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This publication was produced by Willis Towers Watson in collaboration with Raconteur.

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Published: June 2016
Methodology

This index is based on data gathered from anonymous telephone interviews with 350 C-suite executives in the natural resources industry. Survey participants cover a broad spectrum of subsectors and global geographies.

The interviews gauged respondents’ perceptions of risk in relation to five megatrends that were established based on independent, qualified research into the types of risks facing the industry. Survey respondents were asked to rank megatrends and risks for their industry covering three timeframes: the present, 12 months ahead and 10 years into the future. An independent analyst collated and evaluated the data.

Megatrends are defined as global macro forces that impact on business and the marketplaces in which they operate – the risks are defined as specific risk factors constituent to the respective megatrends. Individual risk rankings are a composite score, based on the severity of impact, multiplied by the ease of management. The higher the composite score, the greater the perceived risk. We have also generated a megatrend risk score, independent of individual risks, which ranks each megatrend based on the severity of impact, multiplied by the ease of management.

Geopolitical instability and regulatory change

Ongoing political instability in regions rich in natural resources and increased global regulation rank top for executives, who say regulation is of greater concern than political volatility. Of greatest concern: reclamation obligations, particularly threats to self-insured status, complexity of regulation, cost of compliance, and uncertainty over environmental policy.

Complex operating models in a global business landscape

The move into fast-paced emerging markets, coupled with the pressure to use new technologies to open up previously inaccessible resources, adds another layer of risk. These are further heightened by the risk of “black swan” events: unpredictable situations that cannot be planned, such as pandemic outbreaks or hurricanes, earthquakes and other extreme weather occurrences that have been on the rise over the past decade.

Workforce management and talent optimization

Many companies face the challenge of doing more with less as a shortage of industry-specific skills, lack of international mobility, global competition for talent, the requirement for new skill sets and a volatile industry combine to make talent attraction and retention a key risk.

Business model and strategy challenges

The need to create new business models, access to capital and low commodity prices are of concern, but topping the list of business model and strategy challenges are currency and interest rate fluctuations, the impact of environmental regulation and the volatility of commodity prices.

Digitalization and new technologies

Technology has transformed the industry, improving safety and efficiency, with the potential for emerging technologies to enhance operations. But it has also introduced cyber-threats and greater competition for top talent. Also new entrants, some more agile than traditional players, make the need to innovate and embrace technology critical.

Numerical values in this publication are always represented to a maximum of one decimal place. Calculations in the analysis use two decimal places.
Demographic profile of respondents

**Region**
- North America: 20%
- South America: 9%
- Europe: 11%
- Middle East / North Africa: 11%
- Asia: 9%
- Australia / Pacific: 9%
- Central America / Caribbean: 6%
- Russia, CIS, Central Asia: 9%
- Alaska / Arctic: 3%
- East Asia: 11%

**Company size**
- 100,000+: 2%
- 25,000–99,999: 16%
- 10,000–24,999: 17%
- 5,000–9,999: 19%
- 0–4,999: 46%

**Revenue**
- $0.5bn – $0.99bn: 31%
- $1bn – $4.99bn: 29%
- $5bn – $9.99bn: 13%
- $10bn+: 26%

**Job role**
- CEO: 20%
- CHRO: 17%
- CRO: 17%
- CLO: 11%
- CIO: 9%
- CTO: 9%
- CFO: 17%

**Number of employees**
- 0–4,999: 46%
- 5,000–9,999: 19%
- 10,000–24,999: 17%
- 25,000–99,999: 16%
- 100,000+: 2%

**Sector**
- Metals & Mining
  - Extraction: 17%
  - Fabrication / manufacturing: 8%
  - Processing: 8%
- Oil, Gas & Chemicals
  - Upstream: 17%
  - Downstream: 25%
- Power & Utilities
  - Generation: 8%
  - Infrastructure: 8%
  - Retail: 8%

All percentages rounded to the nearest whole number
natural resources companies are operating in an increasingly connected world. They face significant risks and challenges that will be compounded as we move to 2025, according to the results of our 2016 Risk Index. Our research also tells us that risk management has become firmly entrenched as a boardroom issue.

Willis Towers Watson’s Natural Resources Risk Index gives an insight into what is on the minds of leaders in the industry, across the full spectrum of sectors, including oil, gas and chemicals, power and utilities (including renewable and nuclear energy) and metals and mining. It highlights the most significant megatrends shaping the industry, both today and 10 years from now. (See Methodology for further information on megatrends and risks.)

Within each of the five megatrends, respondents also identified the most critical individual risks. The ranking of some risks varied by sub-sector, but many were identified as critical by the industry as a whole.

Of the five megatrends most critical to the industry, survey respondents named “geopolitical instability and regulatory change” as the most concerning, followed by “digitalization and new technologies”. It’s not difficult to understand why these two megatrends rose to the top. The natural resources industry operates in a geopolitical landscape that is highly complex and unpredictable, and technological change continues apace, forcing businesses to re-evaluate continually whether their strategies will outlast the year, let alone the next 10.

Added to this, natural resources companies compete in a truly global business environment, and in ever more remote and challenging territories. So it’s no surprise that “complex operating models in a global business landscape” also emerges as a top megatrend.

Measuring risk
At the individual risk level, business leaders said that “operating in more technically challenging physical environments” is the single risk that generates most concern. Across the board, “currency risk and interest rate fluctuations” was identified as second most worrisome. The tough times for the industry (particularly the oil, gas and chemicals, and mining sectors) has meant that cost management and operational efficiency are critical, while investment decisions regarding new projects are undergoing even greater levels of scrutiny. Against this background, the burdens of complying with new and often complex regulations competes with a need to stay focused on the fundamentals of managing core businesses – all while struggling to gain access to capital for development projects. In addition, the threat posed by cyber-risk, which ranked at the third most troubling individual risk, is only expected to grow in the future as the natural resources industry contends with IT failures and breaches, as well as cyber-terrorism.

Rapid developments in technology – the second most critical megatrend – is closely tied to our fifth megatrend, “workforce management and talent optimization”, especially as natural resources companies find themselves competing with internet and IT companies for technology talent.

In the face of rapid technological innovation and the arrival of new entrants redefining the competitive landscape, companies in the sector also face real challenges around evolving business models. From a people risk perspective, companies are grappling less with the war for talent and more with talent optimization – doing more with less.

Despite these challenges, for those companies that are able to maintain cost discipline, drive efficiencies and adapt to change, there are many opportunities to grow market share and build competitive advantage.

