Redefining Success in Uncertain Times–

A business perspective for energy executives

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"Current geopolitics, macroeconomics, supply and demand provide opportunity, risk and reward. Over the coming decades, the world will likely need much more energy to meet growing demand. As before, many could be lifted out of poverty. And, as before, our industry could play a crucial role in powering this progress."[1]

Ben van Beurden

CEO, Shell at the 2017 CERAWeek, Houston, TX

1 http://www.shell.com/media/speeches-and-articles/2017/deliver-today-prepare-for-tomorrow.html

To make sense of this uncertain environment, energy companies need reliable, real-time information, proven technology platforms and strategic, expert partners.

Energy companies are experiencing an era of unprecedented uncertainty. Climate science shows the ill-effects of greenhouse gas emissions yet the geopolitical environment points toward a resurgence of fossil fuels.

The market volatility of the past few years has begun to reverse as the segment expands to a more global and distributed network. Simultaneously, the industry is experiencing consolidation and centralization, with Shared Service Centers playing a pivotal role in energy-company operations.

Globalization brings with it complexities related to international distribution, regulation, taxation and litigation. Risk lurks around every corner as diverse and distant supply chains are increasingly susceptible to corruption and bribery.

The liquefaction of gas and new technologies enable LNG to be converted and transported around the globe. Technology is also furthering the dawn of automation and robotics in the sector, while the changing profile of energy companies, where consumers are now power generators and grid suppliers, creates a completely new dynamic as to what constitutes an energy company.

To make sense of this uncertain environment, energy companies need reliable, real-time information, proven technology platforms and strategic, expert partners.

Welcome to the energy era of the 21st century — here’s to prospering in an uncertain environment.


REUTERS/DAVID GREY

A Letter from Thomson Reuters Energy Practice Lead

Energy is the sustenance of life. We depend on it for our 21st-century, technologically advanced existence. Whether from traditional fossil-fuel sources, more environmentally friendly options, or emerging approaches such as lithium-ion batteries or tokamak fusion, energy provides the power needed to run our homes, offices, vehicles, gadgets and everything else on which we rely.

Nevertheless, despite our energy dependence, the sector has faced mounting obstacles over the past decade, making energy-company business operations more complex and challenging.

Headlines such as "Energy drags Wall St lower"[2]; "TSX falls as oil slide hits energy stocks"[3] and "Murky oil inventory picture leaves market grappling for clarity"[4] are some of the many that underscore the challenging situation energy companies face.

Economic gains and profitability once enjoyed by the sector are no longer a guarantee.

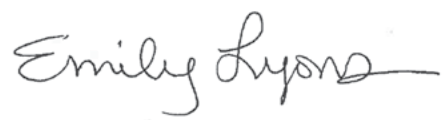
Compounding the complexity of running a business under these market conditions are intense regulatory pressures and an uncertain geopolitical environment. Companies are challenged to work smarter. To provide (greater) shareholder value and returns. To increase efficiencies and productivity while cutting costs. To embrace new technologies. Find new markets. Consider partnerships. Essentially, to reinvent how they operate to ensure their longevity and profitability.

Year-end 2016 results told the story of how energy companies have been struggling. Diversification and M&A activity provided a bit of relief for some organizations, but not enough to turn the tide.

This paper addresses the disruption corporate energy leaders face and provides strategic insight for optimizing tax, legal and financial operations. We are in an ever-changing world that seems to grow smaller as organizations expand. Success in today's environment requires new solutions and a new mindset.

I invite you to explore our executive perspective on energy and reach out with any questions or suggestions you have.

With all my best for business success,



Emily Lyons
Managing Director
Energy PracticeThomson Reuters

2 http://www.reuters.com/article/usa-stocks-idUSZXN0RYX2I
3 http://www.reuters.com/article/canada-stocks-idUSL1N1HR1U7
4 http://www.reuters.com/article/oil-supplies-opec-idUSL1N1HS1G4

REUTERS/LUCY NICHOLSON

Financial & Longevity Uncertainty

In 1789, Benjamin Franklin wrote that "In this world, nothing can be said to be certain except death and taxes."

From a business leader's perspective, this isn't the message you want to convey to your Board, shareholders or customers. Rather, you aim to give them confidence and certainty around your organization's growth potential, profitability, compliance, products and more.

Although such assurances can be challenging, they are nonetheless attainable with the right strategy, infrastructure and culture, even despite external factors such as negative environmental and social sentiment surrounding the use of fossil fuels, overproduction of oil/crude and LNG, and the low price per barrel jeopardizing traditionally high returns.

A prime question facing c-suite executives of IOCs, NOCs and even smaller players is how to sustain growth and longevity while adapting to constantly changing market conditions.

Diversification, mergers and acquisitions, as well as cost cutting measures and operational efficiencies, are all part of the savvy business leader's solution for long-term business success. Case in point, Total's Chairman and CEO Patrick Poyanne said of plans to acquire a century-old battery manufacturer: "[it] allow[s] us to complement our portfolio with electricity storage solutions, a key component of the future growth of renewable energy." [5]

As a leader, you need access to trusted information and insight, reliable yet configurable technology platforms and a corporate approach that is agile, nimble and responsive.

IF YOU CAN'T BUILD IT (AND EVEN IF YOU CAN), BUY IT

The Energy & Power (E&P) sector had a strong start to 2017 in terms of its deals activity. From speculation of a potential mega-deal between ExxonMobil and BP valued at $100B USD to reports of strategic partnerships between oil multinationals and others, it's worth paying attention to the key industry players and their agendas.

