technology or workforce, it is vital to be a front-runner in the oil and gas business.

The experts we spoke to emphasized that front-runners perform well in the following areas:

- ▶ **Mobility programs.** Finding appropriate local talent in some geographies is almost impossible. “In places such as Africa, Greenland, the Arctic and remote parts of Russia, a sufficient local, indigenous workforce with the right skills is virtually non-existent,” observes Ernst & Young’s Stephanie Phizackerley. How companies successfully move people from other markets and into those territories therefore becomes key to operational effectiveness. Unsurprisingly, the industry is already at the cutting edge in terms of the sophistication of global mobility programs and strategy.<sup>4</sup> Indeed, oil and gas companies have been moving people around the world for a very long time, and the nature of the business means that there tend to be large expatriate populations wherever it operates.

- ▶ **Talent management.** Companies that successfully leverage this opportunity have strong talent management programs across their whole workforce. For instance, there should be alignment between a company’s global mobility program and its talent management program. Stephanie Phizackerley explains: “A good strategy is one where the talent management of an individual assists them not only when they are overseas on an assignment but, equally important, continues when they have returned. There is fierce competition for the most skilled people, and if an individual does not feel appreciated between assignments, or supported in their long term career goals, they are likely to go elsewhere.”
- ▶ **Benchmarking.** Companies need to ensure that they are at the front end of the market in terms of the awards package they offer, including long-term incentives and non-cash benefits. Companies that offer below market value need to be prepared to lose their people to competitors.

## Acquisitions or alliances to gain new capabilities and access to resources or markets

Table 16  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
Acquisitions or alliances to gain new capabilities and access to resources or markets	10	8	8

## Specialists and NOCs unite

Making use of acquisitions or alliances to gain access to the right expertise can prove a successful complementary approach to overcoming the human capital deficit. It can also provide access to new resources or markets. Partnerships between companies with different priorities and areas of expertise are often essential. This can be because of the diverse nature of the locations involved,

<sup>4</sup> A 2012 Ernst & Young World Class Global Mobility survey showed that the oil and gas industry consistently performed better in the main global mobility areas, compared with other industries.



capital requirements or the sheer scale and complexity of the work done (see Risk 10: Increasing project scale and complexity).

The industry is beginning to see innovation in how it can use and leverage alliances and joint ventures. As Ernst & Young’s Andy Brogan predicts: “IOCs are going to have to get progressively more creative to access reserves held by NOCs because, as the NOCs become more sophisticated, it will become more difficult to get access just by virtue of having better technology.” With the erosion of the IOCs’ competitive advantage, they will need some other way to make themselves essential business partners.

Developments in recent years have seen a change in the composition of alliances. Previously, NOCs obtained technological expertise from the supermajors in return for access to reserves. Now, however, as Andy Brogan continues: “We are seeing changes in terms of who is entering alliances. We’re seeing NOCs coming together to develop projects, particularly in places such as Iraq. We are also seeing oilfield service companies taking part in some of those projects as joint venture partners.”

While NOCs can access many conventional sources of energy effectively without the technological input of an IOC partner, forays into unconventional sources (such as shale gas or deepwater drilling) remain a challenge for some without external input. For NOCs, as Ernst & Young’s Sanjeev Gupta puts it: “Acquisitions and alliances of this type enable companies to fast-track the learning process and be better positioned to deal with their challenges.” Lacking the technological know-how to exploit such resources, the NOCs see these types of partnerships as the best way to catch up.

Over the two-year forecast period, acquisitions and alliances of this type will remain crucial to the oil and gas industry, as NOCs seek to acquire technology related to unconventional energy and deepwater drilling. We are likely to see more partnerships between local businesses and companies that can provide funding or those that have experience of developing shale gas or possess a technology advantage. Potential challenges include the global trend toward resource nationalism, which is resulting in less favorable terms for international companies and greater local content or local partnering requirements.

## Safety and risk management used as a partnership enabler

Table 17  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
Safety and risk management used as a partnership enabler	-	6	7

### Safety attracts

As noted in the related risk (see Risk 1: The risk of a health, safety or environmental incident and in ensuring regulatory compliance), the Gulf of Mexico spill has further increased focus on safety in the sector.

The track record of an IOC, NOC or supplier affects its appeal and has now become a determining factor in selecting alliance partners. The CFO of a US-based company explains: “When we look for partners we look at their safety record as well as their financial ability to handle an accident in case something happens, particularly if the partnership involves deepwater drilling. The oil spill in the Gulf of Mexico has changed how we evaluate partners.”

While failure to adhere to HSE regulation is the number one risk for oil and gas executives worldwide, this breeds compliance, which enhances partnership opportunities. In the words of Eyvind Aven of Statoil: “If we manage to be best in class in terms of our health, safety and environment records, that is a positive for future partnership opportunities.”

Often, this also means voluntarily adopting social and environmental best practices. While some countries will push for tighter environmental regulations, many developing countries lack the administrative capacity to enforce more stringent rules effectively. In this situation, there are continuing benefits for those companies that move ahead of governments and enforce their own operational and ethical guidelines voluntarily.



“Acquisitions and alliances of this type enable companies to fast-track the learning process and be better positioned to deal with their challenges.”

