

THOMSON REUTERS TOP 100 GLOBAL ENERGY LEADERS



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"The unique, holistic approach Thomson Reuters is taking to identify energy leadership makes a lot of sense given today's complex business environment. At Deloitte, we see how energy companies with operational excellence related to financial operations, risk-management strategies, secure and resilient supply chains, workforce health and safety mandates and responsible environmental practices are well positioned for success. Congratulations to the Thomson Reuters 2017 Top 100 Global Energy Leaders."

Mark Walsh

*National Managing Director
US Energy & Resources Industry
Deloitte Consulting LLP*





A LETTER FROM THOMSON REUTERS ENERGY PRACTICE LEAD

HARNESSING A 360° PERSPECTIVE

There once was a time when you could judge a company's strength by looking at its balance sheet. A quick scan of assets, liabilities and shareholder equity would provide a pretty good sense of where that company stood in the grand scheme of things and where it would likely stay for a long time to come.

That was then. Today, amidst a global onslaught of constant regulatory change, increased supply chain risk, volatile financial markets, rigorous environmental and sustainability mandates, a 24-hour news cycle and a break-neck pace of technological innovation, identifying the global leaders in any industry requires a true 360° view of an incredibly complex business ecosystem.

The fact is, today's business leaders and their organizations can be the victims of rash legislative pens, momentary lapses in compliance, unanticipated legal battles and disruptive technologies. Additionally, climate change is an increasing threat and energy companies will need to play a leading role in reducing emissions.

All sectors of the modern business marketplace are subject to this new normal of financial, operational, regulatory and technological uncertainty, especially energy. Having

weathered the historic financial crisis earlier this century when oil plummeted to below \$35 a barrel, energy companies are adjusting to a persistently lower priced environment and being under the microscope of investors, regulators and politicians as they seek to manage and grow their businesses.

Compounding the issue is the fact that growth in the sector also comes with exploration and expansion in new or high risk markets and the use of sometimes controversial technology. Energy competition has expanded from its traditional scope to include burgeoning entrants, like LNG and renewables, as well as dormant regional players re-joining the mix.

Asserting leadership—and maintaining it—in this type of environment is a balancing act of epic proportions.

That's why we've created the Thomson Reuters Top 100 Global Energy Leaders as both a recognition of the effort that goes into sustained growth, as well as a means of accurately measuring the component elements that determine leadership in such a complex environment.

Our patent-pending methodology is the first valuation metric of its kind based on a truly holistic view of modern-day

business realities including the obvious financial and investor metrics, but also capturing factors such as supply chain risk, pending litigation, innovation and environmental governance.

The companies that rise to the top of this list are the Renaissance Organizations that best succeed across the parameters at the intersection of regulation and commerce. They are the energy industry's decathletes. They embrace the challenge of outsizing business complexity with the acumen and agility to stay one step ahead of constant change.

We salute them.

Emily Lyons
*Managing Director
 Energy Practice Thomson Reuters*

REDEFINING GLOBAL LEADERSHIP IN THE ENERGY SECTOR

The French power giant Alstom became the poster child for the new world order of energy sector business challenges in December of 2014 when it pleaded guilty to international bribery and agreed to pay a \$772 million criminal fine, the largest fine ever levied at the time under the Foreign Corrupt Practices Act.

According to the case documents, the company paid more than \$75 million in bribes through a network of third-party sales consultants to government officials in Egypt, Indonesia, Saudi Arabia, the Bahamas and Taiwan. Today, Alstom's power division is no more. It was acquired by GE, which as part of the deal, had to agree to pay the U.S. Justice Department fines.

The Alstom story is so important because it illustrates just how quickly a major business can be undone by activities that are seemingly beyond the scope of most business evaluation metrics. It shines a light on the very real challenges of aggressive business expansion into high risk markets where the rules of engagement for winning big contracts can sometimes test the limits of increasingly vigilant global law enforcement and regulatory regimes. It also happened at the height of a financial crisis in the energy sector that would continue for two more years.

To succeed in today's energy environment, multinational companies must not only get the basics of running their businesses right—identifying the right markets, investing in the infrastructure required to grow, accurately forecasting supply and demand. They must also manage an interconnected patchwork of legal, regulatory, operational, environmental, supply chain and technological variables that each have the power to make or break the best laid plans for strategic business growth.

Managing those risks, while continuing to make the kind of bold bets that unlock growth and conquer new markets, is the modern day formula for energy sector leadership.

Who's doing that best?

To find out, Thomson Reuters has pioneered a first-of-its-kind evaluation framework that incorporates financial performance metrics, supply chain risk exposures, pending litigation, technological innovation and a track record of environmental governance to capture the real-world performance of today's energy leaders.

Our resulting list of the Thomson Reuters Top 100 Global Energy Leaders, along with snapshots of the top 25 performers across four energy subsectors, showcases the companies around the world that are delivering across a scorecard of critical business success metrics.

Thomson Reuters is uniquely suited to deliver this patent-pending valuation methodology by virtue of our perch at the crossroads of this complex business ecosystem—at the intersection of regulation and commerce. Drawing data, analysis and insights from the financial and risk, legal, tax and accounting and media markets, we've been able to develop a proprietary, objective methodology that evaluates a business' ability to successfully navigate the entire business landscape.



Managing risks, while continuing to make the kind of bold bets that unlock growth and maintain environmental responsibility, is the modern day formula for energy sector leadership.



THE METHODOLOGY BEHIND THE LEADERS

In the field of arts and entertainment, a triple-threat is someone who can sing, dance and act. Hugh Jackman, Jennifer Lopez, Fred Astaire and Ginger Rogers are prime examples. In the energy business, you need to be good at more than three things.

In this report there are eight pillars of energy company performance that capture the current scope of what's needed for success in the current business environment. The list captures a combination of fundamental business metrics, such as revenue growth, operating income, and Return on Invested Capital, along with a comprehensive group of risk metrics, identifying issues such as legal, supply chain and operational risk exposures. It also tracks patent activity as a proxy for technological innovation, news sentiment, and environmental and social factors.

Each of these pillars is evaluated in a statistical model using Bayesian logic to determine the probabilistic relationship between discrete variables and capture all integral parts of an energy company's success quotient.

The Thomson Reuters Top 100 Global Energy Leaders are the decathletes that score the highest.



FINANCIAL PERFORMANCE

How is the company performing financially?
How profitable is it?