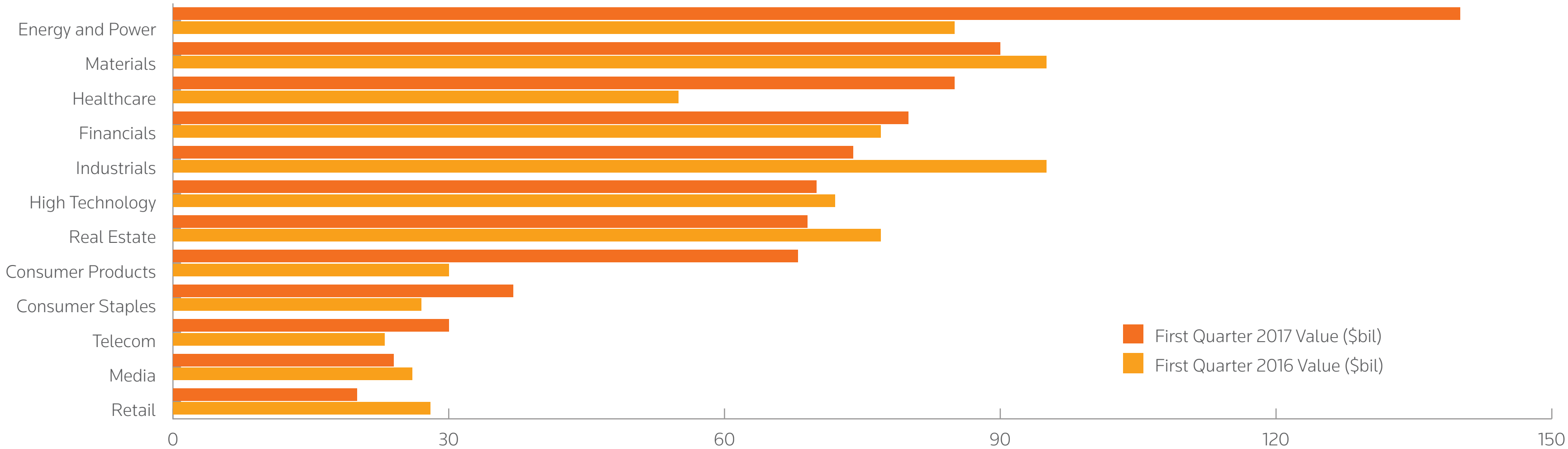
Energy & Power (E&P) has the largest M&A investment of all tracked by Thomson Reuters Deals Intelligence thus far this year, with volume totaling $140.1B USD in just the first three months, as shown in Figure 1. E&P numbers represent a 60 percent increase over the same period last year, with many of the top deals being driven by a reorganization of corporate structures and joint ventures aimed at increasing efficiencies and productivity. For instance, Tulsa, Oklahoma-based Oneok's acquisition of Oneok Partners LP for $17B USD; and, Canada's Cenovus Energy's purchase of FCCL Partnership, a producer of crude petroleum and natural gas for $13.28B USD.

These are on the heels of the purchase of BG by Royal Dutch Shell for $70.1B USD, which closed in 2016, and last year's announcement of Sunoco Logistics Partners LP intention to acquire Energy Transfer Partners LP for $51.4B USD, as shown in Figure 2.

> *"The oil and gas majors are in a fascinating place. They're starting to use clean-energy investments to hedge their bets that markets for oil and gas will exist decades from now."* [6]
>
> Jeremy Leggett
> *Founder, SolarCentury*

5 https://www.theguardian.com/business/2016/may/21/oil-majors-investments-renewable-energy-solar-wind
6 Ibid

Figure 1: Worldwide M&A by Sector, Q1 2017



Source: Thomson Reuters Deals Market Intelligence

MOMENTUM CONTINUES

Despite the uncertain geopolitical environment, sagging prices and questions about OPEC's production output, Thomson Reuters data shows that global deal making activity in the energy sector totaled $608B in 2016, an increase of 15 percent from 2015. Last year was the largest annual period for E&P M&A since Thomson Reuters began keeping records in 1980. Energy & Power M&A was just one of three sectors to experience year-over-year growth during 2016, driven by the largest all-time quarter increase in Q4 ($253.5B USD), as shown in Figure 3. Most other industries saw double-digit declines as the value of overall worldwide announced M&A deals fell 16 percent during the year.

MEGA DEALS ABOUND

Energy & Power also had 59 percent more mega deals (valued at $5B USD or more) in 2016 than 2015, with 27 versus 17 such initiatives, respectively. One-quarter of the worldwide mega deals were from E&P, and it was the only sector to experience increases in both the value and number of mega deals year-over-year, despite the overall economic environment.

The United States was the most acquisition-focused country with $328.3B USD worth of deals, accounting for 42 percent of the global M&A activity. Cross-border M&A deals also fared quite well, accounting for 46 percent of the sector's annual activity and valued at $280.3B USD.

WHAT LIES AHEAD

While there isn't a crystal ball to know for certain the outcome of an ExxonMobil/BP potential merger, or any of the other pending energy-related deals, keeping a finger on the pulse of M&A trends is essential for uncovering opportunities and determining strategic partners to ensure your company's longevity. With the volatile market, ongoing low Brent and crude prices and a vacillating geopolitical environment, the timing appears to be right for the continued clip of activity seen thus far in 2017.

STRATEGIES FOR SUCCESS

It's a massive effort to track and compile M&A-related deals insight, and its even more complex to know how to interpret and act on that knowledge. News feeds are a source of this information, however they are typically a rear-view-mirror look at deal making,

Figure 2: Top Worldwide Energy & Power M&A Deals since 1980

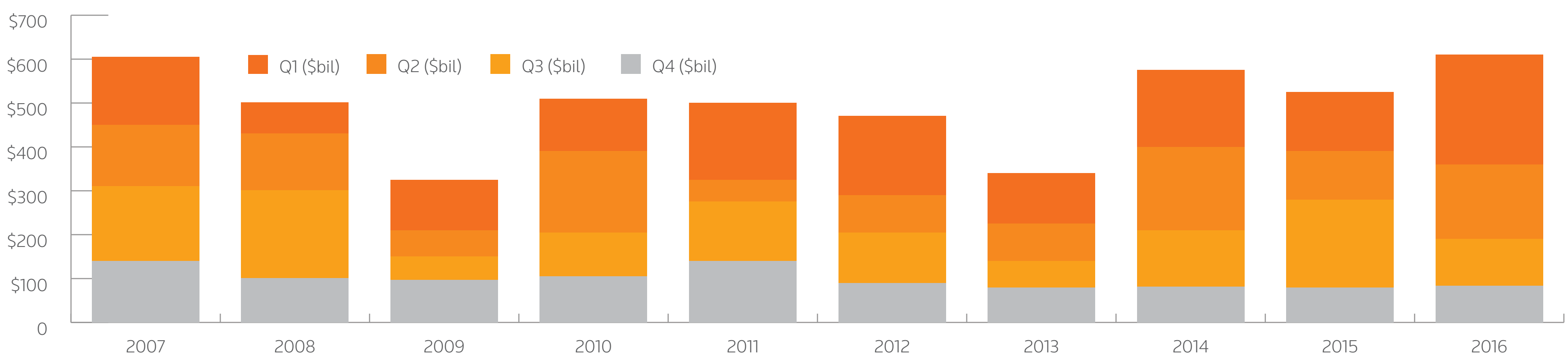
Date	Status	Target Name	Target Nation	Acquiror Name	Acquiror Nation	Value ($bil)	Target Mid Industry
10/28/04	Completed	Shell Transport & Trading Co	United Kingdom	Royal Dutch Petroleum Co	Netherlands	95.44	Oil & Gas
12/01/98	Completed	Mobil Corp	United States	Exxon Corp	United States	85.13	Oil & Gas
04/08/15	Completed	BG Group PLC	United Kingdom	Royal Dutch Petroleum Co	Netherlands	81.01	Oil & Gas
02/25/06	Completed	Suez SA	France	Gaz de France SA	France	75.24	Power
08/10/14	Completed	Kinder Morgan Energy Partners	United States	Kinder Morgan Inc	United States	58.55	Oil & Gas
07/05/99	Completed	Elf Aquitaine	France	Total Fina SA	France	55.34	Oil & Gas
08/11/98	Completed	Amoco Corp	United States	British Petroleum Co PLC	United Kingdom	52.72	Oil & Gas
11/21/16	Pending	Energy Transfer Partners LP	United States	Sunoco Logistics Partners LP	United States	51.43	Oil & Gas
02/26/07	Completed	TXU Corp	United States	TXU Corp SPV	United States	44.37	Power
10/16/00	Completed	Texaco Inc	United States	Chevron Corp	United States	43.32	Petrochemicals

