

Disruption, uncertainty and the role of risk management

IRM Energy and Renewables
Special Interest Group Report



Grant Griffiths



Developing risk professionals

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About the author



Grant Griffiths is an independent risk management professional, non-executive director and an advisor to boards on risk and governance who has held senior leadership roles with private and public sector organisations in energy, engineering and construction, banking, manufacturing and technology. He has worked in regulation and policy, risk, compliance, strategy, business transformation and as a board advisor for some of the world's leading organisations.

As a risk management professional, he has led Enterprise Risk Management (ERM), energy and commodity trading and risk management, and large-scale enterprise transformation engagements across the UK, Europe and Asia Pacific. He is also an experienced trainer and course leader having delivered courses in risk, strategy, leadership development and project and programme management.

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Alexander Larsen holds a degree in risk management from Glasgow Caledonian University and is a Certified Fellow and trainer of the IRM. He has 18 years of experience within risk management across a wide range of sectors, including oil & gas, construction, utilities, finance and the public sector, and has considerable expertise in training and working with organizations to develop, enhance and embed their ERM, Business Continuity Management (BCM), and Project Risk Management (PRM) processes in countries such as Iraq, Saudi Arabia, Malaysia and Nigeria.

Alexander spent the first half of his career in the UK working in senior risk consultancy roles in the UK with Marsh and Zurich before leaving to join Det Norske Veritas (DNV) in Malaysia and the United Arab Emirates with responsibility of developing their risk management services for the energy sector in Middle East & Asia. Since leaving DNV he has worked in the Middle East in a variety of roles. Prior to working with Lukoil, as Risk Manager for major projects and operations in Iraq, Alexander was at Saudi Aramco developing their ERM framework and also spent a few years developing and implementing ERM and BCM within Qatar Foundation.

Foreword

As the global professional body for the risk management sector, the Institute of Risk Management is delighted to publish this document from one of our member experts in the energy industry. Following on from the Energy SIG publication last year “Fuelling the debate - Latest trends in Energy,” which was based on a survey filled out by risk managers globally in the energy sector to better understand areas of improvement and concern, we have encouraged our members to provide further thought leadership articles and publications linked to those findings.

This report, by Grant Griffiths, Deputy Chair of the Energy SIG, explores the latest industry trends and challenges, and risk management’s crucial role in underpinning the future success of the global energy sector.

Grant set out to look at some key trends: the drive towards a greener economy, energy transition and its challenges, the strategic and operational aspects of these, risk management’s role in the changing energy landscape, as well as the recent shifts in market prices, cyber and digital innovation and risks. Then the Covid-19 pandemic struck, bringing even greater disruption to the energy sector. This has occurred at a time when the sector is already under immense scrutiny and pressure to change and transform, yet appears to be ill-equipped to readily adapt in a way which will ensure its long-term survival.

Given the commitments of the [Business Roundtable of leading CEOs](#) and others in addressing corporate objectives, and a new socially-conscious agenda, does this signal the seismic shift some have been longing for in our highly-valued capitalist system, starting with a sudden and total shift in energy? Is this the perfect storm of events?

The global green movement is growing in prominence; there is a drastic downturn in demand caused by the near-grinding-to-a-halt of the global economy; OPEC is continuing to produce at 2019 rates of production; there are excess volumes of gas and Liquefied Natural Gas (LNG); geopolitical conflict is growing; innovation is overturning old ways of operating – and all of these are being exacerbated by Covid-19.

Global energy demand is set to fall 6 % this year, seven times the drop after the 2008 crisis. Coal faces the largest decline since WWII alongside sharp falls for oil and gas. How will future business models change to meet these challenges and how well equipped is the industry?

These and many other aspects are explored in this essay, including the outcomes of our latest survey of global energy firms. This shows how risk management has become an integrated and essential aspect of business and the wider global community, and how we all have a role to play in guiding our organisations through these uncharted times.

I would like to thank Grant for his time and effort and for his massive contribution to this work and to the Energy SIG in general. It was a pleasure supporting him in this effort and I look forward to further contributions from our experienced and expert members in future.

Alexander Larsen CFIRM

Executive summary

The outlook for the energy sector at the beginning of 2020 was largely optimistic. The industry's role as wealth creator for developing countries seemed set to continue unchallenged for the foreseeable future. That was until the global pandemic hit at the beginning of the year.

Now the sector needs to focus more than ever on resilience. Reassessing its direction of travel will be key. Businesses will need to balance competitiveness with market dynamics, likely regulatory action with evolving stakeholder pressures to decarbonise. Achieving better management of capital at risk should be high on the agenda, especially in light of new technologies and shifting consumer habits.

The industry faces some long-term challenges that have become more difficult to manage because of the additional complexity and uncertainty of the Covid-19 pandemic. These include:

- Energy consumption levels hitting a plateau in 2030
- Increased pressure from governments and consumers to adopt renewables
- The impact of geopolitical events on future commodity prices
- Oversupply of oil and shortages of storage facilities
- The reshaping of global supply chains
- The consequences of lockdowns on the ability of businesses to both meet the skills demands of the future while keeping the lights on today
- Organisations' ability to cope with further pandemics in the future

Given that many of these factors have been around for several years, some have asked why risk managers seemed unprepared for an event such as the pandemic. Up to 80 % of organisations surveyed by IRM said they did not have pandemic plans in place.

The good news is that the unpredictable events and uncertainty related to the pandemic have highlighted the need for better crisis management planning in building strategic, operational and financial resilience across the business. Improvements to energy industry organisations' future risk and resilience capabilities are under a renewed spotlight, borne-out by the results of IRM's energy industry survey which show a significant move towards making improvements. Ninety per cent of respondents to the survey said they would actively seek to improve risk and resilience capabilities.

Action for the energy industry risk management function includes:

- ensuring alignment of timely information on capacity and prices
- re-assessing trading limits and strategy
- ensuring models are recalibrated to reflect changes in reference data as well as any newly identified constraints which could impact prices and operational capabilities

In fact, risk managers will play a greater role in bringing clarity to the evaluation and decisions on major new investments by providing input on financial, supply chain, digital, political and emerging risks which could make or break the success of major investment programmes. Not only that, but risk management itself will need to evolve. That could include developing a new range of key risk indicators and better ways of monitoring risk factors in the external environment which, as we have recently learned, can alter much more rapidly and dramatically than anticipated.

Introduction

When we look at our world and the great achievements of mankind, for over a century there has been one factor which arguably has been the driver of our modern society: energy.

Mastering everything nature has to offer and putting it to use for the betterment of society, the development of entire industries, as a catalyst for innovation and as a foundation for ongoing research and innovation, energy in all its forms is so entrenched in our lives it has become something we simply cannot live without.

Think about this: We wake up in the morning and make that coffee, cook that breakfast, catch up with the news, get to work – before we even start to take notice of what’s happening around us, we’ve relied on energy in one form or another – and from many different sources – to fuel our morning.

The effort that goes into giving us light at the flick of a switch involves a major logistical exercise and is part of a complex supply chain which stretches beyond both geopolitical borders and boundaries.

At the heart of the modern energy value chain rests a reliance on traditional fossil fuel sources. The take-up of wind, hydro and solar continues apace, together with lower emissions evolutions in combustion engines and power generation technologies. For many people these changes in the energy mix are still not considered to be enough in terms of their scale or the rate of change at which they are coming to market.

Growth and energy are inexorably linked, so how can we rebalance the energy mix without putting our very survival and economic well-being at risk? Will we crash the global economy in trying to initiate the type of change that is far too drastic and unsustainable in scope and scale?

The dilemma for industry and broader society is whether can we maintain our way of life, manage our demand for energy while striving for greater efficiencies in cost and sustainability, without putting at risk our great accomplishments and our global economy.

