DNV·GL

CHALLENGING CLIMATES

THE OUTLOOK FOR THE OIL AND GAS INDUSTRY IN 2014

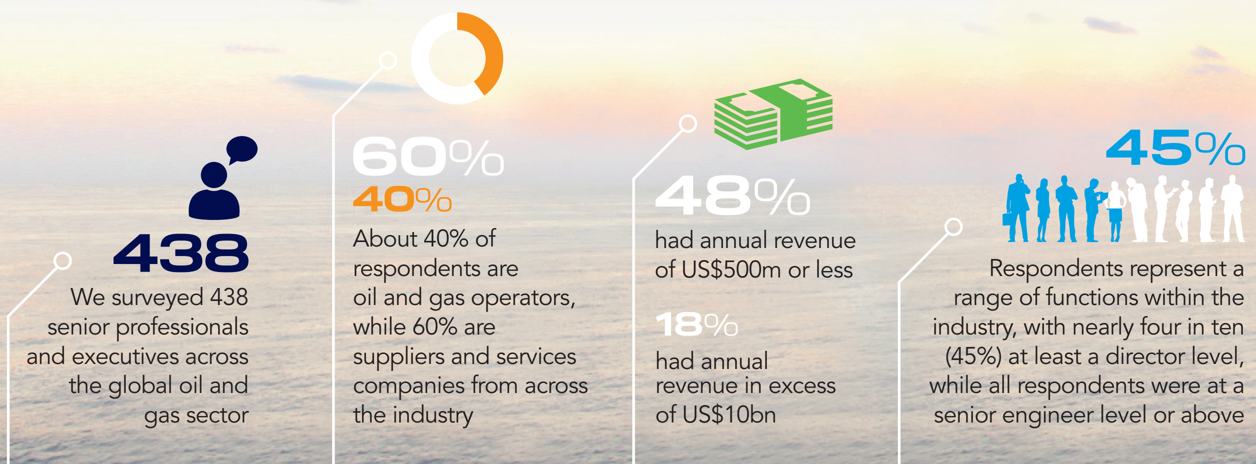
ABOUT THE RESEARCH

Challenging climates: The outlook for the oil and gas industry in 2014 is an industry benchmark study from DNV GL, the leading technical advisor to the sector. It builds on three annual outlook reports, released respectively for 2011, 2012 and 2013.

The report provides a timely snapshot of industry sentiment, confidence, priorities and fears, based on a wide-ranging survey of more than 430 senior industry professionals and executives, along with more than 20 in-depth interviews with a range of experts, business leaders and analysts. The research was carried out on behalf of DNV GL by Longitude Research. The findings and views expressed in the report do not necessarily reflect the views of DNV GL.

During November and December 2013 we surveyed 438 senior professionals and executives across the global oil and gas sector. About 40% of respondents are oil and gas operators, while 60% are suppliers and services companies across the industry. The companies surveyed vary in size: 48% had annual revenue of US$500m or less, while 18% had annual revenue in excess of US$10bn.

Overall, 39% of respondents work for publicly listed companies, with the remainder hailing from either privately held firms (41%), state-owned ones (12%) or from companies operating as joint ventures (4%). Respondents represent a range of functions within the industry: nearly half (45%) are at least at director level, with all respondents at a senior engineer level or above.



We would like to extend our thanks to all participants and, in particular, to the following interviewees for sharing their time and insights with us (listed alphabetically, by surname):

- **Graham Bennett,** Vice President, DNV GL
- **Phillippe Berterottiere,** Chairman and CEO, Gaztransport & Technigaz (GTT)
- **Tim Daigle,** Advanced Technology Manager, Fluor Offshore Solutions
- **Geoff Gander,** CEO, Jupiter Energy
- **Erik Karlstrom,** CEO, North Energy
- **Halvard Hasselknippe,** Chief Operating Officer, Technip
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- **Etienne Romsom,** EVP, Global Business Development and Strategy Director, DNV GL
- **Thina Margrethe Saltvedt,** Chief Analyst, Nordea Markets
- **Paul Shrieve,** Senior Vice President: Inspection, DNV GL
- **Arthur Stoddart,** Director: Marine and Technical, North America, DNV GL
- **Paul Sullivan,** Head of LNG, WorleyParsons
- **B. C. Tripathi,** Chairman and Managing Director, GAIL (India) Ltd
- **Eirik Waerness,** Chief Economist, Statoil
- **Charlie Williams,** Executive Director, Center for Offshore Safety

FOREWORD

Thank you for reading *Challenging Climates: The outlook for the oil and gas industry in 2014.*

Our sector is in the midst of a transformation, as traditional resources, practices and assumptions are redefined, and new opportunities, regulations and technologies emerge.

The findings from this year's research reaffirm the oil and gas sector's focus on finding innovative approaches to meet tomorrow's energy demands. Industry leaders have their sights firmly fixed on developing the deep technical ability and smarter ways of working that are needed to access hydrocarbon reserves in new frontiers that were considered inaccessible just a few years ago.

Among these new opportunities, the ability to enhance production from mature oil and gas fields will be crucial to the sector's success in 2014 and beyond. Our research shows that companies expect to face greater discipline on capital expenditure, an increasing focus on new technologies and standardisation in their supply chains this year in order to achieve this.

DNV and GL Noble Denton joined forces in September 2013 to help oil and gas customers to manage the risks associated with new market opportunities. We understood that there was a gap in the market for an industry-leading technical advisor and innovation powerhouse with the skills, scope and scale to help companies become safer, smarter and greener.

As DNV GL – Oil & Gas we enable safe, reliable and enhanced performance in projects and operations. We will continue to draw upon the proud heritages of our legacy businesses, providing independent services and expert advice to our customers, and collaborating with industry partners to define internationally recognised practices, standards and systems.

Challenging Climates sets out a clear direction for the oil and gas industry this year, helping DNV GL to target investment into services and innovation to support our customers. I hope that it will also help you to successfully navigate the opportunities and challenges facing the sector in 2014.

Elisabeth Tørstad,
CEO, DNV GL – Oil & Gas

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THE OUTLOOK FOR 2014: SEVEN KEY TRENDS

At the dawn of 2014 the global oil and gas industry faces a host of questions about the year ahead. To what extent will increasing US oil and gas production reshape global markets? How will uncertainty over emerging market growth feed into global oil and gas prices? How severely will tougher regulations in some markets affect operating costs? How will project costs affect project approvals? All told, while the overall outlook remains exceedingly strong, it is also clear that the year ahead will demand greater focus and discipline among operators. This research highlights seven key trends for 2014. The second half of this report then explores some of these themes in several in-focus sections.

Snapshot: 7 trends for 2014

01 **A confident outlook for 2014, but with signs of caution.** About nine in ten (88%) survey respondents are optimistic about the outlook for 2014, but several signs of caution are also visible.

02 **Skills gaps, rising costs and tougher competition will define the industry's barriers to growth in 2014.** A shortage of skilled professionals is a top worry for all regions, but especially for North America and Europe. In Asia, high operating costs tops the list.

03 **More cautious and targeted capital expenditure will be evident in 2014.** There are more firms planning to increase spending in 2014, than those who will cut back, but there are clear signs that spending will be even more closely monitored than ever. Over three-fifths (62%) of respondents say they face growing pressure to extend the life of existing assets and increase the return on these investments.

04 **Uncertainty over oil and gas pricing will be more prevalent in 2014.** Nearly one in four (23%) industry professionals think oil and gas pricing will weaken this year, while 36% are unsure.

05 **The industry will consolidate in 2014, with larger organisations coming to the fore.** A majority of survey respondents (55%) expect to see a greater focus on larger companies, with a drive for both greater industry consolidation and supply chain standardisation.

06 **The US, Brazil and Australia are the top investment destinations for 2014.** Frontier markets will also feature high up on the list. Survey respondents worry most about the political challenges of new target areas, ahead of the technical difficulties, as many look to push into East Africa, the Arctic and new deepwater locations.

07 **A deeper industry safety culture is taking root.** Six in ten industry professionals expect their firms to prioritise a stronger safety culture in 2014, with half (49%) noting that their leaders will be deeply engaged in this.

01 A CONFIDENT OUTLOOK FOR 2014, BUT WITH SIGNS OF CAUTION

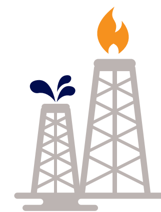
After three years of steady increases in confidence, DNV GL's 2014 report reveals some hints of a more cautious industry outlook for the coming year. Our research registered only a marginal contraction of confidence about the business outlook: a one per cent year-on-year decline is no cause for panic, despite being the first drop in four years. However, the survey does highlight several uncertainties about the year ahead.