Source: Thomson Reuters Deals Intelligence

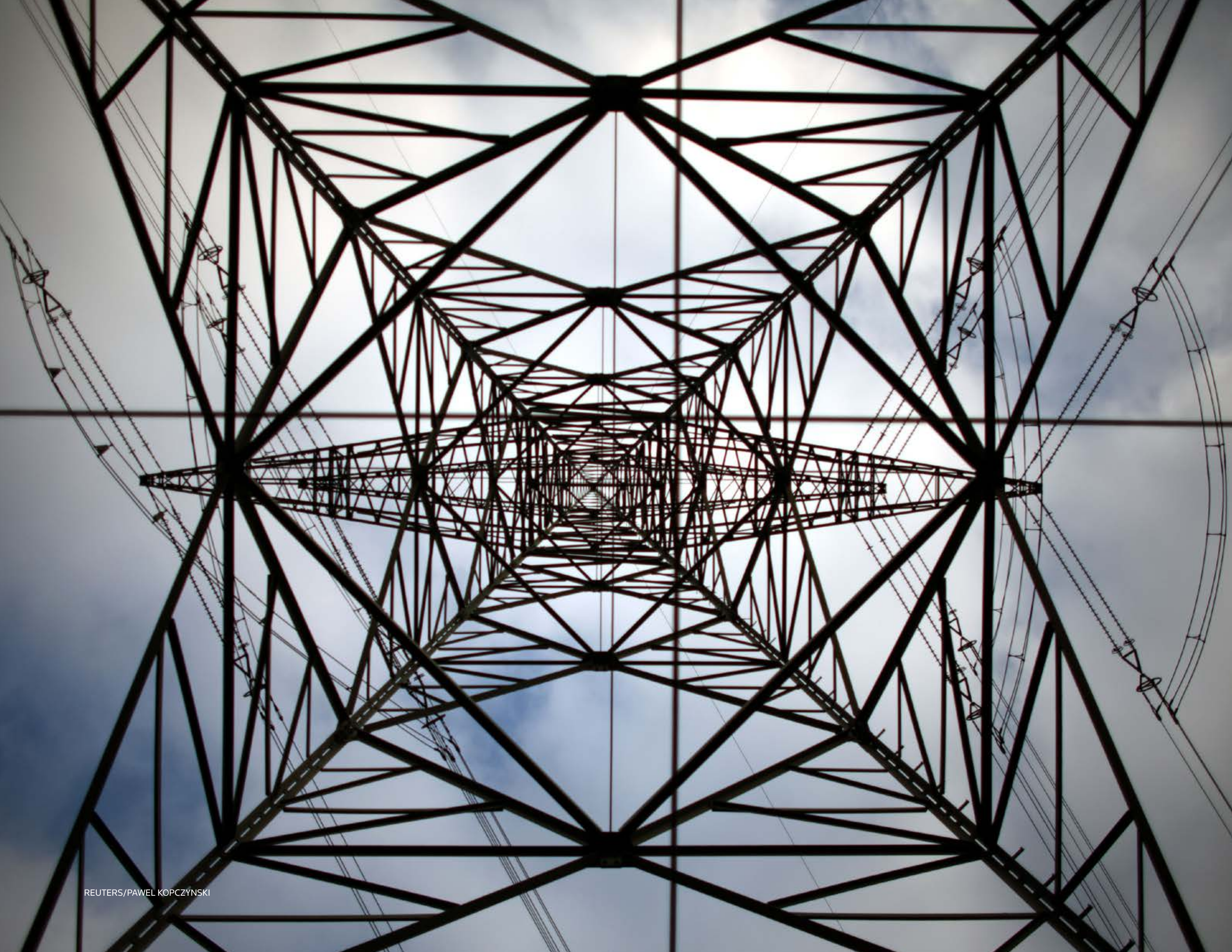
versus an opportunistic, forward-focused one. Credible deals intelligence data can and will give you both. When you arm your strategy and financial professionals with access to platforms populated with reliable deals information, you'll get a first-hand view into the current landscape and uncover opportunities for diversification that could extend the life of your organization.

Another consideration for increasing efficiencies and improving your organization's agility and nimbleness is by giving cross-functional teams access to relevant data and analysis platforms. For instance, legal needs to ensure it is expediting its research and reporting to other parts of the business in a risk-controlled fashion. When that happens, it increases the potential for productivity in departments dependent on legal information. There are different legal-management process solutions and even outsourcing options that can enable this.