Given the cyclical nature of the industry, what happens now will shape the future. Anticipating and managing the key organizational and people risks in this rapidly evolving business environment — and taking considered risks that hold potential for reward — will be key to unlocking future potential.

“ For those companies that are able to maintain cost discipline, drive efficiencies and adapt to change, there are many opportunities to grow market share and build competitive advantage ”

Foreword

Nick Dussuyer
Willis Towers Watson
Global Head of Natural Resources
Executive summary

An understanding of the risks facing today’s industry executives is vital to meeting challenges and creating opportunities.

The number one risks

From Europe to Asia, from oil, gas and chemicals to power and utilities, the risks from operating in more technically challenging physical environments predominate.

Geopolitical instability and regulatory change

With onerous regulatory obligations and geopolitical uncertainty in parts of the globe, pressure is on the industry to remain vigilant.

Digitalization and new technologies

New technology is a key driver of efficiency, but it brings exposure to a number of risks, including cyber-attacks that threaten the stability of critical infrastructure.

Megatrend and risk rating by region

How the megatrends compare and contrast in different parts of the world.
The 50 risks

The top risks: Natural Resources firms must deal both with current rules and be ready for everything to change in this fast-moving sector.

Complex operating models in a global business landscape

As new frontiers bring new challenges, adaptability and resilience are paramount.

Megatrend and risk rating by sector

How the five megatrends rank among each of the six Natural Resources subsectors.

Business model and strategy challenges

Volatility in interest rates and currency fluctuations, and rigorous environmental regulations, call for cost controls to stay competitive.

Workforce management and talent optimization

Reading the generational talent cycles is critical to managing the skills gap.

Conclusion

Given the risks and challenges highlighted by this research, what are our recommendations for business leaders?
An understanding of the risks facing today’s industry executives is vital to meeting challenges and creating opportunities.

As the world has become smaller and faster, effective risk management has developed into an ever-more crucial tool for business leaders, particularly in the extractive and natural resources industries. But what are the biggest risks, challenges and opportunities facing companies working in the natural resources sector?

To find out, Willis Towers Watson surveyed top executives from 350 companies working in oil, gas and chemicals, metals and mining, and power and utilities. We asked them to rank the challenges they see posing the greatest risks to their businesses in the coming weeks, months and years. Among those who participated in the survey, conducted in the first half of 2016, were 70 CEOs, 60 CFOs and 60 CROs. We also conducted in-depth interviews with selected executives to gain greater insight into the risks they face.

Regulatory and geopolitical concerns
The bottom line: industry executives worry most about regulation and geopolitics. Five years after the Arab Spring uprisings in the Middle East and North Africa, some of the most resource-rich countries in the world are in tatters, or their neighbors have fallen victim to instability and are a continuing source of concern. But even more than geopolitical risk, the executives we surveyed are troubled by shifts in the way that today’s governments approach regulation.

According to the American Petroleum Institute, drilling regulations currently under consideration in the U.S. could cost oil companies $31.8bn over the next decade. In Latin America, mining executives worry about “Chavismo” – leftist political movements with an aversion to the private sector and an eye on lucrative resource rights deals. In North America, the concern among producers of so-called “unconventional” energy is one of prohibitive environmental regulation. For one European wind power producer that we spoke to, the problem is weakening government support for alternative energy.

Executives also worry about the risks associated with digitalization and new technologies. Companies’ growing dependency on IT infrastructure has ushered in a litany of new risks of which the executives of yesteryear would never have dreamed: cyber-attacks, cyber-espionage and catastrophic system failures. McAfee, the U.S. cyber-security company, estimates cyber-crime currently costs the global economy anywhere from $375bn to $575bn.

Entering new territories
Our research also uncovered some surprises. C-suite executives in both the oil, gas and chemicals, and power and utilities sectors see the risk of operating in more technically challenging physical environments as the biggest single issue facing their businesses; executives in the metals and mining sector also rate the issue highly.

As the industry operates in a global marketplace, its executives find themselves exploring and extracting in areas that would have been out of the question 20 or even 10 years ago. For oil, gas and chemicals producers, this means searching for new hydrocarbon wealth at incredible depths below sea level and in extreme environments like the Arctic.

For power and utility companies facing a slowdown in mature markets, the challenge is entering new, emerging economies where demand for their services is growing rapidly. France’s ENGIE now produces more power outside continental Europe, historically its core market, than it does inside. But building a power plant in Abu Dhabi is a very different project than construction in France or the U.K. and opportunities in African markets are complicated by lack of existing infrastructure.

Financial and workforce challenges
Perhaps the greatest surprise is the extent to which fluctuations in

### Fig. 1 | Megatrend rank order

<table>
<thead>
<tr>
<th>Risk Area</th>
<th>Impact (10)</th>
<th>Ease of risk management (10)</th>
<th>Change in impact over next 10 years (*/5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geopolitical instability and regulatory change</td>
<td>7.2</td>
<td>7</td>
<td>3.5</td>
</tr>
<tr>
<td>Digitalization and new technologies</td>
<td>7</td>
<td>7</td>
<td>3.4</td>
</tr>
<tr>
<td>Complex operating models in a global business landscape</td>
<td>6.6</td>
<td>6.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Business model and strategy challenges</td>
<td>6.2</td>
<td>6.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Workforce management and talent optimization</td>
<td>5.9</td>
<td>5.8</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Top two risks: oil, gas & chemicals
1. Operating in more technically challenging physical environments: 56
2. Increased cyber-security and data privacy risk: 53.2
currency and interest rates have become a cause for deep concern among executives. The global financial crisis of 2008-2009 may be over but the effects of the period, coupled with policymakers’ attempts to stabilize their economies with radically different strategies, continue to foment uncertainty in key financial markets. The EU Central Bank has cut interest rates to new unprecedented lows to protect the regional economy, while the U.S. Federal Reserve has kept interest rates low for years and is only now contemplating minor increases with great caution. Headwinds across the major hard currencies are unlikely to decrease in the foreseeable future.

Finally, executives worry about their people: finding, training, retaining and motivating. A wave of retirements of skilled engineers and executives is already underway across the sector, and replacing them in time for the next resource boom may prove one of the greatest challenges industry leaders face over the next 10 years.

The 10-year horizon
Executives’ assessment of the greatest risks facing their businesses over the next decade center on several common themes: commodity prices, trends in policymaking and regulation, and the global economy. But the biggest problem is uncertainty — not knowing what challenges the next day, let alone the next year, will bring.

“I think the external factors impacting the industry are only going to increase over the next decade,” the Head of Risk at a major British power and utilities business tells us. “Externally, factors such as climate change, the price of oil, OPEC conversations, developments in the global economy as a whole, the nuclear debate… there are so many issues that are very difficult to call. As a result, I think there is going to be uncertainty in the industry as a whole for some period of time.”