**Sanjeev Gupta**, Ernst & Young, Asia Pacific

Allister Wilson, Ernst & Young's Oil & Gas Global Assurance Leader, noted, "There is a real opportunity for companies to review third party risk from at least two perspectives: first, to review the terms on which they enter into joint arrangements and, second, to identify and use terms related to existing contractual arrangements with partners and third parties to the fullest extent possible as a means of pro-actively managing third party risk. All too often, contractual terms are invoked when things go wrong, rather than used as a means of managing risk before things go wrong."

Of course, the motivation for organizations to be vigilant extends beyond the majors, to their partners too. As more focus is drawn to this issue, oilfield services companies and others on the operational side will need to ensure that they can stand up to greater scrutiny in this area.

## What it all means for businesses

### **Core competences, responsible partnerships**

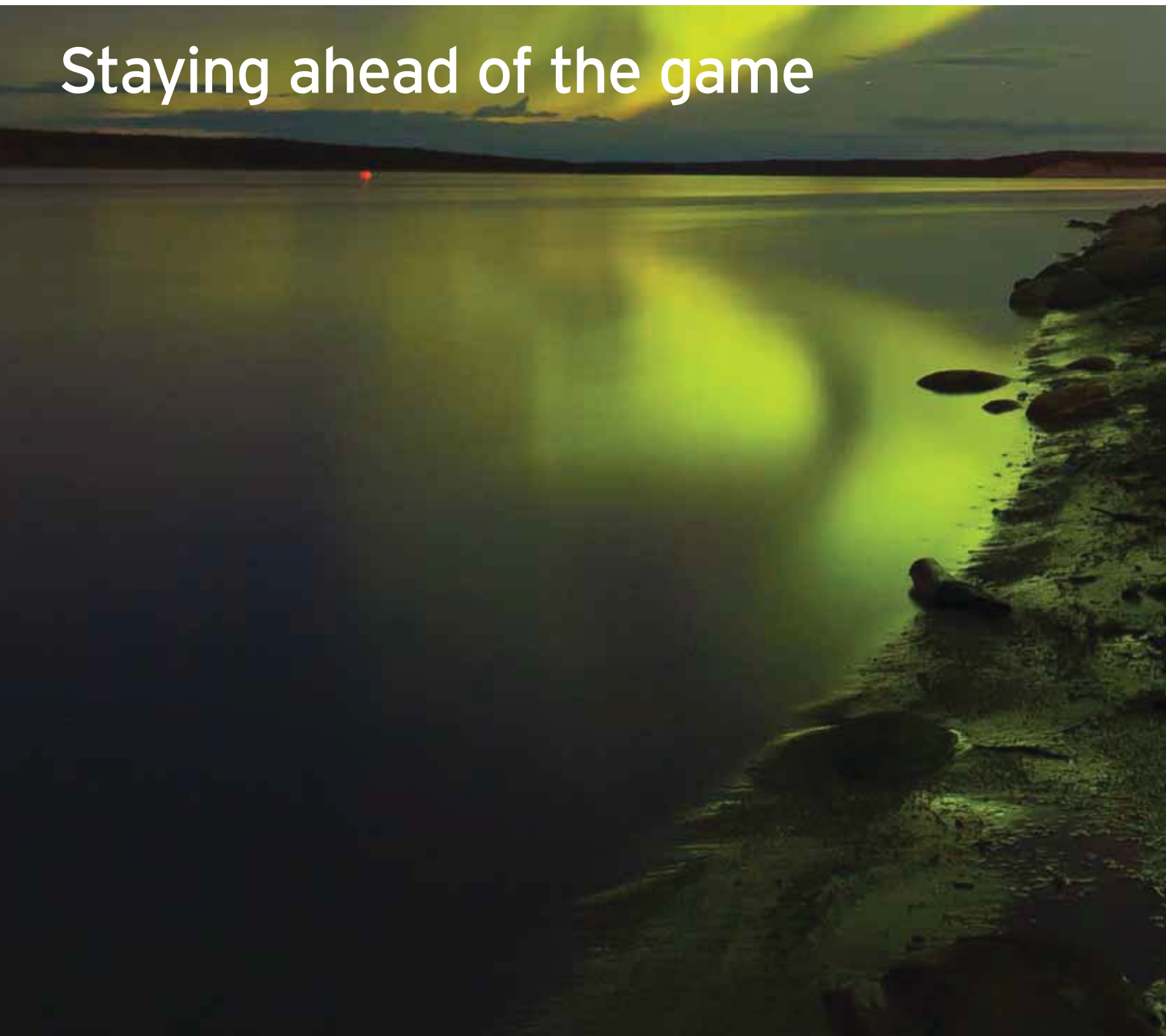
Many risks and opportunities that seem like internal procedural issues can grow into greater challenges that involve more than one organization when counterparty risk is considered. What this means is that companies do not just have to look after their own exposure to control costs and health and safety risks – they have to monitor the exposure of their partners, too. Companies that are effectively able to manage partnerships around a joint agenda of trust and responsibility are best placed to succeed in this environment. Companies are now considering the terms of their contractual