- **Net Assets:** Total assets of the company less its total liabilities
- **Free Cash Flow/Employee:** A measure of financial performance calculated as operating cash flow minus capital expenditures; the cash a company generates after laying out money to maintain or expand its asset base (this number is normalized by the number of employees in the company)
- **Leverage:** The net debt of the company divided by EBITDA
 - Net debt is a company's total debt less cash and short term investments
 - EBITDA is earnings before interest and taxes for the fiscal year plus the same period's depreciation, supplemental, amortization of acquisition costs, supplemental and amortization of intangibles and supplemental
- **Operating Income Margin:** Represents operating income divided by total revenue
- **3-Year Revenue Growth:** 3-year historical revenue growth percentage
- **Return On Invested Capital (ROIC):** A financial measure quantifying how well a company generates cash flow relative to the capital it has invested in its business; expressed as a percentage and calculated as $ROIC = \frac{\text{Net Operating Profit} - \text{Adjusted Taxes}}{\text{Invested Capital}}$



MANAGEMENT & INVESTOR CONFIDENCE

How well run is the company? How much confidence do investors have in it?

- **CAM Sector:** Quantitative equity alpha models that observe market anomalies and human behaviors to provide investment managers with insight in creating market-beating portfolios, distilling volumes of data to a single score for more than 30,000 stocks daily
- **CCR Sector:** The current sector-level percentile rank of a company's one-year default probability distilled down to one final estimate of credit risk at the company level
- **Management Score:** A company's commitment and effectiveness toward following best practice corporate governance principles
- **Shareholders Score:** A company's effectiveness toward equal treatment of shareholders and the use of anti-takeover devices



LEGAL COMPLIANCE

How much litigation is the organization involved in?
Does the company live up to its contracts and regulatory obligations?

- **Average Litigation/Year:** Amount of litigation where the company or subsidiary is a defendant in the areas of environmental, employment, contracts/breaches, torts and negligence
- **Product Responsibility Score:** A company's capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy



INNOVATION

How innovative is the company? How much is it investing in R&D and does it protect its inventions with patent rights that are successfully granted?

- **Average Patent Grants/Year:** The number of granted patents that are issued each year
- **Patent Grant/Application Ratio:** The ratio of granted patents to patent applications
- **R&D Spend:** The amount of money a company is spending on research and development (R&D) annually
- **Environmental Innovation Score:** A company's capacity to reduce the environmental costs and burdens for its customers and create new market opportunities through environmental technologies and processes or eco-designed products



ENVIRONMENTAL IMPACT

What is the company's ability to reduce environmental impact?
What is the external impact on environmental resources?

- **Emissions Score:** A company's commitment and effectiveness at reducing environmental emission in its production and operational processes
- **Resource Use Score:** A company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management



PEOPLE & SOCIAL RESPONSIBILITY

How well does the company treat its employees? How socially responsible is it? What is its impact on the parties with whom it contracts??

- **Community Score:** A company's commitment to being a good citizen, protecting public health and respecting business ethics
- **CSR Strategy Score:** A company's practices to integrate the economic (financial), social and environmental dimensions into its day-to-day decision making
- **Human Rights Score:** A company's effectiveness toward respecting fundamental human rights conventions
- **Workforce Score:** A company's effectiveness toward job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce



REPUTATION

How well-regarded is the organization by the public? What is the overall news sentiment related to the company?

- **Overall News Sentiment:** The median "positive sentiment" and "negative sentiment" values for each company over the last year; the overall sentiment is calculated as the (positive sentiment) – (negative sentiment)
- **Controversies Score:** A company's exposure to environmental, social and governance controversies and negative events reflected in global media

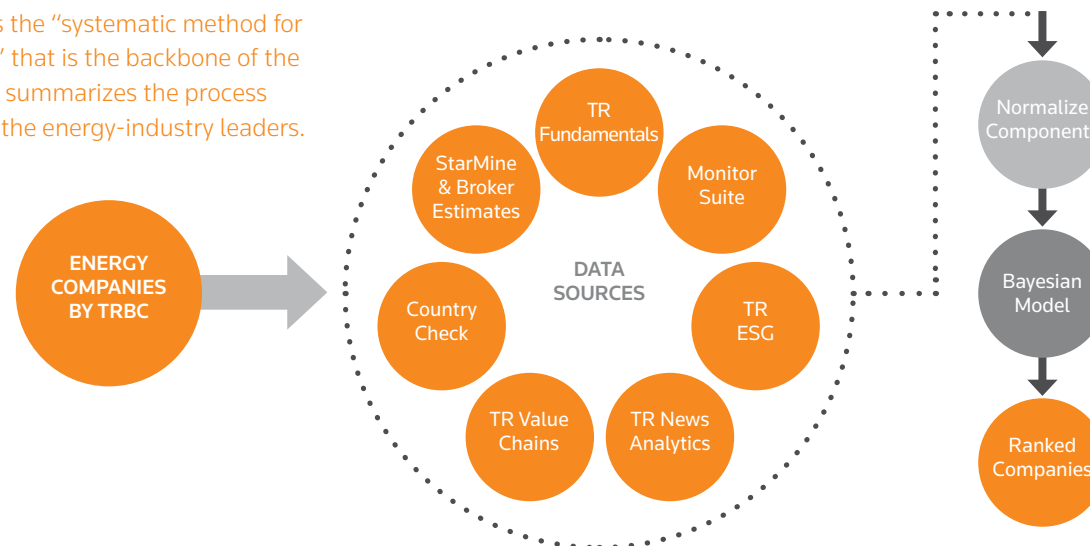


RISK & RESILIENCE

How operationally stable is the company and is it able to withstand shocks and disruptions? How many customers and suppliers does it have? In what countries is it operating?

- **Geopolitical Risk:** A company's geographical risk exposure as determined by the countries from which the company derives its revenue, and associating each fraction of that revenue with the risk index of that country
- **Number of customers:** Number of customers of the company
- **Number of suppliers:** Number of suppliers of the company
- **Supply chain risk:** The risk associated with a company's supply chain, based on the country's risk indices from which the company's suppliers derive their revenue; it attempts to quantify the risk of a company's suppliers and whether they're deriving their revenue from high-risk or low-risk countries

This diagram shows the "systematic method for ranking companies" that is the backbone of the program and which summarizes the process followed to identify the energy-industry leaders.



Source: Thomson Reuters Innovation Lab
TRBC = Thomson Reuters Business Classification Codes

“Energy leadership today, and energy leadership in the decade ahead, will look distinctly different. The latest environmental reports show that we, as a planet, are falling further behind as a global economy in meeting the climate change goals set forth at COP21. It is critically important that all organizations, in energy and every other sector, understand the risks to the global economy if there is not a systemic change in emissions.

There are some companies that have implemented strategic approaches to sustainability and are making significant strides in emission reductions, while also maintaining or improving their financial returns. The two are not mutually exclusive. In fact, our research indicates that companies that embrace sustainability are not only contributing to greenhouse-gas-emission goals, but are also creating the infrastructure for near and long-term economic growth. I invite you to review our latest report, Global 250 Greenhouse Gas Emitters: A New Business Logic, to better understand how Sustainability strategies can add value to your organizations as well as to the environment.”