Figure 3: Worldwide M&A in E&P since 2007 (by quarter)



Source: Thomson Reuters Deals Market Intelligence


REUTERS/PAWEL KOPCZYNSKI

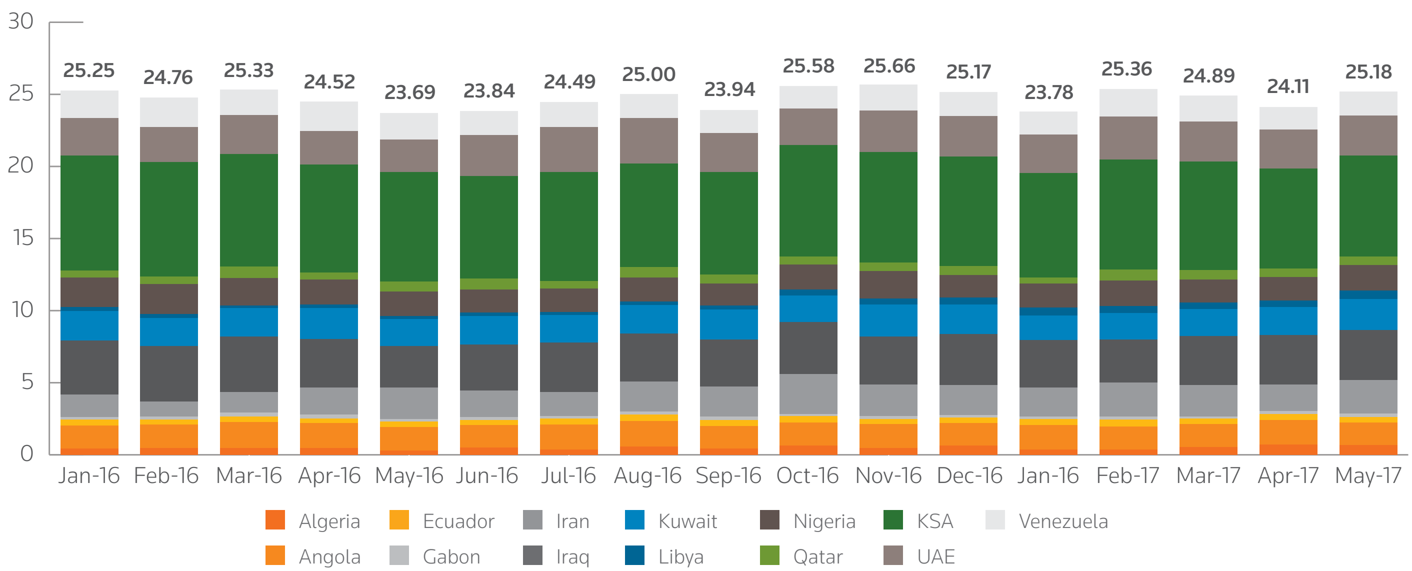
Geopolitical Uncertainty

We're in an era of unprecedented geopolitical uncertainty. The rise of populism has ushered in new administrations (some of which are pro-fossil-fuels); the future of OPEC production is in question, as demonstrated in Figure 4; and regional tensions are contributing to increased competition and global apprehension.

Early in 2017, Rex Tillerson, the prior ExxonMobil Chairman and CEO, was appointed as the U.S. Secretary of State. March brought U.K. Prime Minister Theresa May's letter to the European Union officially launching the beginning of Brexit, only to have her entire Party's future in question following the early June election. June also brought news of U.S. President Donald Trump withdrawing from the Paris Climate Accord. And, ongoing, Russian President Vladimir Putin and Mr. Trump play roulette. Juxtapose this political jockeying against a geographic backdrop including the ongoing war in the Middle East, provocative North Korean actions and increasing oil production from emerging regions, alongside reversals of regulations that were pro-environment and increases in crude oil shipments (Figure 5), and the clarity of uncertainty is apparent.

Determining the best long-term business strategy for an industry that typically deals in 15-to-20-year-time horizons on large projects can be a challenge, especially when the outcome of such geopolitical maneuvers is far from certain. Even if environmental regulations are to change and the landscape improves, the longevity of actors authoring these actions is tenuous, making it a challenge to know how to proceed.

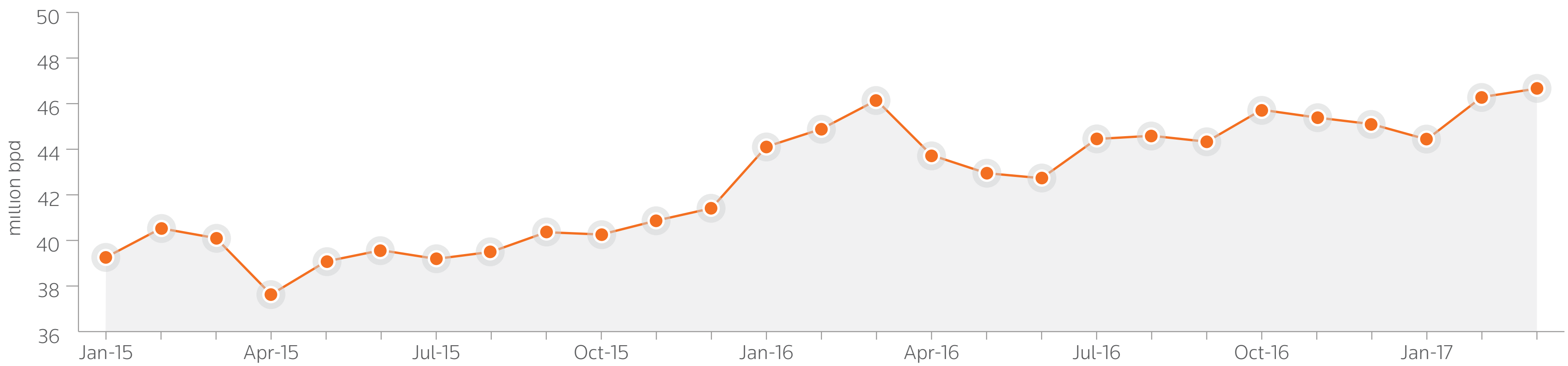
Figure 4: OPEC Crude Exports (January 2016 – May 2017)



Despite the OPEC nation's agreement to cut production in late 2016, the start of 2017 shows fairly consistent exports, putting the OPEC-nation's commitment to decreasing production in question.

Source: Thomson Reuters Oil Research

Figure 5: Global Crude Oil Shipments (2015 – 2017)



Source: Thomson Reuters Oil Research & Thomson Reuters Eikon

SUPPLIER & SUPPLY CHAIN RISK

In today's geopolitical environment and the shrinking world in which businesses operate, supply chains are oftentimes a source of overlooked risk.

Many organizations have limited visibility into the credibility and ethicality when looking beyond first-level suppliers and partners. Bribery, corruption, modern slavery and business operations with politically exposed persons can add unnecessary reputational and financial risk to your organization.

