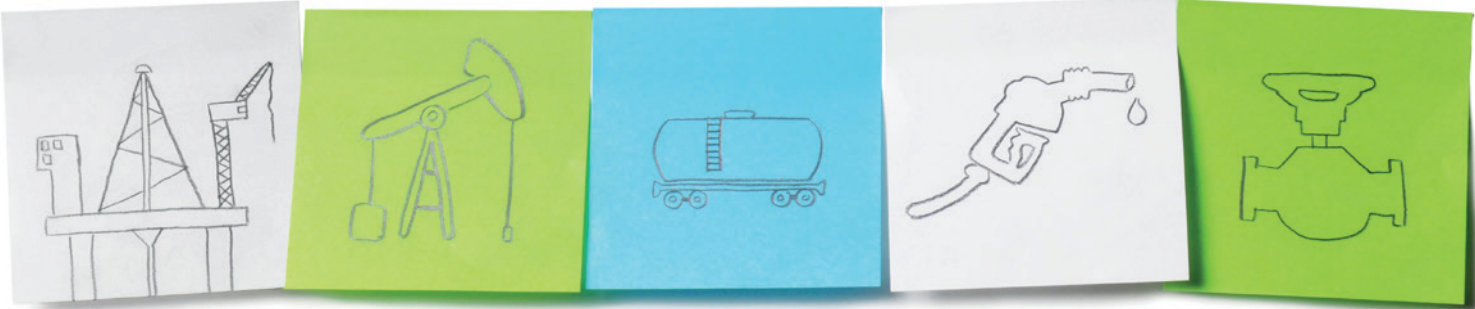


Oil and Gas Reality Check 2015
A look at the top issues
facing the oil and gas sector



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Industry fundamentals being called into question

What a difference a year makes. Last year, we examined industry fundamentals ranging from prevailing macroeconomic conditions, the supply-demand balance and regulatory constructs to cost components, commodity prices and the impact of geopolitics. Stemming from that analysis, we considered the waxing and waning of dominance among suppliers; the progression from regionalization to globalization in natural gas markets and the reverse in oil markets; a shift in the global energy mix; the swelling of capital projects to “mega” proportions; and a move towards greater interdependencies among nations.

This year, however, virtually all of these ‘fundamentals’ are being called into question. Certainly, declining oil prices have taken a toll on the global oil and gas industry. In December 2014, West Texas Intermediate (WTI) crude prices dropped from over \$100 per barrel to less than \$60 per barrel, with Brent oil prices following suit. The slide continued into 2015, dipping below \$45 per barrel before making a modest recovery. The glut of oil amid lagging world demand is altering trade flows and raising concerns for traditional suppliers.

Similarly, North America’s ongoing move towards energy independence continues to reverberate across world markets and may be leading to the emergence of a self-sufficient energy trading bloc across the United States, Canada and Mexico. For Russia, declining market share among western consumer nations is spurring the country to seek friendlier markets in India and China, a trend that stands to alter geopolitical power structures. In fact, geopolitics is taking center stage and, as a result, increasingly standing as the driving force behind emerging relationships and trade patterns. OPEC, too, is seeking new buyers at a time when it is challenged with meeting the vastly differing requirements of its various member states, causing additional geopolitical turmoil.

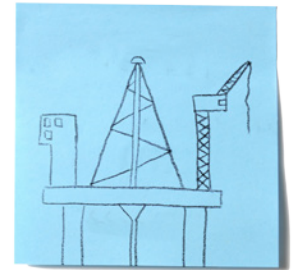
Predictions for the global energy trade are also evolving. Rather than seeing rampant globalization, natural gas and LNG supply is being consumed closer to source – at least for the time being. As buyers gain greater control than sellers over LNG prices, long-term contracts are being renegotiated and the construction of new LNG terminals is slowing. The unchecked growth of megaprojects is also losing speed as international energy companies scramble to cut costs.

This report takes a look at six of the issues currently impacting the oil and gas industry (and the upstream market in particular). Although by no means a definitive list, these issues include an anticipated shift in supply-demand fundamentals, the emergence of new trading patterns, consideration of OPEC’s role in the market – at least over the short-term, falling LNG prices, the long-term costs of complex projects and evolving dynamics between integrated oil companies (IOCs) and national oil companies (NOCs). Drawing on research and the views and opinions of our oil and gas team globally, this report aims to provide you with food for thought, while encouraging healthy debate and discussion.

As ever, we also encourage you to share your views. To that end, please do not hesitate to contact the Partners listed at the back of this report.

Particular thanks go to Adi Karev, our recently retired Global Oil & Gas Leader, for his input into this report, as well as all of our other contributors for providing their input. We hope the combined effort has served to create a report that is relevant, insightful and thought-provoking.

Anton Botes
DTTL Global Oil & Gas Leader



Declining oil prices have taken a toll on the global oil and gas industry. In December 2014, West Texas Intermediate (WTI) crude prices dropped from over \$100 per barrel to less than \$60 per barrel, with Brent oil prices following suit.

Shift in supply-demand fundamentals

As the United States continues to maintain its place as a major producer of both oil and gas, historical energy trade patterns are shifting. The country can now satisfy roughly 90% of its energy needs from domestic sources, up from 70% in 2005.¹

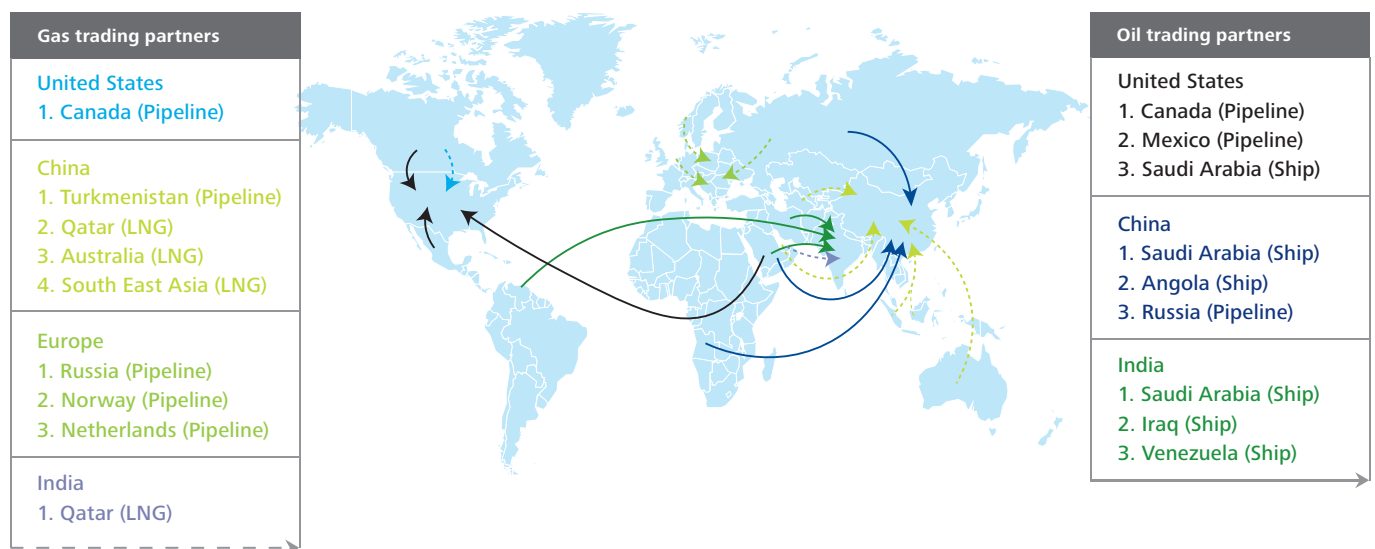
On the oil supply front

With the loss of the United States as an anchor market, the world's major oil suppliers are casting about for new buyers. Over the past four years, the United States completed roughly 20,000 new shale wells.² This has boosted America's oil production to nearly nine million barrels per day (MMbbl/d),³ a number that rises to 12.5 MMbbl/d when natural gas liquids are included.⁴ Since 2008, U.S. tight oil supply has risen from 0.5% of the world's total to 3.7% today.⁵ Notably, the costs of these wells typically make them quite profitable as well. In 2013, eight of the largest independent oil producers in America had average operating costs of \$10 to \$20 per barrel of oil (or equivalent unit of gas) produced.⁶

At the same time, the United States may not be alone in changing supply-demand fundamentals. For instance, while the Middle East can meet its current needs, demand for both oil and gas in the region is growing. A number of emerging, and re-emerging, major suppliers can also potentially change energy market dynamics. Output from Southern Iraq and Iraqi Kurdistan could ramp up, for example, despite the security issues that currently plague the region. Should Iran finalize a nuclear agreement with the P5+1 countries (Russia, China, France, Britain, the United States plus Germany), its oil production could also increase as sanctions are lifted. And production in Brazil, despite its recent political turmoil, still has room to grow.

These fluctuating industry dynamics are fueling a power play between traditional and new oil suppliers. The Middle East, for instance, has seen its U.S. market share fall, for both crude and refined products, and is now struggling to work out the fundamentals of how to operate in a market awash with oil. To this end, Middle Eastern producers are aiming to redirect their flow of oil east to Asia, rather than west to the Americas, while simultaneously increasing their share of European consumption. Russia, too, has seen a change in its traditional consumer market as Europe seeks to diversify supply and has also begun to turn to Asia for new buyers, as have smaller suppliers in Africa, like Angola and Nigeria.

Figure 1. Trade flows – primary movements



Source: BP Statistical Review, 2014

This trend will likely only accelerate should the United States ultimately lift its ban on crude oil exports. To date, the U.S. Commerce Department has only granted waivers for the export of ultralight forms of oil known as condensate. However, at a hearing on March 3, 2015 at the House Subcommittee on Energy and Power, concerns were raised that the export ban – along with continued low oil prices – could force the industry into a protracted downturn. Should these arguments prevail, the implications would reverberate across the globe.

Even without U.S. oil on the global market, legacy suppliers are going to great lengths to maintain market share. At its meeting in Vienna in November 2014, OPEC decided to maintain production at 30 MMbbl/d in an attempt to stifle competition from alternative suppliers, including the United States, Canada, Russia and offshore Brazil. To maintain this volume, roughly 2.5 MMbbl/d of offline production in Iran, Iraq and Libya are being offset by a rise in production of more than 2 MMbbl/d from Saudi Arabia, Kuwait, Qatar and the United Arab Emirates (UAE).⁷ As Saudi Oil Minister Ali Al-Naimi told the Middle East Economic Survey in December 2014, “If I reduce, what happens to my market share? The price will go up, and the Russians, the Brazilians, U.S. shale oil producers will take my share.”⁸ Several nations in the region are holding firm on their production levels: Saudi Aramco, UAE’s ADNOC and Kuwait are collectively expected to increase exploration and production (E&P) spending by 14.9% in 2015.⁹

Yet, while these decisions are affecting the world’s newest producers in various ways, they will likely not affect the direction in which prevailing trade winds are blowing.