Tim Nixon

*Head of Sustainability Thought Leadership,
Thomson Reuters*



MAKING THE LIST

In today's complex business environment, success and leadership require much more than just financial performance. Not only does an organization need to generate enough revenue to demonstrate its strength, it also needs to instill a sense of confidence in its investors, protect itself against supply chain and supplier risk, contend with the persistent threat of litigation, continue to innovate, maintain a positive image in the marketplace, and embody the core values associated with environmental, social and governance responsibility.

It is this unique combination of factors that determines 21st century leadership. Just as a holistic investment strategy evaluates a portfolio based on the relationship between its various components, the formula for leadership in today's marketplace requires a holistic view of the entire organization.

That is why we've developed this proprietary, new Top 100 Global Energy Leaders methodology, to evaluate corporate performance against the multitude of real-world variables that confront businesses of this scale.

GETTING TO THE TOP 100

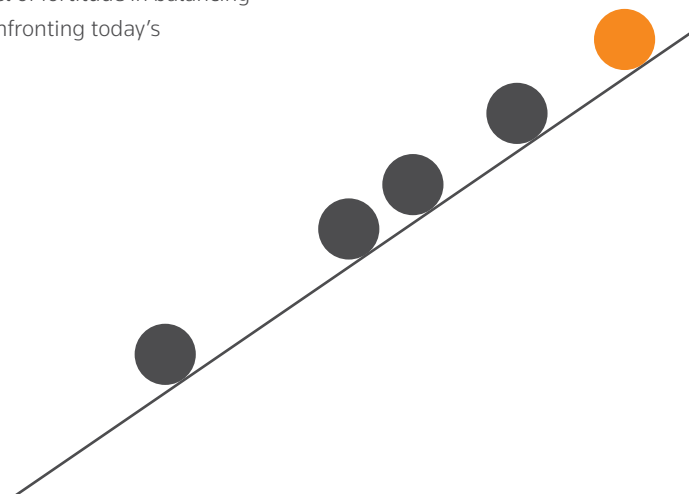
The total universe of energy companies evaluated in the Top 100 Global Energy Leaders program comprises organizations with U.S. \$500 million in annual revenues operating in the Oil & Gas, Oil & Gas Related Equipment and Services, Multiline Utilities, Renewable Energy, and Uranium subsectors.

The top 100 overall performers represent those companies from these subsectors with the highest overall scores across our scorecard of eight pillars as explained on pages 7 and 8. Much like athletes in a decathlon, who must perform consistently across a wide variety of events, the companies selected for the top 100 list exemplify leadership given the holistic approach that addresses the business challenges of the modern world. They are the performers who attain the highest cumulative score across all of the events, being the best at some but not necessarily all.

In addition to the top 100 overall performers, we also selected the top 25 performers from the industry subsectors of Oil & Gas, Oil & Gas Related Equipment and Services, Multiline Utilities and Renewable Energy.

By expanding our analysis deeper into each subsector, we spotlight smaller companies which, while they may not have the scale of many of the energy giants that dominate the top 100 universe overall, do represent a highly sophisticated approach to managing complexity. This phenomenon is most pronounced in the Renewables subsector, which is made up of smaller and younger companies than those in the Oil & Gas sector, yet are the rising stars in their respective areas and demonstrate a remarkable level of fortitude in balancing oftentimes conflicting demands confronting today's energy businesses.

Without further ado, we present the lists, the Thomson Reuters 2017 Top 100 Global Energy Leaders and the Thomson Reuters Top 25 Oil & Gas, Oil & Gas Related Equipment and Services, Multiline Utilities and Renewable Energy Sector Honorees.



INTRODUCING THE THOMSON REUTERS 2017 TOP 100 ENERGY LEADERS

Organization	Industry	Country/Region
Acea SpA	Multiline Utilities	Italy
Aker Solutions	Oil & Gas Related Equipment and Services	Norway
Amec Foster Wheeler	Oil & Gas Related Equipment and Services	United Kingdom
Andeavor	Oil & Gas	United States of America
Anadarko	Oil & Gas	United States of America
Avangrid	Multiline Utilities	United States of America
Bharat Petroleum	Oil & Gas	India
BP	Oil & Gas	United Kingdom
Cairn India	Oil & Gas	India
Cameco	Uranium	Canada
Canadian Natural Resources	Oil & Gas	Canada
Chevron Corporation	Oil & Gas	United States of America
China Petroleum & Chemical (SINOPEC)	Oil & Gas	China
CMS Energy	Multiline Utilities	United States of America
CNOOC Limited	Oil & Gas	China
ConocoPhillips	Oil & Gas	United States of America
DCC	Oil & Gas	Ireland; Republic of
E.ON SE	Multiline Utilities	Germany
Ecopetrol	Oil & Gas	Colombia
Électricité de France	Multiline Utilities	France
Enagás	Oil & Gas Related Equipment and Services	Spain
Enbridge Inc.	Oil & Gas Related Equipment and Services	Canada
Encana	Oil & Gas	Canada
Engie	Multiline Utilities	France
Eni	Oil & Gas	Italy
ExxonMobil	Oil & Gas	United States of America
Fairmount Santrol	Oil & Gas Related Equipment and Services	United States of America
First Solar	Renewable Energy	United States of America
Formosa Petrochemical Corporation	Oil & Gas	Taiwan
Galp Energia	Oil & Gas	Portugal
Gazprom	Oil & Gas	Russia
Global Pwq SE i l	Renewable Energy	Germany
Grupa Lotos	Oil & Gas	Poland

THOMSON REUTERS 2017 TOP 100 ENERGY LEADERS

Organization	Industry	Country/Region
Halliburton Company	Oil & Gas Related Equipment and Services	United States of America
Hellenic Petroleum	Oil & Gas	Greece
Hera	Multiline Utilities	Italy
Hess Corporation	Oil & Gas	United States of America
Hindustan Petroleum Corporation	Oil & Gas	India
Idemitsu Kosan Co., Ltd.	Oil & Gas	Japan
Indian Oil Corporation	Oil & Gas	India
Inpex Corporation	Oil & Gas	Japan
IRPC	Oil & Gas	Thailand
JXTG Holdings	Oil & Gas	Japan
Mangalore Refinery and Petrochemicals Ltd.	Oil & Gas	India
Marathon Oil Corporation	Oil & Gas	United States of America
Marathon Petroleum Corporation	Oil & Gas	United States of America
MOL	Oil & Gas	Hungary
Motor Oil Hellas	Oil & Gas	Greece
National Grid	Multiline Utilities	United Kingdom
Neste Oyj	Oil & Gas	Finland
NiSource	Multiline Utilities	United States of America
Lukoil	Oil & Gas	Russia
Occidental Petroleum Corporation	Oil & Gas	United States of America
Oil and Natural Gas Corporation	Oil & Gas	India
Oil Refineries Ltd.	Oil & Gas	Israel
OMV AG	Oil & Gas	Austria
Ørsted	Multiline Utilities	Denmark
Pennon Group	Multiline Utilities	United Kingdom
PetroChina Co., Ltd.	Oil & Gas	China
Petrofac	Oil & Gas Related Equipment and Services	Jersey
Petronas	Oil & Gas	Malaysia
Phillips 66	Oil & Gas	United States of America
PKN ORLEN	Oil & Gas	Poland
PTTEP	Oil & Gas	Thailand
PTT Public Company Limited	Oil & Gas	Thailand
Reliance Industries	Oil & Gas	India
Repsol	Oil & Gas	Spain