Do energy businesses – and does the energy industry at large - have the operational capability to execute complex, ever-lasting changes, and the strategic imperative and appetite to drive those changes? In facing the current and future challenges, how does the energy industry identify and respond to the risks in a way that balances the expectations of their stakeholders while rising to meet the challenges of the future?

We explore some of the key things affecting the energy industry:

- > What happened in early 2020 in global energy
- > Why it happened
- > What it may mean for energy companies
- > What risk managers must do to build stronger risk competencies and resilience in energy companies
- > What the future may look like

The results of the IRM Energy SIG 2020 global survey (which canvassed the views of global energy firms) are also discussed and shared in this publication. This paper does not set out to provide a panacea for all the problems energy faces but it looks to shed some light on risk management matters against the backdrop of the unprecedented events brought about by the Covid-19 pandemic of 2020.

Energy's role in the global economy

After three years of decline energy investment picked up in 2018 and this trend continued into 2019. Global consumption was up for the year and showed all signs of continuing its strong growth path.

Towards the end of 2019 the outlook for oil (including shale) was optimistic (Brent Crude averaged US\$64 a barrel) and, based on analysis of prices from some of the major European and Asia Pacific region electricity exchanges, electricity prices were relatively buoyant.

The story was slightly different for gas. Liquefied Natural Gas (LNG) prices at the start of this year were already at uncommercial prices, something which was, according to a number of market observers and experts, not unexpected due mainly to an oversupplied global LNG market. A look at the Platts JKM in February this year shows the price tumbling to \$3.512 per MMBtu, which is half the spot market rate in October 2019. This was exacerbated by the threat of Covid-19 and its impacts on demand. The market is seeing prices around US\$2MMBtu for LNG and natural gas is at \$1.62 (Henry Hub price) compared to \$3.04 at the end of 2018 and \$2.13 at the end of 2019.

Coal had started to ease from a 2019 high of \$102 at the start of 2019 to end the year at \$70 and has continued to hover within a narrow range of that level throughout March 2020. With forecasted reductions of electricity consumption in the range of 10% to 40% (Europe: 10%-40%; India and USA: 20%) for 2020 further downward pressure on coal process can be expected.

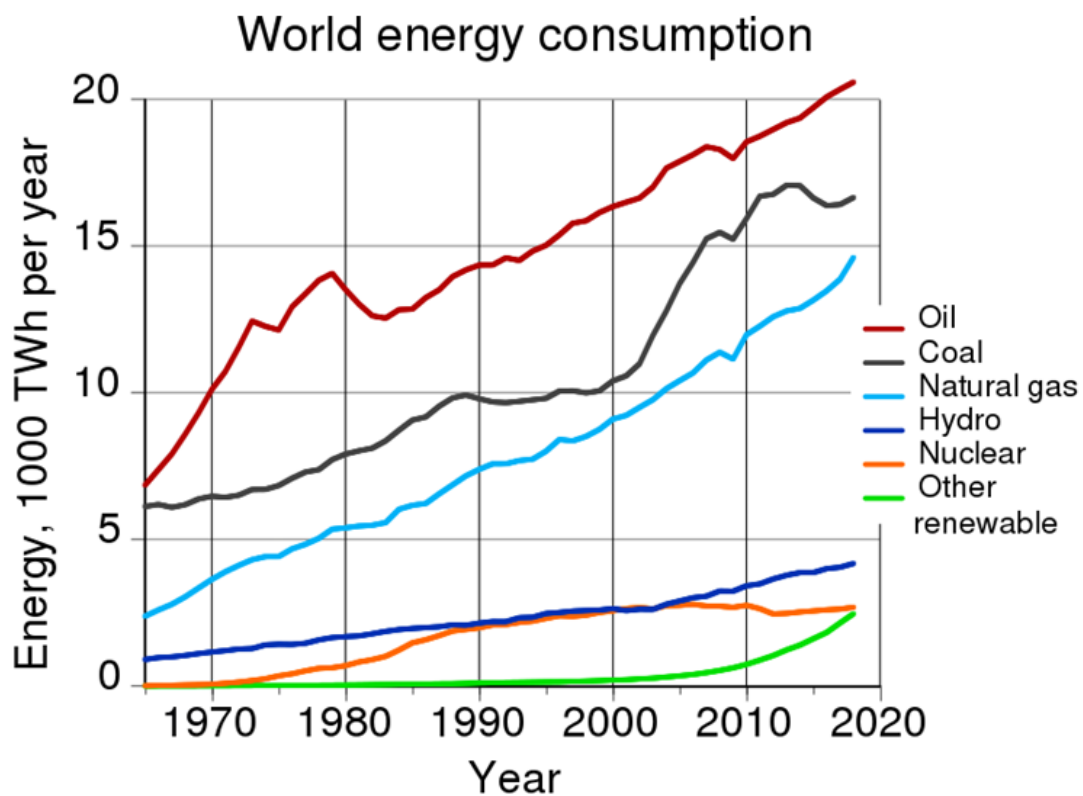


Figure 1: World energy consumption, 50-year trend

Coming into 2020 there was a general consensus that demand for energy would continue at rates close to or slightly above previous years, and of that oil prices and supply being available despite ongoing geopolitical concerns in the Middle East. Investment in new assets would continue, creating jobs and wealth especially for many countries in emerging markets who have pinned their hopes on an oil boom.

And still there are untapped opportunities for energy: Around 1 billion people on the planet still do not have access to electricity despite the largest share of energy infrastructure investment being in power projects, accounting for US\$ 771Bn in 2018, \$304Bn of which was in renewables. Developing and low-income countries account for around 40 % of the world's population yet energy investment in these countries accounted for less than 15 % of energy investment in 2018.

Year	Global GDP US\$	Energy Infrastructure Investment US\$	Energy Infrastructure Investment % Global GDP
2017	80.684 Tn	1.801 Tn	2.232
2018	84.835 Tn	1.842 Tn	2.171
2019	88.081 Tn *(E)	1.85 Tn (E)	2.100 (E)

*estimate. Source: World Bank
Table 1: GDP 2017 – 2019

Energy's forecasted future – 2020 and beyond

Looking forward, global energy demand is expected to show a steady increase across sectors, estimated at around 20% over 2017 figures, with some analyses forecasting as much as 30% growth, despite the growing pressure to decarbonise aided by a shift towards lower carbon fuels.

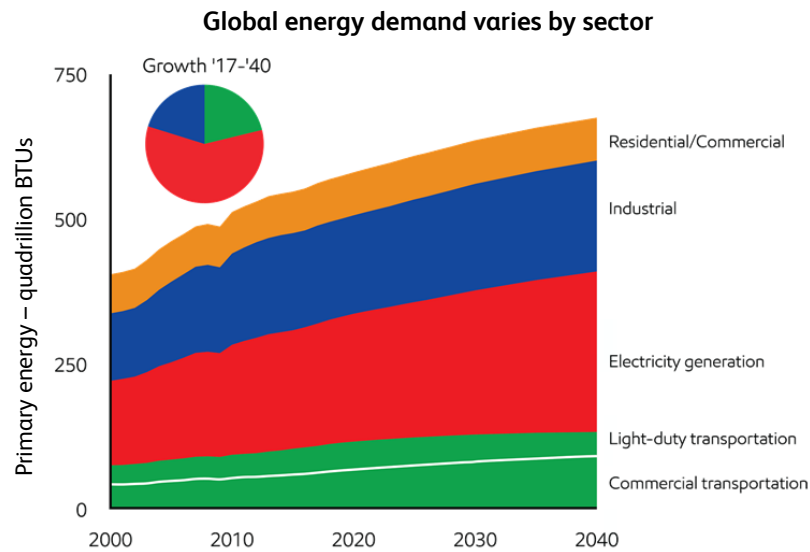


Figure 2: The outlook for energy until 2040 – “despite the move towards decarbonisation, demand will grow by around 20%”. Source: Exxon Mobil Report: “Outlook for Energy”, 28 August 2019.