Over time, today’s dominant global oil suppliers may find their influence waning as alternative producers gain market share (see *New trading patterns emerging*, below).

Oil demand dynamics

The world’s biggest demand centers are also shifting. Demand out of China and, to a lesser extent Western Europe and the United States, was once expected to spur long-term demand. However, the International Energy Agency (IEA) cut demand forecasts and now estimates that oil and gas demand will grow by only 0.9 MMbbl/d in 2015.¹⁰

To be sure, China remains a demand center, with imports up 13% in December 2014 compared to a year earlier.¹¹ It was in December that China’s crude oil imports rose above 7 MMbbl/d for the first time¹² and, by 2040, those imports could grow to just under 18 MMbbl/d.¹³ That said, in 2014, the Chinese economy grew by 7.4%, down from 7.7% a year earlier – which represented its slowest growth rate in 24 years.¹⁴ While demand may remain strong, the nation’s willingness to pay top dollar for imports may increasingly fade, potentially shifting its sources of supply.

For its part, Western Europe continues to suffer from the malaise of the region’s economics. In 2014, European oil demand shrank by 0.20 MMbbl/d, while demand in 2015 is projected to decrease again by 0.10 MMbbl/d¹⁵ (see Figure 2). The U.S. Energy Information Administration (EIA) projects European demand will remain at 14 MMbbl/d through 2040.¹⁶

Today’s dominant global oil suppliers may find their influence waning as alternative producers gain market share.

Figure 2. Oil demand: Germany, France, Italy and the UK, tb/d

	December 2014	December 2013	Change from December 2013	% change from December 2013
LPG	447	436	10	2.4
Gasoline	1,052	1,077	-25	-2.3
Jet/kerosene	713	698	15	2.1
Gas/diesel oil	3,036	3,042	-6	-0.2
Fuel oil	289	277	12	4.3
Other products	827	853	-26	-3.1
Total	6,364	6,384	-19	-0.3

Source: OPEC Monthly Oil Market Report, February 9, 2015

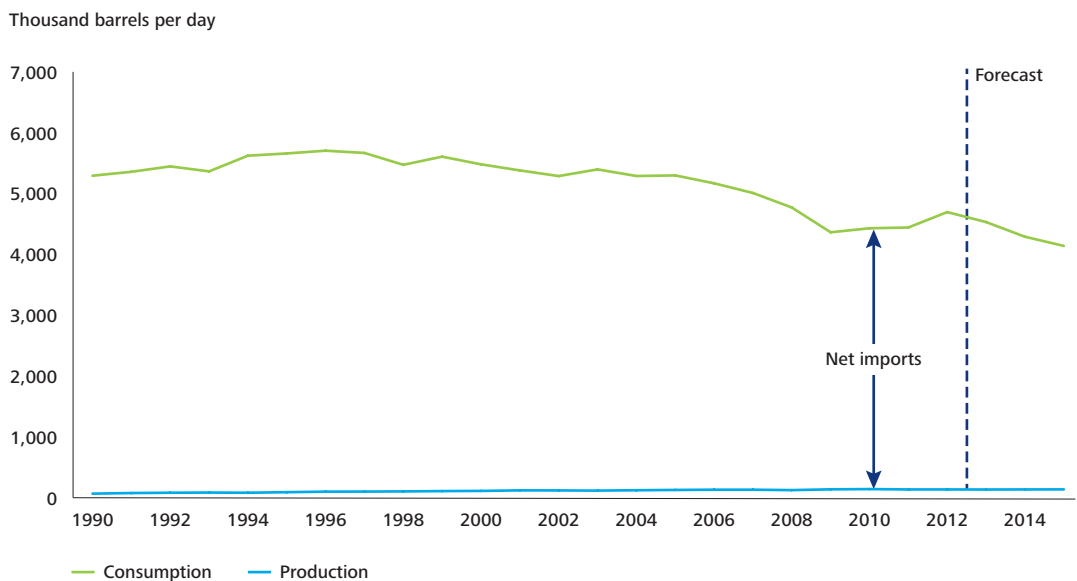


And while the United States remains the world's largest consumer and importer of oil, U.S. crude oil imports dropped 3% year-over-year as of January 2015.¹⁷ Some North American E&P companies are even spinning off their international assets to focus on serving more stable domestic markets, redrawing the lines of supply and demand at the exploration level as well.

Even Japan, which ranked as the world's third-largest petroleum consumer in 2014, has seen its oil demand drop by 22% since 2000 on the back of structural factors such as a declining population and government-mandated energy efficiency targets¹⁸ (see Figure 3). That demand may continue to diminish as the country increases its reliance on natural gas and ultimately resumes its use of nuclear energy as a baseload power source.¹⁹

As these trends accelerate, the world's importing nations stand to increasingly benefit – from China and India to Japan and Indonesia. According to the Baker Institute, the Asia Pacific region will account for an estimated 70% of global oil demand from 2010 to 2020,²⁰ and countries in the region will emerge as beneficiaries. In some ways, the recent oil price drop has also been a boon to many major oil consuming countries. Mexico, Brazil, India, China, Indonesia, Kuwait, Oman, Egypt, Tunisia, Morocco and Malaysia all took the opportunity to cut fuel subsidies, easing pressure on public finances. Notably, that pressure has been considerable: according to IMF estimates, the world's governments spent \$1.9 trillion on fossil fuels subsidies in 2011 alone²¹ (see Figure 4).

Figure 3. Japan's oil production and consumption, 2000-15



Source: U.S. Energy Information Administration, International Energy Statistics and Short-Term Energy Outlook, June 2014

Figure 4. Economic value of fossil-fuel* consumption subsidies, 2013

	% of GDP	Total subsidies all fuels US\$bn	Subsidies on oil products US\$bn
Egypt	11.0	29.9	20.9
Indonesia	3.3	29.1	21.3
Bangladesh	3.2	4.6	0.6
Argentina	2.7	13.4	1.3
India	2.5	47.0	36.6
Malaysia	1.7	5.3	4.9
China	0.2	21	11.8

Source: © OECD/IEA 2014 World Energy Outlook, IEA Publishing; modified by Deloitte Touche Tohmatsu Limited
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Looking forward towards 2020, we will likely see further slackening of demand in both North America and Western Europe, while demand rises across the Asia Pacific and the Middle East. These shifts are changing the traditional dynamics between the world's oil supply and demand centers.

Natural gas supply and demand

Traditional supply-demand balances in the natural gas trade could also shift in coming years. The U.S. shale gas revolution has spurred natural gas price reductions and vaulted the United States into position as the world's largest natural gas producer. These low prices, in turn, have producers calling for the opportunity to export U.S. natural gas as liquefied natural gas (LNG) to Europe and Asia, where prices are higher. The advantage to U.S. producers seemed particularly stark in August 2014, when Japanese spot prices for natural gas rose to over \$16 per million British thermal units (MMBtu), while Henry hub gas prices were trading below \$4/MMBtu.

Yet, hurdles to a truly global LNG trade still exist. Environmental groups in the United States continue to oppose exports for fear that it will encourage increased reliance on hydraulic fracturing. U.S. manufacturers also worry that exports will push up domestic natural gas prices, putting the brakes on the country's burgeoning manufacturing revival. More globalized trade flows have also been compromised in recent months as the spread between North American and Asian natural gas prices narrows amid ongoing oil price weakness, blunting the call of LNG buyers to delink natural gas contracts from oil-indexed pricing.

Traditional natural gas exporters like Qatar (LNG) and Russia (pipeline) could still face growing competition from Australia, which has been on track to becoming the world's largest exporter of LNG, with 62 million tons of new capacity slated to come online by 2018.²² Yet high project developments costs will hamper Australian attempts to cost-effectively supply global consumers. This is especially true in the current low-price environment. Planned LNG export projects are already being put on hold, and the country's coal seam gas projects are struggling to get costs in line with shareholder expectations.

Until the impediments to a global LNG trade are resolved, both LNG and pipeline gas will likely continue flowing predominantly to geographically proximate regions. This may prove a boon for Russia, which is trying to secure a greater proportion of China's natural gas market through its Power of Siberia and Altai pipelines.

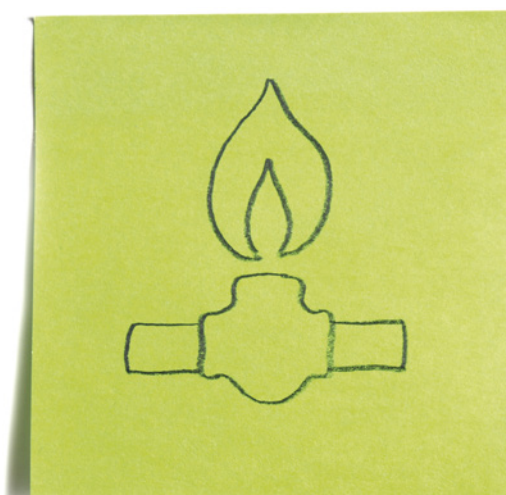
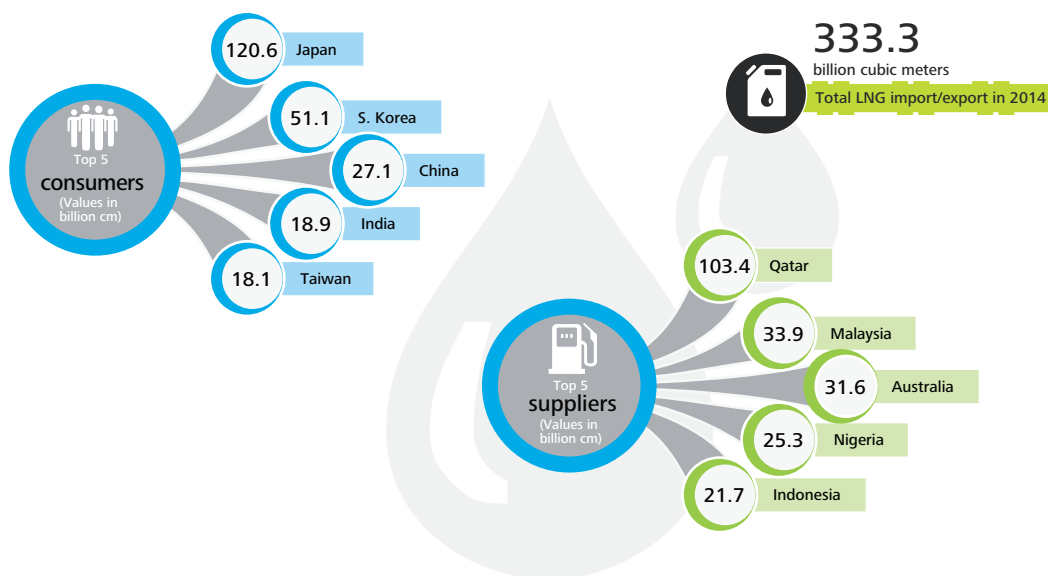


Figure 5. Top 5 LNG consumers and suppliers 2014



Source: BP Statistical Review, 2014

Concluding thoughts

As the United States moves towards energy independence, the opportunity exists for it to exercise greater political freedom. This is not to suggest that the United States will pursue an isolationist strategy. It could, however, gain greater flexibility in structuring its political alliances. Growing energy security may also give the United States greater latitude to flex its muscles in ways it may have avoided in the past. Evidence of this already exists as the country continues to enforce sanctions against Russia and works to negotiate a deal with Iran without the support of Saudi Arabia and the other Gulf states.