What are these concerns? For one, nearly a fifth (18%) of those polled for our survey agree that the prospects for growth in 2014 are less certain than they were last year. A further 38% say they are unsure. Almost three-fifths of respondents (59%) believe energy prices will be weaker, or at least are unsure (see later finding), while costs continue to climb. "There is an anxiety among most oil companies over cost increases, as we've seen sharp rises in almost all costs," notes Bjørn Arne Næsgaard, Director of External Affairs, Total E&P Norway. "But these also show that what we are doing in the industry is more complex and requires more man-hours," says Eirik Waerness, Chief Economist at Statoil.

A related factor is weaker demand for oil and gas from emerging markets such as India. Back in 2011, our research noted robust growth in these markets as a key factor underpinning oil and gas demand[1]. At the dawn of 2014, with economic growth slowing in many of these countries, that picture is less clear.

18% 38%

18% of those polled for our survey agree that the prospects for growth in 2014 are less certain than they were last year. A further 38% say they are unsure



Back in 2011, our outlook noted robust growth in these markets as a key factor underpinning oil and gas demand[1]; at the dawn of 2014, with economic growth slowing in many of these countries, that picture is less clear

59%

of respondents believe oil and gas pricing will be weaker in 2014

Nearly nine in ten are either somewhat or highly confident about the oil and gas sector as a whole

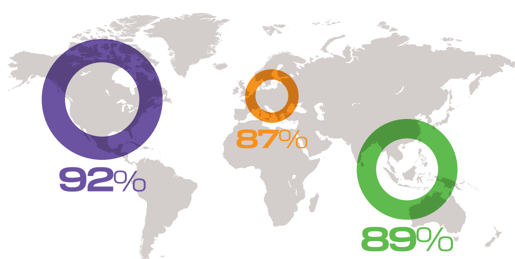
1 "Deep water ahead? The outlook for the oil and gas industry in 2011", Economist Intelligence Unit and GL Noble Denton, 2011

However, any tempered sense of confidence should not obscure the broader fact that the vast majority of executives polled feel upbeat about 2014. Nearly nine in ten (88%) are either somewhat or highly confident about growth in the oil and gas sector as a whole, and eight in ten (81%) are also confident about their own businesses hitting revenue and profit targets. These figures remain higher than those seen in our annual outlook for 2012[2], in which 82% of respondents expressed confidence for the year ahead, though the figures do represent a very slight decline in confidence from 2013 (89%).

Overall business confidence levels vary considerably by region, reflecting differing industry growth prospects across the world – and also varying degrees of pressure on the barriers to growth. Sentiment is lowest in Europe, where just 24% of those polled express strong confidence about 2014, compared with a high of 44% in North America and 38% in Asia-Pacific. For the US this bullishness clearly reflects the expansion of unconventional oil and gas production, as well as rising offshore production. The US Energy Information Administration (EIA) forecasts that US crude oil production will jump from about 7.5m barrels a day (b/d) in 2013 to 8.5m during 2014.[3]

When looking at their core revenue and profit goals, executives are at least as confident as they were in 2013. Overall, 72% of respondents think they will hit next year's revenue targets, slightly up on last year. Marginally fewer (69%, compared with 70% in 2013) expect to hit profit targets. Worries over such targets are stronger in Europe, though, where respondents express the least certainty about hitting their goals. Still, this hardly shows grounds for pessimism: only 10% globally expect to miss their revenue goals and only 12% predict they will fall short on profits.

Percentage of respondents by region who are 'highly' or 'somewhat' confident about the outlook for their business



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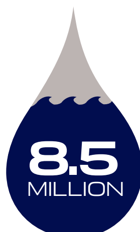


Overall confidence in the oil and gas sector

Source: DNV GL industry outlook survey, November-December 2013

Overall confidence about the oil and gas sector

Confidence about hitting revenue targets

Confidence about hitting profit targets

2 "Big Spenders: The outlook for the oil and gas industry in 2012", Economist Intelligence Unit and GL Noble Denton

3 "Short-term energy outlook", US Energy Information Administration, November 2013

02 SKILLS GAPS, RISING COSTS AND TOUGHER COMPETITION DEFINE THE INDUSTRY'S BARRIERS TO GROWTH IN 2014

All regions worry about the shortage of skilled professionals in the industry, and 47% of respondents consider this the top barrier to growth, as it was in 2013.

However, this issue is far more pressing in North America, given the rapid growth of shale oil and gas production there, and as the nature of projects change. Unsurprisingly, this all affects the pricing of key skills: globally, the median daily rate respondents say they've been willing to pay for individual contractors in technical areas with a particular expertise shortage is US$1,000.

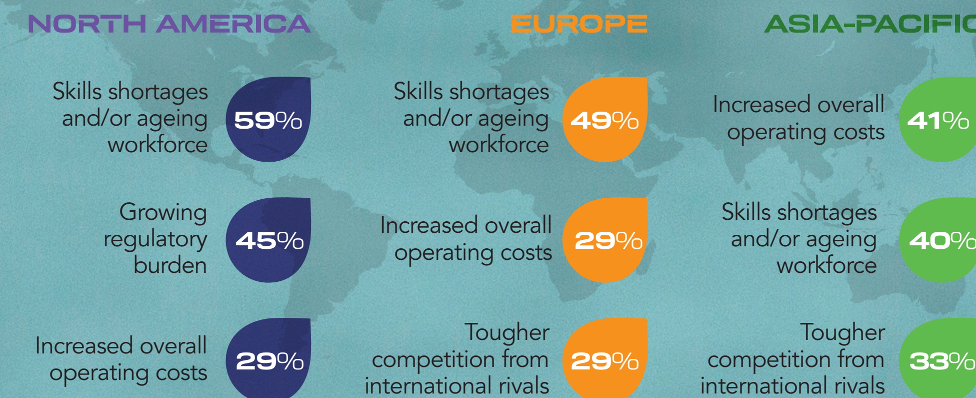
After skills, industry professionals in North America are far more concerned about the growing burden of a new regulatory framework coming into effect in the US: 45% cite this as a key barrier to growth, well above other regions. Indeed, regulatory pressures were the third biggest issue for the industry overall, up from fifth in 2013. This has been a worry for the industry since the first spike

Top 3 barriers to growth for year ahead

Source: DNV GL industry outlook survey, November-December 2013

Top 3 barriers to growth, by region

Source: DNV GL industry outlook survey, November-December 2013



in concern over a regulatory backlash post-Macondo, as charted in our 2011 outlook.[4] "In a sense we're living with a project handbrake on, due to regulators pushing certain financial responsibilities all the way down to the smaller operators. This could be better dealt with on a grouped UK North Sea operator cooperative basis," says the Strategy Director of a small operator active in the North Sea.

In Asia, increasing overall operating costs are the biggest worry, cited by 41%. This is slightly lower than in 2013, but reflects the major cost inflation that a range of huge projects have faced in the region. For example, the Gorgon LNG project, backed by Chevron, has seen the expected cost rise from US$37bn in 2009 to US$54bn by late 2013.[5]

In Europe and Asia, in particular, industry professionals show far greater concern regarding tougher competition from international rivals, compared to their peers in North America. While this has largely focused on international oil companies (IOCs) in the past, these competitive threats increasingly extend to national oil companies (NOCs) too. About six in ten (61%) respondents believe NOCs will increasingly compete internationally in 2014. There are also clear signs of a desire by NOCs to become more self-reliant, not least through their increasing investment in R&D and innovation, but also through more aggressive M&A activity, as they grow outside of their national domains.

For more, see: In depth – NOCs: Fashioning a new role, page 28

THE TOP 5 SCARCEST SKILLS FOR 2014

(as cited by survey respondents)

4 "Deep water ahead? The outlook for the oil and gas sector in 2011", GL Noble Denton, 2011

5 "Cost of Australia's Gorgon LNG project rises to $54bn", *Financial Times*, 12th December 2013

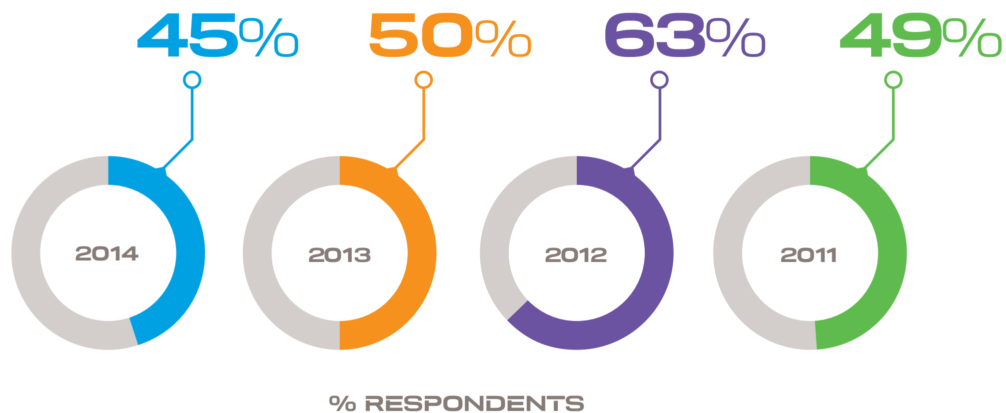
03 MORE CAUTIOUS AND TARGETED CAPITAL EXPENDITURE WILL BE EVIDENT IN 2014

Given some of the caution noted in this outlook and concern over rising costs, one likely trend will be even tighter monitoring of capital expenditure (capex).