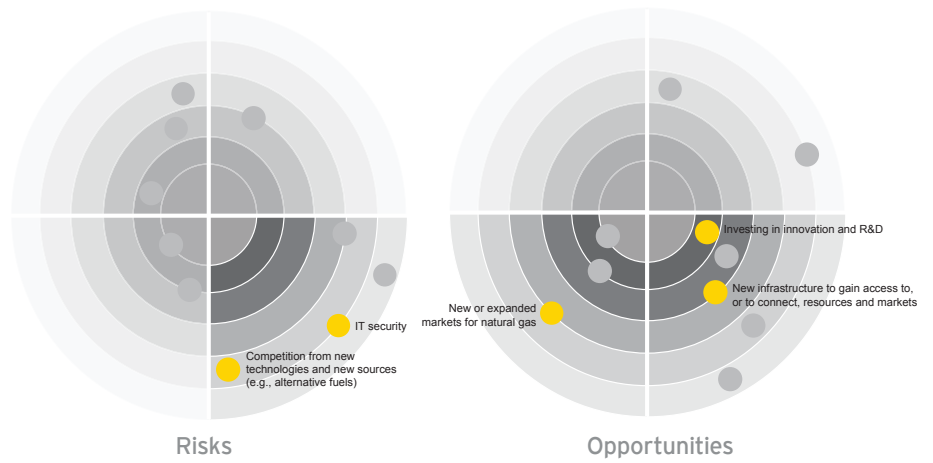
arrangements with counterparties, including indemnities, protection against pre-existing obligations, limiting liabilities or – from the operator side – ensuring that partners share risk proportionately.

At the same time, across both upstream and downstream operations, the landscape is becoming both more competitive and more complex. This necessitates a greater focus on core competence. Whether specialized talent is acquired through talent management programs or a more streamlined organizational structure, companies must adapt to this new industry dynamic.

# The pace of technological change

Staying ahead of the game





The risks and opportunities shown in our radars above have clear links and have been brought together into a combined narrative under the heading “the pace of technological change.”

The risks and opportunities in this chapter appear in the **operational agility** and **customer reach** sections of our radars (see page 7). This reflects the fact that there are significant opportunities for oil and gas companies looking to utilize new technology to identify and commercialize resources, access new markets, serve existing markets more effectively and lower costs.

## Investing in innovation and R&D

Table 18  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
Investing in innovation and R&D	6	2	2

### Innovation throughout the business

Across other industry sectors, the danger of ignoring innovation during a financial crisis is considerable; companies that do will be left behind. In oil and gas, innovation is necessary not just to remain competitive, but also because the industry as a whole is undergoing a fundamental shift in focus.

The move into unconventional resources and new environments such as ultra deepwater and the Arctic is presenting new technological challenges. The wide array of potential unconventional sources means that companies without immediate access to the right technologies risk being left behind. Similarly, using technology to reduce costs and extend the life of conventional production, though enhanced oil recovery techniques, will be critical to future commercial success.

Companies are also incentivized to invest in innovation and R&D by growing environmental concerns including, more specifically, the prospect of stricter carbon emission controls. Those best able to adapt to and overcome these challenges will be the most successful companies of tomorrow.

This opportunity is more pronounced in the upstream space. Traditionally, oil and gas majors have held big advantages in this area, but the innovation gap is closing due to the prevalence of IOC-NOC partnerships. As one surveyed expert explains: "Today, the industry sees more partnerships than in the past, particularly on the R&D side, and consequently technology appears in the public domain more quickly." What IOCs can offer in access to technology, NOCs can offer in access to reserves.

Despite these partnerships, the managerial and technical expertise of oil and gas majors remains one of their core strengths. Innovation is a big part of this. Their immense scale also helps them to withstand major shocks as well as respond quickly to major new opportunities.

For companies looking to adapt, internal R&D is unlikely to be sufficient. Oil and gas organizations must have a full, in-depth understanding of the technological processes involved, which involves acquiring expertise through a multifaceted approach. This means buying stakes, engaging in joint ventures and acquisitions, and undertaking internal training programs to gain experience in different fields. Companies need to look at innovation both internally and externally when assessing potential mechanisms for growth. This can often involve looking at other sectors. For example, as the industry is increasingly considering unmanned operations in remote or harsh environments, the technologies and skills required to develop these "smart" operations may well be found in the aviation, telecommunications or aerospace industries.

Companies that are seen as strong innovators are trusted, attractive partners. Organizations seeking this status must balance cost-efficiency with their continuous search for the next big technological breakthrough.

### Competition from new technologies and new sources (e.g., alternative fuels)

Table 18  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
Competition from new technologies and new sources (e.g., alternative fuels)	10	8	8

### Racing through the innovation maze

As we have mentioned, investment in innovation and R&D is key to keeping up with the game, and investing in new technologies and new sources of energy is an inevitable extension of this. Companies that do not actively evolve in this area may find themselves operating in a different, less attractive part of the industry altogether from those that succeed. Given that oil and gas companies are often investing in mega-projects that have a business case and asset lifetime of 20-30 years, the risk of asset stranding due to a technological breakthrough is one that companies need to consider. There are two key elements to this risk:





In oil and gas, innovation is necessary not just to remain competitive, but also because the industry as a whole is undergoing a fundamental shift in focus.