Regardless, the benefits of energy security remain considerable, which will likely prompt any country capable of ramping up domestic production to make the attempt. That's especially the case if access to affordable LNG remains elusive. This quest for energy security may take many forms, from increased reliance on renewables to greater investment in the extraction of tight oil and shale gas. Although many countries continue to resist the shale revolution on environmental grounds, this stance will change over time if energy shortages become a serious inhibitor to economic growth and independence.

To facilitate greater national production, many governments with currently 'protected' markets are already loosening their regulatory stances in an attempt to foster local competition and boost energy sector investment. Energy reforms have been introduced in Mexico and Argentina. Similarly, China National Petroleum Corporation (CNPC) recently announced plans to sell stakes in its upstream assets in Northeast China's Jilin Oil Field and in the Tianjin-based Dasang Oil Field to private sector buyers. What the price-sensitive consuming nations do to meet their energy needs – and the extent to which their demands can be regionally satisfied – will likely have a major impact on both global geopolitics and international trade patterns.

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New trading patterns emerging

As oil and gas supply and demand fundamentals continue to evolve, new global trading patterns are emerging.

U.S.-Canada-Mexico

The United States, Canada and Mexico are increasingly operating as a self-sufficient trading bloc, spurring a move towards a more regional energy trade. This is largely driven by the rise in unconventional oil and gas in the United States, the easing of regulatory restrictions in Mexico and the high cost of exporting Canadian oil sands output beyond North America, due at least in part to the lack of cross-border infrastructure. Thanks to the cultural and geopolitical alignment of these countries, this bloc will only strengthen – a trend that would also accelerate should the U.S./Canadian Keystone pipeline ultimately receive approval.

Russia-China-India

For its part, Russia is more actively seeking new buyers. Notably, as China and India strive for greater supply diversity, they may increasingly rely on Russia's production. In July 2013, Russia's Rosneft entered a long-term supply agreement to more than double its oil shipments to China.²³ Russia now supplies 12% of China's crude imports,²⁴ and was China's fourth largest crude oil supplier in 2013.²⁵ In May 2014, China's CNPC also entered a \$400 billion deal with Russia's Gazprom that analysts believe will see 38 billion cubic meters of natural gas flow to China via pipeline over a 30-year period, at a cost of \$10 per million cubic feet, with delivery slated to begin in 2018.²⁶ With the IEA predicting that China's natural gas demand will rise 6% per year through 2035, this deal gives Russia access to one of the world's fastest growing natural gas markets.²⁷

These deals highlight the growing ties that have been forming between China and Russia. Since 2012, the countries have engaged in more frequent state visits, closer military relations (including joint training exercises and Russian military exports to China) and coordinated voting at the United Nations Security Council on Syria and Crimea.²⁸ The \$400 billion gas deal also represents only one of several bilateral energy agreements that are spurring closer economic cooperation between the nations.

To solidify its so-called 'pivot to Asia' further, Russia also recently entered commercial contracts with India worth roughly \$100 billion. The deals include a \$40 billion nuclear energy agreement, a \$50 billion contract for the supply of crude oil and gas, and \$10 billion in other deals that span a range of sectors – including defense, agriculture and aerospace.²⁹ India's ONGC Videsh Ltd., the upstream division of the country's Oil and Natural Gas Corporation Ltd. (ONGC) also recently entered discussions with Rosneft to acquire interests in two Siberian oil fields.³⁰

Where does this leave OPEC?

As relations between these emerging trading blocs strengthen, OPEC may look to expand its share of the Western European market. This would not, however, be a self-sustaining strategy. In 2013, almost 60% of OPEC's crude oil exports went to Asia,³¹ and European consumption could not replace this volume.

Still, Western Europe is seeking to free itself from over-dependence on Russian imports and could arguably turn to OPEC for a higher proportion of its energy supplies. This becomes increasingly imperative in light of the region's significant production drops: oil production in the European Union has declined by 50% since 2002.³² Saudi Arabia is closely monitoring this trend – in an attempt to win European market share, Saudi Aramco cut the official selling price (OSP) for its Arab Light crude to Northwest Europe by \$1.50 per barrel for February 2015, putting it at a discount of \$4.65 per barrel to the Brent Weighted Average (BWAVE) – the lowest price since 2009.³³

Not set in stone

To be sure, these trading patterns are not inviolable. In 2013, while just over 17% of OPEC's supply went to Europe, 16% still went to North America.³⁴ Similarly, in 2013, OPEC supplied China with roughly 71% of its crude oil³⁵ and supplied India with a similar percentage of petroleum and other liquids.³⁶ Many other major supplier and consumer nations will also continue to exert influence over global oil and gas trading patterns, including Japan, Australia, Kazakhstan, Qatar, Brazil and countries across Southeast Asia and West Africa.



OPEC will be seeking new buyers as North America increasingly meets its own demand, and it may aim to pick up a growing market share from Western Europe.

Russian attempts to forge a bloc across Asia are also not without their challenges. Bilateral tensions between Russia and China are unlikely to dissipate any time soon. Similarly, neither China nor India is inclined to become overly dependent on Russian imports. Diversity of supply remains a critical pillar of energy security, which speaks to shifting trading patterns over time. Currently, Qatar provides the vast majority of LNG to Asia and even though its export volumes have declined, nations other than Russia are ready to make up the shortfall – including Australia and Turkmenistan.

Mozambique and, more broadly, east Africa, should also not be discounted. Around 180 trillion cubic feet of gas has been found in Mozambique's offshore Rovuma basin. This would be enough to supply Germany, Britain, France and Italy for 18 years.³⁷ This presents a considerable opportunity for India, as there are no geographic chokepoints obstructing the flow of LNG from East Africa to India. In May 2014, India's ONGC, Oil India and Bharat Petroleum bought a combined 30% stake in the offshore Rovuma Area-1 from U.S.-based operator Anadarko (an early investor) – only to find that the area held 43% more recoverable reserves than originally estimated.³⁸ China's CNPC, too, has invested in the region, buying a 20% stake in a key block operated by Italy's Eni.³⁹

For its part, Western Europe will need to make significant investments before it can truly reduce its reliance on Russian natural gas sources, a situation only compounded by the long-term nature of its current supply contracts with Russia. While the optimal resolution would be to increase domestic supplies, reserves are depleting in both Norway and the UK, and barriers to shale gas exploration remain. While the region could increasingly turn to suppliers in North Africa, costly infrastructure improvements will be needed to make this possible, and the stability of some African suppliers is not assured. While sufficient turmoil to disrupt trade routes may be a black swan event, its potential impact could be catastrophic to consumers.

And, of course, as LNG production becomes more cost effective, it may be possible for the United States, Australia and East Africa to ship economically to the vast majority of the world's consumer nations – redrawing the lines of the trading blocs currently emerging. Australia is already the fourth largest supplier of gas to Asia Pacific's major importing countries, behind only Qatar, Malaysia and Indonesia.⁴⁰ Qatar too remains an unknown – while its share of the global gas market is shrinking given its current moratorium on LNG exports above 77 million tons per annum, it may ultimately choose to win back market share by either undercutting Australian prices or seeking new markets in Europe, Brazil and Africa.

Concluding thoughts

With Mexico's Pemex ending its 76-year state oil monopoly, the United States, Canada and Mexico are poised to realize a higher degree of energy cooperation. ExxonMobil, Chevron and BHP Billiton have all expressed interest in exploring for oil in Mexico, which has roughly 13.4 billion barrels of proven reserves.⁴¹ Combined with U.S. and Canadian production, this would allow these nations to meet an ever-growing percentage of domestic demand with domestic supply.

As the U.S.-Canada-Mexico trading bloc becomes stronger and increasingly competitive over time, Russia will be ever more impelled to push its agenda in China and India with the aim of not only acting as the region's primary energy supplier, but drawing closer from an economic and geopolitical standpoint as well. Should the full potential of this Russia-India-China bloc be met, Russian gas could pass through China not only to India but into Southeast Asia too, reaching rapidly-developing nations such as Thailand, Vietnam, Laos and Malaysia.

While these trends could threaten OPEC's traditional position on global markets, this is not a likely outcome in the short-term. To be sure, OPEC will be seeking new buyers as North America increasingly meets its own demand, and it may aim to pick up a growing market share from Western Europe. Yet, in a global market, output goes where it must and OPEC nations will likely remain critical suppliers to countries around the globe for many years to come.

OPEC: under pressure

According to a recent article in *The Economist*,⁴² an effective cartel needs three things: discipline, a dominant market position and barriers to entry. At the moment, OPEC may be struggling in all three areas.