The proportion of companies planning to increase investment in new projects has now declined for three years in a row, from a high of 63% in 2012 to just 45% for 2014 (see chart). As one example, Royal Dutch Shell expects its net capital spending to fall sharply in 2014, after an active year of acquisitions in 2013 that sent its net capex to a record US$45bn.[6] Furthermore, while 11% of survey respondents planned to cut headcount last year, 16% plan to do so for 2014 – a minority, clearly, but a shift in sentiment nonetheless.

Proportion of respondents expecting to increase capex in year ahead

Source: DNV GL industry outlook survey, November-December 2013



16%

While 11% of survey respondents planned to cut headcount last year, 16% plan to do so for 2014

Six in ten intend to pressure suppliers to curb cost increases next year

6 "Oil Majors under pressure to curb spending", *Financial Times*, 5th November 2013

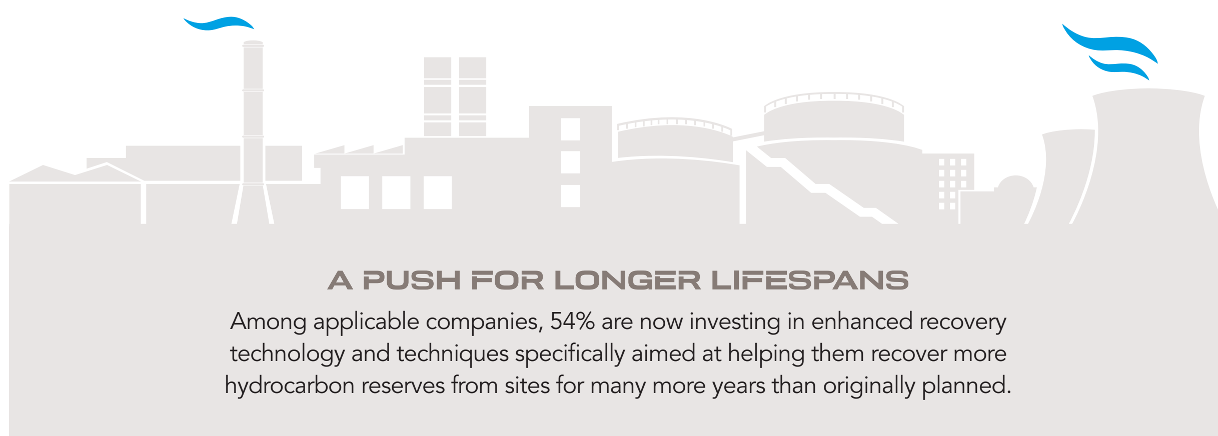
> **"Rather than falling investments you will likely see more targeted deployment of capital."**
>
> *Thina Margrethe Saltvedt, Chief Analyst, Nordea Markets*

Of course, none of this suggests a major reversal in industry spending: the proportion of firms planning to boost spending and headcount clearly outweighs those planning to cut back. But spending will likely fail to exactly equal that of recent years, with a narrower strategic focus applied during 2014 and better returns on investment demanded. "I wouldn't be surprised if we don't see the industry capex growth match the levels of previous years, though it is still at a very high level," says Statoil's Waerness.

This tighter rein can be seen in two other areas. Firstly, survey respondents expect a closer watch on cost: six in ten (62%) intend to pressure suppliers to curb cost increases next year, when equipment, material and labour costs are all set to rise, especially across Asia. Secondly, the same proportion (62%) of respondents admit to strong pressure within their business to safely extend the lifespan of their existing assets and increase the return from these investments. A further 47% acknowledge that their companies are now actively planning for far longer asset life spans than ever before.

Thierry Pilenko, the CEO of Technip, a global oil and gas services firm, recently noted that majors are making a much stronger effort to control capex spending.[7] "I think this discipline will be applied to downstream investments in particular, such as trimming refining costs," he says. Nevertheless, upstream exploration and production (E&P) activities are not immune to cost pressures. Erik Karlstrom, CEO of North Energy, an oil company, notes that while investments into the Norwegian Continental Shelf have risen at double digit rates for the last four or five years, the rate will fall to 4-5% in 2013-14. "This has a lot to do with cost, which is one of the biggest challenges," he says.

There may also be more careful geographic allocation of E&P capex, as margins are squeezed by rising costs and sideways price moves, according to Thina Margrethe Saltvedt, Chief Analyst at Oslo-based Nordea Markets, a large financial group. "Rather than falling investments you will likely see more targeted deployment of capital," she says, citing greater spending in North America balanced with far more hesitancy across the Middle East and North Africa.



47% acknowledge that their companies are now actively planning for far longer asset life spans than ever before

While investments into the Norwegian Continental Shelf have risen at double digit rates for the last four or five years, the rate will fall to 4-5% in 2013-14

7 Statement from 2013 third-quarter earnings call

04 UNCERTAINTY OVER OIL AND GAS PRICING WILL BE MORE PREVALENT IN 2014

Whether spending is more carefully targeted or not, oil and gas firms still dominate the list of the top global capital spenders across all sectors in 2013, holding eight out of the top ten spots, according to Standard and Poors.[8]

Many companies based their 2013 E&P spending on a Brent oil price forecast of US$101 a barrel and US natural gas price of US$3.62. However, the core challenge here is that while oil and gas prices have remained relatively stable, capex costs have soared by as much as 300% over the past five years, according to Graham Bennett, a Vice President at DNV GL.

Added to this, the sentiment in our survey suggests some uncertainty over future oil and gas price levels. When asked about the key risks facing the sector in 2014, a drop in the oil price (or uncertainty around the price), was one of the top five most commonly cited issues. Overall, 23% of survey respondents agree that energy prices will be weaker in 2014, a further 36% remain on the fence, and 39% disagree. Other forecasters see a similar risk, although scarcely at a worrying level: the US Energy Information Administration (EIA) currently expects Brent crude to average US$104 a barrel in 2014, down from US$111 in 2012 and US$108 in 2013.

Our survey results show that respondents' uncertainty around whether or not oil prices will fall is prompted by two key factors. Of those respondents who predict a drop in oil price in 2014, 69% said it would be influenced by the rising supply of unconventional oil and gas. Meanwhile, 55% cited the weakness of the global economic recovery and relatively low emerging market demand as a key factor. Added to this, sustained gains in road transport fuel efficiency has further curbed demand for hydrocarbons, as has the ongoing switch in marine propulsion to LNG.

"The world is seeing a 1-1.5% growth in petroleum product demand in the near term, but in the longer term, unconventional oil sources, which include deepwater and oil sands, will lead to supply outpacing demand growth," argues Ed Morse, Head of Commodities Research at Citigroup, the global bank. A third reason is the potential for up to 800,000 b/d of Iranian crude oil to re-enter global supply, following a preliminary diplomatic deal over the country's nuclear program.

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> *Ed Morse, Head of Commodities Research at Citigroup*

8 "Global corporate capital expenditure survey 2013", Standard and Poors, 2013

Nevertheless, even if prices do soften, this could have other benefits, such as lower price volatility and increased demand for oil and gas. Geoff Gander, CEO of Jupiter Energy, an independent oil company active in Kazakhstan, says companies can still make good money despite soft domestic prices. "There are other challenges ahead, but at this time pricing is not necessarily one of them. Oil prices would have to drop significantly before I believe anyone would stop production and leave it in the ground – presently we're a long way away from that."