This report examines these megatrends in detail, using data from our survey and interviews conducted with top executives. We hope that it helps our clients, prospects and strategic partners better understand the complex world we are working in and the challenges and opportunities that lie ahead to 2025.
The number one risks

Operating in more technically challenging physical environments
Vulnerability to reclamation obligations, particularly threats to self-insured status
Uncertainty over, and encroachment of, climate change and environmental policy
Increased cyber-security and data privacy risks necessitating increased investment in technologies and strategies
Currency and interest rate fluctuations creating uncertainty

From Europe to Asia, from oil, gas and chemicals to power and utilities, the risks from operating in more technically challenging physical environments predominate.

The number one risks

Subsector

- Extraction
- Fabrication
- Manufacturing
- Processing
- Upstream
- Downstream
- Chemicals
- Generation
- Infrastructure
- Retail
From Europe to Asia, from oil, gas and chemicals to power and utilities, the risks from operating in more technically challenging physical environments predominate.

**Megatrend**

Operating in more technically challenging physical environments

Vulnerability to reclamation obligations, particularly threats to self-insured status

Currency and interest rate fluctuations creating uncertainty

Vulnerability to reclamation obligations, particularly threats to self-insured status

Uncertainty over, and encroachment of, climate change and environmental policy

Increased cyber-security and data privacy risks necessitating increased investment in technologies and strategies

**Region**

Arctic Region

North America

Central America

South America

Europe

Russia / CIS / Central Asia

Sub-Saharan Africa

Middle East / North Africa

East Asia

South Asia

Australia / Pacific
Geopolitical instability and regulatory change

With onerous regulatory obligations and geopolitical uncertainty in parts of the globe, pressure is on the industry to remain vigilant.

Check the news on any given day and you could be forgiven for believing the world is more volatile and dangerous than at any other time since the early 20th century, particularly in the resource-rich Middle East and North Africa.

And indeed, it’s been a tough few years. Companies with investments in Iraq, Egypt, Libya, Syria and Yemen, and businesses operating in central Africa and some parts of Central and South America, still face constantly shifting political headwinds and the daily threat of random violence. While this state of affairs is worrisome, participants in the Willis Towers Watson Natural Resources Index survey overwhelmingly place regulatory issues and changing government attitudes to the industry well above geopolitical challenges as a source of current and future risk.

Counting the cost of compliance

The biggest overall risk identified by executives within the megatrend is vulnerability to reclamation obligations, particularly threats to self-insured status, followed by increased complexity of regulation and cost of compliance and uncertainty over environmental policy. Executives were blunt about the challenges at play and the extent to which policymakers are moving further in their efforts to regulate the industry.

“Examples of regulatory pressures that the U.S. and Canadian governments are putting on the business are numerous and include the Clean Power Plan and Mercury rules,” says Jennifer Grafton, Senior Vice President and Chief Administrative Officer at Westmoreland Coal, a U.S. coal company. “In the past, the coal industry was indirectly targeted via power plants, but governments are now targeting coal directly via the Federal leasing programs for land and through stream rules and reclamation rules.”

“We have this problem in Peru, where environmental legislation has put unachievable air standards in place,” says Raúl Jacob Ruisanchez, Vice President, Finance and Chief Financial Officer at Southern Peru Copper, a Latin American copper producer. “Our modernized smelter captures over 95% of all emissions, which is a lot. But the government put in place a standard that was technically unfeasible. Once we demonstrated this, instead of going...
for a more reasonable standard, they maintained their position and gave us a waiver. The practical problem with a waiver is that it doesn’t allow you to propose an expansion of your facilities to the board. So we had to pass on that. That is an example of how these things can be incorrectly implemented. We believe that environmental standards should be increasing and will be increasing in the future, but at the same time, we expect policymakers to know the technologies that are available, what is feasible and what is not.”

**Shifting perceptions**

These issues are part of a wider trend of public scrutiny in a sector whose reputation has been under the spotlight for the past two decades, combined with increasingly global political trends. In December 2015, some 195 countries agreed to the world’s first universal, legally binding global climate deal in Paris. The U.N.-brokered deal calls for governments to arrest the rise in carbon emissions worldwide in an effort to prevent the temperature of the planet from rising more than 2°C over pre-industrial levels. Signatories to the deal have agreed to present plans to limit carbon emissions. They are likely to place much of the burden of actual implementation on the companies that produce, process and sell natural resources such as oil, gas, metals and minerals.

This presents particular risks for companies that produce unconventional fuel such as shale oil and gas, and fracked fuels. These companies are seeing the political narrative shift against them, and the current election cycles in North America and Europe could well increase the number of governments that are critical of these types of fuel production. For example, in Canada, the new government of Justin Trudeau looks likely to take a quite different view of shale fuel producers than the administration of his predecessor, Stephen Harper.

**Reclamation obligations**

Part of the evolving regulatory mix is a growing focus on how to deal with assets once they’ve outlived their economic lifecycle, an issue that affects both upstream resource producers and companies that process and use them further down the chain. Power and utility companies see reclamation obligations as the greatest risk they face in coming years, particularly producers who operate nuclear and coal plants that are approaching the end of their natural productive life.

The cost of decommissioning a nuclear power plant, together with meeting environmental regulations and clean-up costs, is about $1bn in the U.S. today, about 10 to 15% of the capital expenditure
involved in building a new plant. And many governments are demanding that resource producers and users have cash on hand to decommission facilities before they will give the regulatory go-ahead for new projects, placing a strain on companies’ cash flow.

“The issue is a particularly acute one for mining companies, says Fred Smith IV, US Metals and Mining Leader at Willis Towers Watson. "Over the last 10 to 15 years, the various U.S. government agencies and state agencies responsible for permitting mines have been requiring more rigorous financial assurances be posted by the companies to get or modify their operating permits," he says. "Corporate guarantees are pretty much a thing of the past. The agencies are requiring the miners to be very comprehensive in estimating the cost of the reclamation. Those costs are then validated by the regulatory agencies that require a commensurate amount of financial assurance to make sure the reclamation gets done."

Increasingly stringent regulation is pushing up the cost of projects. “Other companies that don’t have bonding arrangements in place are being told by the government that they can’t self-bond anymore and need to have hundreds of millions of dollars in place in collateral to underpin their environmental obligations,” says Grafton at Westmoreland Coal. “We don’t have any of that; we’ve always had cash posted against our obligations. If the reclamation obligation is $100m, the cash collateral is typically 15 to 20%, so you need an additional $15-20m just to do a deal. The cash collateral posted isn’t released until the bond is released, which can be decades.”