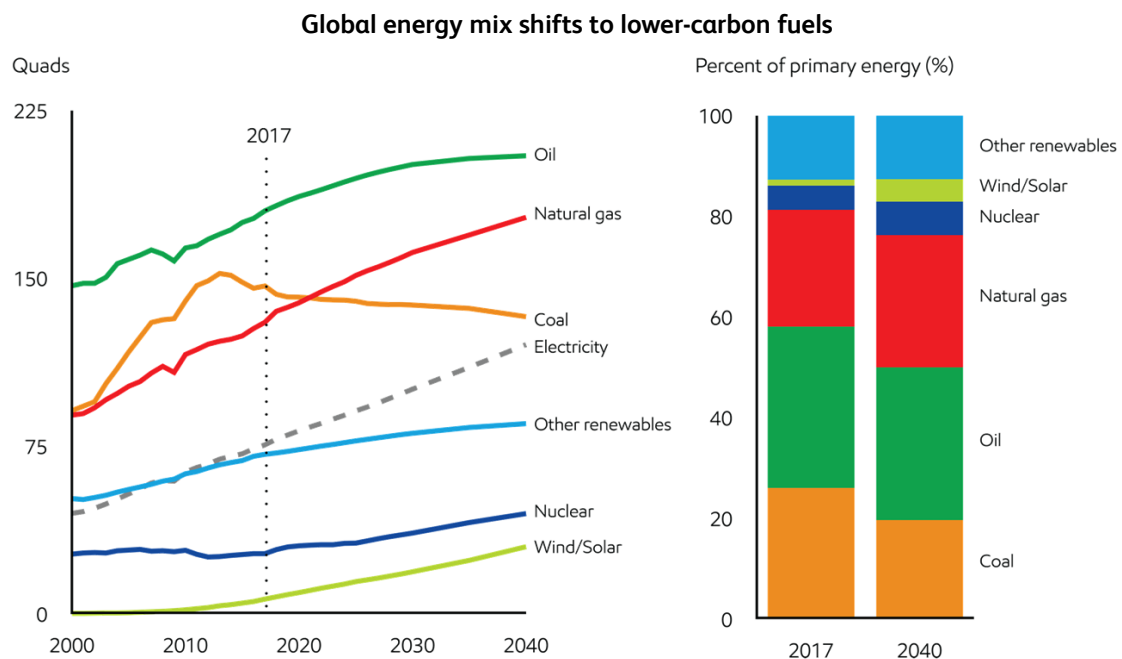
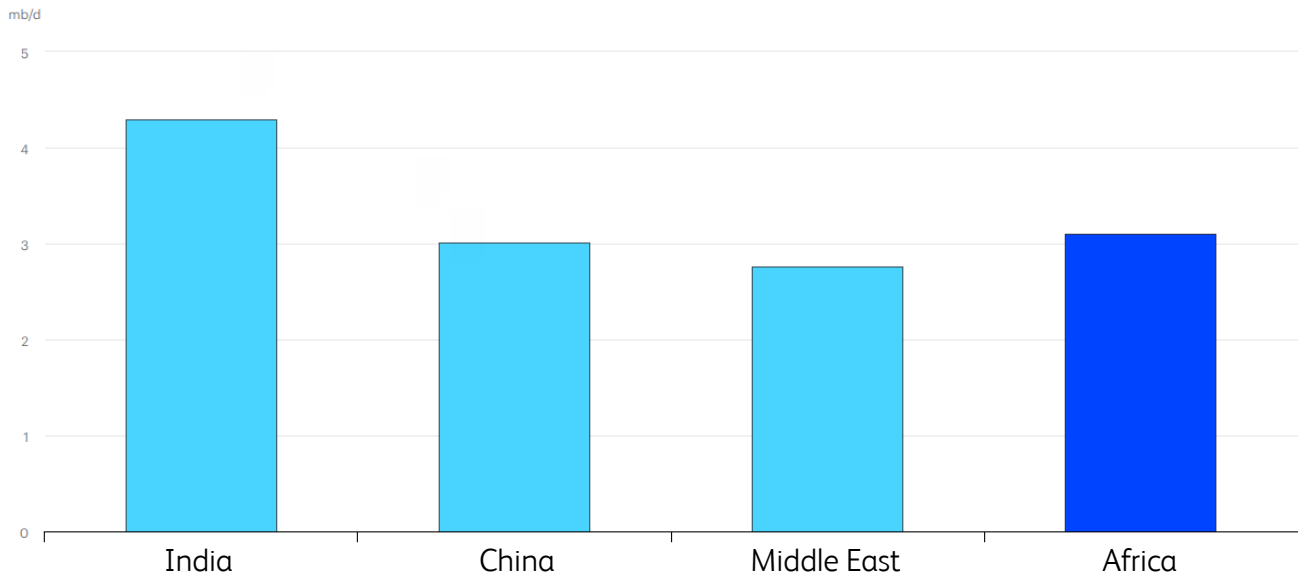


Figure 3: The change in the energy mix – “The demands will factor in peoples’ energy preferences, with a strong increase in demand for electricity. Peoples’ preferences, combined with regulatory changes being imposed by governments, will drive a shift towards greater use of lower carbon fuels”. Source: Exxon Mobil Report: “Outlook for Energy”, 28 August 2019.

Energy’s role as a creator of wealth and opportunity for people in the less developed and generally poorer parts of the world appeared set to continue unchallenged for the foreseeable future. A quick look at some of the forecasts reflected in the charts show the extent to which the traditional oil industry was shifting its focus to emerging markets.



IEA. All Rights Reserved

Figure 4: China, India, Middle East and Africa: Oil demand, 2018 – 2040.
Source: IEA (2019) World Energy Outlook. All rights reserved.

Note that the above is based on “pre Covid-19” growth and demand scenarios. Despite the impacts of Covid-19, they still provide a reasonably accurate longer-term outlook which, as we will explore later, is unlikely to significantly change.

Future energy use is expected to plateau by around 2030. This is not because the world’s population is decreasing or becoming less mobile (nor less reliant on technology) but rather by lower energy intensity which driven mainly by increases in efficiency and changes in energy consumption mindsets and habits. This is expected to take place during a forecasted period of continuing economic growth while energy demand continues to increase but at a slower rate.

The most prominent anticipated change is the large-scale increase in Electric Vehicles (EVs) which is being driven by a combination of consumer behaviour, including increasing sensitivity to the environment, and governments pursuing agendas aimed at decarbonising their economies. As politicians look to drive post-Covid-19 economic recovery, we are witnessing some shift in central government policy towards relaxing the decarbonisation targets in some parts of the world. How this will translate into fossil fuel dependency longer term remains to be seen.

With the effects of Covid-19 lockdowns around the world, there has been a paradoxical and marked shift away from the trend to a higher use of public transport. In countries such as Sweden where decarbonisation is high on the agenda the political and social response to managing Covid-19 has been to avoid lockdowns. This has resulted in people gravitating away from public transport and towards private vehicles.

The current global situation during the Covid-19 pandemic has resulted in revised downward estimates of 5 % for electricity demand in 2020, the biggest drop since the 1930s ([IEA 2020, Global Energy Review 2020](#)). However, global electricity demand decreased by 2.5 % in the first quarter of 2020 even though lockdown measures were in place for less than a month in most countries. It will be some time before the total impact of Covid-19 can be fully assessed, especially since a milder European winter in 2020 needs to be accounted for.

The current generation mix of renewables and large inflexible generators may mean curtailment of some renewable sources as grid operators try to balance market demand and generation production in a competitive, flexible and optimal manner to ensure security of supply and affordability. However, there has been an increase in renewables as a percentage of the generation mix in all regions that implemented lockdown measures during the first quarter of 2020.