For more, see: In depth-Gas: Globalisation in process, page 24

Europe Brent crude spot price: US Dollar per barrel

Source: EIA

9 "Short-term energy outlook", US Energy Information Administration, November 2013

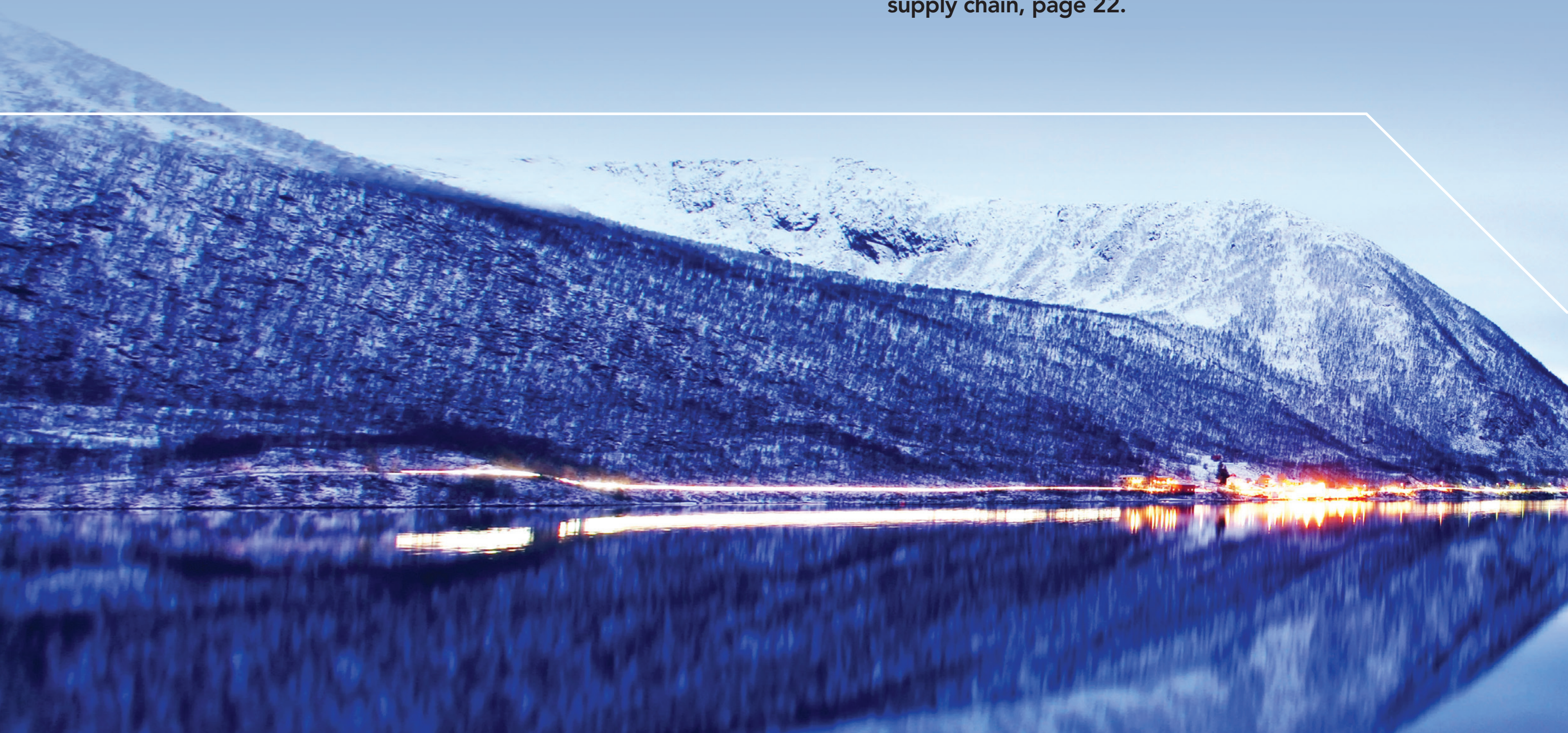
05 THE INDUSTRY WILL CONSOLIDATE IN 2014, WITH LARGER COMPANIES COMING TO THE FORE

Over half (55%) of oil and gas industry professionals agree that the sector will increasingly be characterised by larger, global organisations in 2014. Just 16% disagree. More than one-third (36%) also think the industry will see greater consolidation in the year ahead, as companies join up to better deal with the increasingly complex challenges ahead.

All this has an impact on supply chains, as operators seek to push for a more standardised way of working from suppliers. About half of all respondents to our survey (52%) say the industry will increasingly apply pressure on suppliers to standardise their delivery globally in 2014, supporting a move towards market domination by multinationals. This continues the trend identified in our 2013 survey, in which 48% of respondents expected that oil and gas operators would consolidate their supply chains more intensively, as a result of increased pressure on operators to show that they have paid full attention to due diligence issues when selecting suppliers. For 2014, about three times as many respondents (22%) will increase their reliance on large external partners, compared with those planning to reduce this (7%). This contrasts with the results of our 2012 survey, where only 6% of respondents cited the need for closer collaboration with partners as being a key challenge for them.

One driver for the emergence of larger suppliers is the pressure of both tougher regulation and rising costs, which larger companies can more readily take on. But another relates to the increasingly challenging operating environments that the oil and gas industry is dealing with. More than one-third of our survey respondents (37%) say that their companies intend to acquire partners with the specialist knowledge and skills they need as they move into tougher E&P sites. Collaboration is another trend among companies in the oil and gas sector; nearly half of respondents (49%) say they will need to increase alliances with others to share knowledge in order to cope with more challenging environments. Companies also expect to rely more on external partners for technology and advisory services, with 30% identifying this, ahead (albeit narrowly) of those choosing to develop new technologies internally (cited by 26%), an option only open to already large firms.

For more, see: In depth – The shifting supply chain, page 22.



A push towards consolidation

Source: DNV GL industry outlook survey, November-December 2013

The industry will increasingly push suppliers to standardise their delivery globally

The industry will increasingly be characterised by larger, global players, both in terms of operators and their suppliers

One of the key trends of 2014 will be increased industry consolidation within the oil and gas sector

52%

55%

37%

7%

1%

6%

13%

16%

8%

33%

27%

44%

AGREE NEUTRAL DISAGREE DON'T KNOW

06

THE US, BRAZIL AND AUSTRALIA ARE THE TOP INVESTMENT DESTINATIONS FOR 2014. FRONTIER MARKETS WILL ALSO FEATURE HIGH UP ON THE LIST

According to our survey respondents, the US, Brazil and Australia are the top three countries offering the most favourable investment destinations for 2014, unchanged from last year. In fourth place is Malaysia, up from eighth in 2013, followed by China, which rose one spot to fifth place.

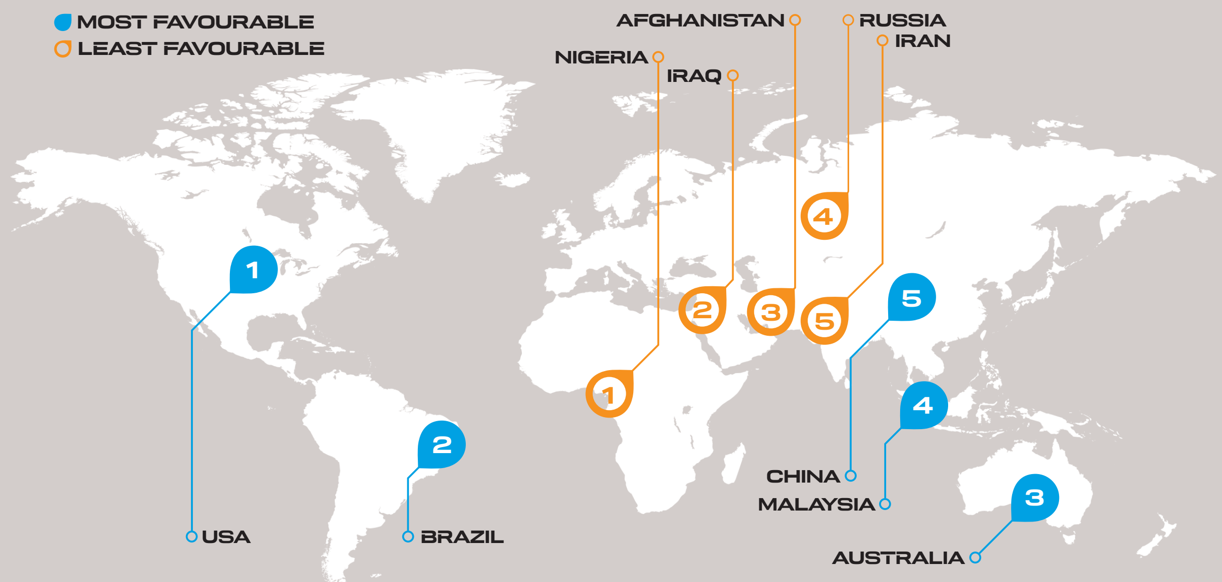
Security issues, corruption and political uncertainty leaves Nigeria as the least favourable country to invest in, as it was in 2013. Other key destinations regarded as highly risky for investment include few surprises (see map). Afghanistan recently issued an oil and gas E&P tender, in an attempt to attract operators to tap its oil and gas reserves, which remain largely unutilised due to ongoing military conflict in the country.[10]

Heightened political risk in parts of the Middle East and North Africa region could trigger a shift in priorities for oil and gas operators, says North Energy's Karlstrom. "Companies are moving their activities away from areas that were once looked upon as very promising, towards areas like the Norwegian Continental Shelf, which is seen as a safe haven in terms of geopolitical stability," adds Nordea's Saltvedt.

The allure of new reserves will mean operators continue to push the boundaries in terms of the new frontiers they pursue. Among operators, nearly three in ten (29%) intend to expand into challenging territories in 2014. This is especially true among larger operators, reinforcing the trend that such exploration will increasingly become the preserve of those companies with the greatest financial resources. Deepwater locations, the Arctic and East Africa were the most commonly cited destinations that companies plan to target, along with shale oil and gas and offshore sites in North West Australia.