In some cases, mining companies are on the hook almost indefinitely, Smith IV adds. “A big issue we are dealing with now is that once reclamation is done, the miners can’t exit the property because the work isn’t over,” he says. "Most of these mines require long-term monitoring or post ‘closure’ activities to reach final closure, and indeed, they may never get there. Thus far there are no viable long-term financial assurance products in the marketplace that will satisfy this requirement."

The regulatory lottery
Traditional and conventional natural resources companies are not the only businesses to be affected by new regulations. Alternative energy companies — wind, solar, and wave power — are also feeling the pinch in developed countries as cash-strapped governments ease the generous incentive systems they put in place in the early 2000s for “clean” energy production.

“How the different governments view renewables is a big issue for us,” says Jesper Ejsing, Head of Group Risk Management and Insurance at Vestas, the Danish wind turbine manufacturer. “There was a period when we were able to get significant support from governments. Now there’s a trend toward an auction-based market, where price is more important than anything.”

“There was a period when we were able to get significant support from governments. Now there’s a trend toward an auction-based market, where price is more important than anything.”

— Jesper Ejsing, Head of Group Risk Management and Insurance at Vestas

“We work a lot with government, industry, anywhere.”

Meanwhile, geopolitical risks inform our decision making knowledge, understanding and experience to formulate input to the thinking so that we have the political parties and the wider industry bodies to understand, influence and give government outreach they do and have to increase the amount of natural resources companies will benefit system for companies that have the production tax credit, a tax manufacturer. "There was a period when we were able to get significant support from governments. Now there’s a trend toward an auction-based market, where price is more important than anything. What’s good for us is we are truly global; we can have changes in one market but improvements in another. But it’s a development we monitor continuously.”

But, Ejsing says, regulatory change can also work in his company’s favor. “In the U.S., they
have the production tax credit, a tax benefit system for companies that invest in alternative energy. That credit was renewed annually for a number of years, which made it very hard to plan for the years ahead,” he says. “It has now been renegotiated for a period of five years, which will make that market much more stable for buyers and manufacturers.”

Meanwhile, geopolitical risks also remain a key area of concern, and businesses have to take into account both political instability and reputational risk. “When we do development we take into account country-specific risks,” says Oliver Wild, Group Chief Risk, Insurance and Compliance Officer at the French utility Veolia. “We developed an annual risk evaluation review process for 122 countries that looks at over 65 indicators. We don’t limit our review to countries where we are present; we also review countries where we might want to do business in the future.”

The 10-year horizon
Executives are clear about the political challenges ahead for the next decade: increasing government regulation of the sector, which in turn increases the cost of doing business. To mitigate that risk, big natural resources companies will have to increase the amount of government outreach they do and find better ways of communicating their point of view to politicians.

As the head of risk at a major U.K. power and utilities business tells us, “We work a lot with government, political parties and the wider industry bodies to understand, influence and give input to the thinking so that we have the knowledge, understanding and experience to formulate policies and inform our decision making.” He adds, “We recognize the obligation, and for us it’s about being collaborative. We see the need to work on solutions rather than pointing out the limitations in existing approaches or new thinking. That won’t get us, or the industry, anywhere.”

“We work a lot with government, political parties and the wider industry bodies to understand, influence and give input to the thinking so that we have the knowledge, understanding and experience to formulate policies and inform our decision making.”

—Head of risk at a major U.K. power and utilities business
Digitalization and new technologies

New technology is a key driver of efficiency, but it brings exposure to a number of risks, including cyber-attacks, that threaten the stability of critical infrastructure.

Recent advances in information technology have led to significant changes in the way the natural resources industry operates. Automation, live data analytics and live-streaming feeds of operations have helped an industry that’s under enormous pressure to find production efficiencies and streamline and accelerate work in the face of increasingly large, complex projects and shortages of skilled staff.

Many companies are finding innovative uses for emerging technologies: BP, for example, plans to acquire a fleet of drones to oversee some of its facilities. Companies like SAP believe that the “Internet of Things” – connecting and controlling devices that previously operated autonomously – could improve automation and operations and help the industry become more efficient and safe.

But along with rewards, new technology brings any number of risks, many of them unfamiliar and dizzyingly intricate. In our survey, industry leaders worried about the rising threat of cyber-attack, and with good reason – the number of digital assaults on oil, gas and chemicals and power and utilities companies in particular is on the rise.

Cyber-attack

After an outage at a power plant in Western Ukraine run by Prykarpattyaooblenenergo, a Ukrainian power company that caused a blackout in the local capital Ivano-Frankivsk, IT security experts found the malware that had led to the outage was present in the systems of two other Ukrainian utilities. In January 2015, a cyber-attack was found to have caused physical damage to a private company for the first time, when a virus targeting the operating system of a steel producer in Germany caused what was described as a “massive” explosion in the company’s main blast furnaces.

An early 2016 poll by Tripwire, a leading cyber-security company, found 82% of executives from the natural resources sector had experienced an increase in cyber-attacks against their businesses during the previous year. Just under 70% said they did not think their companies were fully prepared for future cyber-attacks. With malware and hacking threats on the rise, companies in the natural resources industry will have to invest heavily in cyber-security in the coming years or risk accusations from shareholders that they are not properly protecting their increasingly large and technologically-dependent investments.

“In common with other companies in the sector, it is the vulnerability of our information and our information systems that we need to protect against malware and cyber-attack,” says Erin Link, Group Risk Insurance Manager at Lundin Petroleum. “It is something that everyone is thinking about today. It affects privacy as well as critical systems.”

For retail companies using big data and gathering large amounts of customer information, cyber-attacks that lead to the theft of data can be devastating to their public reputation.

“We’re a big brand with client data and it is as much the reputational risk to the business as the physical work of having to deal with the customer base in the event of an attack,” says a head of risk at a major U.K. power and utilities company. “When a big brand is targeted, it’s big news, so the reputational risks are significant.”
Due to the threat of cyber-attacks, many companies have had to invest in entirely new practices and people. “We regularly run internal tests to assess the resilience of firewalls, networks and the critical systems related to production to ensure they are as risk free as possible to cyber-threat,” says Lundin’s Link. “We also closely monitor the effectiveness of policies and procedures to test and re-test the adequacy of our risk control environment. We’ve carried out a full risk review with the information systems department to identify critical systems. Those that have been identified as ‘high criticality’ are the ones we are particularly focused on.”