Organization	Industry	Country/Region
Rosneft	Oil & Gas	Russia
Royal Dutch Shell	Oil & Gas	Netherlands
Rubis	Oil & Gas	France
RWE	Multiline Utilities	Germany
Saipem	Oil & Gas Related Equipment and Services	Italy
Santos	Oil & Gas	Australia
Saras	Oil & Gas	Italy
Sasol	Oil & Gas	South Africa
Saudi Basic Industries Corporation (SABIC)	Oil & Gas	Saudi Arabia
Schlumberger	Oil & Gas Related Equipment and Services	United States of America
Scorpio Tankers Inc.	Oil & Gas Related Equipment and Services	Monaco
Sempra Energy	Multiline Utilities	United States of America
Showa Shell Sekiyu K.K.	Oil & Gas	Japan
Siemens Gamesa Renewable Energy	Renewable Energy	Spain
SK Innovation Co., Ltd.	Oil & Gas	Korea; Republic (S. Korea)
Snam	Oil & Gas Related Equipment and Services	Italy
S-Oil	Oil & Gas	Korea; Republic (S. Korea)
Statoil	Oil & Gas	Norway
Suncor Energy	Oil & Gas	Canada
SunPower	Renewable Energy	United States of America
Técnicas Reunidas	Oil & Gas Related Equipment and Services	Spain
Tenaris SA	Oil & Gas Related Equipment and Services	Luxembourg
ThaiOil	Oil & Gas	Thailand
Total	Oil & Gas	France
TransCanada	Oil & Gas Related Equipment and Services	Canada
Tullow Oil	Oil & Gas	United Kingdom
Tüpraş	Oil & Gas	Turkey
Ultrapar Participações S.A.	Oil & Gas	Brazil
Vallourec	Oil & Gas Related Equipment and Services	France
Vestas	Renewable Energy	Denmark
Weatherford International	Oil & Gas Related Equipment and Services	Switzerland
Woodside Petroleum	Oil & Gas	Australia
WorleyParsons	Oil & Gas Related Equipment and Services	Australia



THE FOUR SUB-SECTOR LISTS

OIL & GAS

ORGANIZATION	COUNTRY/REGION
Bharat Petroleum	India
BP	United Kingdom
Chevron Corporation	United States of America
ConocoPhillips	United States of America
Eni	Italy
ExxonMobil	United States of America
Gazprom	Russia
Hess Corporation	United States of America
Indian Oil Corporation	India
Inpex Corporation	Japan
MOL	Hungary
Lukoil	Russia
PetroChina Co., Ltd.	China
PKN ORLEN	Poland
PTT Public Company Limited	Thailand
Reliance Industries	India
Repsol	Spain
Royal Dutch Shell	Netherlands
Saudi Basic Industries Corporation (SABIC)	Saudi Arabia
SK Innovation Co., Ltd.	Korea; Republic (S. Korea)
S-Oil	Korea; Republic (S. Korea)
Statoil	Norway
Suncor Energy	Canada
ThaiOil	Thailand
Total	France

OIL & GAS RELATED EQUIPMENT AND SERVICES

ORGANIZATION	COUNTRY/REGION
Akastor ASA	Norway
Aker Solutions	Norway
Amec Foster Wheeler	United Kingdom
Boart Longyear	United States of America
CGG	France
China Oilfield Services Ltd.	China
Enagás	Spain
Enbridge Inc.	Canada
Fairmount Santrol	United States of America
Halliburton Company	United States of America
Wood Group	United Kingdom
National Oilwell Varco (NOV)	United States of America
Petrofac	Jersey
Petroleum Geo Services	Norway
Saipem	Italy
SBM Offshore	Netherlands
Schlumberger	United States of America
Scorpio Tankers Inc.	Monaco
Snam	Italy
Técnicas Reunidas	Spain
Tenaris	Luxembourg
TransCanada	Canada
Vallourec	France
Weatherford International	Ireland; Republic of
WorleyParsons	Australia

MULTILINE UTILITIES

ORGANIZATION	COUNTRY/REGION
Acea SpA	Italy
Ameren	United States of America
Avangrid	United States of America
Avista	United States of America
Centrica	United Kingdom
CMS Energy	United States of America
E.ON SE	Germany
Électricité de France	France
Energijos Skirstymo Operatorius AB	Lithuania
Engie	France
EVN	Austria
Hera	Italy
Iren	Italy
MDU Resources Group, Inc.	United States of America
MVV Energie	Germany
National Grid	United Kingdom
NiSource	United States of America
Ørsted	Denmark
Pennon Group	United Kingdom
PPL	United States of America
RWE	Germany
Sempra Energy	United States of America
Shenergy Co., Ltd.	China
Tianjin Development Holdings Ltd.	Hong Kong
YTL Corporation Berhad	Malaysia

RENEWABLE ENERGY

ORGANIZATION	COUNTRY/REGION
Canadian Solar Inc.	Canada
CropEnergies	Germany
First Solar	United States of America
GCL-Poly Energy Holdings Ltd.	Hong Kong
Global Pvc SE i I	Germany
Green Plains Inc.	United States of America
Guodian Technology & Environment Group Corp Ltd.	China
Hanergy Thin Film Power Group Ltd.	Hong Kong
Inox Wind	India
Jiangsu Akcome Science & Technology Co., Ltd.	China
Motech Industries Inc.	Taiwan
Pacific Ethanol	United States of America
Renewable Energy Group Inc.	United States of America
Risen Energy Co., Ltd.	China
Shanghai Aerospace Automobile Electromechanical Co., Ltd.	China
Siemens Gamesa Renewable Energy	Spain
SolarWorld Industries	Germany
SunEdison	United States of America
Sungrow	China
SunPower Corp	United States of America
Suzlon Energy Ltd.	India
TPI Composites	United States of America
VERBIO Vereinigte BioEnergie	Germany
Vestas	Denmark
Xiangtan Electric Manufacturing Co., Ltd.	China



WHAT IT TAKES TO BE THE BEST

One fact that's impossible to ignore when looking at the Thomson Reuters Top 100 Global Energy Leaders is that it's good to have resources. Many of the companies on the list are among the largest organizations on the planet, let alone in the energy sector.