For the remainder of 2020 and into 2021 sources of power generation will vary from region to region based on a combination of factors including market structure, cost, availability and demand. In addition, they will be affected by the shape of the recovery from Covid-19 imposed lockdown measures, changes in political policies, and the increase in available renewable capacity from new projects that have been built over the past year coming online.

Annual average growth rates of electricity demand in selected regions, 2001-2020

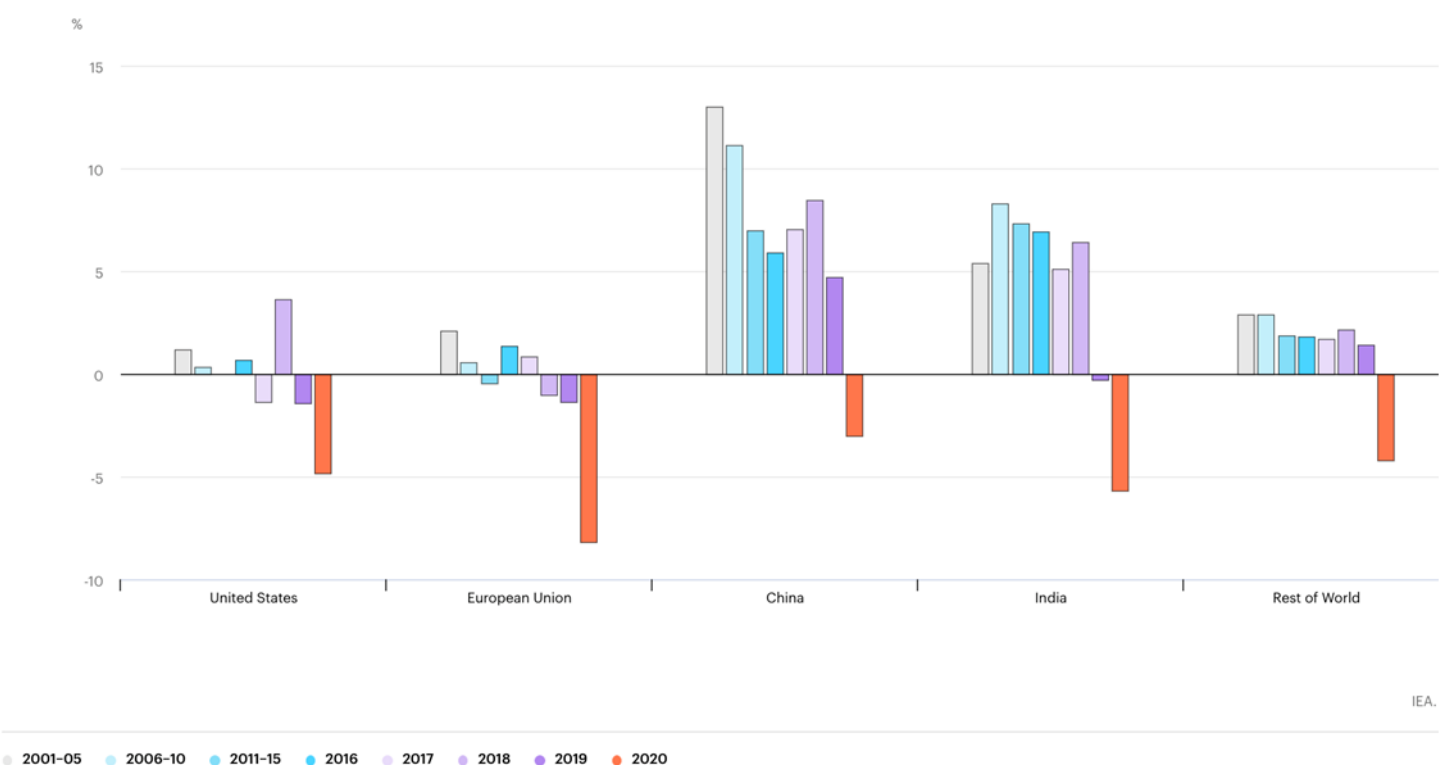


Figure 5: Annual average growth of electricity demand in selected regions.
Source: IEA (2020) Global Energy Review. All rights reserved.

The resilience of oil

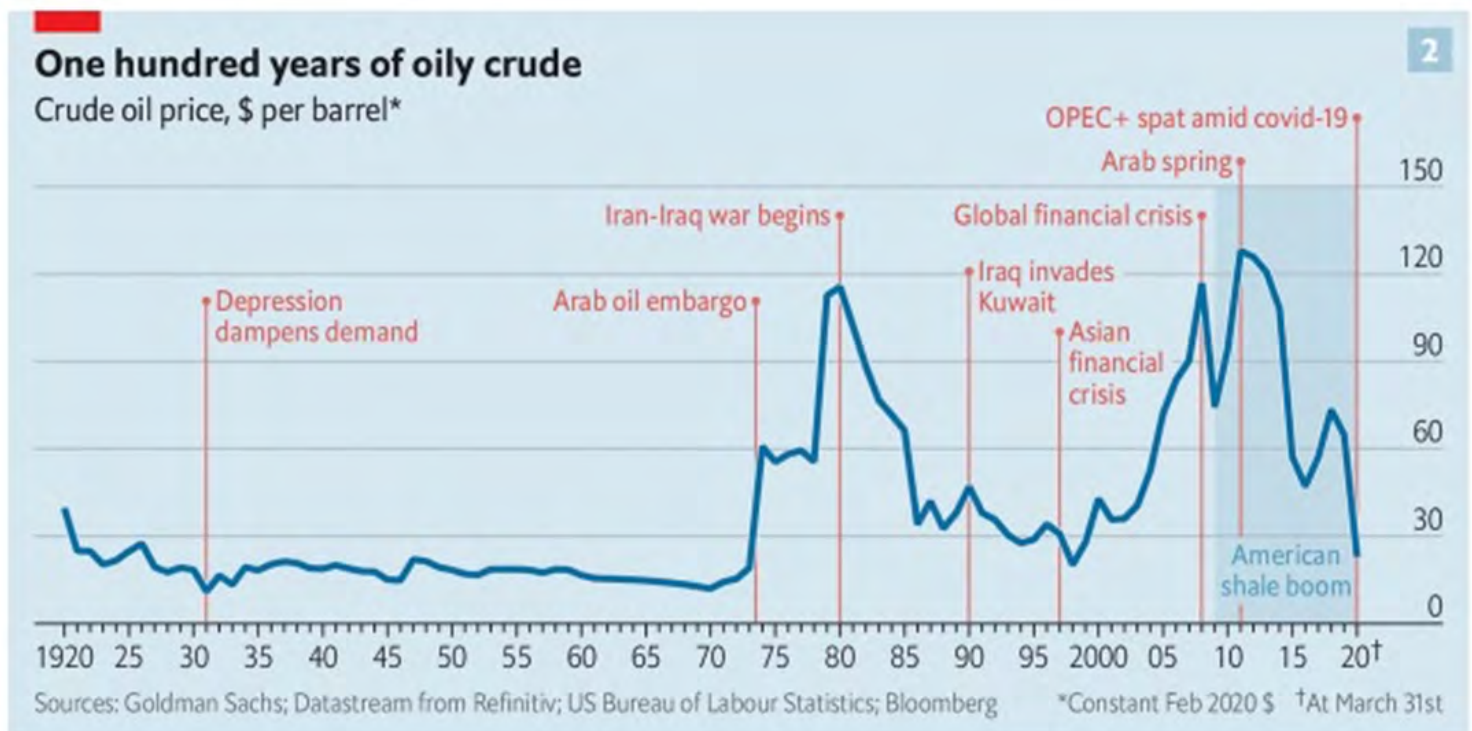
The energy industry needs to continually review its direction of travel and balance the shifting sands of competitive and market dynamics, regulatory policies and the evolving stakeholder landscape to ensure its future.