Top five most favourable and least favourable investment destinations

Source: DNV GL industry survey, October-November 2013

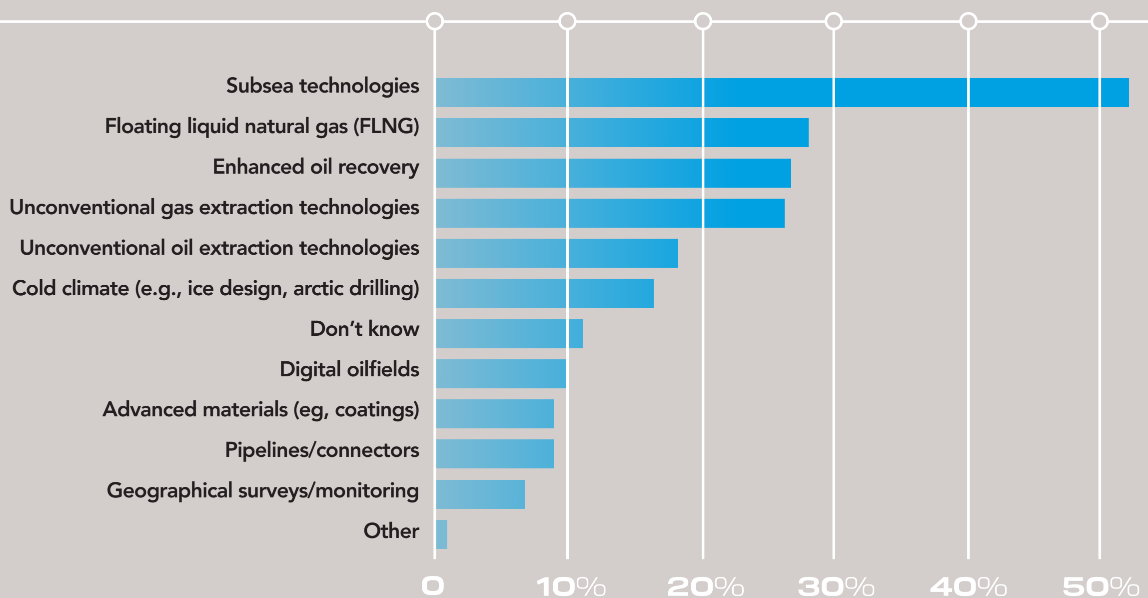


10 "War-torn Afghanistan issues oil and gas tender", *The Telegraph*, 7 October 2013

The above trends are also reflected in the direction in which technology investments are expected to be focused in 2014. Many industry professionals agree that the necessary technologies for exploiting frontier markets are not yet sufficiently developed (41% agree, just 15% disagree). Just over half of respondents said that subsea technologies will see the greatest investment in 2014, along with newer technologies, such as floating liquefied natural gas (FLNG), as shown below.

Which of the following technologies will see the strongest investment in the coming years, to support exploration into new or challenging environments?

Source: DNV GL industry outlook survey, November-December 2013



Nevertheless, technology is not the primary barrier to entry in these new E&P zones. According to those polled, political barriers, from market access to regulatory regimes, are the top concerns for our survey respondents (22%), along with the challenge of sourcing skilled professionals to work in these locations (18%).

"The political framework is becoming more challenging, particularly in parts of the Middle East, which is making it more challenging for IOCs active there," says Saltvedt.

For more, see: In depth – New frontiers: Targeting challenging environments, page 26

SIZE MATTERS

Two-thirds (67%) of oil and gas professionals agree that the financial demands of successfully operating in challenging environments makes it far more suitable for larger operators, rather than smaller players.

07 A DEEPER INDUSTRY SAFETY CULTURE IS TAKING ROOT

During 2014, health, safety and environmental (HSE) issues will continue to develop as important priorities for senior management in the oil and gas industry, according to our research.

This is increasingly resulting in a more deep-rooted safety culture setting in, and the change in behaviour is spreading through operators, and their chains of suppliers and contractors. However, it is worth noting that many of these changes are driven by local regulatory requirements, which can vary widely across different regulatory regimes.[11]

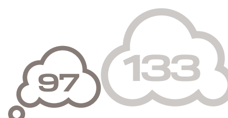
Overall, 44% believe that their companies' current approach is not just defined by box-ticking, but will lead to a genuinely safer operating environment, twice as many as those who disagree (see *Perspective: Why safety is a leadership issue*). This is likely to bolster the trend of a steadily safer industry. In the UK, for example, the number of offshore hydrocarbon releases dropped to a record low of 97 in 2012, down from 133 the previous year and continuing a downward trend, according to the Health and Safety Executive(HSE).[12]

One reason for this increase in general safety is that more companies now view a well-managed HSE process as a competitive advantage, a trend identified in related 2013 research.[13] "The industry has made tremendous improvements in safety, and does not just look at the minimum of investment to reach the lowest target. More and more companies see the area of HSE as an opportunity to compete. And it's in their own interests to do so," says Karlstrom of North Energy.

"The continuing emphasis on safety has led to a sea change in the way companies think about the issue," says Paul Sullivan, Head of LNG at WorleyParsons, an Australian energy services firm. "In the past, major companies had safety programmes in place, but often these weren't integrated into all aspects of their design and development."

44%

44% believe that their companies' current approach is not just defined by box-ticking, but will lead to a genuinely safer operating environment



The number of offshore hydrocarbon releases dropped to a record low of 97 in 2012, down from 133 the previous year

PERSPECTIVE: WHY SAFETY IS A LEADERSHIP ISSUE

Charlie Williams is the Executive Director of the US Center for Offshore Safety, an industry-sponsored organisation set up to ensure the safe development of America's deepwater resources. It was formed in 2011 to promote advances in subsea containment and spill clean-up, foster innovation and share good practices. One of the organisation's good practices, "Guidelines for Leadership Site Engagement", addresses the ability of company leadership to influence site-level safety.[15]

How can companies best guard against HSE problems?"Major safety incidents typically occur from a systematic problem in the way that companies execute their work. Firms have to have the right balance in protecting themselves from these so-called "black swan" events, while protecting people from being individually hurt."

15 www.centerforoffshoresafety.org/documents/COS%20Guidelines%20LSE.pdf

11 "Offshore oil and gas regimes", DNV GL, 2014
12 "Offshore hydrocarbon releases reach record low – but number of major incidences rise", Health and Safety Executive, 17 June 2013
13 "Reinventing regulation: The impact of US reform on the oil and gas industry", GL Noble Denton, May 2013

There are clear signs of this in the HSE issues industry professionals say their firms will prioritise during 2014. The majority (60%) say they will push harder to develop a more widespread safety culture, which shows that many companies are now trying to effect an organisational culture change as the best way to meet increased long-term requirements on safety. About half (49%) also expect stronger engagement by senior leadership on safety, and one-third (35%) are pushing to develop more robust safety processes.

Inevitably, this drive for safety adds pressures on cost. A report from Lux Research suggests that the industry's spending on HSE will rise by 60% to an estimated US$56bn by 2030, albeit rewarded by a continued reduction in the rate of safety and environmental incidents.[14]

There is, however, a minority of respondents whose answers suggest safety is not as important to them, or perhaps are unconvinced that their companies are approaching the issue in the right way. Some 14% say their company's approach is not leading to a safer operating environment and 22% think current efforts are more about box-ticking than improving standards.

60%, say they will push harder to develop a more widespread safety culture

HSE aspects being prioritised in 2014

Source: DNV GL industry outlook survey, November-December 2013

Was the Macondo spill in 2010 a wake-up call to the industry? "Even companies that had comprehensive management systems that embed safety into all parts of their projects, operations and operational planning were reinvigorated by the Macondo incident to look at those systems and to see how they can make them even more robust and effective. As a result, people became extremely aware of what percentage of the work is actually executed by companies contracted out by operating companies, rather than actually being executed by the operators themselves. This in turn, is triggering operators to re-evaluate the number of suppliers they use and the quality of their work."

What is the most important aspect in improving safety? "The key to a good safety culture lies in the senior leadership. You can have excellent systems, you can have excellent procedures, you can have excellent processes, but you will also have to have people who are personally committed – and who believe the leadership of the company is committed to executing those correctly and following them. One example of this more focused culture can be seen in leadership site visits. When you're a senior leader visiting a site, what kind of questions should you ask? How should you prepare yourself to interact with the people there to drive their belief and safety management?"

14 "Oil industry spend on health, safety and environment jumps 60% to $56 billion in 2030", Lux Research, 18 April 2013

IN DEPTH

THE SHIFTING SUPPLY CHAIN

As operators continue to move into steadily more difficult territories and re-evaluate the safety and risk profiles, they bring with them an increasingly complex supply chain of equipment suppliers, technical advisors and other specialist partners.

But, given the pressures of dealing with rising costs – not least with equipment cost increases forecast for later in 2014, according to IHS[16] – there is a renewed interest among our survey respondents in seeking out greater supply chain efficiencies, not least as companies seek to impose more targeted spending in 2014.