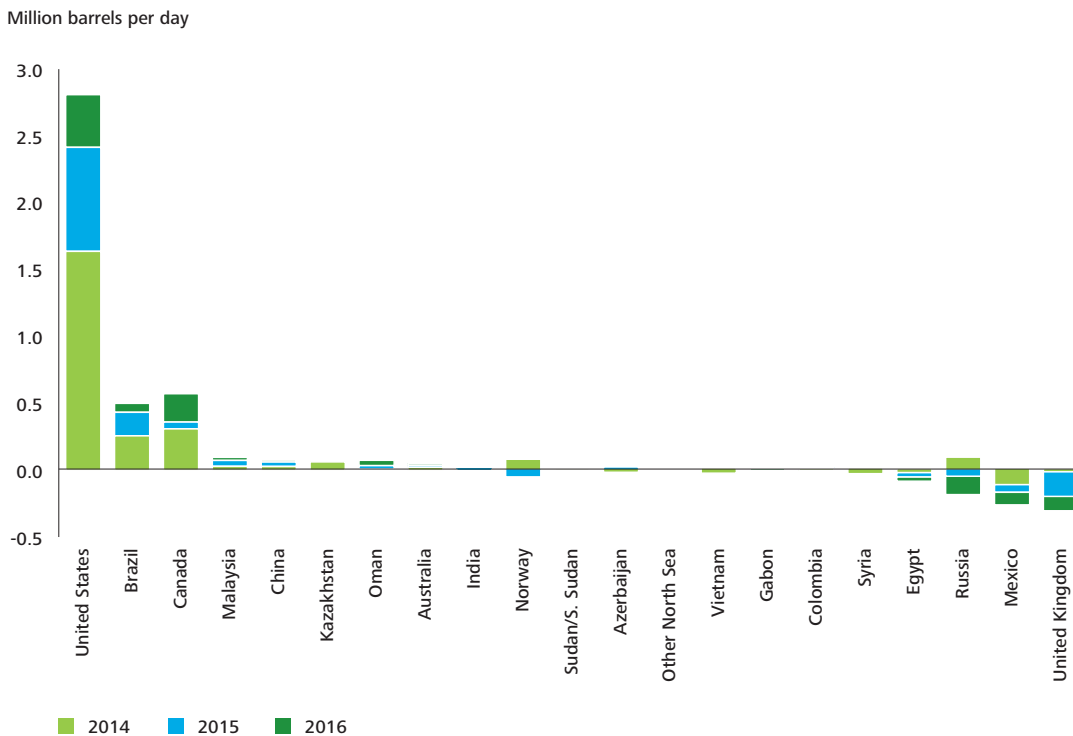
Although OPEC has regularly met over the years to set supply quotas and targeted price levels, OPEC member nations do not always comply with these production targets – which may suggest weaknesses in organizational discipline. OPEC established a crude oil output ceiling of 30 million barrels per day since 2012, without specifying quotas for individual members. In 2013, the average production was 31.6 million bpd. After refusing to cut output last year, OPEC keeps pumping much more than the overall output target of 30 million bpd because of record Saudi Arabian output and partial return of Iraqi and Libyan crude.

In terms of OPEC’s market dominance, currently the organization supplies approximately 32% of the world’s crude oil, and its share of that market is declining. According to its own World Oil Outlook for 2014, OPEC’s oil market share may fall by 5% by 2018 as the supply of U.S. tight oil picks up.⁴³ While that share may recover over the long-term as supply patterns shift (particularly if U.S. production flattens), OPEC may cede power in the interim.

And while barriers to entry once existed due to the complexity of traditional exploration and production, new technologies and innovations spurred by the U.S. shale revolution have changed that equation. As unconventional oil production evolves, shale producers gain more leverage – particularly given their ability to adjust to changing price signals more quickly than conventional oil producers.

There are also numerous producing nations operating outside of OPEC’s influence. In 2014, non-OPEC supply growth rose by 1.99 MMbbl/d to reach 56.23 MMbbl/d, driven by higher output across the OECD and in Brazil, Kazakhstan and China⁴⁴ (see Figure 6). While the rate of non-OPEC supply is expected to slow somewhat for 2015, the production capacity of non-OPEC suppliers prevents the organization from exerting the same level of control it may once have had over world markets.

Figure 6. Non-OPEC crude oil and liquid fuels production growth



Source: U.S. Energy Information Administration, Short-Term Energy Outlook, April 2015

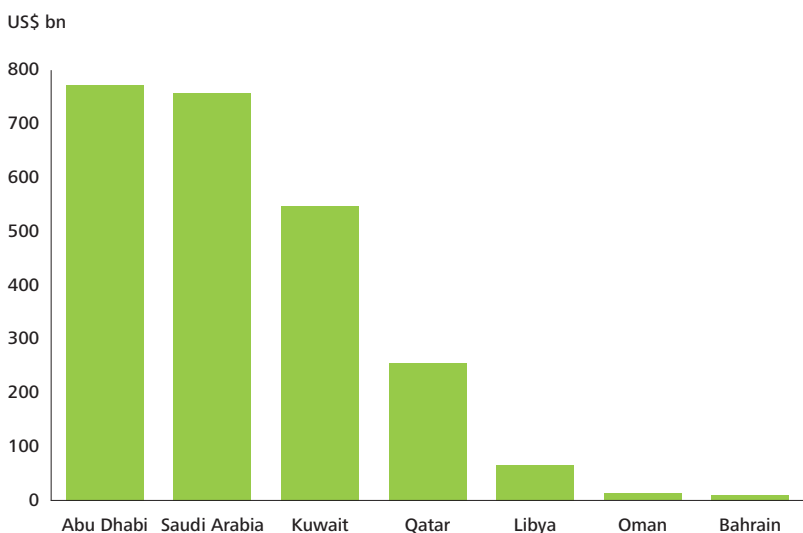
Not created equal

This isn't to suggest that all OPEC nations have lost their influence. Certainly, its most stable members have the resources to increase – or withhold – production as they see fit. Those members of the Gulf Cooperation Council (GCC) that are also members of OPEC fall into this category: Saudi Arabia, Kuwait, Qatar and the UAE.

Saudi Arabia produces roughly 12 MMbbl/d of petroleum liquids⁴⁵ and remains the world's low cost producer. Its production capacity along with its cost advantage give the country considerable leverage as an international energy player, even without taking its influence over other OPEC nations into account. With over \$740 billion in foreign exchange reserves, Saudi Arabia also has the wherewithal to withstand any deficits it may run if its oil revenues decline.

The Kuwait Investment Authority also has considerable foreign exchange reserves, estimated at \$548 billion while the UAE's Abu Dhabi Investment Authority holds roughly \$773 billion in foreign exchange reserves – an amount equivalent to 190% of the country's GDP⁴⁶ (see Figure 7). In many ways, it is the strength of these nations that has given OPEC the power to maintain its production volumes despite current oil price weakness.

Figure 7. Sovereign wealth funds, 2013




Source: Sovereign Wealth Fund Institute, swfinstitute.org


The remaining OPEC members, however, are facing greater challenges. Some argue that the divergence between OPEC have and have-not nations may create a splintering of those countries whose breakeven points require higher oil prices than those that currently prevail.


As Figure 8 shows, most OPEC nations require oil prices of about \$100 per barrel to balance their domestic budgets. If prices remain low for an extended period of time, some of these nations risk traveling a slippery slope towards greater social unrest. Consider:

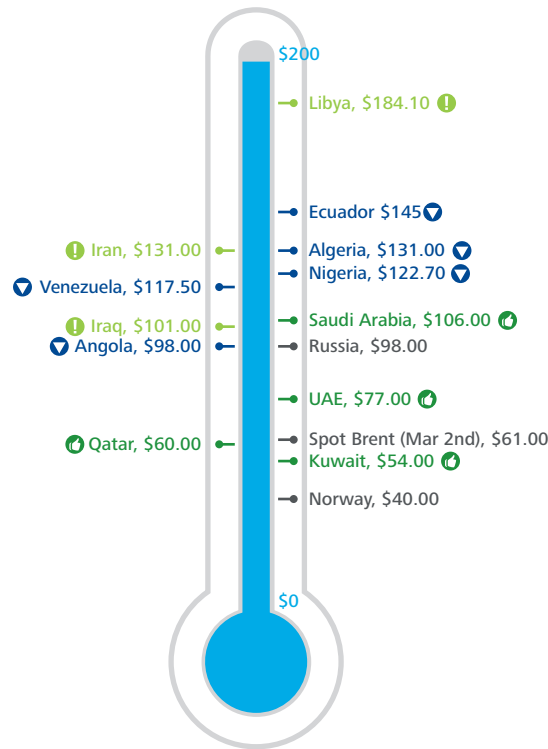
- Combined, Iraq, Iran and Nigeria's foreign currency reserves are less than \$200 billion.⁴⁷ Additionally, Iraq must continue to divert resources to its fight with ISIS (Islamic State); Iran has lost oil revenues due to Western banking sanctions imposed in response to its nuclear program; and Nigeria's oil production continues to fall under the assault of theft and lack of investment.
- After years of civil war, Libya is also suffering acutely. By late 2014, oil production in the country had fallen below 300,000 barrels per day – a full 65% drop from October 2014.⁴⁸ Militant targets in recent months have included Libya's largest oil export terminal and oil storage tanks, promising ongoing disruption to Libyan output.
- Although Venezuela has the world's largest oil reserves, its oil production has been declining for years and the country faces rampant inflation. In October 2014, Petróleos de Venezuela (PDVSA) imported oil for the first time in the country's history, receiving a shipment of light crude oil from Algeria.⁴⁹ In January 2015, the country was also forced to turn to China for help in maintaining its production, entering \$20 billion in financing agreements with its largest creditor.⁵⁰

Figure 8. Breakeven oil prices, 2015

- 
The healthy: Saudi Arabia, Kuwait, Qatar, UAE
 - Has the capacity to increase production and the wealth to withhold it.
 - Kuwait has joined Saudi Arabia in offering steep discounts to Asian crude buyers.

- 
The declining: Algeria, Angola, Ecuador, Nigeria, Venezuela
 - Experienced production decline in recent years.
 - Cash-strapped PDVSA closed \$20bn financing agreement with China, which helps maintain oil production.
 - Two major deepwater fields are expected to rise production in Nigeria by late 2017.

- 
The dysfunctional: Iran, Iraq, Libya
 - Has potential capacity to increase production, but production levels, controlled by politics, have been volatile.
 - In Dec 2014, Iraq resumed export from the north since Mar, while Libyan output fell to the lowest since Jul.
 - Libya rarely used to sell to Asia, but since Aug China has replaced some of its Mediterranean customers.