Perhaps the most widely referenced indicator is that of global commodity prices, especially oil, given they tend to reflect demand, supply and forecasted growth in GDP, as well as other industry specific and politically-driven imperatives.

The combination of current societal pressures facing the energy industry, the wide-scale global disruption brought on by the pandemic, and an oversupply of oil and gas may well be the industry's greatest period of uncertainty. This raises the question, is big oil in a fight for its very survival?

The volatile nature of the energy industry makes it naturally resilient. Decade after decade, crisis after crisis, it has always exhibited an ability to bounce back, innovate, adapt and change.

Looking at the last 100 years of oil we can see how geopolitical events, incidents and unrest, and OPEC decisions have traditionally impacted oil prices. Ongoing unrest in the Middle East will always tip the balance of the supply / demand equation and create ripples in prices. But right now, there are several other factors at play exacerbating the current market, such as oversupply coupled with a demand shock and a battle for market share. And the end of Covid-19 may not necessarily bring the immediate bounce back many are expecting.



The Economist

Figure 6: Crude oil prices, key events: 100 years. Source: The Economist.

The energy industry is highly capital intensive. In recent years we have seen the shortening of project lead-times bringing benefits for investors and the markets. Time to market for the construction phase is now typically 20 % shorter than at the start of the decade with the time taken to complete projects falling across all sectors.¹

To illustrate this point, conventional oil and gas projects are coming to market within three years (compared with 2014: off-shore 4.5 to 6 years, and onshore taking an average of 3.75 years to complete) and for power generation renewable projects are now coming to market in under 2 years (in 2014 it was taking an average of 2.6 years).

Why does this matter? Any move towards better management of capital at risk for energy industry players delivers significant bottom-line and competitive advantages.

And there are a range of other trends and events shaping and driving the industry.

Some of the trends and opportunities risk managers need to keep their eyes on include:

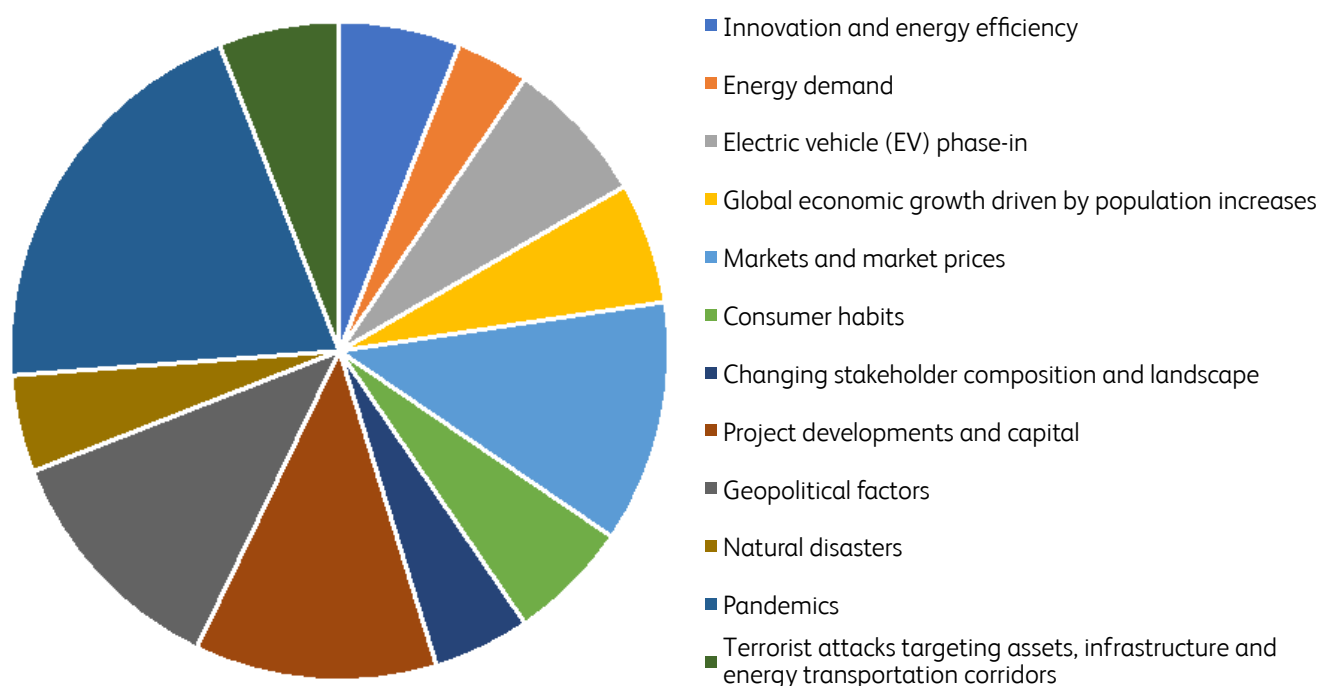


Figure 7: Key Risk Manager trends and imperatives for the global energy industry. Source: IRM Energy SIG Survey, 2020 and the author's own research and interviews conducted between February and April 2020.

Understanding the current state, trends, challenges and the risks facing the global energy industry are critical in building organisational resilience as a means to achieving ongoing and sustainable success through challenging times.

¹ The reference made to time to market for projects refers to the construction and commissioning phase and does not include the often-long periods associated with feasibility studies, granting of licences and complex government consents and approvals.

A dip into negative oil prices

Given the role markets play in shaping the investment strategy, industry development, R&D, innovation and employment in the energy industry, any commentary on the trends and challenges and risk management's role requires us to look at this critical aspect.

As mentioned earlier, the outlook coming into 2020 was a positive one for oil as was the industry's viability in the medium to long-term based on the signs of demand remaining relatively strong. It was evident there was a reasonable balance between supply and demand, a strong pipeline of upstream projects, new mid-stream assets coming to market and significant opportunities for value creation to be leveraged across the entire value chain.

This has all changed in just a few months. Two new risks have emerged:

1. The negative impact of Covid-19 on energy demand
2. The impact of the pandemic not only energy but the entire global economy

But it is too simple to say Covid-19 is the sole cause of the resulting low oil and gas prices that have followed it.

Energy prices and markets are highly sensitive to supply and demand fluctuations and the market risks have been generally relatively easy to follow, forecast and respond to based on events and factors such as an OPEC decision, unseasonal weather, planned asset outages, or pipeline, storage, or transmission constraints, or geopolitical events.

Oil, gas and minerals commodities, which are traded on a global scale, drive business decisions starting with large-scale capital investment programmes and trickling down to more discreet, localised distribution and consumption investment and expenditure decisions. When prices are high, the investment appetite is correspondingly high based on likely direction of travel of commodity prices. That is the nature of markets and returns on investment.

Prior to 20 April, crude oil had hit its lowest level in 18 years. On 20 April 2020 we woke up to find US physical oil has achieved what many thought was unachievable: negative prices. This was history-making.