- ▶ New technology applied to hydrocarbon development and production displaces existing supply patterns, e.g., the shale gas revolution in the United States made the investments in Gulf Coast LNG import capacity largely redundant. Although, illustrating the close linkage between risks and opportunities, it now seems likely that some of that investment may be recouped by the development of LNG export facilities at the intended import terminals – using the same port facilities and land set aside.
- ▶ The development of new technology or the new application of existing technology displaces or reduces the use of hydrocarbons within the energy mix, e.g., wind-assisted cargo ships reducing the demand for marine fuels.

The global economic downturn has inevitably focused even greater attention on the cost differentials of competing energy sources. Currently, energy derived from hydrocarbons is generally cheaper than that derived from most renewable sources. 2012 was a record year for coal sales, despite environmental concerns over its use in power generation – it is cheap, plentiful, easy to transport and can provide continuous, reliable power generation.

However, while oil and gas costs continue to rise as we near the end of easy oil, the cost of renewables is likely to fall as technological breakthroughs and efficiency savings improve performance. The key question is: at what point will renewables offer reliable, continuous and scalable energy provision at a comparable cost with hydrocarbons?

For some companies, the potential risk is in the future rather than the present. As Eyvind Aven of Statoil explains: “This risk is not that important for us yet. Statoil has invested significantly in a wind farm in the UK, which has just started to produce, but wind is not yet competitive with fossil fuels and remains dependent on subsidies from the UK Government. However, we expect it to be more competitive in the future.” Despite this, companies realize that tomorrow’s world will be more energy-efficient and the energy mix will contain a larger proportion of alternative energy.

## New or expanded markets for natural gas

Table 19  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
New or expanded markets for natural gas	–	7	6

## Gas demand to grow ...

Alongside the expected rise in alternative fuels and the ongoing debate about the future of coal and nuclear, natural gas occupies an important place in the global energy mix. It is expected to increase steadily as a percentage of the global fuel mix over the next two decades, rising to account for almost a quarter of the world’s energy demand by 2035.

The major rapid-growth economies currently generate much of their energy from coal but, as a cleaner substitute, natural gas will grow in importance over the medium term. The fastest growth in gas consumption in the next 20 years is expected in China, the Middle East and India. According to the IEA, gas demand growth in non-OECD countries will be three times greater than in the OECD.

Recent questions about the safety of nuclear power have also benefited natural gas. Countries needing to increase power capacity quickly are particularly likely to turn to natural gas, as the construction time for natural gas generating plants is just two to three years. The foundations for a world in which gas will play an increasingly important role will be laid by 2015 if governments can put the necessary regulatory conditions in place.

## ... and the shale rush is under way

Natural gas markets have changed beyond all recognition in the last decade, primarily due to technological change. The shale gas boom in the United States has fundamentally shifted the world’s second-biggest energy market from being a gas importer to potentially being an exporter within five years. Although the costs and benefits of hydraulic fracturing are debated, the practice has had a dramatic effect on the industry as a whole. The IEA recently projected that the United States will attain virtual energy self-sufficiency by 2035. If this happens, it will have a huge effect on the global energy market.



China may be set to follow a similar pattern. According to IEA data, China will account for 26% of global growth in gas demand in the period from now to 2035. With gas set to become an increasingly important component of China's energy mix, concerns about its growing dependence on imported natural gas are driving a push to bring large quantities of domestic shale gas online quickly. The US Energy Information Administration estimates that China holds the world's largest technically recoverable shale gas resources, accounting for one-fifth of the combined total of the 32 countries assessed. However, China's geology is unique, and the technology developed for North American shale cannot be directly applied; technological innovation will play a key role in developing this resource.

To achieve its ambitious shale gas production targets, China has chosen to open the shale gas sector to private Chinese companies and foreign-funded joint ventures that are controlled by Chinese investors. This provides some opportunity for foreign investors, particularly those experienced with the technology, to enter the Chinese market. With the Chinese shale gas industry in its infancy, the processes involved will be extensive. They include conducting vast, detailed exploratory surveys, training the labor force, drilling thousands of wells and building the necessary infrastructure to transport large volumes of gas from remote areas.

Other countries that are in the early stages of developing their shale resources include Poland, the United Kingdom, Australia and Argentina, where differences in geology and operating environment mean that new technological innovations will also be necessary. Buying stakes in shale gas producers, particularly in North America, will be key for organizations looking to understand the technology involved.

The abundance of gas from both shale and conventional sources has resulted in many companies developing significant LNG portfolios. There will be a significant increase in gas liquefaction capacity in the next couple of years as new plants come on-stream in Australia, which will turn the country into one of the world's largest LNG exporters, and plans are implemented to monetize the significant gas discoveries made off the coast of East Africa. Additionally, there is likely to be approval for a set quantity of LNG to be exported from the US and Canada. Learning to operate in LNG is, therefore, essential for companies wanting to thrive in this area and expand the market opportunities for their gas. Over the next few years, natural gas will rise up the

list of priorities for Western companies. As Ernst & Young's Andy Brogan explains: "Oil majors are going to find accessing oil reserves progressively more difficult, so their reserves and production are likely to shift further toward gas. On the other hand, many NOCs have access to large, cheap oil reserves, so they will stay interested in oil and less so in gas."

With gas likely to constitute a greater share of the world's future energy production, this opportunity will continue to rise in importance in the years ahead.