It's essential for business leaders to have a broader view of their supplier and supply chains in order to avoid lack of regulatory compliance and the pitfalls of dealing with corrupt networks.

STRATEGIES FOR BUSINESS SUCCESS

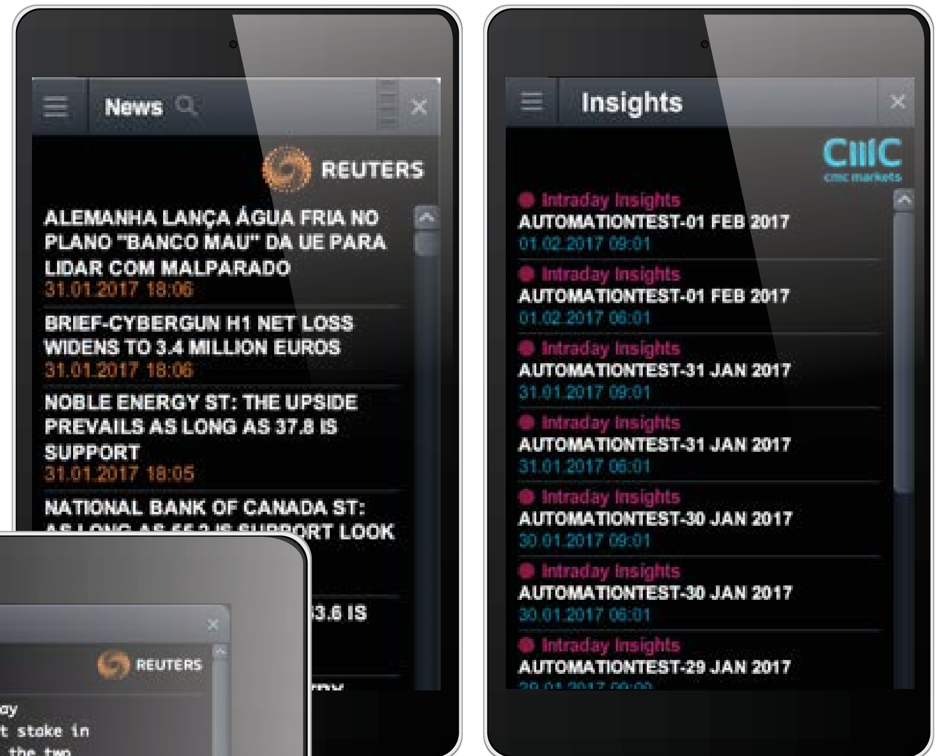
News and data feeds, such as those featuring commodity information and trusted journalism, are essential to understanding what's happening in today's business environment and how to respond, in real time and with real answers.

Feeds such as those shown in Figure 6 enable organizations to bring current-day production, flow, shipment and pricing trends in house, supplementing them with proprietary data that makes strategic hedging and decisions about longer-term profitability more certain.

"The strategy of the U.S. Fed will influence the oil market through the effect it will have on the U.S. dollar. It is broadly expected that the Fed will increase interest rates, resulting in an even stronger dollar that could have an impact on oil prices and/or oil demand, although the upside will likely be limited. The Trump administration is expected to create a generally favorable environment for U.S. oil producers, through lower taxation and reduced environmental regulations, that in hand can lead to a strong recovery in the U.S. upstream oil industry."

Shakil Begg
Head of Oil & Gas Research, Thomson Reuters

Figure 6: News & Data Feeds for Real-Time Insight



Thomson Reuters Data Feeds can be customized to the specific parameters which you want to track, as well as merged with your internal data, creating a knowledge web that is essential to professionals making strategic decisions on behalf of your company.

Source: Reuters News Data Feed

REUTERS/SERGIO MORAES

Regulatory Uncertainty

As new government regimes assume office, the regulatory atmosphere is being muddied by changes to environmental mandates seemingly in favor of traditional energy companies[7] and a wavering Paris Accord commitment. This is happening while regulations related to supply chains, knowing your customer and third-party risk also become more stringent. Complex financial, legal and tax requirements are the corporate compliance team's raison d'etre.

TAX REGULATIONS

The OECD's Base Erosion and Profit Sharing (BEPS) Action Plan and its country-by-country reporting (CbCR) mandate have added to the complexity of regulatory compliance for many energy organizations given the volume of companies conducting business across national borders. Such is now the norm, as 63 percent of the world's oil is transported over maritime routes, according to the U.S. Energy Information Administration.[8] Figure 7 shows recent vessel traffic in the Persian Gulf. A view of this one waterway depicts just how congested oceanic shipments can be, underscoring the complexity of country-by-country tax reporting.

Figure 7: Vessel Shipment Tracking

Source: Thomson Reuters Interactive Map and Thomson Reuters Eikon

7 http://www.reuters.com/article/us-usa-trump-energy-idUSKBN16Z1L6
8 https://www.eia.gov/beta/international/regions-topics.cfm?RegionTopicID=WOTC

> *"BEPS creates additional complexity under Action 8 for energy companies when it comes to developing and sharing intangibles. There is a gray area between intangibles and services that are significant to a global energy company."*
>
> Pete Roberts
> *Market Development Lead, Energy–Tax & Accounting, Thomson Reuters*

83% of respondents report **Transfer Pricing (documentation & country-by-country reporting)** as the biggest departmental change among all of the BEPS actions, **an increase of 7 percentage points over the prior year.**

In a recent Thomson Reuters survey, 83 percent of respondents listed Transfer Pricing (documentation and country-by-country reporting) as the most significant change of all BEPS Actions.[9] While the concept behind transfer pricing is clear, its manifestation can be murky, with organizations grappling to ensure they're paying adequate taxes in jurisdictions where profits are generated and providing accurate-and-transparent reporting. Case in point is Chevron's legal dispute in Australia regarding lingering transfer pricing issues from 2004 – 2008.[10]

EFFECTIVE TAX RATES

To aid in understanding jurisdictional tax requirements, the Effective Tax Rate (ETR) of an organization is used to show the average rate at which a company pays taxes globally. In energy, the ETR tends to be lower than that of other industries, and significantly lower than the 35 percent rate paid by many companies within the U.S. Figure 8 highlights the median ETR for various sectors including energy. Energy's ETR is 26.0 percentage, the third lowest of all featured. This is primarily due to the larger-than-average investment in property, plant and equipment such as oil rigs and refineries on the part of the IOCs.