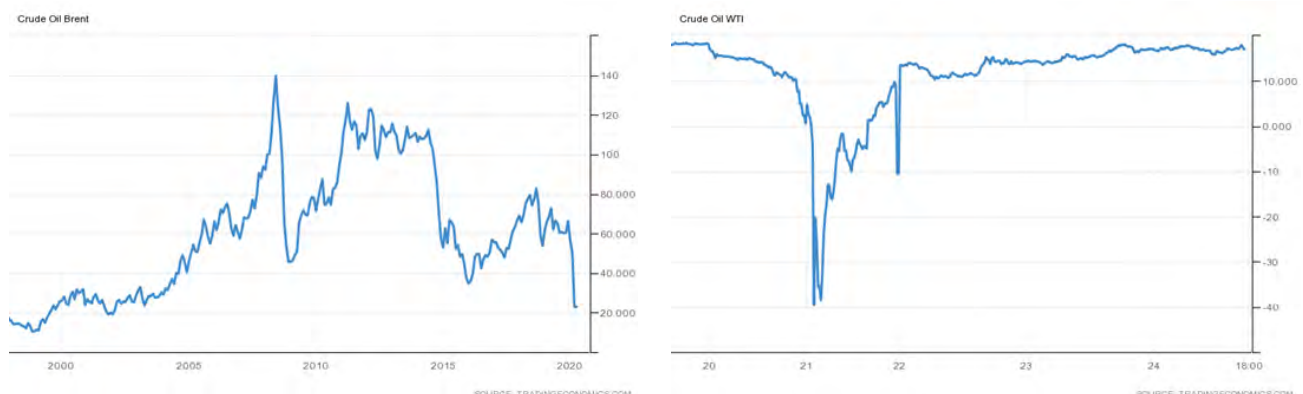


Figure 8: Left: 2000 – 2020 Brent Oil prices. Right: WTI price 20 April 2020 (USD per barrel)
Source: Trading Economics

While many people have pointed to the actions of OPEC for this unprecedented shift in prices, OPEC is only a very small part of a much larger picture. The primary reason for the lack of alignment on production output is a war for market share between Russia, Saudi Arabia and the USA – prompted by Russia’s actions.

One of the underlying fundamentals that drive market prices is that Russia’s budget is balanced at a lower oil price than the economies of Saudi Arabia and other OPEC members. Russia’s risk tolerance for a lower oil price is higher, which means it is able to ride out lower prices while maintaining a budget surplus. And considering its sluggish economic growth since 2015, Russia also wanted to bring more oil to market to generate extra revenue. Moreover, Moscow saw an opportunity to push US competitors out of Europe by driving prices down to levels at which US shale production would be unprofitable.

Russia’s relatively higher cost of oil production defines its price flow. Its cold climate means that it needs technology to maintain the flow of crude oil and to stop gas from freezing in pipelines. Responding to such events means applying some good old-fashioned risk-based thinking. For example, businesses could move their maintenance periods forward and align them with agreed production cuts.

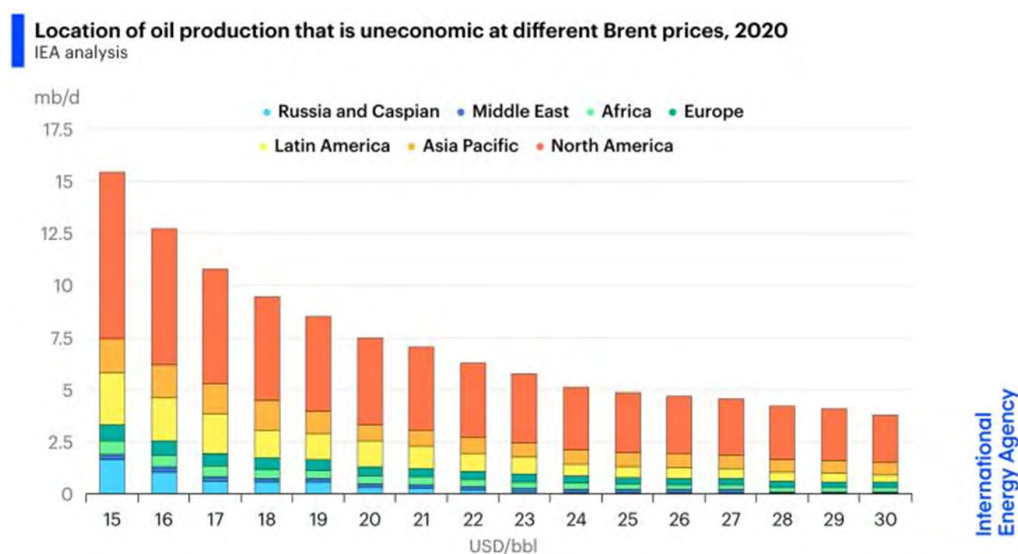


Figure 9: Location of uneconomic oil production at Brent prices, 2020.
Source: IEA (2019) World Energy Outlook. All rights reserved.

No room for oil

We are living through an unprecedented demand shock, reflected in the 6 Mbpd demand decline in Q1 2020. Benchmark this against the previous global economic turmoil of the 2008/09 global financial crisis when demand fell by around 2.9Mbpd in Q1 2009.

Let’s look more closely at 12 April 2020 and the agreement of the OPEC+ group to cut output by around 9.7 Mbpd in an effort to re-balance the supply / demand equation.

Under normal circumstances one would expect a significant rebound in oil prices for both Brent and WTI. Unlike in the past, prices picked up only to retreat until US WTI reached negative prices of around -\$37.63 per barrel on 20 April. Brent crude was trading around \$26 per barrel at the same time.

Why? In summary, storage is full. This includes facilities such as Cushing in the US, as well as marine storage in tankers. There was also a sell-off as funds and other investors raced to get out of the May contracts hours before they expired. This was largely driven by the lack of storage, an oversupplied market and the demand shock. It is the perfect storm of oversupply and a demand shock happening all at the same time.

Even prior to this historic low, US shale had become uneconomic. LNG remains commercially unviable. For those producing oil, despite prices making it a prime “buyers’ market,” the question is, who would possibly buy it?. In these circumstances, refinery demand is down by around 20 Mbpd. Those cargoes currently on the water and on their way to refineries will only further exacerbate the problem.

And the outlook for industry service providers is no better. Under ordinary circumstances including some sustained downward trends in commodity prices, service providers still experience modest to strong demand for their services. However, even if demand for services is still there the current restrictions on movement of people imposed by Covid-19 complicate matters. Given the need to physically turn up and do the job, the energy industry faces the additional challenge of uncertainties should critical infrastructure fail.

In the northern hemisphere as we move into summer, electricity producers especially face extra challenges. If we experience a prolonged period of travel bans, a hot summer and high electricity demand, an unexpected outage or series of outages could bring on havoc, or even a new crisis, in some regions. This is partly to do with social movement restrictions and supply challenges, and partly due to do with a change in expected demand profile changes driven by the Covid-19 induced economic activity downturn.

This raises the question, should risk managers have seen this coming? Was the scenario on their radars? For some businesses, it may be that their business continuity and supply chain risk management lacked the efficacy needed to support operational continuity.

Few pandemic plans in place

A global pandemic and its effects were not given prominence by most organisations prior to 2020. The World Economic Forum's annual Global Risks Report which, based on the results of those surveyed, indicated the threat of a global infectious diseases pandemic had fallen in recent years despite warnings to the contrary. This in part is likely attributable to the blind spots most countries, and industries, have when it comes to the realities of a pandemic.

"Infectious diseases" was rated below the dominant top 5 long-term risks which were all centred around climate change and environmental issues.