## New infrastructure to gain access to, or to connect, resources and markets

Table 20  
Ranking from 2011 to 2015

Opportunity	2011 ranking	2013 ranking	2015 expected ranking
New infrastructure to gain access to, or to connect, resources and markets	-	5	5

## Infrastructure improvements in the pipeline

Our fifth opportunity in this year's top 10 also primarily concerns natural gas. Changing global market dynamics mean that, for many rapid-growth markets, new infrastructure is needed to connect resources and markets.

The unconventional boom in North America is illustrative of the transformative capacity of technology; a large amount of infrastructure is now needed to transport the shale oil and gas from the middle of the continent to the coastal areas, where the demand lies. As Ernst & Young's Dale Nijoka explains: "The elephant in the room in North America is the question of how companies are going to connect the reserves that are in Canada. How will they get them into the United States, or move them to the Pacific coast? And what do they do with all the hydrocarbons that are being produced in the middle of the United States; how do they get them out to the coast, where the demand is? How do you eliminate the oversupply that exists in the middle of the continent?" This is a medium- to long-term opportunity, as the rate of production is likely to continue increasing, creating further demand for infrastructure growth.



“The elephant in the room in North America is the question of how companies are going to connect the reserves that are in Canada.”

**Dale Nijoka**, Ernst & Young, US

Another key illustration of this opportunity is the buildup of LNG infrastructure to link the Australian North West Shelf venture to the Asian market. As Ernst & Young’s Andy Brogan points out: “LNG is the cost-effective way to link the big natural gas deposits in Australia, East Africa and Canada to the big Asian markets, notably Japan and Korea – and, in the future, Malaysia, Indonesia, China and India.” Learning to operate in LNG is essential for companies wanting to expand the market opportunities for their gas. Regulation can impede such ventures. For example, only one US energy company has been permitted to build an LNG export terminal in Louisiana following a complex regulatory process.

In Europe, gas pipelines are again the main focus of this opportunity for companies. Connecting the major reserve locations in Central Asia and Eastern Europe with the primary source of demand in Western Europe could be crucial in the coming years. Jeffrey Butrico, OMV’s Head of Corporate Risk, explains: “One of our most visible projects is the Nabucco pipeline. This is part of our strategy; to bring gas from Azerbaijan and the Caspian region, as well as Romania and Turkey, into the European market and beyond. There should be major developments in Europe in the years ahead.”

The industry is recognizing the need for greater collaboration and focus on connecting infrastructure. This can be seen in the UK and Norwegian sectors of the North Sea, where certain finds in the UK are only commercially viable using Norwegian sector infrastructure and vice versa. Resource owners and infrastructure owners are increasingly working together on these initiatives to ensure technically and commercially viable resources are recovered.

For many oil and gas companies, this opportunity may come to fruition after the 2015 time frame covered by this report. Within the United States, Ernst & Young’s Dale Nijoka predicts a consistent increase of production over the next decade and, consequently, greater infrastructure capacity to move it. This opportunity will move up in importance over the next two years. The connecting infrastructure will, in many cases, take longer.

## IT security

Table 21  
Ranking from 2011 to 2015

Risk	2011 ranking	2013 ranking	2015 expected ranking
IT security	–	9	10

## Waking up to an invisible threat

When discussing the pace of technological change, we have so far concentrated on new technology and infrastructure that directly relates to the extraction and distribution of oil and gas. However, there is another dimension to the industry’s technological development. The increasing sophistication of control systems used by oil and gas companies across the world has delivered immense benefit to both the industry and the consumer. Yet, despite the productivity enhancements afforded by increased automation, the risks associated with having a physical network controlled digitally are significant. Oil and gas facilities are crucial to a country’s national infrastructure and, as such, are likely to be among the primary targets for cyber attacks.

At the same time, the amount of sensitive proprietary information circulating within and between oil and gas companies and their counterparties means that information security needs to remain watertight to prevent both industrial espionage and breaches by “hacktivists” – those who hack into computer networks to promote a political or social ideology. Given the number of new and emerging technologies in this sphere, many of which we explain in the global *Business Pulse* report, organizations must keep one step ahead of those individuals or organizations who may attempt to compromise their organization’s IT security. As one company tells us: “When we go to particular countries we go with clean cell phones and clean computers. We don’t store any information, we don’t transmit any information back home and we don’t go on any networks.”



For oil and gas companies, their joint venture partners and their contracting partners, there are three main types of IT security threat:

- ▶ **Operational sabotage.** This is potentially the most damaging and high-profile type of threat. Targeted attacks increasingly have the potential to bring down crucial components of a company's infrastructure network.
- ▶ **Intellectual property (IP) theft.** Companies illegally obtain, often with state-backed assistance, the valuable intellectual property of IOCs and others investing in new technologies.
- ▶ **Commercial espionage.** Untimely third-party access to commercial information (such as bids and proposals) can result in significant amounts of lost revenue. Eyvind Aven of Statoil notes that the key IT-related risk for his organization would be for "its sensitive information, for example as part of a bidding process, to be disclosed by hacking."

There is a scramble for expertise in this area to keep up with the increasing sophistication of aggressors. Some companies have been losing information for years without being aware of it, but the level of awareness among majors is increasing all the time. Companies, particularly majors, are recognizing that there is very little they can do to protect against the most skillful and tenacious attacks. As Ernst & Young's Ben Taylor advises: "What [companies] have to do in this situation is to be selective about the information they absolutely have to protect, and protect it at all costs."