Source: Wall Street Journal⁵¹

Implications

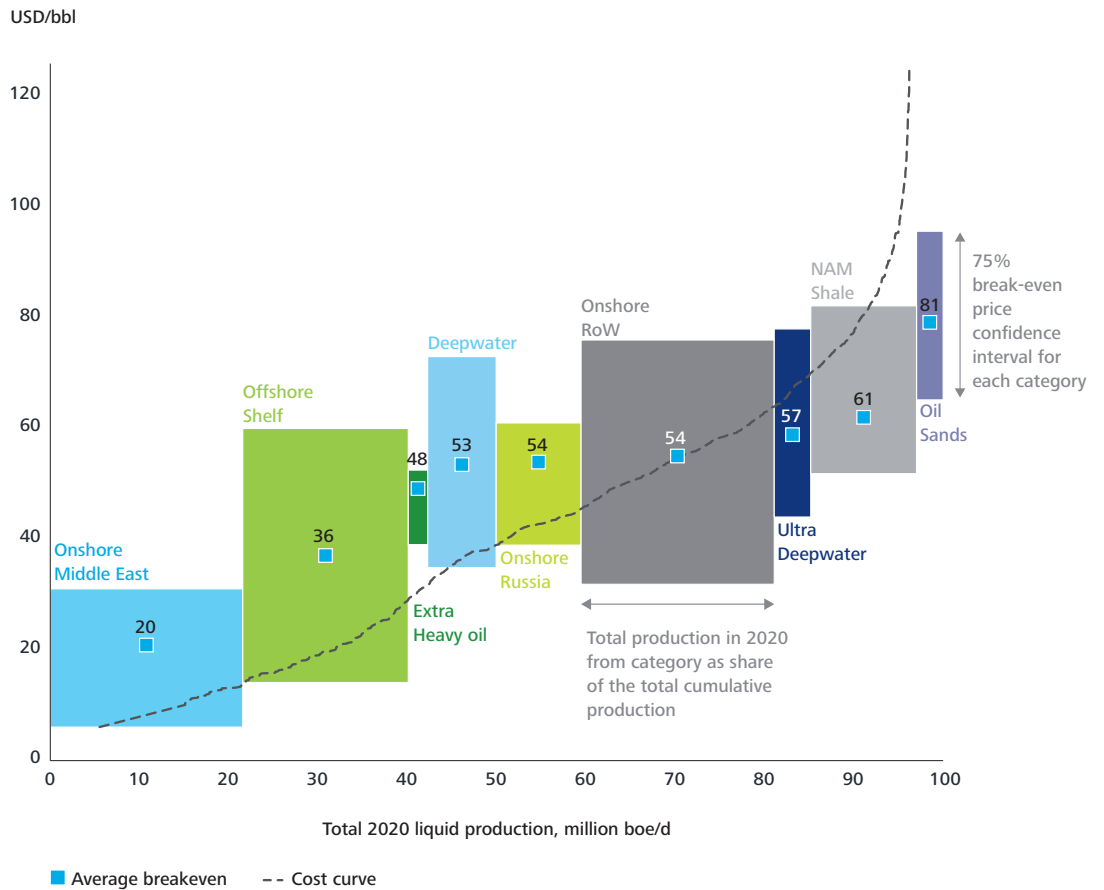
Despite the challenges many OPEC nations are facing, the GCC countries capable of holding the line on production still have market sway. Their recent decision to maintain production has certainly created implications for non-OPEC producers.

In Brazil, for instance, Petrobras will see revenues decline – especially as the margins to produce the country’s offshore deepwater pre-salt oil reserves shrink (and as fraud investigations rage on). Canada’s oil sands are also under pressure given their high development costs; Norway’s Statoil, for instance, put its Canadian Corner oil sands project on hold for at least three years in September 2014.⁵²

Russia is struggling too. With exports of approximately 7.5 MMbbl/d of crude oil and refined products, Russia is the second largest oil exporter after Saudi Arabia.⁵³ The country is heavily dependent on oil and gas exports, which together generate over half of its national revenue. Its loss of oil revenues comes on top of the financial losses it continues to experience due to the imposition of U.S. and Western sanctions over the Ukraine. In recent months, the ruble has plummeted and inflation has soared to over 16%,⁵⁴ spurring the International Monetary Fund (IMF) to downgrade its outlook for Russia to a 3% contraction in 2015.⁵⁵

The U.S. oil and gas industry is also not immune: onshore drilling activity fell from a peak of 1,609 rigs in October 2014 to 976 rigs in April 2015,⁵⁶ investors are demonstrating greater reluctance to finance shale projects, and highly-leveraged drillers and more marginal oil fields may struggle to survive. Research firm Wood Mackenzie estimates that if investment falls by 20%, America’s shale production growth could go down to 10% a year.⁵⁷

Figure 9. Global liquid supply cost curve



Source: Rystad Energy research and analysis

Concluding thoughts

Despite the fact that OPEC’s decision to refrain from bolstering oil prices has created challenges for many producers, those challenges may be short-lived. The United States-Canada-Mexico trading bloc is particularly well-positioned to weather the storm. Mexico’s Pemex, for instance, has been hedging oil prices for a decade and is somewhat shielded from mid-term oil price drops due to its oil stabilization fund.⁵⁸ While some Canadian projects will likely become uneconomic over the short-term, the industry has been built on long-term investments and has successfully emerged from cyclical downturns in the past. Similarly, U.S. breakeven levels will likely continue to fall as the shale industry makes efficiency gains. Some analysts say a median U.S. shale project only needs an oil price of \$57 per barrel.⁵⁹ And while capital can flow out quickly from unconventional oil plays, it can flow back in equally as fast in response to shifting market signals.

Taken together, these trends suggest that OPEC’s power over long-term market movements is waning. Certainly, its dominance as a coordinated entity is long past. Yet, the end of one era often signals the start of another: arguably, the GCC states could stand in for OPEC in the years to come. As long as these nations maintain spare capacity and have the ability to ramp production up (or down) to meet shifting global price signals, they will remain influential – despite having to share that influence with other major producers to a greater extent than perhaps they did in the past.

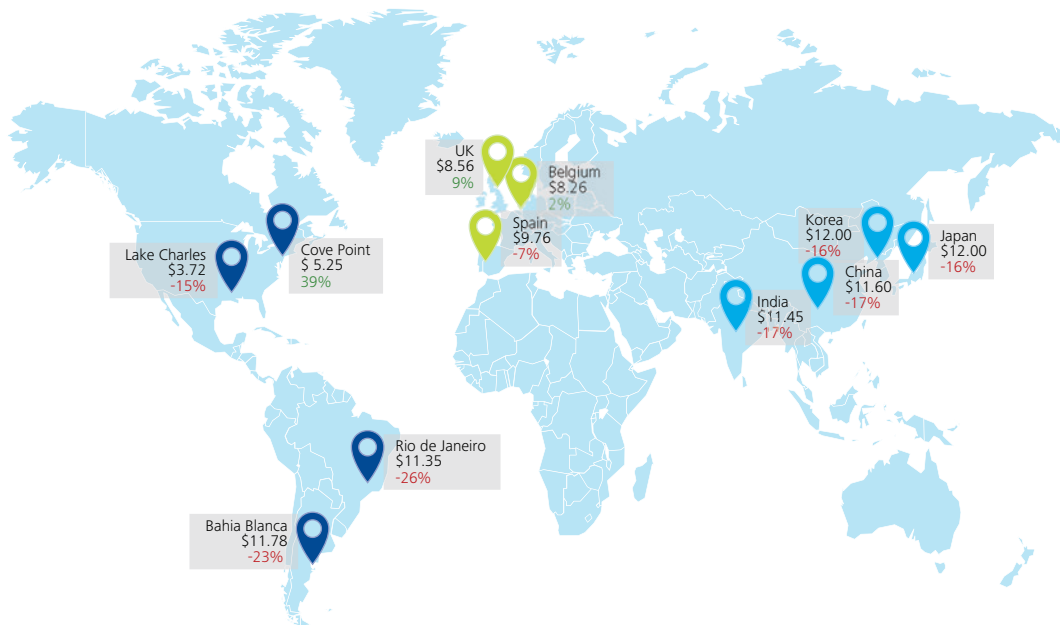
LNG prices: a buyer's market

At the start of 2014, the outlook for liquefied natural gas (LNG) was fairly rosy, especially in light of the rising demand forecasts for China, India and Southeast Asia. Prices were so high in Asia Pacific that customers were trying to decouple gas prices from oil and began demanding contracts that featured price flexibility clauses with greater linkage to the Henry Hub benchmark.

The spot trade was also picking up as buyers and sellers tried to capitalize on regional price differentials, which widened considerably when the spot price for LNG delivery to Asia reached a multi-year peak of over US\$20/MMBtu.⁶⁰

By December 2014, however, the spot price of LNG delivery to Asia had dropped 29.4% for the year⁶¹ and had fallen to \$10.70/MMBtu by February 2015.⁶²

Figure 10. December 2014 LNG landed prices compared to June 2014 prices



Source: Federal Energy Regulatory Commission

Tracing the causes

Several factors are driving these falling prices. In Europe, for instance, gas demand remains weak due to the lingering effects of the financial crisis, coupled with growing reliance on renewable energy sources. While Asian demand is typically strong, it was lower than anticipated due to mild winters in North Asia, and may be further weakened as Japan brings some of its nuclear plants back online and switches over to coal where it can to reduce the high cost of LNG imports. China is diversifying supply as well, as its recent gas deals with Russia attest. According to Macquarie, the deals will reduce Chinese demand for LNG to the point that only one-in-20 proposed LNG projects targeting the 2020 market will be needed.⁶³

Global oversupply is also a significant factor: over the past decade, LNG volumes grew at an average of more than 6.5% per year,⁶⁴ and the projects scheduled to come on-stream shortly will only add to those volumes (see Figure 11). Papua New Guinea was the latest producer to add new LNG supply to the market in 2014, and the Queensland Curtis LNG plant in Australia further increased supply since it began exporting cargoes to China National Offshore Oil Corp (CNOOC) in January 2015, with which it has a 20-year supply contract. If Australia's seven LNG terminals currently under construction are completed by 2018, as originally planned, an additional 62 MTPA of new capacity would come online,⁶⁵ and position the country to overtake Qatar as the world's largest LNG supplier by 2020.⁶⁶

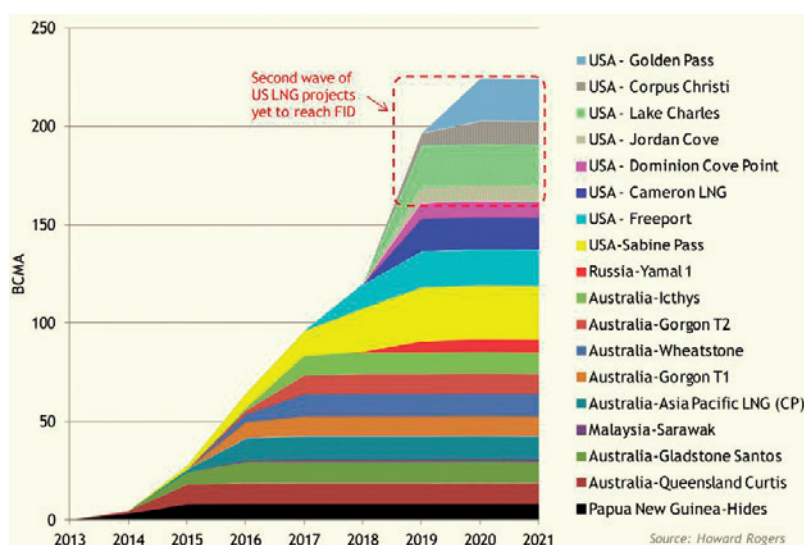
And, of course, falling oil prices have also played a role in pulling down contracted LNG prices that remain predominantly linked to oil.