The risk and reward of digitalization
Business leaders were unanimous in identifying disruptive new technology as a source of major concern; the issue ranked second overall among risks they identified within the digitalization megatrend. "Technology has impacted the whole industry," adds Alister Cowan, Executive Vice President and Chief Financial Officer at Suncor Energy, a Canadian energy producer focused on oil sands. "When you think about shale, it wasn’t really there a few years ago. Technology has moved on and that has had a huge impact on the whole industry... about 10 or 12 years ago, our oil sands steam injection plant was the first in the world on a commercial basis, so we have come a long way in oil sands in the last 10 or 15 years," he says. “We see technology doing two things for us in our industry. It will drive down capital costs and significantly improve environmental performance, all of which is a good thing. We're going to be in a growing business. I think technology is always going to be a disruptor for the oil, gas and chemicals sector, but it should allow us to improve our performance and operations as we go forward.”

Because of the low unit cost of power generated by alternative energy producers — wind, solar and wave power — and new "black box" battery technology that allows the unpredictable volumes of power they produce to be stored with minimal loss, many executives worry that the era of depressed commodity prices could continue. Long-predicted advances in battery technology — allowing cars, for example, to travel thousands rather than hundreds of miles with a single charge — also threaten the underlying operating model of many businesses.

“In theory, there should not be any critical threats to the future of the coal industry,” says Grafton. “That said, if there was a major discovery in, say, battery technology where hydro, wind and solar power could be effectively stored in a way that cannot be done today, that could be a major disruptor to our business.”

Oliver Wild, Group Chief Risk, Insurance and Compliance Officer at Veolia, worries about the “Uber effect”: new startups with new technology disrupting the business model of established players. “We have always focused on developing new technology internally and working with startups to make sure we have the best solutions for our clients,” he says. “The risk I see in digitization is the fact that potentially smaller players or new actors will come into the market and disrupt the evolution of our business models by creating new and differentiated solutions that our clients could find appealing, notably in terms of prices. This is why we focus on innovation to try and stay ahead of them.”

"It is the vulnerability of our information and our information systems we need to protect against malware and cyber-attack"

— Erin Link, Group Risk Insurance Manager at Lundin Petroleum
Fig. 4  |  Risk hierarchy for digitalization and new technology megatrend

The 10-year horizon
For the executives we interviewed, the main challenge over the next decade is, in many ways, simple to identify: keeping up with the competition and the speed of technological change across their businesses. Technology brings risk and reward in equal measure, and keeping up with the rapid pace of change is no longer a choice; it’s a necessity. That also means having a staff capable of keeping up with increasingly specialized technology. That, in turn, means identifying the right people for new technology-facing roles.

“As some of the traditional technologies and models change, requirements will become more niche-oriented and then we will face more competition for skills, right across the breadth of the supply chain,” a head of risk at a major U.K. power and utilities company tells us. “From a supply chain perspective, are all those other component parts and links in the chain able to adapt as well, or to adapt quickly enough? That’s where we will face additional challenges.”

“Organizations understand they are moving into a more technological and digital world, and they’re training people for that,” says John Pymm, Global Head of Natural Resources Industry Talent and Rewards at Willis Towers Watson. “They need to have people with the right skills for the digital world...Technological change moves faster and faster, and natural resources companies need people who are adept at managing this change.”

Megatrend risk rank order

<table>
<thead>
<tr>
<th>Rank</th>
<th>Risk Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Increased cyber-security and data privacy risk</td>
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<tr>
<td>2</td>
<td>Tech opening up market place to disruptors</td>
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<tr>
<td>3</td>
<td>Risks emerging from new technologies</td>
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<tr>
<td>4</td>
<td>Inability to capitalize on automation</td>
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<tr>
<td>5</td>
<td>Speed of change / slow innovation strategy</td>
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<td>6</td>
<td>Outdated legacy, IT systems, infrastructure</td>
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<td>7</td>
<td>Cost / operational impact of IT implementations</td>
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<td>8</td>
<td>Insurability of unproven technologies</td>
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<tr>
<td>9</td>
<td>Third-party security vulnerability</td>
</tr>
<tr>
<td>10</td>
<td>Increased usage of (own) mobile devices</td>
</tr>
</tbody>
</table>
Margate and risk rating by region

Rank order determined by combined risk score
(severity of impact × ease of risk management)

- Combined risk score

- Geopolitical instability and regulatory change
- Complex operating models in a global business landscape
- Business model and strategy challenges
- Digitalization and new technologies
- Workforce management and talent optimization

- #1 risk

- Alaska and Arctic Region
  - Increased cyber-security and data privacy risk
  - Currency and interest rate fluctuations
  - Uncertainty over climate change and environmental policy
  - Combined risk score: 47

- North America
  - Currency and interest rate fluctuations
  - Operating in more technically challenging physical environments
  - Increased cyber-security and data privacy risk
  - Combined risk score: 42.3

- Central America and Caribbean
  - Currency and interest rate fluctuations
  - Operating in more technically challenging physical environments
  - Increased cyber-security and data privacy risk
  - Combined risk score: 64

- South America
  - Currency and interest rate fluctuations
  - Operating in more technically challenging physical environments
  - Increased cyber-security and data privacy risk
  - Combined risk score: 40.6

- Sub-Saharan Africa
  - Currency and interest rate fluctuations
  - Operating in more technically challenging physical environments
  - Increased cyber-security and data privacy risk
  - Combined risk score: 59.8

- Middle East and North Africa
  - Currency and interest rate fluctuations
  - Operating in more technically challenging physical environments
  - Increased cyber-security and data privacy risk
  - Combined risk score: 56.2

- South Asia (inc. India)
  - Currency and interest rate fluctuations
  - Operating in more technically challenging physical environments
  - Increased cyber-security and data privacy risk
  - Combined risk score: 63

- Eastern Asia (inc. China)
  - Currency and interest rate fluctuations
  - Increased cyber-security and data privacy risk
  - Combined risk score: 56.7

- Europe
  - Operating in more technically challenging physical environments
  - Increased cyber-security and data privacy risk
  - Combined risk score: 56
The 50 risks

Workforce management and talent optimization

8 General shortage of industry specific skills
9 Difficulty attracting and retaining key talent
11 Lack of international mobility within workforce
19 Inability to maintain competitive compensation and reward schemes
22 Lack of safety culture
25 Unethical behavior of workforce or direct representatives
26 Lack of potential business leaders and robust succession planning
29 Increasing difficulty complying with local employment laws
44 Ageing workforce and related health issues
45 Difficulty ensuring workforce security