The penalty for inaction may be severe. Whether or not they are aware of the threat, companies can be open to legal challenges if part of their corporate value includes IP that has been compromised. Ernst & Young research<sup>5</sup> has shown that most information leakages or threats come from internal rather than external sources.

Companies have struggled for some time to keep up with the increasingly sophisticated methods used by those seeking to generate disruption in this area. Ben Taylor notes that: "Suppliers to oil and gas majors are also gradually waking up and recognizing that they need to step up their game in responding to this risk." Consequently, IT security has moved from the periphery of a company's risk management structure to the core of its operations, a subject of ongoing dialogue. According to Ernst & Young's Marcela Donadio: "Chief information officers have suddenly become very important with respect to the management of companies. Previously, the major IT issue concerned the operational effectiveness of systems, but now, security is equally important."

---

<sup>5</sup> 2012 *Global Information Security Survey*, Ernst & Young, 2012. For more information, please visit <http://www.ey.com/GL/en/Services/Advisory/2012-GISS---Fighting-to-close-the-gap---Overview>



“Chief information officers have suddenly become very important with respect to the management of companies. Previously, the major IT issue concerned the operational effectiveness of systems, but now, security is equally important.”

**Marcela Donadio**, Ernst & Young, US

## What it all means for businesses

### **Targeted investment with constant vigilance**

Major technological advances across the industry have transformed its dynamics, opening up new worlds of possibilities, as well as vulnerabilities for all its players. Within such an environment, the risk of either being left behind or being caught unaware by an external threat is ever-present. However, those that succeed in the future will continually

monitor and adapt to this changing environment with prudent, targeted investments in technologies likely to yield revenues in the medium to long term.

Industry-leading players need to develop new technologies that will give them a competitive advantage, while taking appropriate measures to protect their IP effectively.




# Emerging challenges





This year's report features a section on the geopolitical risks that may emerge over the next three years, called emerging challenges. We define emerging challenges as those that are often thought of as predictable – and therefore manageable – but which at some point acquire a degree of volatility and unpredictability that may derail strategic and commercial decision-making. These risks are based on input from an expert panel and Oxford Analytica's Global Risk Monitor.

Each emerging challenge can have an impact on the top 10 business risks and opportunities in this report. Each risk below therefore offers plausible scenarios for the risk trajectory, inviting readers to reconsider their assumptions about the geopolitical context, stress test their company's strategy and explore the potential interactions between these macro forces and their business implications.



## Access to finance and capital market constraints

### Capital challenges to increase

Capital costs and financial risks are increasing as reserves are developed in challenging or remote regions and as larger-scale developments are undertaken – such as deepwater oil and gas, LNG and infrastructure projects. Creative financing techniques and new sources of finance will be needed to facilitate the allocation of risks. Mechanisms such as insurance, private equity, contracts, local and international banks and international capital markets will be involved in making certain that adequate funding is provided to finance new oil and gas developments.

While credit conditions appear to be improving globally, our recent *Capital Confidence Barometer*<sup>6</sup> shows an increase in the percentage of oil and gas executives who are worried about future capital availability. Returns are currently being challenged from both directions – revenue and costs. The rapid oil price rises that have underpinned returns for the last decade have stalled and are expected by many to reverse. Key causes are the slowing of the global economy (particularly the energy-intensive emerging market components) and the impact of new technology on production. The gas market is more geographically fragmented, but where prices haven't already fallen dramatically, they now look subject to downward pressure.

Multiple factors have combined to raise the finding and development costs of many companies. The lack of opportunities available to companies without the sponsorship of resource-rich nations, such as the IOCs, has driven a portfolio shift toward unconventional projects, extreme conditions, remote projects, new geology projects and conventional projects with an inherently higher cost of delivery than earlier conventional developments. Base commodities used in delivering projects, such as steel, have risen in price. Just as significantly, the scarcity of experienced and skilled labor has caused a massive increase in project labor costs. In some particularly active basins, a local market inflation factor has compounded the global one.

The last few years can be broadly characterized by a scarcity of public equity financing (and what is available is expensive), combined with corporate credit conditions that were initially tight but are now loosening. However, it is important to note the extent to which the credit market has fragmented. Banks have been through a process of rebuilding their balance sheets. In many jurisdictions, this process has been largely completed, but in some key ones, a lot of work remains. As a result, bank credit is broadly available, particularly to large-cap enterprises. However, caution around risk management and the pressure to deliver an appropriate return has led banks to tighten lending standards, particularly for small-to-medium enterprise (SME) borrowers. The bank lending climate is more important for the oil industry than other capital-intensive sectors, as it has traditionally relied much more heavily on bank lending (especially corporate). The power and utilities and real estate sectors, for example, have made much greater use of project or corporate debt finance.

With oil and gas capital requirements forecast at around US\$700 billion a year for the next 15 years and the continued evidence of cost pressures throughout the value chain, capital challenges seem likely to increase in future years.

## Increasingly high local content requirements

### Nationalism threatens progress ...

Local content requirements are contractual commitments that oblige oil and gas companies to procure a specified minimum percentage of goods and services from domestic suppliers. Local content requirements vary widely between countries, but there is clearly an appetite for increasing the level of local content around the world.