Projects under pressure

No matter the cause, falling natural gas prices are threatening the economic viability of new LNG projects around the world. With U.S. gas prices expected to range between \$4 and \$4.50/MMBtu through 2016, U.S. LNG exporters may have a slight competitive advantage: it is estimated they need a European price of \$9/MMBtu and an Asian price of \$10.65/MMBtu if they hope to turn a profit.⁶⁸ However, considering the detrimental effects of the oil price plunge, U.S. LNG linked to Henry Hub prices suddenly becomes less competitive relative to the oil-linked prices being offered by global competitors (at least in the short-term).

Australian projects are under even more pressure. Credit Suisse and Wood Mackenzie estimate that most Australian LNG projects need to earn \$12-to-\$14/MMBtu to break even.⁶⁹ For their part, LNG projects in Mozambique need a breakeven price of roughly \$11.50/MMBtu and those in Tanzania need \$13/MMBtu given the significant infrastructure investments that must still be made to develop these resources.⁷⁰ Even Canadian projects are estimated to require \$9-\$10/MMBtu.⁷¹ To add insult to injury, LNG projects are struggling under a burden of more than lower prices. In recent years, project development costs in many nations have spiraled.

Figure 11. A shipload of new supply over the next five years



Source: Timera Energy⁶⁷

Notably, all this turmoil has boosted Qatar's market position. Aside from being the cheapest natural gas producer in the world and the world's top supplier of LNG, the majority of Qatar's production volumes have been sold in long-term contracts. While those may fall if oil prices remain low, Qatar is fairly well-positioned to ride out the cycle with minimal loss.

Buyers in control

As a result of LNG price declines, the long-term contracts that have typically dominated the LNG industry are under mounting pressure. As sellers lose negotiating power, buyers are increasingly likely to demand more flexible terms, ranging from destination flexibility to price review provisions. New tolling models already allow customers to buy natural gas from the U.S. market at the Henry Hub price, then pay a capped fee to liquefy the gas and load it onto ships for export – reducing pricing volatility. In addition to giving buyers complete destination flexibility, the lower investment required by the tolling model also reduces the need for long-term contracts to stabilize cash flows – which could ultimately alter traditional LNG market economics.

With buyers reluctant to sign long-term contracts and the rising availability of incremental cargoes (by 2017, up to 5 million metric tons per year of LNG could be available for the spot market from Australia alone⁷²), spot trading is also on the rise. Additional spot availability could serve to push down spot prices and induce consuming nations to find a way to link new contracts to spot indices. In November 2014, for instance, Japan's Chubu Electric signed a deal to buy LNG from France's GDF Suez at prices partially linked to spot prices in Asia.⁷³ In a related move, Asian buyers are trying to smooth out price volatility by establishing an LNG derivatives trading platform. Japan, Singapore and China all currently have plans to launch LNG futures trading, although the potential success of these initiatives remains uncertain.

As the impasse between buyers and sellers drags on, many developers are delaying their final investment decisions (FIDs) on global LNG projects. At the same time, lenders are becoming more averse to financing additional drilling and production. Taken together, these trends have slowed the construction of LNG terminals and have compromised several projects: Exceleerate Energy in Houston put its Lavaca Bay project on hold;⁷⁴ Chevron Corp. significantly slowed spending on the Kitimat LNG project in Canada, and plans to cut spending on LNG worldwide by 20% in 2015;⁷⁵ Malaysia's Petronas indefinitely delayed starting construction of a \$32 billion LNG plant on Canada's Pacific coast;⁷⁶ and investments that were supposed to flow to planned LNG terminals in Tanzania and Mozambique are now being called into question. The trend, however, is not universal, as Royal Dutch Shell's recent takeover offer for BG Group demonstrates. Of course, should supply dwindle, demand will likely push prices back up over the long term, once again fueling a more global LNG trade.

Concluding thoughts

While the price of LNG may once have been a model for stability, it is less so now. Until prices stabilize, natural gas will likely trade in more geographically proximate regions. That means Australian LNG will likely retain its north/south advantage, providing supply to Singapore, Taiwan, Japan and South Korea. Conversely, North American producers have a more natural trading advantage with Europe.

That said, the most cost efficient producers are the ones most likely to win global market share, especially as supply-demand economics kick in. This may ultimately give the United States (and perhaps Canada) a competitive advantage, as their breakeven points on LNG projects are typically lower.

New contractual mechanisms may become more prevalent, potentially changing the long-term pricing dynamics of the global LNG industry. Hub-linked pricing, destination flexibility and new tolling models are increasingly shifting market power from sellers to buyers – a trend that will only accelerate if spot-linked pricing contracts become more prevalent.

While the price of LNG may once have been a model for stability, it is less so now. Until prices stabilize, natural gas will likely trade in more geographically proximate regions.

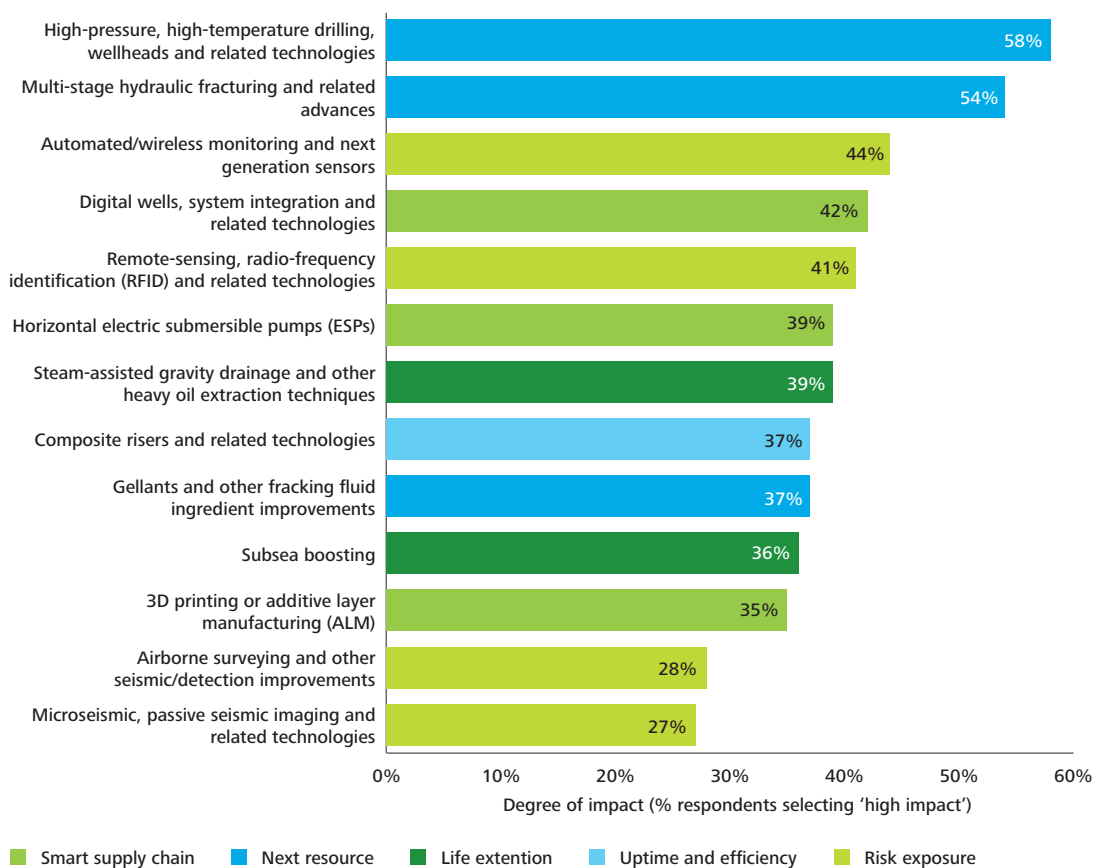


Investing in innovation: the cost of complexity

While E&P spending is slowing amid ongoing commodity price volatility, as of March 2014, the world's four biggest super-major oil and gas companies were spending roughly 40% of their capital budgets on megaprojects⁷⁷ (those with capital investments of \$1 billion or more). Notably, a full 50% of that 40% allocation was going to technically complex projects, such as the Gorgon LNG project in Australia, the Pearl GTL project in Qatar, the Kashagan project in the Caspian Sea and the Sakhalin project in Russia.⁷⁸

Thanks to significant investments in technology and innovation, the industry is accessing previously-inaccessible deposits by engaging in deepwater and ultra-deepwater exploration, building floating LNG (FLNG) and storage facilities, and exploring new frontiers in the Arctic. Innovations include the automation of remote and subsea operations; high-pressure, high-temperature (HPHT) drilling; multi-stage fracking; and even subsea robotics (see Figure 12).