"Projects are increasingly complex or in more challenging environments, for example in deepwater or at deeper reservoir depths, so costs of exploration and production are inevitably higher. The challenge for the supply chain is to help find further innovative ways to reduce costs and increase production, and demonstrate a real quality in the products and services they deliver," notes DNV GL's Arthur Stoddart.

This greater push for efficiency is giving rise to three broad trends. The first, and most obvious, is that this will result in tough cost negotiations in the year ahead: about six in ten (62%) survey respondents expect the pressure being imposed on suppliers to curb costs to increase. For both oil majors and vendors, keeping a rein on costs has become a major challenge. "We've seen a sharp escalation in costs, particularly in the E&P space. For our business as a whole we are seeing historically high investment levels partly as a result of these cost increases," says Total's Næsgaard.

The second trend is that operators will more often seek to rely on bigger supply chain partners that are more capable of providing a consistent global service. "In every successful industry in which companies need to invest large amounts in infrastructure, research and development, and systems, bigger is generally better. The oil and gas industry is no different," notes Stoddart.

Overall, about one in five (22%) of survey respondents say that their company will increase its use of larger partners, three times as many as those who will seek to limit their reliance on such partners. In turn, this is

"We've seen a sharp escalation in costs, particularly in the E&P space, and for our business as a whole we are seeing historically high investment levels as a result of these cost increases."

Bjørn Arne Næsgaard, Director of External Affairs, Total E&P Norway

About six in ten (62%) survey respondents expect the pressure being imposed on suppliers to curb costs to increase

16 "IHS: Costs of Building and Operating Upstream Oil and Gas Facilities Hold at or Near Record Levels", IHS, 10 December 2013

pushing companies to seek greater standardisation in their procurement approaches, giving rise to greater interest in centralising, standardising and streamlining their supply chain. "Everybody is trying to achieve standardisation in the supply chain and in so doing, avoid the costs involved in creating new solutions. At Total we are also trying to achieve this and, in addition, we encourage competitive bidding before awarding contracts," says Næsgaard.

This trend is evident on the global stage. "As opposed to companies procuring on a local basis and therefore having numerous different providers around the world, you are starting to see certainly some of the major ones procuring on a global basis with fewer providers on the approved list," says Paul Shrieve, Senior Vice President for Inspection at DNV GL.

A third trend is that operators will increasingly ask suppliers to deliver greater consistency in their approach to quality and risk management. One in two (52%) survey respondents plan to increase efforts here. And our survey suggests that the focus on quality management systems will be heavily pointed towards companies' supply bases: 57% are aiming to increase their focus on quality management systems, with the specific aim of ensuring better supply chain consistency, with the rest at least maintaining existing levels. "Some firms are really driving quality, and pushing for competency and consistency. Their whole emphasis is to have the appropriate management systems in place, the appropriate coordination in place and a good level of engagement on this," says Shrieve.

In order help improve safety and quality of supply, BP has introduced safety performance indicators into contracts of suppliers involved in high-risk activities. Suppliers who do not meet these standards may be removed from contracts. As part of this safety focus, BP is also planning to reduce use of agency staff in procurement roles and boost its in-house expertise in supply chain management. This kind of sentiment is spreading: "Quality is not just about ISO 9000 anymore," says Tim Daigle, Advanced Technology Manager at Fluor Offshore Solutions. "There's a much greater level of accountability now, and you can see that in the training. There's a huge amount of testing and assuring the performance of given equipment and operations. That's important and clients will continue to spend a lot of time doing what it takes to get the quality right."

Sustainability across the supply chain is also a key issue here for the largest oil majors. "The focus on sustainable risk management and ensuring that equipment works as it is supposed to is something that has been growing over time. It affects cost developments and the relationship between operators and suppliers, and there's no reason to believe this focus will diminish in importance," explains Statoil's Waerness.

One in five (22%) of survey respondents say that their company will increase its use of larger partners, three times as many as those who will seek to limit their reliance on such partners

57% are aiming to increase their focus on quality management systems

Quality is not just about ISO 9000 anymore

IN DEPTH

GAS: GLOBALISATION IN PROCESS

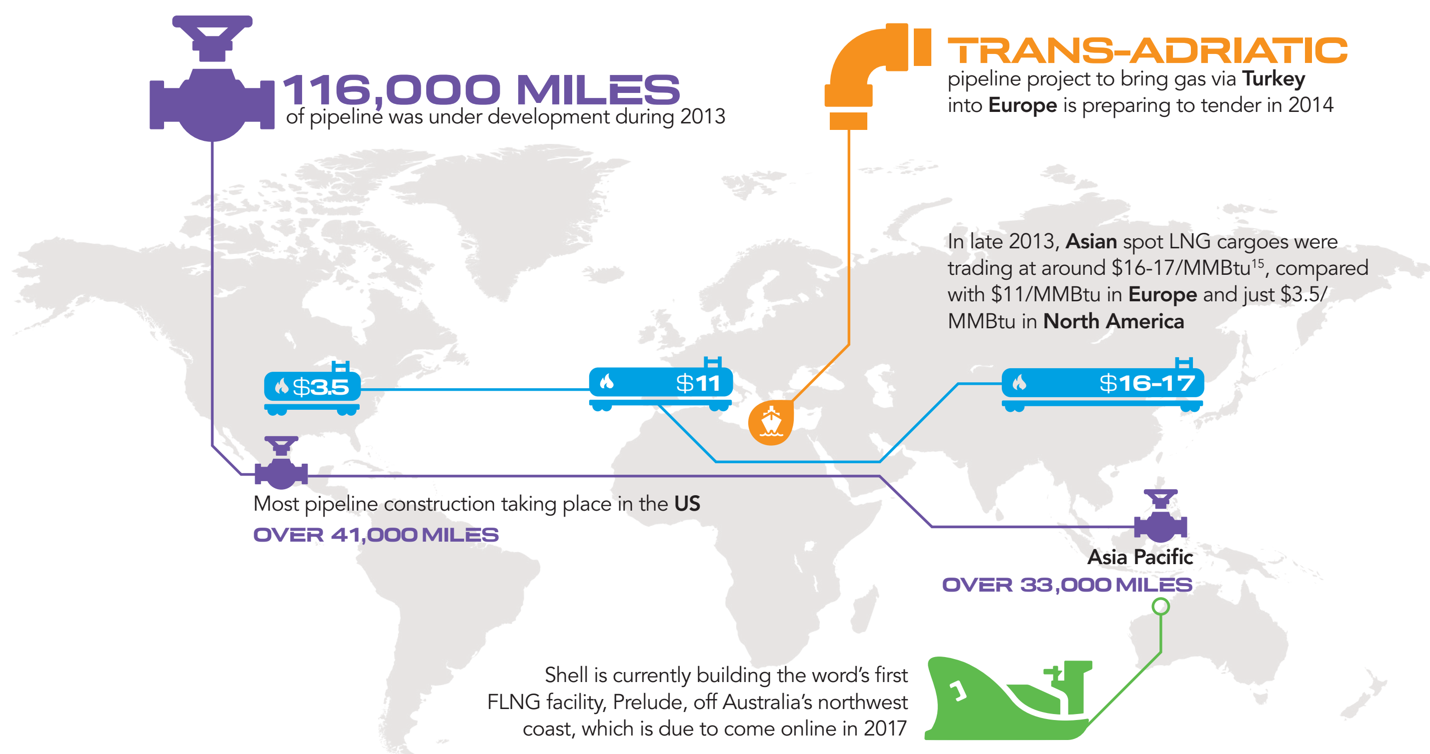
The rising importance of natural gas emerges as a key theme for our 2014 outlook. Recent years have seen substantial investment in global gas infrastructure, from new pipelines to liquefied natural gas (LNG) facilities, in anticipation of continued robust demand for gas.

According to Pipeline & Gas Journal, over 116,000 miles of pipeline was under development during 2013, with most pipeline construction taking place in the US (over 41,000 miles) and Asia Pacific (over 33,000 miles).[17] This investment into gas-related infrastructure is primed to continue during the year ahead.

Other drivers, such as environmental pressure to reduce dependency on coal, will also help to boost gas demand. But for Asia and Europe, where gas prices remain high, the investment case for gas-related projects is more compelling. In late 2013, Asian spot LNG cargoes were trading at around $16-17/MMBtu[18], compared with $11/MMBtu in Europe and just $3.5/ MMBtu in North America.