Complex operating models in a global business landscape

1 Operating in more technically challenging physical environments
4 Natural disasters and epidemics
15 Supply chain vulnerability
27 Increasing threats to stability of operations and trade
30 Workplace safety concerns and protection of workforce
33 Issues arising from operating in fragile natural ecosystems
34 Capital portfolios and projects suffering budget and timeline overrun
35 Risk of incident at facility that causes outage
43 Cost cutting causing increased risk
46 Ageing assets leading to risk of outage

Geopolitical instability and regulatory change

6 Vulnerability to reclamation obligations
7 Increased complexity of regulation
10 Uncertainty over climate change and environmental policy
12 Increased political risk
17 Reputational risks arising from social issues
26 Resource nationalization
32 Regulatory approval for projects causing delays and missed opportunities
40 Intellectual property and patent breaches
47 Active penalty culture

Digitalization and new technologies

3 Increased cyber-security and data privacy risk
5 Technology opening up marketplace to disruptors
14 Risks emerging from new technologies
23 Inability to capitalize on automation of processes
24 Speed of change / slow innovation strategy
31 Outdated legacy, IT systems and infrastructure
36 Cost and operation impact of IT implementations
37 Uninsurability of unproven or prototypical technologies
41 Third party security vulnerability
48 Increased usage of (own) mobile devices

Business model and strategy challenges

2 Currency and interest rate fluctuations
13 Increasing environmental pressure on business model
16 Volatility and depression in commodity prices impacting growth and investment
18 Increasingly complex asset portfolios and ecosystems
20 New entrants challenging traditional models of delivery
21 Falling profits prohibiting infrastructure investment
38 M&A and industry consolidation
39 Failure to deliver business transformation and / or diversification
42 Disruptive change to global supply-demand dynamics
50 Unmanageable increase in funding, liquidity and debt requirements
Severity of impact

10 = High severity
1 = Low severity

Ease of risk management

1 = Easy to manage
10 = Difficult to manage

# Rank order
Complex operating models in a global business landscape

As new frontiers bring new challenges, adaptability and resilience are paramount

The search for profit is now global. Unearthing new stores of natural resources has become an increasingly challenging task, requiring producers to adapt to ever more demanding environments and technically complex projects. Downstream operators, having exhausted mature market demand for their services, are moving into emerging markets, where demand for commodities, goods and basic services is evolving at a much faster pace than in more developed territories. This means moving into riskier, more challenging territory during a period when the pressure to generate returns and provide the highest possible operational efficiency is greater than ever. The cost of getting things wrong is also at an unprecedented high. This was highlighted by the major pollution incident in the Gulf of Mexico in 2010.

“More and more, we’re getting requests on how to improve infrastructure, not just in terms of performance but also in terms of resilience”

— Oliver Wild, Group Chief Risk, Insurance and Compliance Officer at Veolia
Crossing frontiers
Expanding into new, more demanding areas without overexposing businesses to risk is a top challenge for today’s executives, and ranked as the highest area of concern. Part of the challenge, executives told us, is the industry’s reliance on suppliers and strategic partners — something that many companies have been reviewing in recent years.

While the demands for upstream producers are well known — oil, gas and chemicals companies have been managing technically challenging projects such as deepwater drilling and production in the Arctic for many years — the issues facing metals and mining and power and utility producers are less well documented.

For mining companies, the key issue is one of location: many countries that promise the best returns lack sociopolitical stability and, in many cases, the infrastructure required for major mining initiatives. To operate in some promising countries, producers have to build roads, power generation and transport facilities, including airports and ports while constantly calculating the risk of political change. This has seen the cost of investment rise sharply, and with it the overall risk of major new projects.

There are also demands from some countries that mining companies work with local communities to help develop the areas they mine. “We are a mining industry and we mine natural resources. In our country all those natural resources belong to the state,” says Mathias Sithole, Group Executive: People, at Implats, South Africa. “Whatever you do, whenever you mine, you must get a license from the government and you must make sure you comply with the mining charter that we have in our country, which deals with issues like transformation, skills development and community development.”

In the power and utilities sector, many major companies have largely exhausted the opportunities of developed and OECD countries and are looking to new, fast-growing markets — what McKinsey calls the “$30 trillion decathlon” — but again face both logistical and technical challenges in doing business in frontier territories.

“We work in the environment our clients are in,” says Veolia’s Wild. “Some of our clients are working in places with old infrastructure or no infrastructure at all and that’s what our role is — putting in place infrastructure to respond to demographic needs, for example.”
More and more, we’re getting requests on how to improve infrastructure, not just in terms of performance but also in terms of resilience. That’s on the agenda of a lot of cities around the world that operate in harsh weather environments, for example.

Other challenges for increasingly globalized companies that gave executives pause for thought include the dangers of “black swans” — catastrophic events that cannot be planned for.

Executives also ranked as high risk supply chain vulnerability, the increasing complexity of processes and the potential liabilities involved in working with foreign partners or in joint ventures. It’s almost impossible, in today’s globalized economy, to avoid working across a complex supply chain, or to avoid working with foreign partners. In fact, these are often requirements imposed by governments in resource-rich states. And as several executives noted, while supply chain issues have eased during the recent downturn in commodity prices and demand – the number of oil wells being drilled in 2015, for example, was at an historical low – improvements in the market could lead to a constrained supply chain in a repeat of the bottleneck that came as oil prices improved in 2009.

The 10-year horizon

In discussing the outlook for the sector, executives were clear on one point: their companies have no choice but to plow ahead into new territory in the coming years. Over the next decade, they will have to develop more complex projects in more challenging operating environments, at the same time facing increasing scrutiny from their financial backers, insurers and shareholders. Part of the solution to this problem will be the people they hire — their ability to innovate, their problem-solving skills and their judgment when it comes to risk.
Megatrend and risk rating by sector

Rank order determined by combined risk score (severity of impact × ease of risk management)

Combined risk score

- Geopolitical instability and regulatory change
- Complex operating models in a global business landscape
- Workforce management and talent optimization
- Business model and strategy challenges
- Digitalization and new technologies

#1 risk

- Operating in more technically challenging physical environments
- Increased cyber-security and data privacy risk
- Increased complexity of regulation / cost of compliance
- Currency and interest rate fluctuations

Megatrend and risk rating by sector

Combined risk score
Business model and strategy challenges

Volatility in interest rates and currency fluctuations, and rigorous environmental regulations, call for cost controls to stay competitive

Have we reached the end of the commodities super-cycle? How will businesses cope with new environmental regulations? How can companies rooted in a traditional business model of extraction, production and arbitrage compete in a world which, we are told, is ripe for innovation and disruption and in which the titans of tech rule supreme? And, crucially, how can they raise the capital needed to invest in increasingly large, challenging projects during a period of low commodity prices, with banks ever-cautious about the lines of credit they are willing to extend?