This size and scale give them tremendous advantage when it comes to the financial metrics in the methodology. They also make it much more likely for them to create a solid infrastructure with regard to the people and social factors.

But size alone is not the magic bullet for success. Interestingly, the largest companies in the analysis also had a higher likelihood of litigation, negative press and exposure to geopolitical risks given their footprint in the marketplace.

Ultimately, what the Top 100 Global Energy Leaders is proving is that it is possible to balance the financial demands of an incredibly challenging marketplace with the regulatory, risk, legal, social and environmental needs of a fragile world that increasingly finds itself at the intersection of regulation and commerce. And, that those organizations that succeed across these parameters are today's industry leaders.

KEY DIFFERENTIATORS

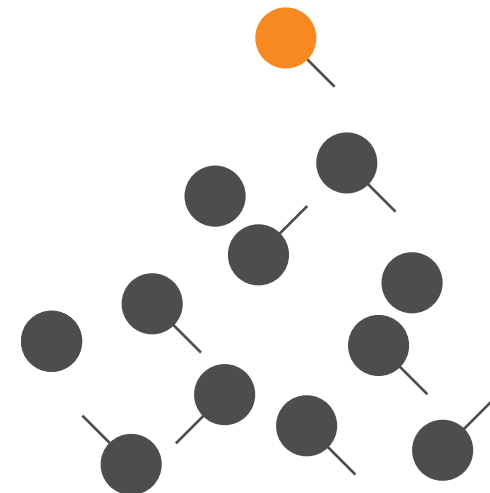
What does it take to be the best of the best? The methodology favors companies that perform consistently across a number of metrics, the decathletes, as opposed to more volatile companies that may have outsized financial results at the expense of outsized risk. There are a few key areas where the Top 100 Global Energy Leaders stand out from the pack—the areas of leadership they share in common.

In the People & Social Responsibility category, for example, which is measured by tracking each company's commitment to maintaining a healthy and safe workplace, cultivating diversity and equal opportunities, and the capacity to exclude child, forced or compulsory labor from its workforce, it's clear that companies in the top 100 performed significantly better in the Workforce and Human Rights scores than peer group companies that did not make the list—30 percent better in fact.

Likewise, the Top 100 Global Energy Leaders outperform their peers across half of the Risk & Resilience parameters, including the concentration of risk exposure within supplier

networks and in customer bases. Meaning, those with the largest, most geographically diverse supplier and customer networks are also much less susceptible to disruption from external influencers. They are better insulated from regional turmoil and have alternatives to ensure continuity in their manufacturing and sales operations. This type of operational risk exposure for the Top 100 was 20 percent less than it was for peer-group companies not on the leader's list.

The top companies in the study also showed stronger performance related to the Resource Use Score, which capture a company's capacity to reduce the use of natural resources, such as water, in the energy production process. In fact, they were 26 percent better than those not on the list.



HEADWINDS FOR THE TOP 100

While the Top 100 Global Energy Leaders methodology favors companies that perform best across the largest number of criteria at the intersection of regulation and commerce, there are some specific areas where the top companies in the study under-performed their peers. Specifically, they perform worse in the category of Perception: 25 percent more poorly when it comes to their Controversy Scores and 20 percent worse in Overall News Sentiment. They also tend to be involved with a higher number of active legal cases.

Additionally, climate change represents a unique and growing risk for the top 100. For those able to decarbonize, their business model opportunity will grow. Increased compliance with reporting requirements will differentiate those that remain in the top 100, as seen in the case study featuring Total S.A. on page 21.

Ironically, many of the same attributes that help these companies succeed operationally—factors such as outsized earnings growth, large numbers of customers, large numbers of suppliers, successful investments, and active R&D, among others—also expose them to a larger-than-average share of public scrutiny and controversy. The fact that the Top 100 can outshine their rivals despite sometimes being a lightning rod for controversy speaks to the strength they demonstrate in other facets of the study.

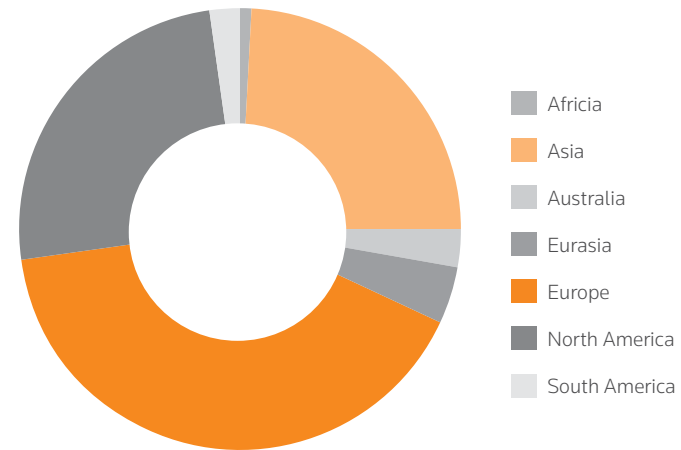
GEOGRAPHIC DISTRIBUTION

On a geographic basis, the Top 100 Global Energy Leaders are primarily located in Europe (41), North America (26), and Asia (25). Europe’s 41 energy leaders come from 19 different European nations, with Italy contributing the most at six, followed by five each from France and the United Kingdom. Three percent hail from Australia, while South America and Eurasia each contribute 2 companies to the list and one company is based in Africa, as shown in Figure 1.

SECTOR PERFORMANCE

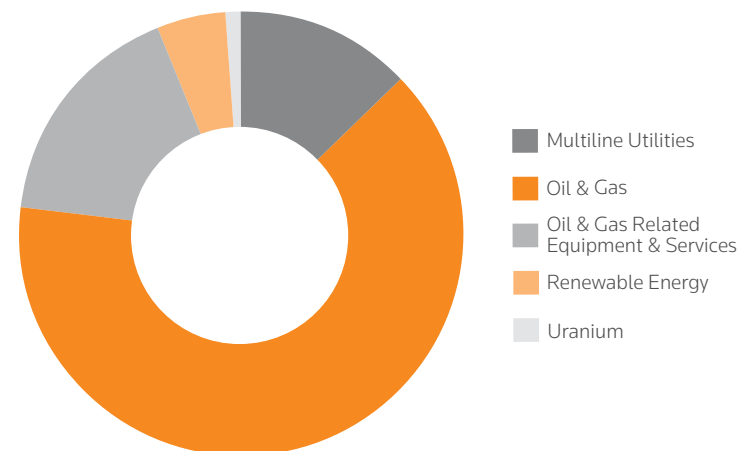
At the sector level, a majority (63) of the Top 100 Global Energy Leaders hail from the Oil & Gas field, reflecting the maturity of that area. Oil & Gas Related Equipment and Services ranks second, with 18 companies on the list, followed by Multiline Utilities (13), Renewable Energy (5), and Uranium (1), as shown in Figure 2.