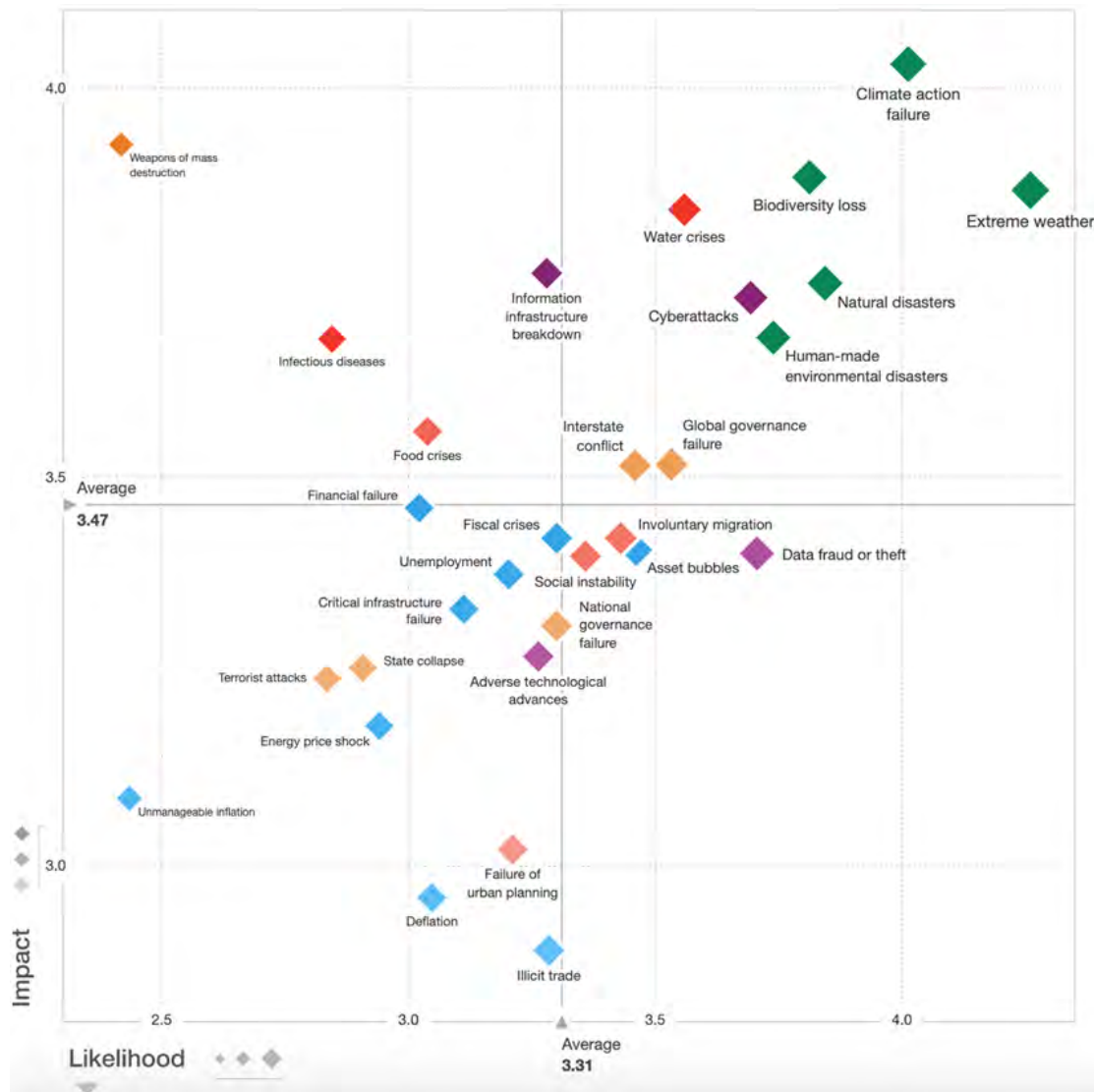


Figure 10: Source: World Economic Forum, Global Risks Report (2020) (extract)

A recent survey conducted by the IRM's Energy SIG polled a cross-section of global energy companies and asked how they were dealing with the current Covid-19 situation, and specifically how well prepared they were to deal with pandemic related issues. Around 80% stating their organisation did not have pandemic plans in place.

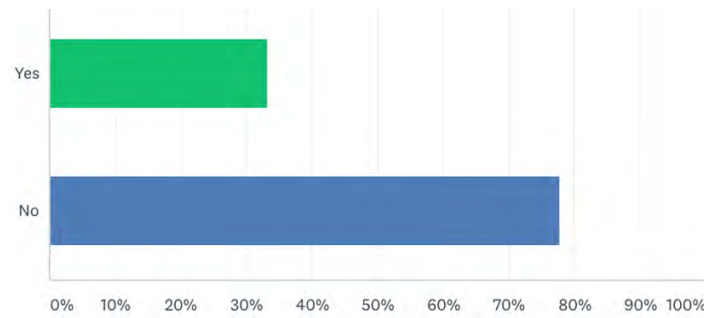


Figure 11: Organisational readiness for dealing with a pandemic.
 “Prior to the pandemic did you have well established pandemic plans in your organisation?”
 Source: IRM Energy SIG energy global industry survey, May 2020.

Research by a global consulting firms compared the preparedness of different sectors and found that the financial services sector felt more prepared with 80 % of directors indicating that they felt their firms were very, or very nearly, prepared to respond to such events as Covid-19. This reveals a very large difference of perspective between sectors who have previously had to deal with significant disruptive events (financial services) compared with the level of preparation undertaken by energy companies.

Yet 90 % of energy companies went on to state that as a result of the current Covid-19 pandemic they are now working on updating or implementing (from scratch) pandemic management and / or business continuity management plans, reflecting a strong call to action initiated by the pandemic.

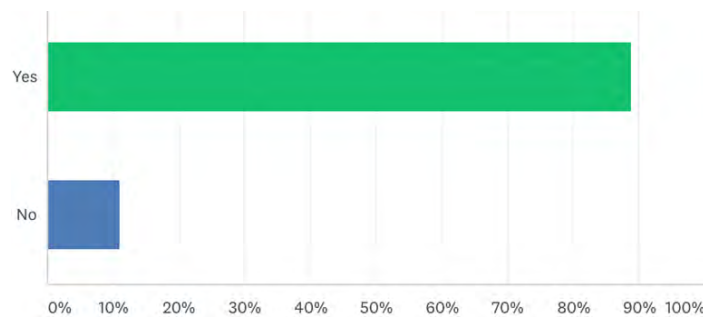


Figure 12: Organisations now working on updating or implementing.
 Source: IRM Energy SIG energy global industry survey, May 2020.

Despite this lack of preparedness by energy companies, the great majority (around 90 %) felt they had responded well to the pandemic.

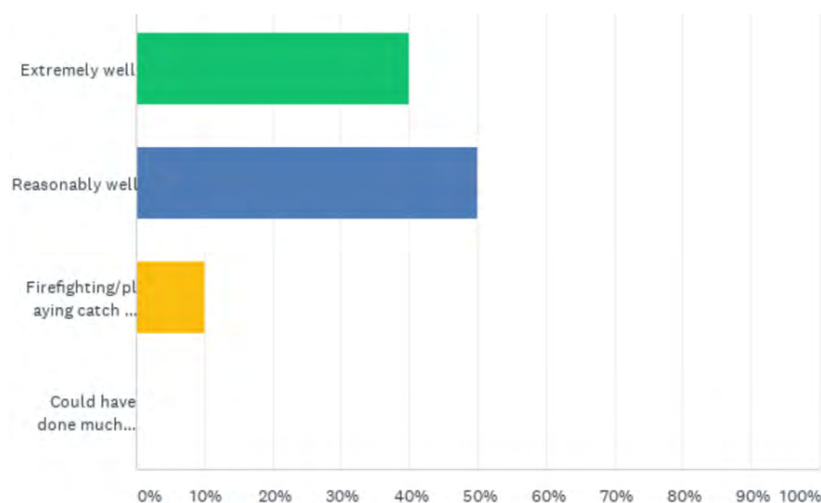


Figure 13: Organisations who feel they have responded well to the Covid-19 pandemic.
 Source: IRM Energy SIG energy global industry survey, May 2020.

Industry challenges

In terms of industry challenges there will be a rebalancing across a number of areas from strategy to operations to regulation, all aimed at facilitating a smooth exit from the current turbulence.