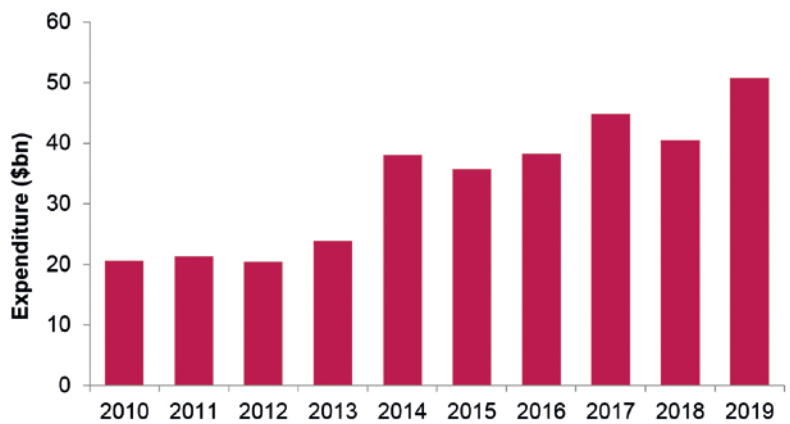
Figure 12. High-impact technologies going mainstream in the medium-term (around 2020)



Source: Lloyd's Register Energy – Oil and gas Technology Radar 2014 www.lr.org/technologyradar

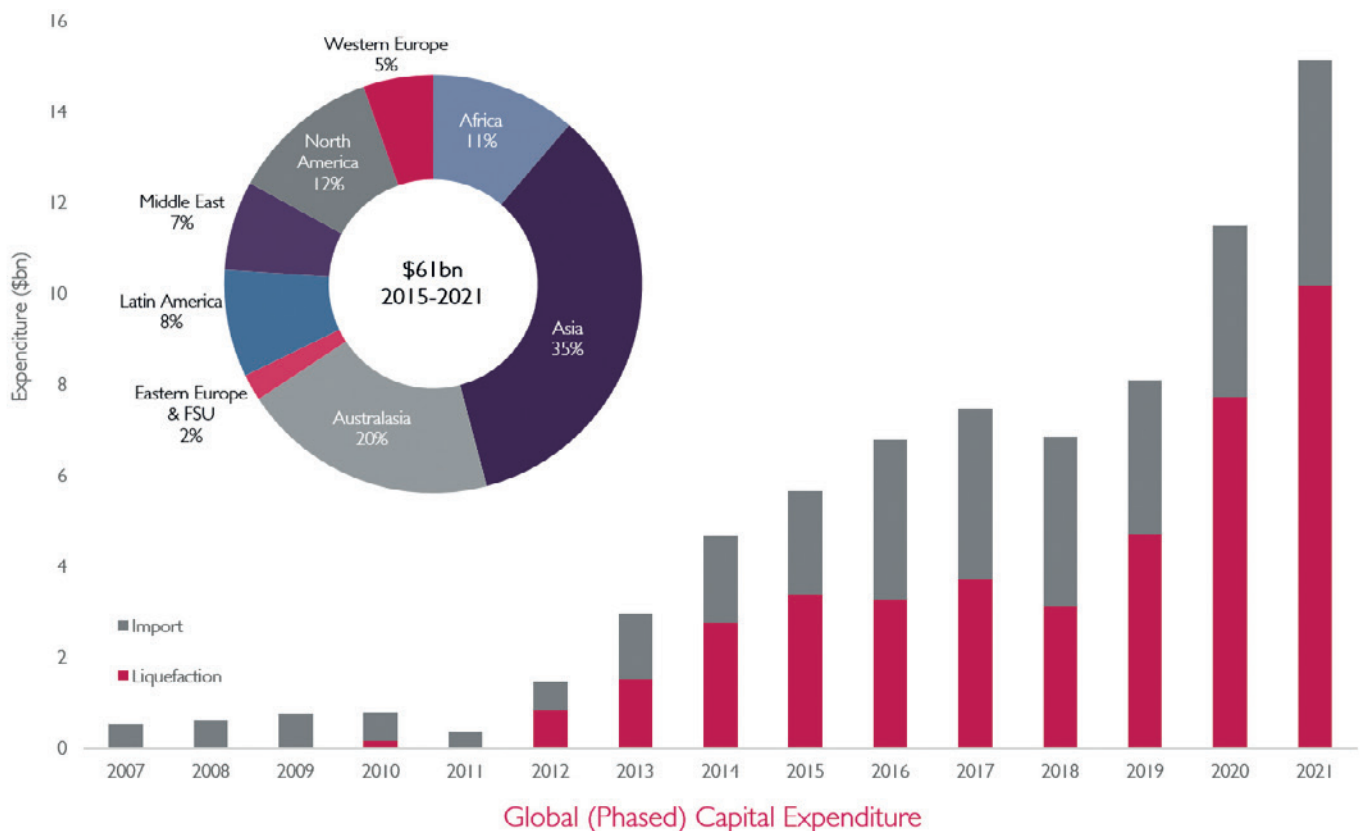
In E&P companies' quest to innovate, global exploration and production spending in 2014 reached an estimated \$723.3 billion,⁷⁹ despite lower energy prices. While overall spending is expected to fall for 2015, projects past FID are unlikely to be cancelled. As of December 2014, Douglas-Westwood⁸⁰ was still predicting offshore development wells to grow by 17% by 2018. Of the \$1.4 trillion that is projected to be spent on offshore E&P during that time period, 39% is expected to go to life-of-field services, 31% to drilling and 15% each to EPC and subsea development. In fact, deepwater capital expenditures are set to rise by 130%, as an additional 1,500 subsea wells are drilled and completed around the world. The spend on floating production is also anticipated to grow, reaching \$164 billion by 2020, with FLNG accounting for roughly \$81 billion of that capital expenditure.

Figure 13. Deepwater capital expenditure 2009-2019



Source: Douglas-Westwood – Deepwater market forecast 2015 edition

Figure 14. FLNG global capex and regional split



Source: Douglas-Westwood – World FLNG market forecast 2014 edition

Over time, over budget

The challenge, however, which has been brought into particularly sharp relief in recent months, is the significantly high spending associated with so many complex projects. A full 65% of capital projects around the world exceed budgets by at least 25% and/or exceed scheduled timelines by up to 50%.⁸¹ As the technical risk of projects rises, capital expenditures rise apace.

In Australia, for instance, the Pluto LNG project came online a full 14 months after its target start, at a cost of U.S.\$14.9B – 33% above original estimates,⁸² the Gorgon LNG project went 40% over cost and saw delays of over one year⁸³ and the Wheatstone project's price went up 13% between 2011 and 2013.⁸⁴

Elsewhere, the Pearl GTL project in Qatar rose nearly 300% from its 2003 budget of \$5 billion,⁸⁵ while Norway's offshore oil and gas projects are running roughly 20% above original cost estimates.⁸⁶ Cost and time delays have also plagued the only two offshore fields currently producing in the Arctic: the Snøhvit field in Norway which is the region's first LNG development,⁸⁷ and the Prirazlomnoye project in Russia which is the Arctic's first oil development. Meanwhile, in October 2014, the cost of Kashagan – already the world's most expensive oil project – was set to rise by nearly \$4 billion as developers were forced to replace roughly 150 miles of leaking pipelines.⁸⁸

There are myriad reasons for these overruns, ranging from regulatory mandates that require additional investment, rising labor and material costs, and mounting technical and geopolitical risks. Less benign factors exist as well, including a tendency to over-invest in bleeding edge technologies and an insistence on customizing each project rather than looking for ways to standardize.

The case for cost consciousness

With energy prices declining, companies are already postponing FIDs and putting low-margin projects on hold. Now that companies have lost the cushion of buoyant prices that could have bailed them out of a cost overrun, the imperative to wrestle costs under control is becoming even more critical. According to Goldman Sachs, companies will need to cut costs by up to 30% to make a range of high-cost projects profitable should oil prices average roughly \$70 per barrel.⁸⁹

This is mandating new approaches to project design, development, financing and approval. Traditional stage gate processes still have their place for highly technical projects. The complex projects that increasingly dominate the oil and gas industry, however, have a high degree of variability, reducing the utility of stage gate processes. The challenging geologies, engineering and regulatory environments associated with these projects make outcomes unpredictable and mandate more dynamic responses.

To address poor project performance, companies are adopting a range of strategies. These include:

- **Integrated project delivery (IPD)** – by improving collaboration across the supply chain, the intent of IPD is to align the commercial objectives of all project participants (owners, engineers, contractors, subcontractors, major suppliers). This serves to focus team efforts on improving project delivery from inception through final turnover and closeout.
- **Advanced analytics** – as industry reliance on so-called 'big data' rises, companies can increasingly benefit from the use of advanced analytics to identify early indicators of potential issues that could affect project performance. For instance, by leveraging vast sets of in-field employee performance data, companies can make more informed workforce planning decisions. Similarly, by integrating external data (i.e. weather patterns, political unrest, multi-tier supply chain issues), they can model scenarios in which projects typically go off the rails and put mitigation strategies into place in advance.
- **Lean project management** – this involves the dynamic adjustment of project delivery needs to contemporaneous project mandates, enabling organizations to adjust workflow and resource allocation in real time, in response to shifting requirements.
- **Talent management** – during industry downturns, companies have a tendency to lay off professionals and reduce their hiring of entry-level workers. In the past, this created a generation gap that still defines today's oil and gas workforce. To avoid fueling a shortage of skilled workers into the future, companies need to pursue talent processes that better manage the attraction and retention of engineering and technical talent. At the same time, training programs should also focus on fostering a higher level of cost-consciousness among existing workforces, who will likely be asked to operate in more fiscally constrained manners going forward.

- **A shift towards the digital oilfield**, which relies on technologies such as 4D seismic imaging to business intelligence initiatives. Investments in the digital oilfield are changing project economics. For instance, Shell's Amberjack project reported a 20% reduction of operating costs, a 5-10% increase in recovery and a 75% reduction in work flow cycle times – results that enable this so-called 'smart field' to produce an additional 600 barrels of oil per day.⁹⁰
- **Modular approaches** – as an engineering-dominated industry, modular standardization is sometimes regarded as suspect in the oil and gas sector. Applied effectively, however, modular approaches can reduce project costs by up to 15% and accelerate project delivery by up to 20%.⁹¹ Modularization spans the gamut and could include using common design specifications for similar projects, reusing already-developed plant designs for new projects and relying on rapidly-evolving modular technologies (i.e. skid-mounted process systems, pre-assembled infrastructure components) to streamline work efforts.

Service sector struggles

In the short-term, oilfield services (OFS) costs are also likely to come down due to market overcapacity. Given the frequency with which both IOCs and NOCs outsource substantial portions of their development and production operations to the OFS sector, declining costs in this area can help strengthen margins. While this may come as good news to large E&P companies, it's already taking a serious toll on the OFS sector.

Schlumberger intends to lay off a full 20,000 employees through 2015,⁹² while Baker Hughes, which recently merged with Halliburton, announced headcount cuts of 7,000 people.⁹³

OFS mergers and acquisitions also fell 40% for the second half of 2014 compared to the year previous. This reduced activity most acutely affected drilling (deals down 67%) and support services (deals down 56%), although these numbers were offset by two U.S. deals that comprised roughly 70% of total OFS deal value: the merger between Halliburton and Baker Hughes, and Siemens' acquisition of Dresser-Rand.⁹⁴

Just as in the E&P sector, recovery in the OFS sector will require more rigorous cost discipline, particularly given the huge debt burdens under which many of these companies operate.

Concluding thoughts

Although capital spending is likely to fall off in the near-term, megaprojects will still be required to meet long-term global energy demand. To avoid the cost and time overruns that have typically characterized these projects, companies may want to explore a range of strategies, including pre-project planning, integrated project delivery, lean project management, modularization and talent management. They may also want to invest in advanced analytics to enable agile project monitoring and evaluation.