Figure 1: Geographic Breakout of the Top 100 by Continent



Source: Thomson Reuters Data & Analysis

Figure 2: Sector Representation of the Top 100



Source: Thomson Reuters Data & Analysis

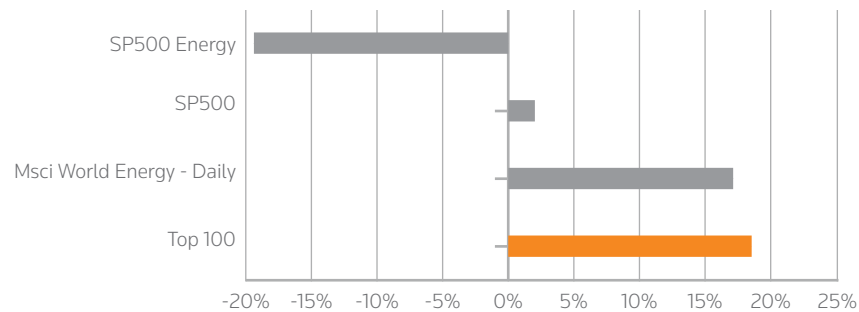
OUTPERFORMANCE METRICS

The Thomson Reuters Top 100 Global Energy Leaders outperform a number of major world indices on several fronts. This appears to be due to efficiency in their business operations as well as them being more resilient to stock price changes despite the low-priced oil environment.

COMPARISONS

The energy leaders perform better than the S&P 500, S&P 500 Energy and MSCI World Energy – Daily Indices in year-over-year gross profit by 16.52 percent, 37.93 percent and 1.41 percent, respectively, as shown in Figure 4.

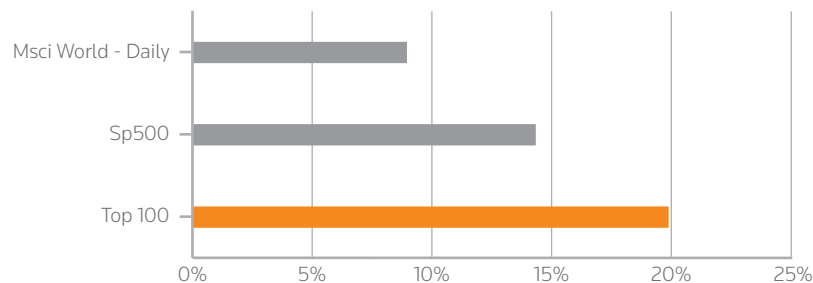
Figure 4: Gross Profit Year-over-Year Percent Change (2016 vs. 2015)



Source: Thomson Reuters Deals Intelligence Data & Analysis

They also outperform the MSCI World-Daily and S&P 500 indices in annual stock-price change by 10.93 percent and 5.55 percent, respectively, as shown in Figure 5. In addition, the Top 100 leaders also had less change in their stock prices changes than other energy companies, making them less susceptible to volatile market movements.

Figure 5: Year-over-Year Stock Price Change (2016 vs. 2015)



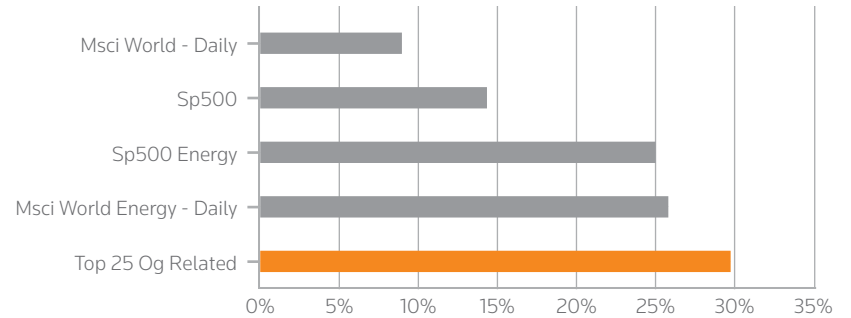
Source: Thomson Reuters Deals Intelligence Data & Analysis



SUBSECTOR ANALYSIS

There are outperformance measures in the subsectors as well. For instance, the Oil & Gas Related Equipment and Services group outperformed all major indices in year-over-year stock price change, as shown in Figure 6, with the most significant change being against the MSCI World-Daily with a more than 20 percent difference.

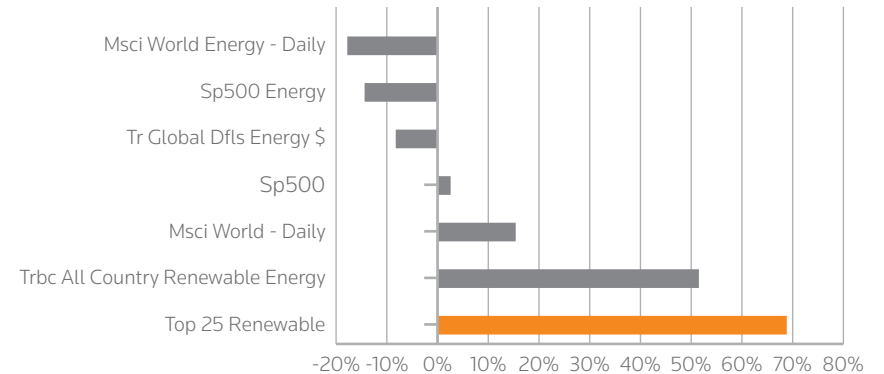
Figure 6: Year-over-Year Oil & Gas Related Equipment Services Stock Price Percent Change (2016 vs. 2015)



Source: Thomson Reuters Deals Intelligence Data & Analysis

The Renewables subsector is the one with the greatest investment in R&D, as shown in Figure 7, as well as employee growth and year-over-year revenue change.

Figure 7: Year-over-Year Renewable Energy R&D Investment Percent Change (2016 vs. 2015)



Source: Thomson Reuters Deals Intelligence Data & Analysis

These outperformance measures help validate the methodology and approach Thomson Reuters has taken to assess energy leadership. While the immediate intention is not to create an investment index, it is of value to see how the Top 100 Global Energy Leaders compare to these other indices.

THE ENERGY ELITE — A CASE STUDY

Thomson Reuters works daily with corporate executives, government officials and the scientific community to build awareness for the importance of sustainability in today's business environment and the growing benefits of building sustainability into business models.

While Environmental Impact is one of the eight pillars of the Top 100 Global Energy Leaders methodology, the companies on the list demonstrate varying levels of success related to it and sustainability.

To highlight climate and sustainability leadership for carbon-intensive businesses, Thomson Reuters has a separate initiative, its annual Greenhouse Gas (GHG) Global 250 report, showcasing the growing business case for integrating sustainability into the organization. It identifies companies across the spectrum of carbon reduction and which demonstrate leadership on sustainability and the environment. These include some of the companies on the Top 100 Global Energy Leaders list as well as some of the largest and most carbon-intensive organizations globally. One such example is Total Group, which is profiled here in an excerpt from the Thomson Reuters GHG Global 250 report.