The manifestation of BEPS in combination with other regulations and compliance mandates add to regulatory complexity. Energy companies must comply with current regulations according to the rules and requirements of each jurisdiction. To manage this on a multinational basis is a detailed and time-consuming process, albeit a necessary one.

FINANCIAL REGULATIONS

On the financial side of the house, the Market in Financial Instruments Directive (MiFID) II is a regulation taking effect January 3, 2018 that will directly impact companies trading energy as a financial instrument. It fundamentally extends the reach of its 2007 predecessor, MiFID, which created the regulatory framework for European financial services.

MiFID II will require significant changes to the operating models, systems, data, personnel and processes an organization uses. It ultimately seeks to ensure non-financial firms transacting commodity derivatives such as emissions allowances are properly regulated. To make this possible, MiFID II necessitates that various platforms formalize their status as a trading facility and publish market and reference data in a consistent manner.

9 https://tax.thomsonreuters.com/BEPS/survey-report-2016/
10 http://www.reuters.com/article/us-australia-chevron-taxavoidance-idUSKBN17N08V

Figure 8: Median Effective Tax Rates by Industry (2015)

Sector	Median Effective Tax Rate
Consumer Discretionary	32.3%
Consumer Staples	31.9%
Energy	26.0%
Financials	27.4%
Health Care	25.0%
Industrials	31.4%
Information Technology	23.1%
Materials	27.8%
Telecommunication Services	33.6%
Utilities	34.0%
AVERAGE	29.3%

Source: Thomson Reuters I/B/E/S

According to the Futures Industry Association (FIA.org), in order for commodities derivatives trading activities to be considered ancillary to a firm's main business (which must not be a MiFID-investment business), they must constitute a minority of activities at the group level. In addition, firms must consider the size of their trading activity compared to the size of the overall EU market's trading activity in the particular commodity derivative. In the Consultation Paper, there are two threshold tests that propose firms exceeding either will be subject to MiFID II.

Under the first test, where a firm's capital employed for its eligible activities in the European Union constitutes more than 5 percent of the capital employed for the overall activities of the global group, it will fall within scope of MiFID II. Eligible activity comprises activities listed in Article 2(1)(j) of the recast Directive. Privileged transactions (which include certain liquidity obligations, intra-group and risk-reducing transactions) will be deducted from the eligible activity. Capital employed for trading activity carried out by MiFID-authorized members of the group will not count toward the calculation. A group may establish a subsidiary in which all MiFID II activities requiring authorization are bundled.

Under the second test, a firm will be caught by MiFID II if the size of the commodity derivatives trading activity by its group in the European Union constitutes more than 0.5 percent of the overall market trading activity in the European Union in any of the eight specified commodity classes. These include: metals, oil and oil products, coal, emission allowances, gas, power, agricultural products, and other commodities (including freight and commodities under C10 of Annex I to the recast Directive). MiFID II will apply to firms that exceed the threshold in any of the commodity classes. Again, privileged transactions will be deducted from the trading activity and trading carried out by MiFID authorized members of the group will not count toward the calculation. There is a de minimis-proposed threshold of 0.25 percent. Entities whose commodity trading activity falls below this level will not have to apply the first test in order to be able to invoke the ancillary exemption.

It is anticipated that a number of IOCs and large multinational corporations with trading floors will be subject to the MiFID II requirements.

"MiFID II represents one of the most fundamental and far reaching regulations the industry is addressing. Its effect is not just in the European Union, its ripples will reach far out into the global financial industry, impacting all financial organizations that deal with the European markets."

John Mason
Head of Regulatory Content Propositions, Thomson Reuters

STRATEGIES FOR SUCCESS

Transfer pricing work has traditionally been handled regionally, however many organizations are moving to a central location, platform and process that manages all of the rules and data for the jurisdictions in which they operate. This allows energy corporate leaders to see complete transfer-pricing data in a similar format and identifies real-time policy changes, thereby helping to lower the company's risk.

To meet the financial requirements on the horizon with MiFID II, it's imperative that organizations work with MiFID-compliant partners that can help them ensure their data, systems and services are compliant.

REUTERS/DAN RIEDLHUBER

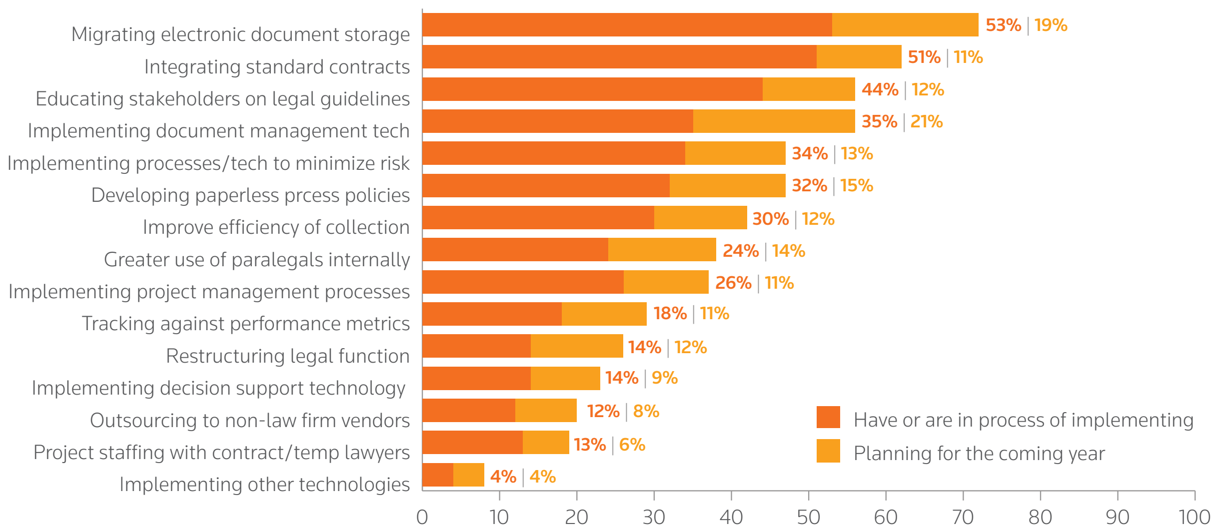
Tech Disrupters and Operating Uncertainty

The 21st century is a century of innovation and technological advancement like no other in history. Ubiquitous connectivity (the Internet of Things) coupled with regulatory changes and environmental pressures make this an era that's disrupting "business as usual," creating new norms, identifying new competitors and forever altering the notion of what constitutes power (energy) and from where it comes.