Overall, more than 40% of oil and gas professionals surveyed believe that uneconomic gas prices will subdue gas-related investments during the year ahead, while just 15% felt otherwise. They are not alone: the IEA warns of many uncertainties about medium-term trends in the global LNG market, with issues ranging from the future direction of Japanese nuclear policy, through to delays in Australian LNG projects.[19]

The International Energy Agency's Chief Economist, Fatih Birol, expects European gas demand will struggle to return to 2010 levels for at least 20 years, as gas wrestles to compete with the price competitiveness of coal, and as governments push renewable alternatives.[20] There also remains strong political and public ambivalence over the merits of unconventional gas in Europe, given concerns over the potential environmental effects of fracking. Accordingly, respondents remain uncertain over how quickly unconventional gas



17 "2013 worldwide construction report", *Pipeline & Gas Journal*, January 2013
18 "Asia Spot LNG Prices for December Delivery Rose 11.5% on Stockpiling," Platt's, 19 November 2013
19 "Medium term gas report: 2013", International Energy Agency, 2013
20 Comments made at IEA press launch of World Energy Outlook, 2013

Overall, more than 40% of oil and gas professionals surveyed believe that uneconomic gas prices will subdue gas-related investments during the year ahead

51%

More than half (51%) of survey respondents see rapidly expanding gas transport infrastructure between key markets as helping to boost price equality

28%

28% of respondents polled think FLNG will be the second strongest target for technology investment, second only to subsea technologies

projects might come online outside the US: 33% of survey respondents think little will happen in 2014, but nearly as many (27%) disagree.

Stronger gas infrastructure will globalise pricing, but not in 2014

In the longer term, survey respondents see the natural gas market becoming more globalised, not least thanks to a greater diversity of sources and more fluid trade through pipelines and shipping. New supply sources from Australia and East Africa are part of this trend. Furthermore, a range of pipeline projects will all help to smooth out price differences – such as new links between Turkmenistan and China, or the ambitious plan to develop a West Africa gas pipeline spanning Nigeria, Ghana, Togo and Benin, among many other plans.

More than half (51%) of survey respondents see rapidly expanding gas transport infrastructure between key markets as helping to boost price equality. For some countries, such as Canada, this is demanding a change in focus in where it seeks to export, as the US becomes more self-reliant. "It will need to develop infrastructure, such as LNG export facilities, to reach new export markets," says DNV GL's Stoddart.

But this globalisation process will take many years, according to experts and executives interviewed for this report. "Convergence is likely in the medium to long term, particularly with Asian buyers looking to replace the traditional models that are tied to oil indexation, which will become less viable given the abundance of supply sources," says Martin Layfield, Global Gas Segment Director at DNV GL.

US LNG shipping exports, which are expected to begin from 2017, will do most to help narrow global gas price differentials. Political changes will also have an impact.

For some of the most significant potential buyers of LNG, such as India, domestic regulations serve to limit demand, as the industry remains highly regulated. Elsewhere, such as in the Middle East, subsidy regimes cap domestic natural gas prices at below $2/MMBtu.

A floating future

Given the long-time horizons for building gas infrastructure – the Trans-Adriatic pipeline project to bring gas via Turkey into Europe is preparing to tender in 2014, ahead of first gas flows in 2019, as one example – various FLNG facilities are currently under development. Shell is currently building the word's first FLNG facility, Prelude, off Australia's north-west coast, which is due to come online in 2017. Indeed, 28% of respondents polled think FLNG will be the second strongest target for technology investment, after subsea technologies.

"Convergence is likely in the medium to long-term, particularly with Asian buyers looking to replace the traditional models that are tied to oil indexation, which will become less viable given the abundance of supply sources."

Martin Layfield, Global Gas Segment Director, DNV GL

The attraction of FLNG, and its related floating storage and regasification (FSRU), is particularly keen in high-growth markets that can't wait for the slower build-out of other energy infrastructure. "You need FSRU because it enables the expansion of energy supply in a matter of months, whereas alternatives like coal power or nuclear take much longer," explains Phillippe Berterottiere, Chairman and CEO of Gaztransport & Technigaz (GTT), an LNG specialist.

IN DEPTH

NEW FRONTIERS: TARGETING CHALLENGING ENVIRONMENTS

Frontier areas have emerged as serious attractions for oil and gas operators in recent years, and our survey shows a clear appetite for tapping these challenging environments.

One in five respondents (22%) intend to move into challenging new environments in 2014, reflecting the fact that a substantial proportion of future oil and gas volumes will be sourced from undeveloped fields. Among operators, the figure is even higher: 29% plan to enter new frontiers.

The prize is substantial. According to consultancy Wood Mackenzie, an estimated 1.4 trillion barrels of oil equivalent (boe) lie in undeveloped oil and gas fields globally.[21] These include deepwater areas, pre-salt basins, tight oil and gas, and other challenging new frontiers, which have largely been inaccessible due to technical, political or geological challenges.

Our survey reveals strongest interest in deepwater sites in East Africa and the Arctic for 2014, although these sites will not yet get to full production until around 2018, notes DNV GL's Bennett. The highest proportion of respondents by a considerable margin (52%) expect subsea technologies to absorb the strongest investment in coming years, to support exploration into new or challenging environments. This indicates that many view the development of deepwater reserves as a principal means of replacing depleting traditional reserves.

In the Arctic where the damaging environmental impact of global warming is most evident, there has been a steady reduction in ice pack size over the past decade. Conversely, this is opening up the region to previously impossible exploration, offering potential access to as much as 13% of the world's undiscovered oil reserves, and 30% of its gas reserves.[22] Per Olav Moslet, Arctic Technology Programme Director at DNV GL, believes there will be a significant increase in offshore activity there during 2014, compared to last year. He notes several significant planned drilling campaigns, such as Shell in the Chukchi Sea off Alaska, and ExxonMobil and Rosneft in Russia's Kara Sea, among others.

These gains are increasingly driven by sustained technological advances, which are continuing to further the industry's reach. The effects of this have been most powerfully witnessed in the US unconventional sector, where breakthroughs in fracking and horizontal drilling technologies helped lead to that sector's explosive growth.[23] The industry is now pushing to make similar technological breakthroughs elsewhere. In particular, subsea technologies look set to receive the largest share of new R&D investment.

Climate changes are also incentivising exploration activity. These days, Arctic offshore drilling occurs during the ice-free summer season, with much less ice during summer in some areas today compared to 30 years ago. Moslet says this is conducted with drilling rigs that are strengthened and "winterised" – with enclosed topsides, including equipment and material modifications for cold climates – in case ice approaches the drilling locations. "The current philosophy is to closely monitor the ice conditions with aerial and vessel surveillance, satellite imagery and specialised ice drift models in order to forecast when ice will be coming so close to the drilling location that operations should be postponed," he says.

"Major offshore projects are now generally require floating structures as opposed to fixed structures. Even for floating structures, in the past, station keeping was a matter for mooring experts. Now dynamic positioning technology and experts are required."

Arthur Stoddart, Director: Marine and Technical, North America, DNV GL

21 "One trillion barrels – the global potential of undeveloped discoveries", Wood Mackenzie, 12 September 2013
22 "Arctic oil and gas", EY, 2013
23 "Gas works", *The Economist*, 14 July 2012

Aside from the technical challenges, the industry is facing difficulties in a lack of trained personnel, says Moslet. Operating in the Arctic requires something special. "It is not only the competence of working in a harsh cold climate which is important, but it is also the understanding of the potential risks, and what the likely consequences of an accident could be for the personnel, environment and company," he says.

Only for the big operators?

According to our survey, bigger firms are nearly twice as likely as smaller ones to indicate an interest in targeting difficult new areas (33% versus 17%). This reinforces an expectation of a growing dominance of larger organisations, as the industry moves into tougher environments. Bucking this trend, of course, is the US unconventional growth story, which is dominated by small and mid-cap players.

The expected dominance of large players is hardly surprising. Operating successfully in frontier regions requires leading-edge technologies, new skill sets and deeper pockets. Significant risk exposure is increasingly encouraging companies to collaborate: almost half (49%) of those surveyed expect to forge alliances in these frontier regions. One-third said they expected to pursue acquisitions to bring in the necessary skills. Indeed, skills are seen as the second biggest difficulty to overcome, in part due to the changing nature of projects. "For example, major offshore projects now generally require floating structures as opposed to fixed structures. Even for floating structures, in the past, station keeping was a matter for mooring experts. Now dynamic positioning technology and experts are required," explains DNV GL's Stoddart.

Highly prospective frontier regions are drawing in an array of new firms, which often develop alliances with the prevailing national oil companies (NOCs), says North Energy's Karlstrom. "We see interest coming from companies that we have never seen before in these territories. They have established themselves and increased their activities in the Barents Sea in a way that most people had not expected."

There are significant hurdles facing IOCs in frontier regions – such as a shortage of specialist skills to operate there, and financial risks associated with moving into uncharted territory – but topping the list is political risk, cited by 22% of respondents. "Finding the oil is pretty straightforward. It's going through all of the regulatory hoops to get it out of the ground that probably creates most issues," says Jupiter Energy's Gander.