THE BACKGROUND

Non-state actors, especially in the private sector, will play a critical role in addressing climate change and reducing GHG emissions as we proceed through the coming decades. Indeed, the 250 companies¹ referenced in the Global 250 report, along with their value chains, account for approximately one third of global annual emissions.² For years, management in many large organizations has recognized the future constraints that climate change could

pose on their business operations and outlook. While many have deferred making a strategic shift toward a low-carbon future, others have recognized a new business logic: the historic opportunity for innovation that drives sustainable growth and competitive advantage.

The good news is that some companies in the Global 250, such as Total, Ingersoll Rand, Toyota, Iberdrola and Xcel Energy, are diversifying and decarbonizing their business models. Their plans, started over a decade ago, have produced positive business results and provide a pathway to a profitable low-carbon future that stretches to 2050 and beyond. Looking at the Global 250, evidence is accumulating that companies that demonstrate leadership toward a decarbonized economy gain strategic advantages.

CASE STUDY OF TOTAL GROUP³

France's Total S.A. (Total)⁴ is the fourth largest publicly held oil and gas company in the world. The firm is responsible for GHG emissions that place it on the list of major emitters. Yet, Total is also widely recognized as a leader among major fossil fuel companies for its vision of a new clean energy future and its progress on adapting a large, complex business for that future.

Understanding the complex process of strategy-driven business transformation requires a framework to connect actions to outcomes over the long-term. The model presented in the GHG Global 250 was adapted from previous work (Lubin & Esty, *The Sustainability Imperative*, HBR, 2010) to assess a firm's progress in transitioning along a "climate impact management maturity curve." Total's climate-related efforts can be traced back 20 years or more, with its initial recognition of the challenges that climate change poses for a major energy company and the need to address them.

¹ Thomson Reuters and CDP have collaborated on this report to bring together the latest data from companies that do report emissions and the latest estimates for those which do not or incompletely report emissions. The finance sector was excluded, as there are insufficient estimates on its Scope 3 emissions.

² This is measured against total anthropogenic emissions, including land use of approximately 52 Gigatons CO₂e. This number includes direct, indirect and value chain emissions (scopes 1, 2 and 3) adjusted for a double counting of 60%.

³ Note this is an abridged version of case study as it appears in the full Global 250 report.

⁴ Of the examples of emerging leadership in this report, Total Group represents an underlying thesis that even the most carbon intensive firms have the opportunity for transformative business model change.



Stage 1: Initial Engagement – In 2006, Total was one of the first major fossil fuel companies to publicly acknowledge the importance of climate change as a global risk. Its initial efforts focused on implementing cost-effective approaches to significantly reduce flaring gas emissions.

Stage 2: Systematic Management – By 2008, Total led other major oil companies in systematic reporting of GHG and climate-related performance metrics, including product use, and included initial target setting for improvements in the company’s operational footprint.

Stage 3: Transforming the Core – In 2009, Total launched EcoSolutions, its low-carbon products and services portfolio. With a series of investments, including SunPower (solar), Saft (battery design), Stem (energy optimization) and BHC Energy (operational energy efficiency), Total committed to shifting its revenue base toward sustainable energy solutions.

Approaching Stage 4: Creating Competitive Differentiation – In 2014, under the leadership of Patrick Pouyane, Total’s Chairman and CEO, the company fully articulated its strategy to differentiate itself from other oil companies. Going forward, Total is building its future business on three strategic pillars:

1. Reducing the carbon intensity of its fossil fuel product mix;
2. Investing judiciously in carbon capture, utilization and storage technologies; and
3. Expanding its business base in “renewables,” which includes production, storage and the distribution of clean energy and biofuels.

In 2015, Total exited the coal business. Total’s 2016 reorganization now has a strong focus on renewables and low-carbon energy solutions, setting policy support and goals aligned with the IPCC’s 2°C target.

If Total is to realize the full potential of its competitive advantage in the energy sector, it will need to continue to

demonstrate viable decarbonization pathways consistent with the 2-degree boundary. This will require continued rapid growth of its EcoSolutions portfolio revenues and leadership among the oil companies as they address the potential challenge of stranded assets, oil reserves that could go unutilized, or be “stranded” due to the evolving strategic climate landscape.

Reduced GHG Impacts

Total has reduced emissions over the last three years well ahead of IPCC guidance, with an approximate 20 percent aggregate decline (or roughly 130 million tonnes) in total GHG emissions across all scopes.⁶ And while emissions declined, Total’s carbon intensity saw a 9.2 percent average annual rate of decline in GHG / BOE (greenhouse gas emissions/barrel of oil equivalent), between 2013 and 2016, or a cumulative decline of 27.5 percent from the baseline year of 2013.⁷ Both aggregate emissions and the GHG intensity of its footprint are falling significantly.

Financial Outcomes: Reduced Cost of Capital

Figure 3 provides evidence that Total’s strategy, along with its ability to execute it, is already generating value for the firm. The Thomson Reuters Eikon platform displays Total’s

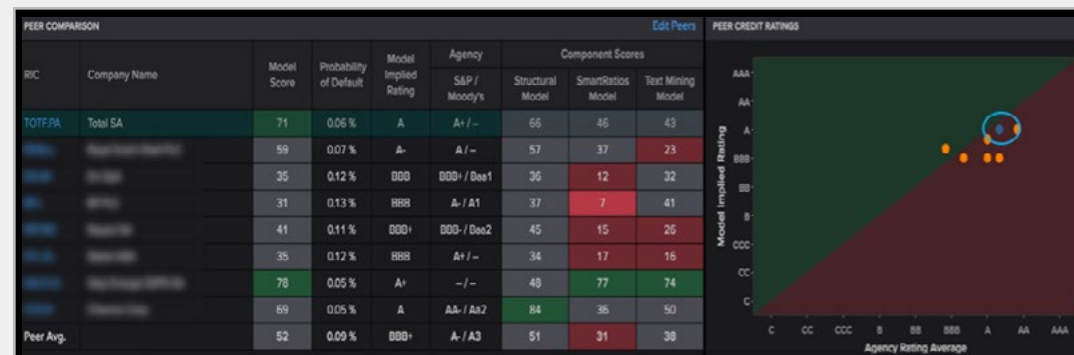
peer-leading credit rating, represented by the blue dot in the peer-scatterplot. This is a significant advantage in the capital-intensive energy sector. As Total continues to extend its climate impact with more renewable and low-carbon solutions, the increasing value of its transformed green product portfolio is likely to significantly outpace the potential declining value of its traditional high-carbon products.