Whether it is the expansion of renewable technologies, changing dynamics of power producers and suppliers, or corporate-operation automation, the way energy companies run their businesses is evolving.

Corporate finance, legal and tax teams are being pressed to increase productivity in order to reap greater efficiencies. "Technology" is being hailed as a way to do this.

Figure 9: Areas where in-house counsel use technology for greater efficiency (2016/2017)



Source: Thomson Reuters Legal Survey

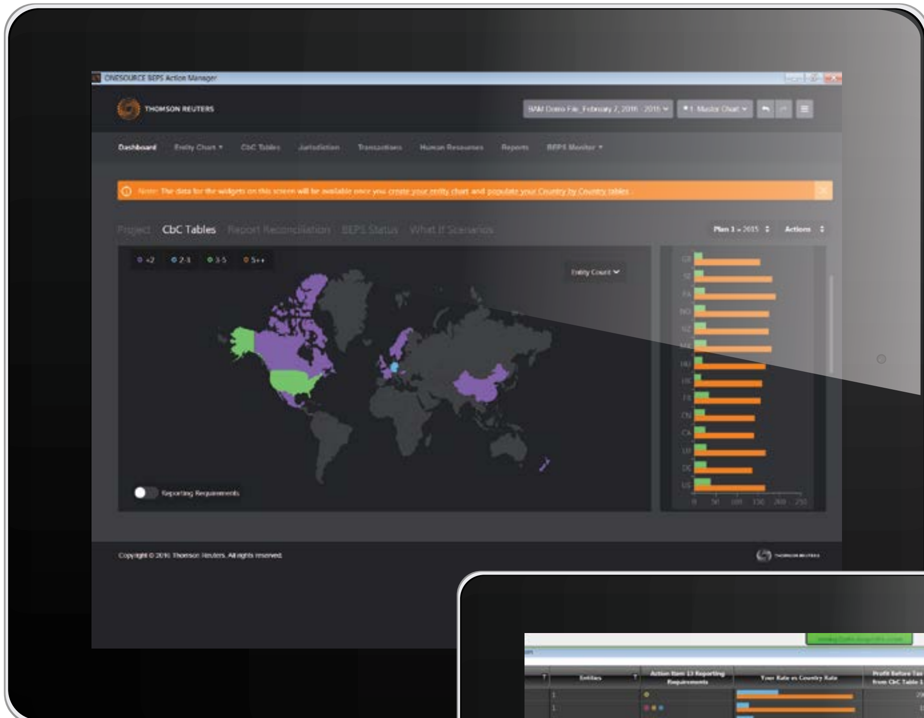
A recent Thomson Reuters survey of 450+ legal professionals found that technology plays an important role in their future operations, as shown in Figure 9. Migrating to electronic document storage; integrating standard contracts; and implementing document management technology are among the top five areas where technology is improving corporate legal department efficiencies.

Insight into the energy sector unveiled that many legal departments in energy companies are not yet collecting and analyzing their data in order to make data-driven decisions . There's an opportunity to apply a methodology to manage external counsel, capturing matter and billing information in a data pool for benchmarking to track matters internally more efficiently and manage bills from external counsel.

TECHNOLOGY IMPACTING TAX OPERATIONS

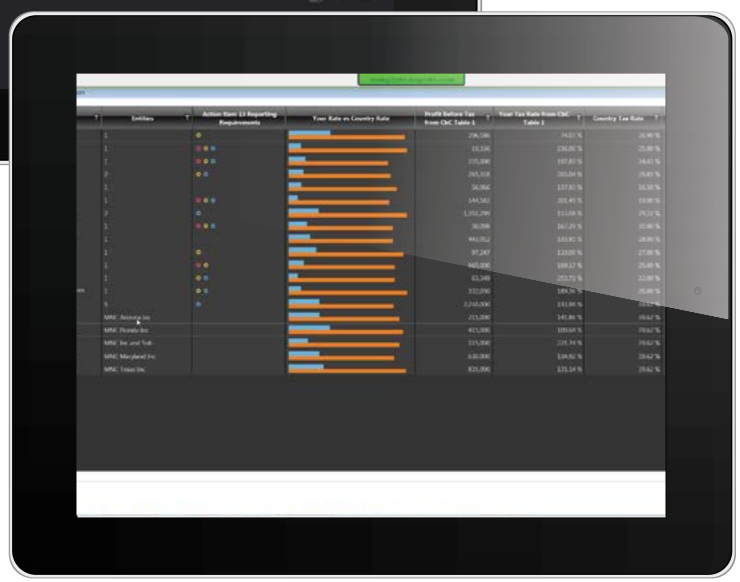
Technology is also impacting corporate regulations. Governments' use of electronic tax data is making corporate tax management more cumbersome. Government-revenue organizations are more often engaging in the real-time collection, processing and reporting of tax data, proactively informing corporations what they owe (versus the traditional paradigm where

Figure 10A: Effective Tax Rate by Jurisdiction and How the Corporation Compares



Source: Thomson Reuters ONESOURCE BEPS Action Manager

Figure 10B: Tax Rate Comparisons



Source: Thomson Reuters ONESOURCE BEPS Action Manager

organizations self-report). This makes the job of managing direct and indirect taxes, as well as cross-border transactions, more difficult. And, it's precisely why tax professionals need a view into global tax rates and how they compare to jurisdictional norms, such as is shown in Figures 10A and 10B.

STRATEGIES FOR BUSINESS SUCCESS

Pre-configured, end-to-end technology solutions are increasingly more important for improving corporate business operations and compliance. Workflow platforms that enable users to manage the full extent of their supply chains, multi-jurisdictional tax filings and global vessel shipments (among other data points) are essential to maintaining efficiencies and increasing productivity.

Another technological mainstay that's providing tangible benefit to energy CTOs is the transition to cloud-based storage solutions. The move from manual data management via large Shared Service Center teams to a hosted environment utilizing the cloud can free up large numbers of staff for other tasks, resulting in increased productivity and operational efficiency, while decreasing certain overhead expenses.

" With the legal market and energy sector both experiencing significant change, it could be said that legal departments supporting energy corporations face the perfect storm.