These are hugely important questions for the natural resources sector. But for participants in our survey, the most important challenges are more tactical and day-to-day. They worry about currency and interest rate fluctuations, the impact of environmental regulation and the volatility of commodity prices.

A state of flux
C-suite executives named currency and interest rate fluctuation as their top risk management priority in the megatrend.

This isn’t surprising; natural resources companies deal with incredibly complex transactions across multiple currencies and countries.

Part of the problem is that interest rates linked to two of the most important currencies in the world — the U.S. dollar and the Euro — are at historical lows. In December 2015, the U.S. Federal Reserve announced plans for gradual interest rate increases, doubling benchmark costs of borrowing to 0.5%, the first hike since 2009. At the same time, the Fed indicated that it planned to bring the interest rate to over 1% by the end of 2016. Despite the hike (perhaps because the Fed has walked back the plan to push the interest rate up as quickly as originally thought), the dollar has remained incredibly strong relative to other currencies, hurting companies whose costs are mainly in U.S. dollars.

“The main producers of platinum group metals are in South Africa and Russia, and we’ve obviously seen their currencies weaken significantly against the U.S. dollar,” says Mick McMullen, President and CEO of Stillwater Mining Company, a U.S.-
headquartered palladium and platinum miner. “Our main competitors’ costs have devalued in U.S. dollar terms – up front, it gives them an advantage that we definitely do not have.”

But in the longer term, McMullen adds, the current challenges his company faces could prove beneficial. “I think what it has led us to do is to review our cost base and make cuts where we can and those cost savings to the business are now there regardless of currency fluctuations,” he continues. “Our competitors tend to get somewhat complacent and don’t always fix the structural cost issues, which can then act as a squeeze on their business. If the underlying problem of poor productivity isn’t adequately addressed, over the long-term this can make a real difference to their overall ability to compete.”

Increased borrowing costs during a period of lower commodity prices is also bad news for many companies working in the heavily capital-dependent extractives industry, particularly highly leveraged companies that may need to refinance in the near future. “The headlines are creating uncertainty, which in turn means that accessing capital can be a real challenge,” says Brian Cantrell, Senior Vice President and Chief Financial Officer at Alliance Resource partners, a U.S. coal mining company. “That’s what is different today. In the past, it was really just a question of economics and being able to underwrite the risks around your business, demonstrating that the entity was profitable and able to pay its obligations. Now financial institutions are also dealing with their own regulatory constraints, managing pressure from environmental and investor activists and other pressures that have nothing to do with evaluating the underlying economic fundamentals of the business we are trying to underwrite.”

Increasingly stringent environmental regulations and the current depression in commodity prices – which has seen many companies cut back capital expenditures – remain core concerns. But for countercyclical investors with strong balance sheets, the pullback (rig counts are at recent historical lows) provides an opportunity. “Crude prices are at a 10-year low,” says Lundin Petroleum’s Link. “Most of our competitors, partners and contractors have cut staff, exploration and development projects. Lundin Petroleum is one of the few that continues to explore.”

Accessing capital and controlling costs

“The good news is that as the traditional sources of capital move away, opportunities are created for others willing to take a different approach in how they assess and finance risk,” adds Alliance’s Cantrell. “We believe that for well-positioned, financially strong companies, capital will continue to be available, but it may be in different forms or at a higher cost structure. How the capital markets ultimately respond to these factors is a new dynamic, and one that we will continue to monitor closely.”

Cantrell’s perspective is echoed by Raúl Jacob Ruisanchez of Southern Peru Copper. His company faces the challenge of a heavily depreciated copper price, particularly in China, which will represent 46% of world...
copper demand by 2018. “Copper prices are very close to half of what they were four years ago,” Jacob says. “Now, companies struggle to meet their budgets because of the soft pricing in the market. Some companies have been facing the difficult challenge of closing operations or selling projects.” Jacob, however, believes this risk can be mitigated. “In our case, we have one of the most competitive cost bases in the industry and that has been a key part of our strategy as a business,” he says.

“One thing that we’ve observed in the industry is that, at a certain point in time, some of our competitors lost their compass. They forgot about controlling costs, and keeping costs as low as you can is one of the key characteristics of our industry,” he points out. “We avoid going into projects where the estimated costs per ton of capacity are relatively high. We had very good prices for a very long time, a ‘super cycle,’ and then we had the opposite, very low prices that are taking longer to correct, also because of a super cycle. So you always have to be aware of that. In simple terms, you have to stick to the basics of the business. You have to have cost control in order to be competitive, and cost control is especially important when things are going well,” he concludes.

For alternative energy producers, lower electricity unit costs have also proven a challenge. “We try to compete on an even plane with fossil-based energy manufacturers, so of course a drop in the fossil-based energy price will force wind energy to become that much more cost-competitive,” says Ejsing of Vestas. But, again, in rising to meet the challenge of the lower unit cost, he believes that his company can outperform its traditional rivals in the future. “One of our main strategies is to become as cheap as the fossil-based manufacturers,” he says.

The 10-year horizon
The executives we spoke to believe the core challenges facing business strategy over the next 10 years will be the same issues they grapple with today: unpredictable commodity prices, tightening access to capital and tough new regulations. But for companies that can cope with these challenges — by streamlining their businesses, finding new ways of accessing capital and anticipating regulatory change — there is also a huge opportunity: outlasting the competition.

“We believe that for well-positioned, financially strong companies, capital will continue to be available, but it may be in different forms or at a higher cost structure.”

— Brian Cantrell, Senior Vice President and Chief Financial Officer at Alliance Resource Partners
Even the best business model suffers if companies don’t have skilled, engaged employees and access to the additional talent they need. The challenge of recruiting, training, motivating and keeping the best people neared crisis levels in some parts of the natural resources sector during the boom years, and while most businesses in the sector are doing their best to operate with as lean a staff as possible, it’s possible that an uptick in commodity prices could cause a similar problem in the near future.

In every down cycle, skilled staff move to new careers, further depleting the supply of talent, particularly in specialized areas such as management of large-scale projects. It’s for this reason that, despite the current downturn, many in the industry face a shortage of talent at the C-suite and upper executive level. Layoffs and belt-tightening in the extractives industry in the early 1980s and again in the 1990s have left a smaller than usual pool of talent for businesses to select from in the coming years. With many engineers and executives who survived past layoffs now approaching retirement age, many companies are struggling to recruit externally for top positions.