At the same time, it bears recalling that weak price signals often spur innovation. It is more than reasonable to expect that lagging oil prices will spur greater innovation as well.

National and integrated oil companies: evolving dynamics



For decades, integrated oil companies (IOCs) have ranked among the world's most advanced enterprises in terms of their industry expertise, R&D capabilities and operational skills – giving them a significant edge in the global energy space. In recent years, however, that edge has been eroding. In some ways, this can be traced to the fact that the production of the largest public IOCs has been declining for several years, despite ongoing increases in capital spending. Between 2006 and 2012, for instance, oil production by the major companies fell from 16.1 MMbbl/d to 14 MMbbl/d, while capital spending rose from \$109 billion to \$262 billion.⁹⁵

Given the depletion of conventional reserves – and the upside of alternatives – IOCs have been focusing on unconventional plays to increase production. Their efforts, however, have been only moderately successful. While ExxonMobil and ConocoPhillips each boasted a reserve replacement ration (RRR) in excess of 100% in 2014, Chevron's RRR was 89%, BP's was 62% and Royal Dutch Shell's was only 26%.⁹⁶ To simply maintain current production levels, the IEA estimates that E&P companies will need to spend a total of \$680 billion per year.⁹⁷

Of course, spending trends in recent months have been moving in the opposite direction. To bring costs back under control, IOCs have been cutting capital expenditures and putting projects on hold.

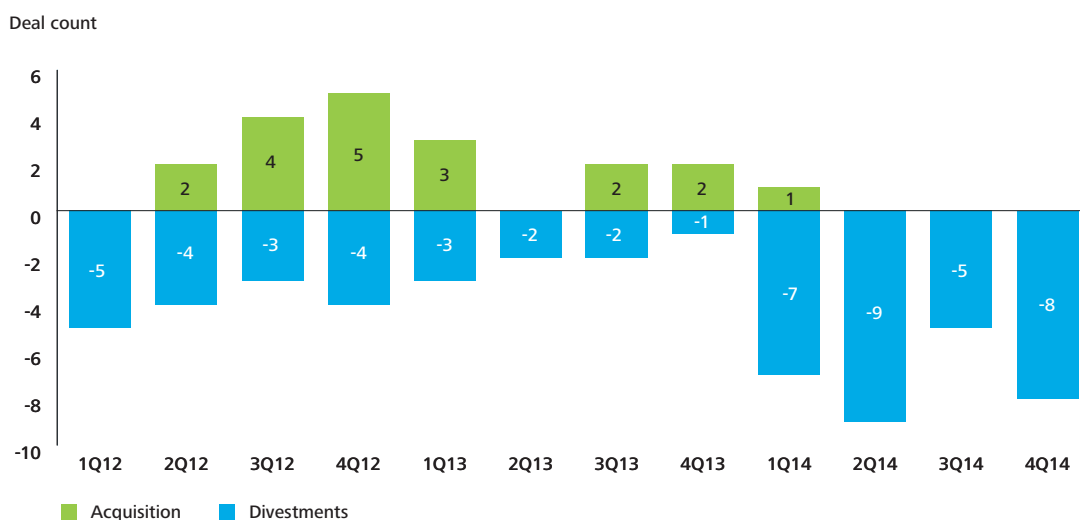
BP, for instance, cut \$1 billion from its capital spending plans;⁹⁸ ExxonMobil said it anticipates capital spending of about U.S.\$34 billion in 2015, 12% less than in 2014.⁹⁹ Royal Dutch Shell pulled out of its deal with Qatar Petroleum to build a \$6.5 billion petrochemical plant in the emirate;¹⁰⁰ and Chevron halted its shale gas projects in Poland, the Ukraine and Romania.

Closing the gap

This storyline runs in contrast to the trend prevalent among some of the world's better-funded national oil companies (NOCs). Today, NOCs control roughly 90% of the world's known petroleum reserves.¹⁰¹ This includes not only their ownership of a large percentage of their domestic production – either independently or through production sharing contracts – but also their stakes in international energy ventures.

Acquisitions by China's CNPC, CNOOC and Sinopec, Russia's Gazprom and Rosneft, and Malaysia's Petronas have made headline news for years. Together, Asia's NOCs have invested roughly \$40 billion in foreign countries in the past two years.¹⁰² Just this past year, Saudi Aramco bought a 28% stake in a South Korean oil refining and marketing company, Turkey's NOC (Turkish Petroleum Corp.) made investments in Azerbaijan and Qatar's NOC bought a \$1 billion stake in a Brazilian oil field from Royal Dutch Shell.¹⁰³ Between 2012 and 2014, six NOCs each paid at least \$5 billion in an acquisition.¹⁰⁴

Figure 15. Upstream deals by selected integrated oil companies, 2012-2014



Source: PLS Inc. and Derrick Petroleum Services Global Mergers & Acquisitions Database as of 9 January 2015

Admittedly, the pace of NOC acquisitions slowed in 2014. Of the 10 largest upstream deals for the year (those that exceeded \$2 billion), seven involved North American E&Ps as either buyers or sellers. Asian and Caspian NOCs were notably absent. Acquisitions by Chinese NOCs fell steeply for the year as well, from \$20 billion in 2013 to under \$3 billion in 2014.¹⁰⁵

Despite this more cautious approach, NOCs do not seem to be cutting as steeply as IOCs. For instance, although IOCs are planning for a 13% drop in capital spending for the year, NOCs are cutting a considerably smaller percentage of their expenditures, while Saudi Aramco, ADNOC and Kuwait Oil Company may even increase spending.¹⁰⁶

In the realm of innovation, too, some NOCs are upping their game. In a recent industry survey,¹⁰⁷ IOCs were seen as being responsible for introducing roughly 46% of the industry's breakthrough technologies between 2012 and 2014. By 2016, however, IOC breakthroughs are expected to drop to 36%, while NOC breakthroughs rise to 28% from 24% between 2012 to 2014.

Follow the leaders

NOCs interested in ascending the maturity curve don't have far to look for precedents. BP got its start as a NOC, as did France's Total. Many would also argue that Norway's Statoil straddles the line between NOC and IOC. NOCs that may follow these trends could include China's CNPC, CNOOC and Sinopec, India's ONGC and Indian Oil Corporation, among others.

Many of these NOCs are already taking steps to strengthen their operations and market dominance. From an operational perspective, NOCs are increasingly entering partnerships with OFS companies capable of giving them access to a greater range of financial, human and technical resources. This is positioning them to grow their internal skillsets and become more commercially viable. From a market dominance perspective, NOC actions have been both more subtle and more varied – forging more direct alliances, for instance, with domestic OFS providers that they either partially or wholly own.

Not universal

To be fair, this pattern does not hold across the board. The majority of the world's NOCs will likely continue to rely on IOC expertise for years to come, particularly given the IOCs' strength in technological innovation, management style and collaboration with local communities. Development of unconventional reserves and complex fields also calls for ongoing IOC involvement.

Given the risk levels and budgets associated with these megaprojects, their success hinges on significant investment and technical expertise – areas where the IOCs continue to dominate. In early 2015, for instance, China went in search of foreign operators to help it develop its offshore oil and gas assets¹⁰⁸ Most NOCs also cannot come close to competing with the IOCs' midstream and downstream operations, where partnerships will continue to endure.

In recognition of these strengths, some countries have taken steps to open their previously-closed borders in an attempt to attract greater IOC investment. Mexico's Pemex immediately comes to mind, but other NOCs – such as those in Myanmar, Ethiopia and Honduras – have also opened their energy sectors to private investors in recent years.

Concluding thoughts

It is currently hard to foresee a future where IOCs don't play a pivotal role in oil and gas exploration and production. Yet, in areas where the IOCs' traditional strengths are not required, it is possible to envision IOCs losing market share to large OFS players and to NOCs, particularly for non-technical projects. To prevent this slow erosion, IOCs will need to guard against the instinct to engage in mass layoffs while commodity prices remain soft. Although there is always room for heightened cost consciousness, IOCs may want to avoid putting themselves into a position where they lack the talent and momentum they need not only to ramp production back up once prices recover, but to maintain their edge in a shifting competitive landscape.

At the same time, as IOCs move towards leaner business models, cash-rich NOCs may increasingly be in a position to acquire coveted assets, further attract industry-leading talent and forge stronger relationships with leading OFS companies. Over time, this focus will likely position certain NOCs to compete more effectively on the international stage. That said, while closer commercial relationships between major service companies and NOCs could disintermediate IOCs in some situations, some EPCs remain unprepared to assume the risks associated with project cost and scheduling overruns. This will force NOCs moving up the maturity curve to assume a higher level of risk than in the past, mandating the adoption of much more sophisticated risk management programs, governance structures, innovation cultures and organizational efficiency practices than those that currently prevail. While the building blocks to make this happen aren't currently in place, these trends may result in different forms of collaboration in the future.

IOCs will need to guard against the instinct to engage in mass layoffs while commodity prices remain soft.

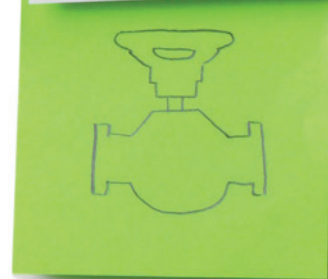
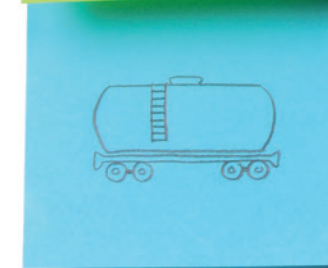
Staying agile

There's little doubt that the oil price drop was the headline story this past year. Lower commodity prices have already taken a toll from the upstream sector and continue to spur retrenchment of E&P budgets.

Yet, the cyclical nature of the oil and gas industry is not a new development. Over the long term, price fluctuations are unlikely to significantly affect the industry's trajectory – although they may speed up some of the trends that were already unfolding.

Countries capable of ramping up domestic energy production will increasingly be looking for ways to do so. In addition to shifting supply-demand fundamentals, this quest promises to change relationships between IOCs and NOCs. The ongoing quest for energy security is also altering global trading patterns and reshaping the power bases of producing nations (from North America and Russia to OPEC nations and Africa). At the same time, new dynamics in the commodity markets are changing the game in the LNG sector and impelling companies of all sizes, and in all regions, to get more serious about cost containment.

As these trends unfold, energy players across the board can only hope to adapt by remaining agile. It is our hope that this report assists in that regard by pointing to sectorial developments rising over the horizon.



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