Brazil has generally been working toward 65%-70% targets for local content, but the average on onshore blocks was already over 80% in the 2010 licensing round. Brazilian government officials have already suggested that local content requirements for some items could reach 95% by 2020. Meanwhile, Ghana has set a target of at least 90% local content throughout the oil and gas value chain by around 2020. In 2010, Nigeria signed the Oil and Gas Industry Local Content Development Bill into law which stipulated, among other things, a minimum Nigerian content on oil and gas projects of up to 100%, depending on the type of activity.

6 Ernst & Young's *Capital Confidence Barometer*, Oil & Gas results, October 2012.





An introduction of nearly 100% local content requirements would probably only apply to certain activities; for instance, onshore areas rather than deep offshore areas, and procurement of pipes rather than high-tech electronic equipment. Companies would also likely be given a specified period of time for adjustment. Nonetheless, an introduction of increasingly high local content requirements would create major logistical difficulties for oil and gas companies in the short and medium term, as local capacity for the delivery of many goods and services would not be readily available. The lack of local capacity is already obstructing the expansion of oil and gas production in some countries with local content requirements.

### **... in numerous ways**

Furthermore, excessive local content requirements would create challenges in terms of IP rights for the most sensitive technologies, which are normally not transferred by oil and gas companies to host countries.

Very high local content requirements would also significantly raise costs of inputs, as local oil services companies generally charge more for equivalent equipment than their international competitors. Despite higher costs, governments of many oil-producing nations support local content requirements, which typically enjoy popular public support.

In a worst case scenario, an international bandwagon effect could be created. A relatively successful introduction of nearly 100% local content requirements by one major producer such as Brazil could lead to the model being imitated by other countries.

## **Catastrophic environmental events**

### **Carbon politics**

The impetus behind carbon reduction policies has been weakened by fiscal austerity. The EU Emissions Trading System (ETS) has not developed into a worldwide carbon trading system, and efforts at Intergovernmental Panel on Climate Change (IPCC) conferences to find a global agreement on climate change have been stymied by national concerns about the impact on economic growth and the division of costs.

It is generally agreed that acting earlier rather than later on carbon abatement is cost-effective, but national governments remain reluctant to make short-term sacrifices for long-term gains. A major natural disaster could change these priorities, re-energizing efforts both at the national and supranational levels. Perception is as important as fact; the closer the environmental costs of climate change appear, the stronger the argument that not only is early action affordable, it is necessary.

Examples of such natural disasters would be “tipping points,” in which weather change prompts a reinforcing cycle of emissions-releasing events. Alternatively, extreme weather events may result in dramatic food price rises via major crop failures or the collapse of fishery stocks. This could prompt governments to commit to decarbonization of the power and transport sectors at dates much earlier than currently anticipated. Policy would become much more heavily weighted toward zero and low carbon technologies, and against hydrocarbons.

While oil would be a certain loser in such a scenario, the position of gas would be more uncertain, as it is both an emission-emitting energy source and the cleanest-burning hydrocarbon, and therefore a potential low carbon displacement for coal in power generation and oil in transport.



# Methodology

## **Risk and opportunity identification**

The initial stage of the process involved identifying key risks and opportunities, both for global businesses across sectors and within each sector itself.

For each sector, as well as for the global report, we spoke to at least five experts in each field, asking them to identify what they thought were the leading risks and opportunities for the 2013-15 period.

We asked the interviewees to focus particularly on risks and opportunities for multinational, global organizations within their sector. We narrowed the final list down to 15 risks and 15 opportunities per sector, which were then used as a basis for ranking in the next stage of the process.

## **Ranking the top 10**

This stage involved a large-scale survey of 90 companies across the world. For the survey, we asked whether individual risks and opportunities within the report were important for their organization both now and in two years' time.

Respondents to the survey rated each risk and opportunity between 1 (not important) and 10 (extremely important). The results were then aggregated. The 10 risks and opportunities with the highest mean score then became the top 10 risks and opportunities.

## Understanding the impact of, and companies' response to, the top 10

We then interviewed a number of senior executives at major organizations within their field to understand how individual companies see these risks and opportunities impacting them, and how they go about responding to individual risks and opportunities.

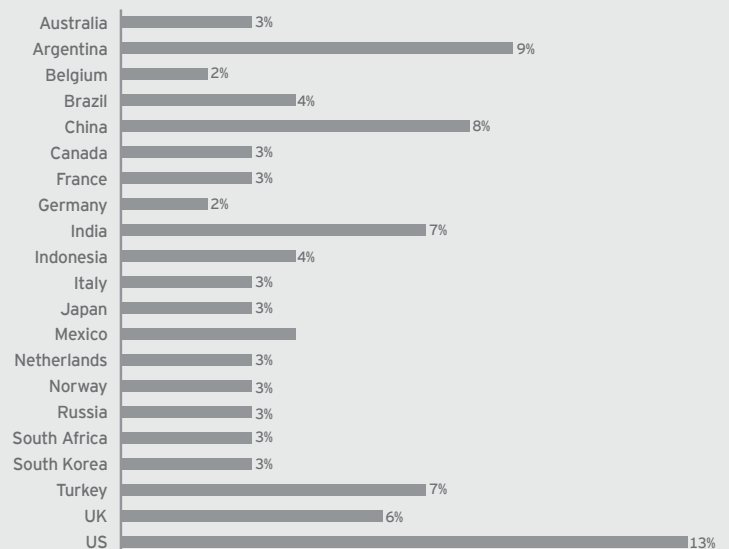
The interviewees were asked to identify three risks and opportunities that are particularly relevant to them. They were asked five questions for each of those they identified:

- ▶ What has been the impact of these risks and opportunities on your organization?
- ▶ Have they increased in importance over the last two years? If so, why?
- ▶ How has your organization dealt with these risks and opportunities? What approach have they taken?
- ▶ What would your advice be to others facing these risks and opportunities?
- ▶ Are these risks and opportunities likely to become greater between now and 2015?