Volatility and the need for skills
“Because the industry is volatile, there have been waves where companies hire, then have a lean time because of downturns and don’t hire and train for skills they might need in the future,” says John Pymm of Willis Towers Watson. “That leaves age-related talent gaps in the industry. You can have critical skills that are missing even during a downturn.”

Although many companies are cutting headcount, executives understand they will likely need to staff up once commodity prices come back. “When we get the inevitable rebound and the need for investment, we will be able to bring those people back into the business,” says Alister Cowan of Suncor. Because Suncor executives believe retaining staff outweighed the short-term benefits of improved margins, it has been less affected by this issue than many other companies, “We don’t want to end up having cut costs so much that we are increasing risk on our business as a whole,” he says. “But for some companies that are under dire financial pressure, that is not going to be top-of-mind.”

Executives see a general shortage of industry-specific skills as the
The biggest challenge they will face in the coming years, although leaders in the metals and mining and oil, gas and chemicals sectors say that they see a lack of international mobility within the workforce available to them as a significant risk factor to their current business models. “There is a skills gap from the international perspective because you do need people to travel to difficult places,” says Willis Towers Watson’s Pymm. “That needs to be compensated for with hardship allowances... but even then it’s not always easy to find people.”

The talent contest
Improvements in the image of mining companies in Africa has helped ease the pressure to bring in staff from abroad, says Mathias Sithole of Implats, the South African platinum mining company. “In our country, during the early days of mining, a big percentage of local people did not want to work for the mines,” he points out. “So we have a history of migrants doing the work. But that has changed, and we have got a lot of locals now wanting to work in the mines and communities wanting to benefit from the mines. So for us, the big shift has been in terms of labor relations.”

Perception of the industry is not just an issue for companies like Implats. Increasingly, natural resources companies are competing with tech companies for the best engineering and project management talent. The ability of power and utility companies to attract and retain key talent is one of the greatest risks they face. “One of the issues for the
industry is how to create the right image to attract younger workers, now and in the future,” Pymm says. “Right now, for younger talent, internet and IT companies top the list of desirable places to work.”

Oil, gas and chemicals and power and utilities executives highlight the growing problem of keeping employee compensation and executive reward programs competitive while remaining profitable. “Executive compensation has its own particular market that tends to move more quickly than workforce pay does,” Pymm says. But, he adds, many shareholders, facing declining profitability during a period of lower commodity prices, are questioning the rationale behind higher executive pay.

**Safety measures**
Executives also worry about workplace and safety culture, a critical issue at a time when companies increasingly depend on subcontractors to execute major capital expenditure projects. “We expect as high a level of safety awareness and responsibility for safe operations from our contractors and subcontractors as from our own organization,” says Erin Link of Lundin Petroleum. “With the decline in oil prices, suppliers and contractors have less work and more limited funds to invest in quality and that can affect safety. It’s therefore critical to remain diligent moving forward.”

“Are we keeping up to date, are we investing in maintenance, are our quality standards high? These are questions that we ask ourselves and that insurers ask us,” she adds. “We have done a full review of all of our contractors and how they may be affected by declining oil prices and have gone back to each of them individually to ask what measures they are taking in terms of maintenance plans and adherence to high standards. From this we have conducted a risk assessment to identify those suppliers and contractors that should be sourced elsewhere. We would move suppliers if their risk rating was considered to be unacceptably high.”

**Training for the future**
The current business cycle does offer a number of opportunities for companies with strong balance sheets that are willing to invest in their employees with an eye on future growth — treating employees as assets to be cultivated for the future rather than commodities to be bought and sold today.

“We spend a lot of money on training,” says Veolia’s Oliver Wild. “We actually have Veolia campuses around the world training young people to do our jobs and activities. That’s a key element. We have a massive number of engineers in our headcount and we do have specific training on our technologies.”

**The 10-year horizon**
Natural resources companies will need to strike a delicate balance over the next decade, executives told us, between keeping their businesses lean and investing in the talent needed to see their companies through not just the current cycle but the next generation of business cycles. And preparing for the industry in 2025 means employing and cultivating the right people today: finding tomorrow’s leaders and making sure they are in place in another decade’s time.
Conclusion

Given the risks and challenges highlighted by this research, what are our recommendations for business leaders?

Our first Natural Resources Risk Index shows that the industry is united on its views of the key megatrends and risks it faces today and over the next 10 years. Certainly geopolitical instability and regulatory change, coupled with digitalization and new technologies, have created new risks for the industry to understand and mitigate. At the same time, a changing industry landscape provides opportunities for companies willing to embrace a degree of risk.

In our view, the following risks – and responses – are key management considerations for companies competing in the natural resources industry.

The increasing spotlight on regulation
Over the next decade, it is likely government regulation of the industry will increase. If companies want a role in shaping the regulatory agenda and to have a voice, they need to engage proactively with government and put forward their point of view.

The growth of cyber-risk
In all its varieties – from unintended security breaches to cyber-terrorism – cyber-risk is now a boardroom issue for the industry. Companies that focus on effective risk mitigation strategies and continually review how their risk profile is changing will go a long way toward developing resilience against this growing threat.

The importance of big data
As smaller, more agile competitors enter the industry, companies need to embrace data-driven analytics to drive more effective decision-making in a faster, more connected world. This means collecting data, analyzing it correctly and using it to drive strategy.

Technological innovation
The natural resources industry is known for its ability to innovate and change with the times. At the risk management level, it is vital that mitigation strategies are regularly evaluated to ensure they remain relevant and effective in the face of technological change.

The right risk management team
As the types of risk the industry faces shift, companies’ risk functions must ensure their teams have the right breadth and depth of skills to help their organizations manage new risks and build flexibility.

Increasing interconnectivity between people and risk
As companies in the sector work in more physically challenging environments, it’s critical that human resources and risk functions have a coordinated strategy. This will involve addressing issues ranging from workforce safety to talent management to the challenges of managing a highly diversified workforce.

Human capital optimization
How should top performers be incentivized when merit budgets are slashed? Should employers in the industry consider segmenting the workforce, such as critical skill and hard-to-fill roles, diverting more funds to pay and reward people in those roles? From a training and leadership perspective, companies need to keep investing in careers and people development, with a long-term view.

Reputational risk
When the market rebounds, prompting increased demand for talent, those companies that have damaged their reputations by poorly managed downsizing will struggle to find the right people and will ultimately face higher compensation costs to attract talent. Companies that emphasize their corporate social responsibility, work with communities and countries to be good environmental stewards and effectively communicate their point of view help maintain not only their own reputation but that of the industry as well.
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