View the full GHG Global 250 Report, A New Business Logic, for answers to questions about how a changing climate disrupts markets and ecosystems, including:

1. How are emissions for the GHG Global 250 trending over the past three years?
2. Is there evidence that decarbonization creates a drag on financial performance, or a premium?
3. Given the long-term transformation challenge confronting these emitters, how can we assess a company’s progress and define leadership?
4. How are policy and investor leadership evolving in a post-carbon economy?

This section contributed to by David Lubin, Constellation Research and Technology, and Timothy Nixon, Thomson Reuters.

Figure 3: Total’s Credit Rating (2017)



Source: Stamine, Thomson Reuters Eikon

5 <http://www.ipcc.ch/>

6 According to Total completed CDP Climate Change information request submissions.

7 http://www.annualreports.com/HostedData/AnnualReportArchive/t/NYSE_TOT_2015.pdf

A CONDUIT TO ENERGY LEADERSHIP

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Thomson Reuters is the world's leading source of news and information for professional markets. Our customers rely on us to deliver the intelligence, technology and expertise they need to find trusted answers. Our business has operated in more than 100 countries for more than 100 years.

The Thomson Reuters Energy Practice Group comprises business experts from finance, risk, tax and legal with deep energy domain knowledge. We provide corporate oil, gas,

power, utility, renewable and alternative-energy companies with the insight, tools and analytics necessary to excel in their business operations.

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THE INNOVATION LAB TEAM

Members of the Thomson Reuters Boston Innovation Lab, in conjunction with the Energy Practice Group, worked to develop an objective methodology to assess energy-industry leadership.



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Amit Shavit
Data Scientist



Brian Ulicny
Senior Director

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Trading Floor & Risk Management

Providing shareholder value is paramount to ensuring your organization's longevity. One way to do this is via a financial technology platform that comprises news, content and analytics in an integrated system that trades, manages risk and settles positions, as well as supports the onboarding and ongoing vetting of your trading partners.



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.



Global Trade and Supply Chain Management

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.



Third-Party Risk Management

Managing the third parties and partners with which you do business - and the potential reputational risks they pose related to modern slavery, bribery and corruption - can be a daunting task. Set your team up for success by promoting compliance, transparency and reputational integrity while also monitoring what the third parties are doing in order to mitigate price risk, supply disruptions and supplier issues.



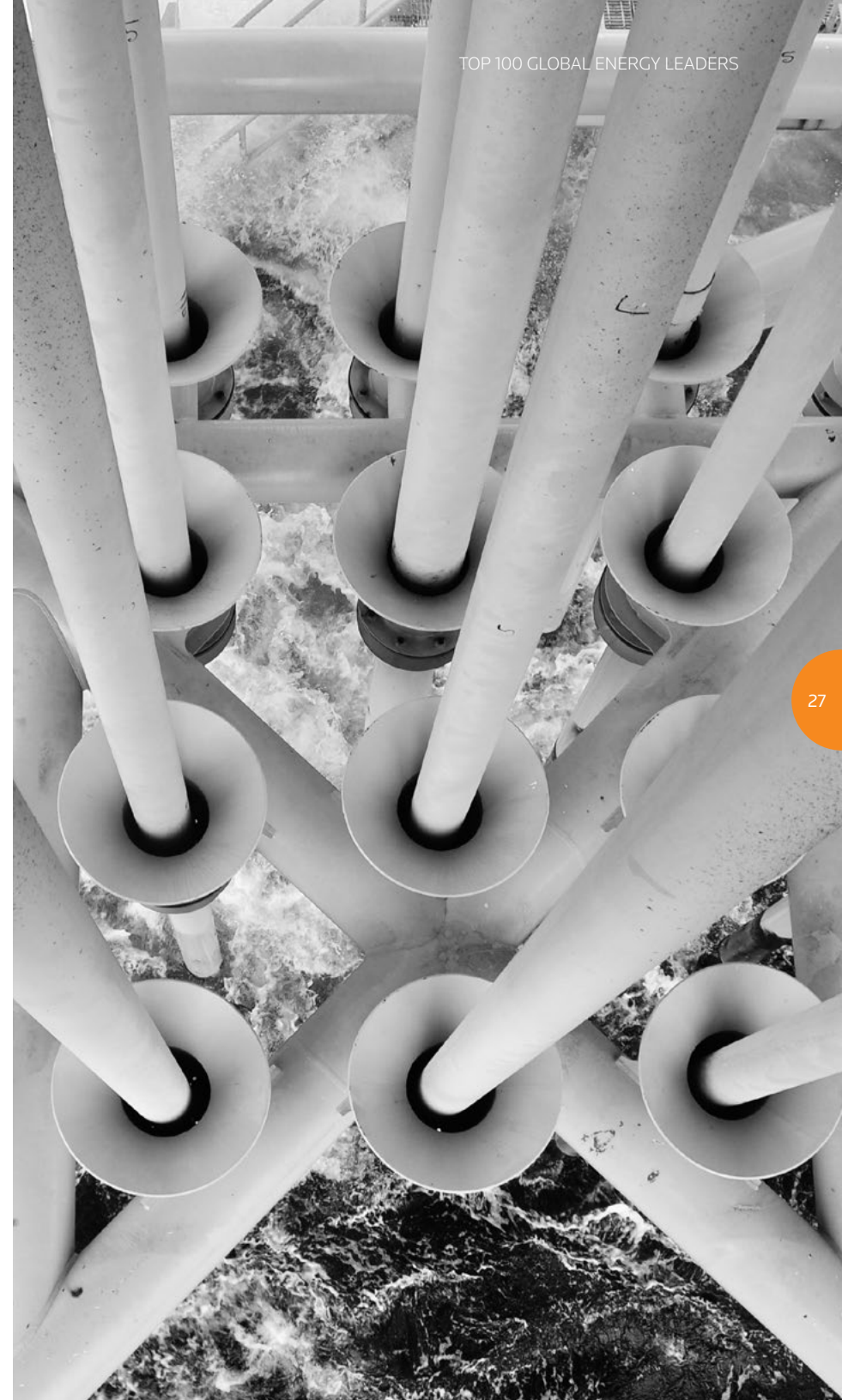
Legal-Spend Management

With stretched legal teams and tight budgets, it's essential to find ways to control expenses. Now you can automatically manage external legal spend, ensuring compliance with billing rules and utilizing analytics gathered from over a thousand legal departments around the world. Organize matters to know the right work is being done by the right teams. And further maximize efficiencies by automating document and contract work with software that eliminates the delays, expense and risks inherent in manual drafting.



Litigation and Case Management

Whether it's fighting litigation or closing the transactions that keep your business going, when the stakes are high you need to build a strong legal argument. The best way to do this is with authoritative, primary content, exclusive analytical material, practice area insights and public records. Add to these: expert legal insight from over 500 former lawyers around the world and your team is set to win. In addition, supplement your team with professionals skilled at discovery and process-related matters, so your in-house and external counsel are free for more strategic initiatives.



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