Survey results also suggest that risk management in the post-Macondo era is still a work in progress, even though operators are more attuned to dangers associated with drilling in new frontiers. For example, hardly any survey respondents (6%) noted public sentiment as a concern in these areas. However, there are limitations to oil companies' capacity to deal effectively with oil spills in areas like the Arctic. Mitigation and remediation efforts at Macondo were helped by close proximity to major supply beachheads on the US Gulf Coast, a resource that exists nowhere near the Arctic Circle.

Just over one in five respondents (22%) intend to move into challenging new environments in 2014

Even though operators are more attuned to dangers associated with drilling in new frontiers, hardly any (6%) survey respondents noted public sentiment as a concern in these areas

13% of the world's undiscovered oil reserves, and 30% of its gas reserves could potentially be found in the Arctic

IN DEPTH

NOCS: FASHIONING A NEW ROLE

Whether as competitive challengers, partners or clients, our 2014 outlook shows that national oil companies (NOCs) will play a more assertive role in the global oil and gas sector in the coming year.

This fits with the increasing weighting of NOCs in the global oil and gas industry. "NOCs' share of global oil and gas resources has grown to 80%, and of the 20 companies with largest E&P expenditures in 2013, ten are NOCs. These numbers illustrate how important the NOCs are," explains Etienne Romsom, EVP and Global Business Development and Strategy Director at DNV GL.

While some state-backed NOCs have been content to dominate their home resources, many are seeking to compete abroad like IOCs. More than six in ten (61%) industry professionals surveyed believe that NOCs will increasingly compete internationally in 2014. The underlying drivers for this are clear, in Romsom's view: cost inflation is eroding the profitability of NOCs' domestic reserves; investment is struggling to offset depletion rates in many places; and new reserves are typically more difficult to access, which demands new skills and capabilities.

This is driving NOCs to expand globally and to become more self-reliant – and without their natural home advantage, they have to act more like IOCs. "This has been happening since the 1990s, when NOCs expanded overseas. Chinese NOCs took full advantage of the global financial crisis to conduct an aggressive acquisition campaign," says Romsom. Indeed, the lengthy list of Asian NOCs – China National Petroleum Corporation (CNPC), China National Offshore Operating Corporation (CNOOC), India's ONGC and Malaysia's Petronas, among others – that have looked to gain access to Brazil's offshore pre-salt fields provides clear evidence of this trend.

Asian NOCs are also prominent players in East Africa's gas discoveries. In Mozambique, Chinese and Indian NOCs spent over US$9bn on deals during 2013, excluding the fourth quarter.[24] Our survey results reflect an awareness of this trend: over one-quarter (28%) of respondents say NOCs will dominate investment in new exploration and production frontiers, such as the Arctic and East Africa in 2014. According to the *Financial Times*, the value of acquisitions by Asian NOCs in the global upstream market has exploded from US$1.2bn in 2007 to US$45.3bn in 2012.[25] It reports that Chinese

80%

NOCs' share of global oil and gas resources has grown to 80%, and of the 20 companies with largest E&P expenditures in 2013, ten are NOCs. That tells you something about how important they are

US$9BN

In Mozambique, Chinese and Indian NOCs spent over US$9bn on deals during 2013, excluding the fourth quarter

"One proposition we bring to the table when negotiating with host governments is a strong focus on getting more from their existing assets."

Mohamad Azmi Mohd Noor, Advisor: Technical, Integrity & Process Safety, HSE Division, Petronas

24 "China takes the lead in oil M&A activity," *Financial Times*, 8th September 2013
25 Ibid.

NOCs accounted for 22% of the global upstream M&A market in the first-half of 2013.

Bringing new skills to the table

NOCs, with significant state-backed capacity to deploy capital, are also increasing their ambition levels with regards to innovation. A rapidly growing proportion of their capital is going into R&D, not least as they seek to compete in more complex fields, such as in Brazil. Already by 2011, the most recent available data, R&D spending by NOCs outpaced that of IOCs by 25%, according to Deloitte.[26] And our survey data supports this, with almost one-third (31%) of respondents believing that NOCs will invest more heavily in technology and R&D in 2014.

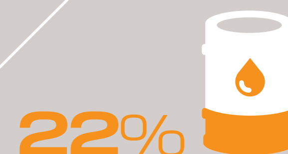
But in order to more rapidly bridge the gap in technological prowess between many NOCs and IOCs, many will seek to form new partnerships in 2014, including with IOCs, not least as they bid for new deals. "Cooperation with other NOCs or IOCs has proven to be crucial for NOCs to enter into many unfamiliar host countries. These not only mitigate political challenges, but also enhance transfer of technical know-how and help their managerial teams gain experience of international standards," says Romsom. "An ultimate aim of this international strategy for NOCs is to deploy this new knowledge and skills in the development of more difficult oil and gas domestically."

As one example, CNOOC is working with Total to develop technical expertise in deepwater exploration in various projects in Africa, before applying this to its domestic reserves. Chinese NOCs have also been investing billions into US shale gas leaders such as Chesapeake Energy and Devon Energy in order to learn about technologies that can be exploited at home. Sinopec, for example, has been selectively investing in some of the US's early stage shale plays: it signed a billion-dollar deal with Chesapeake and a US$2.5 billion deal with Devon.[27]

But NOCs also bring their own unique capabilities. One is a strong capacity to extend the life of maturing assets – the mainstay of many NOCs that have sought to get as much value as possible from home resources, such as Malaysia's Petronas or Petroleum Development Oman. They operate highly geologically complex oil and gas fields, and are now some of the most advanced developers of enhanced oil recovery (EOR) techniques.

Mohamad Azmi Mohd Noor, a Technical Advisor in Petronas' Exploration and Production business, notes that his firm's work in Malaysia has been strongly centred on managing ageing assets. In particular, the firm has developed strong capabilities around enhanced oil recovery (EOR), which is opening new doors. "One proposition we bring to the table when negotiating with host governments is a strong focus on getting more from their existing assets," he says. In one example of the possibilities this opens up, Petronas is working with Shell on the Baram Delta Chemical EOR project, the world's first full-scale offshore implementation of Chemical EOR. "Nobody has yet done a successful EOR project in the offshore yet. We're the first," says Noor.

The value of acquisitions by Asian NOCs in the global upstream market has exploded from US$1.2bn in 2007 to US$45.3bn in 2012[25]



Chinese NOCs accounted for 22% of the global upstream M&A market in the first-half of 2013

26 "Oil & Gas Reality Check," Deloitte, 2013
27 "China Ready to Reap Billions from US Shale Gas Technology", *Daily Finance*, 2 August 2013

CONCLUSION: HOW TO SUCCEED IN 2014

While the outlook of 2014 remains robust overall, it's clear that greater attention is being given to soaring costs and a greater focus on challenging new environments. Those firms that are likely to succeed will do well to bear the following in mind:

Find innovative cost solutions to maintain margins

Clamping down on costs will absorb the industry's attention in 2014, with efforts ranging from greater supplier competition through to introducing more flexibility in the labour force. It may be crucial to recognise the scope for cost savings and act on this, since during 2014, cost will be a prime determinant of which projects will go ahead and which won't get off the ground. "Major players can see that the dollar per ton per year capex has the potential to be reduced considerably in overheated markets," says WorleyParsons' Sullivan.

Narrow the focus of spending

More firms are targeting their capex more carefully, such as through more targeted deployment of capital across geographic locations. There is also greater pressure to drive up return on investment. "Against a background of rising expenditure amid low production growth, it should come as no surprise that companies will be focusing their efforts on targeting their capital expenditure far more effectively," says Statoil's Waerness.

Standardise global procurement

Growing cost-consciousness will prove a trigger for shifts in the supply chain, with standardised procurement terms becoming increasingly common. This is also underpinning a move to larger, and fewer, suppliers for many companies. Fluor Offshore Solutions' Daigle says that now oil companies are under such pressure on quality management, they should use standardisation of global procurement as a way to assist on this.

"Jumping around between different vendors is not always good if your processes require an element of quality control," says Daigle.

Maintain a frontier spirit

Technological advances are helping to open up new acreage for production in inhospitable terrains, with the subsea a particular focus of activity. The commercial success rate in the Barents Sea is now extremely high, according to North Energy's Karlstrom, whose firm is active in that region. "There is no doubt that we are facing a breakthrough, and I think we will see activity levels this year that we have never seen before," he says. While these frontiers throw up complex new challenges, they offer the potential for outsized returns for those with the necessary risk approach and investment capacity.

Be safe, not sorry

Successful firms will be those that make safety and HSE issues a core part of their culture, both internally and throughout their supply chain. They will ensure that these issues are embedded in their leadership, and that contractors, vendors and operators are all aligned. "While it's great to have the procedures and the processes, the key to success is to have people who are personally committed to safety – and that the corporate leadership is personally committed to executing those systems effectively, every day, all day long," says the US Center for Offshore Safety's Williams.

"While it's great to have the procedures and the processes, the key to success is to have people who are personally committed to safety – and that the corporate leadership is personally committed to executing those systems effectively, every day, all day long."

Charlie Williams, Executive Director, Center for Offshore Safety

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