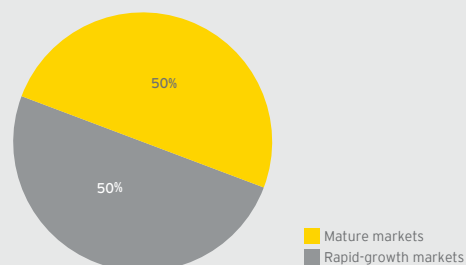
We also asked companies about the nature and structure of their risk management functions, and whether or not this had recently changed.

Additionally, we interviewed our own Ernst & Young practice professionals, to get their take on the impact of these risks and opportunities, and their opinion on how they see companies responding to them.

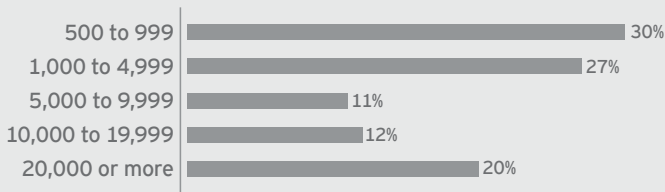
### In which country is this interview taking place?



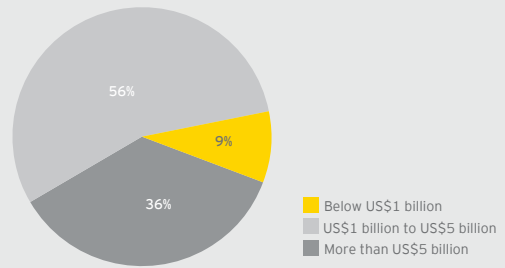
### In which country is this interview taking place?



**How many employees does your organization have?**



**What was the sales revenue (roughly) worldwide?**



**Which function do you work professionally at the moment?**



# Appendix

## Risks and opportunities below the radar

The risks that formed part of our top 15, but did not make it into the top 10, are listed below.

### Risks

11. New operational challenges
12. Counterparty risk and contractual disputes caused by increasingly complex projects and supply chains
13. Access to financing and capital market constraints
14. Dealing in countries without well-developed legal or oil and gas regulatory frameworks
15. Supply or demand shocks (e.g., related to geopolitical events, accidents, or unusual weather or natural disasters)

### Opportunities

11. NOC-IOC partnerships
12. Conventional resources in new and challenging areas
13. Unconventional resources
14. Cross-sector strategic partnerships
15. Alternative fuels, including second generation biofuels





## Ernst & Young

Assurance | Tax | Transactions | Advisory

### About Ernst & Young

Ernst & Young is a global leader in assurance, tax, transaction and advisory services. Worldwide, our 167,000 people are united by our shared values and an unwavering commitment to quality. We make a difference by helping our people, our clients and our wider communities achieve their potential.

Ernst & Young refers to the global organization of member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. For more information about our organization, please visit [www.ey.com](http://www.ey.com).

This report has been produced in collaboration with:

**Oxford Analytica** is a global analysis and advisory firm which draws on a worldwide network of experts to advise its clients on their strategy and performance.



Oxford  
Analytica

### How Ernst & Young's Global Oil & Gas Center can help your business

The oil and gas sector is constantly changing. Increasingly uncertain energy policies, geopolitical complexities, cost management and climate change all present significant challenges. Ernst & Young's Global Oil & Gas Center supports a global practice of over 9,000 oil and gas professionals with technical experience in providing assurance, tax, transaction and advisory services across the upstream, midstream, downstream and oilfield service sub-sectors. The Center works to anticipate market trends, execute the mobility of our global resources and articulate points of view on relevant key sector issues. With our deep sector focus, we can help your organization drive down costs and compete more effectively to achieve its potential.

For more information, please contact your local advisor on:

[www.ey.com/oilandgas/business-pulse](http://www.ey.com/oilandgas/business-pulse)

© 2013 EYGM Limited.  
All Rights Reserved.

EYG No. AU1590



In line with Ernst & Young's commitment to minimize its impact on the environment, this document has been printed on paper with a high recycled content.

This publication contains information in summary form and is therefore intended for general guidance only. It is not intended to be a substitute for detailed research or the exercise of professional judgment. Neither EYGM Limited nor any other member of the global Ernst & Young organization can accept any responsibility for loss occasioned to any person acting or refraining from action as a result of any material in this publication. On any specific matter, reference should be made to the appropriate advisor.

The views of third parties set out in this publication are not necessarily the views of the global Ernst & Young organization or its member firms. Moreover, the views should be seen in the context of the time they were expressed.

ED None

EMEIA MAS. E231.1212