Legal functions focused on delivering value are making data driven decisions regarding engagements with external counsel, utilizing technology to speed up internal processes, exploring ways to offer self service solutions and seeking the right mix of in house, alternative legal service provider and external counsel support for their matters."

Christopher Jeffery
Market Development Lead, Legal

REUTERS/

ExxonMobil Chairman and CEO Darren W. Woods on The Energy Industry

Today, I want to talk about growth—not only energy and economic growth, but also growth in environmental progress.

I want to challenge the assumption made by many that a growing economy and a cleaner environment are mutually exclusive, that as we step forward in developing more oil and natural gas, our environment, including our climate, must step back.

All of us share the same aspirations—to live in a world that is clean, and safe, and prosperous. A place where our children can grow up looking forward to healthy and happy lives with higher standards of living. Affordable energy plays an important role in achieving this.

I believe the assumption that affordable energy and a cleaner environment are a zero-sum game is mistaken. It underestimates the power of technology. The zero-sum view is a static one, and the world of energy is anything but static. All things being equal, this view is understandable.

TECHNOLOGY CHANGES THE EQUATION

But technology changes the equation. It makes a dream—growing the economy while reducing emissions—a reality.

Through our research and technology organization, I have seen the transformative power of innovation. I believe in it. At ExxonMobil, we are determined to pursue it.

Take carbon capture and storage. It is a technology we have invested in—and will continue to. We currently have an interest in about one-quarter of the world's carbon capture and storage capacity.

Last year, we announced a technology partnership to research whether carbonate fuels cells can be used to more economically capture carbon dioxide at scale—enabling widespread use. . . .

PARTNERSHIPS

Many more innovations are emerging from corporate, academic and government research centers around the world. ExxonMobil alone is partnering with over 80 universities to explore new energy frontiers.

Our scientists are working with MIT, Princeton, Stanford, the University of Texas and Georgia Tech—among others—to advance fundamental research that could significantly reduce emissions and profoundly shape our energy and environmental future.

Through our work with Georgia Tech, we have pioneered a new membrane for the process of reverse osmosis that enables us to convert oil and natural gas to higher-value fuels and chemicals. If we can scale it, this breakthrough could reduce global carbon-dioxide emissions up to 45 million tons, annually. . . .

We are incorporating fuel-saving technologies into a portfolio of innovative products that enable cars and trucks to go further with less, including advanced synthetic lubricants, improved tire liners and lightweight plastic body parts. If these existing technologies and others were applied to a third of the vehicles in this country, it would avoid greenhouse gas emissions equivalent to removing eight million cars from the road. . . .

We are a leader in cogeneration—a technology that uses waste heat to generate steam and reduces the need to burn fuel and emit more. ExxonMobil's cogeneration capacity worldwide is the equivalent of the annual energy needed to power 2.5 million U.S. homes. That's a sizeable environmental savings. . . .

Reflecting on these examples, we can ask ourselves: What drives our industry to innovate?

FACTORS DRIVING INNOVATION

Governments plays a role, for sure, but a supportive one. For example, they can help by opening trade channels and implementing smart regulations.

In the area of climate regulation, policies fostering transparent, uniform carbon prices that allow market forces to drive effective solutions, minimize administrative burdens and promote global participation can be effective.

But policies in the forms of subsidies, mandates and trade barriers only hinder progress. They are more expensive and lead to poor investment decisions, focused on the limitations imposed, not true innovation.

THE COMPETITIVE DRIVE

The real drive to innovate comes from competition in a free market. It comes from all of us striving to out-perform one another to find a cleaner, cheaper, smarter way to meet society's needs.

When we win, we are rewarded in this market, and we use these rewards to invest in more technology and more growth. The only way to keep winning in a competitive market is to keep innovating.

Let me illustrate this with an example.

SHALE REVOLUTION

Here, in the United States, industry sparked a revolution —the shale revolution. We did this with a breakthrough applying hydraulic fracturing technology.

Hydraulic fracturing has opened up a whole new energy future for the United States, and potentially for many other countries. It is turning the US from energy importer to energy exporter. Today the United States is a top producer of oil and natural gas.

But this technology has done more than that. It is also incentivizing U.S. manufacturing to invest and grow.

One example—very close to home for me—is in the refining and chemicals sectors. These businesses are leveraging the shale revolution to manufacture cleaner fuels and more energy-efficient plastics. We are using new, abundant, domestic energy supplies to provide advantaged products to the world.

In this way, an upstream technology breakthrough has led to a downstream manufacturing renaissance. It has created new manufacturing jobs, investment and exports.

And, very importantly, we have managed to create these benefits while reducing the environmental impacts.

Natural gas, including the gas produced from shale, is cleaner burning than coal. The increased use of gas is decreasing emissions. The United States is now emitting fewer greenhouse gases than it has in a generation—thanks largely to fuel switching to natural gas. . . .

If we stop and think about it, we have managed, in the United States, to accomplish what was practically unthinkable only a decade ago. At the turn of the century, analysts were predicting "peak oil" and that we would soon be undersupplied. Today, we see the opposite—abundant supplies at lower emissions levels. It's a remarkable development. . . .

As we look forward, our opportunity is to grow. It is also our responsibility. The world's energy industry, is the engine of the world's economy. We help make the world work.

As populations grow, and with them dreams of a better future, it is our job to help make those dreams a reality, by continuing to produce energy, reduce emissions and deliver growth.

Source: ExxonMobil, repurposed from speech presented at CERA Week, March 2017

http://corporate.exxonmobil.com/en/company/news-and-updates/speeches/growing-the-gulf

REUTERS/SERGEI KARPUKHIN

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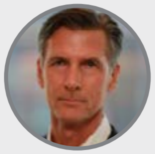

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Free trade agreements, import/export controls, transfer pricing, invoicing, customs and taxes are a significant part of the global trade management supply chain. Manage them all with confidence and clarity partner with the right technology platforms, data and expertise.

Real-Time News Management

It's imperative your team has its finger on the pulse of the latest market-moving updates in the energy sector from a trusted, reputable journalism source. News feeds enable you to keep abreast of the latest events in a reliable and efficient way.

Cover Image:

The sun sets behind the stacks at the gas plant at the state-run Sonatrach gasfileds located 1200 km (750 miles) south-east of Algiers, on Thursday February 24. The plant has a processing capacity of 48.3 million cubic metres to produce 3,860 tonnes per day of liquefied petroleum gas, 612 tonnes of condensed gas per day and 46 million cubic metres of liquefied natural gas.

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