The historic oil and gas price lows have focussed attention on storage as an initial response to the supply glut, but storage has physical constraints. Global oil storage capacity is estimated to be between 900 million and 1.8 billion barrels, which is equal to roughly 9 to 18 days of global supply (based on 2018 numbers). With the low market prices many organisations have raced towards storage as a natural response but as we have seen oil storage is now fully booked and storage costs have spiked (>500 % in some cases). This is great upside news for both storage facility operators and tanker owners.

The full take-up of available storage will likely have a longer lasting effect on the industry as cheap oil and gas commodities are expected to be around for some time and global demand is also expected to continue lagging. It could take some time for prices to get to anywhere near full recovery.

An oil industry executive weighing up whether to divert capital investment into storage is likely to quickly realise such a strategy probably is not sustainable. Future prices, the timeframe associated with developing new storage capacity (years), and uncertainty over future demand (especially given ongoing uncertainty around Covid-19 and the rate of demand recovery) would count against it.

One of the biggest trends will be in the reshaping of the global supply chain, not only for energy but across a wide range of commodities, availability of services, and personnel – including how, where and why energy companies invest.

The growing significance of the global environmental movement and an increase in activism is driving a major shift in thinking and decision-making for boardrooms and investors through the targeting of investor stakeholders. Many have started to withdraw from investing in fossil fuel-based projects, which has forced the hand of energy companies to reconsider how they invest.

Our energy dependency and reliance on fossil fuels continues to be questioned and challenged by an array of stakeholders around the world from governments to big oil, from lobby and interest groups, to consumers with changing habits.

The response by governments around the world as to how they evaluate and grant licences for new projects may change as a result of the impact Covid-19 has had on global economies. The level of uncertainty in terms of exiting the current pandemic, the shape of economic recovery and the ability to kick-start economic activity, brings further challenges for an industry already faced with significant disruption and change.

The availability of experienced personnel and the resourcing strategies for both development projects and for operational sites may need to be re-imagined and re-engineered with energy companies potentially taking a more proactive role in the training, education and ongoing development of skilled and qualified personnel – possibly with a greater emphasis on location, ability to deploy to site and cost. In some parts of the world this will be easier to execute, while in other regions it will be a matter of developing industry centres of competency which will take years to scale and fully realise.

According to recent data from the Global Wind Energy Council (GWEC) and the Global Wind Organisation (GWO), the offshore wind sector estimates some 77,000 trained workers will be needed by 2024. This skills requirement will no doubt call for redeployment of skilled staff from current utilities and energy businesses.

Addressing risks

Unpredictable events and uncertainty related to the pandemic continue to expand the scope of risks, highlighting the heightened need for crisis management planning in building strategic, operational and financial resiliency across the business.

Improvements to energy industry organisations' future risk and resilience capabilities are under a renewed spotlight, borne-out by the results of our energy industry survey which show a significant move towards making improvements. Ninety per cent of respondents to IRM's survey said they would actively seek to improve risk and resilience capabilities.

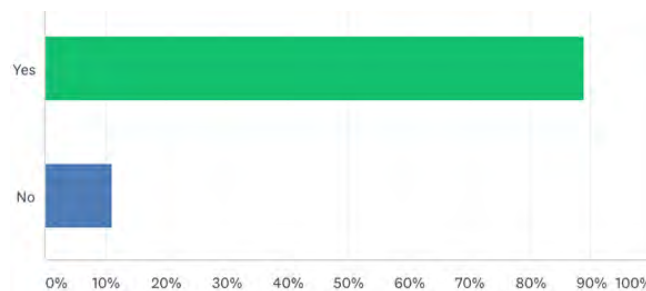


Figure 14: Organisations looking to actively improve or implement risk / resilience capabilities.
Source: IRM Energy SIG energy global industry survey, May 2020.

(Note: An interesting observation shows the responses to the question: “are you working on updating or implementing (from new) pandemic management and / or business continuity management plans?” produced exactly the same percentage response as it did to the question: “Will you be actively doing anything aimed at improving risk / resilience capabilities?”)

While many might suggest that putting together or updating pandemic plans now is too little too late (we are already in a much more severe situation than a pandemic), it is important to remember that the pandemic is not going away just because lockdowns are easing. Risk managers need to consider a second wave, a potential second lockdown or even their own employees getting sick. Being prepared for this is going to be vital in ensuring that any newly developed strategies are suitable and effective going forward. These scenarios need to be considered as part of strategic planning too and stress tested to ensure that the company can withstand another worst-case scenario of a lockdown.

Market and Financial Risks

Market and financial risks include geopolitical risks due to their influence on markets, including prices. The IRM survey returned a unanimous view that aside from Covid-19 low oil prices (in the US\$ 20 to \$30 price range per barrel) and adverse global economic events (namely the GFC) have posed the biggest risks to energy companies.

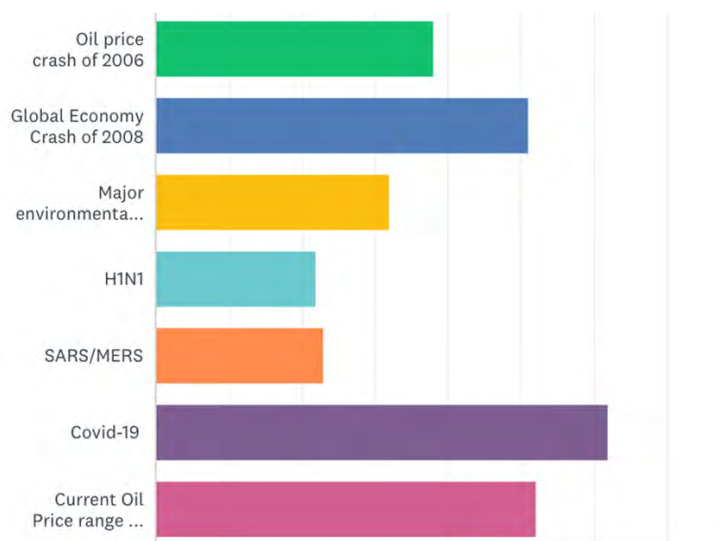


Figure 15: The ranking of the impact of major events on the energy industry in response to the question: “How do the following events compare in terms of impact on your organisation?”

Source: IRM Energy SIG energy global industry survey, May 2020.

Global market prices continue to be uncertain.

Trading market risks are well illustrated by the recent negative oil price seen in the US in April, as we saw earlier.

Risk managers will need to drive scenario analysis of lower oil prices – including the potential for repeats of negative dips in value.

Operators with physical assets including midstream transportation and storage businesses face near-term volume risks with the likely shut-ins caused by the over-supplied market and fully booked storage.

Physical cargoes are contracted on an FOB basis and already belong to the refineries that bought them. This will create further storage challenges and have an effect on refinery operations and refined product prices. In the USA, for example, the contracts they have from the Middle East will soon arrive (mid 2020) and refinery runs will need to be carefully planned to help mitigate the effects of excess supply, while hoping there will be a some return to pre-Covid-19 levels of demand to further offset any oversupply.

Risk managers will need to facilitate discussions as to how the physical supply chain could be re-engineered to help address the backlog, including feasibility studies on the potential for development of additional physical storage, refinery capacity upgrades and acquisitions.

Challenges in the electricity sector have also been worsened by Covid-19. The generation mix is inflexible and still undergoing change as the move toward renewables continues. Current tenders aimed at meeting (pre-Covid-19) capacity forecasts may well be put on hold given the global economic uncertainty. This could impact the attainment of de-carbonisation targets within mandated timescales. Flexibility and security of supply are key. Both transmission system and market operators will need to work closely with regulators and governments to solve any political problems. For the owners and developers of new generation assets there will be a re-think over fuel costs and types. Innovation and technology improvements could play a part in bringing greater resilience and certainty to strategy and operations. In addition, possible changes to regulatory criteria and process may come into play.

Action for the energy industry risk management function includes:

- ensuring alignment of timely information on capacity and prices
- re-assessing trading limits and strategy
- ensuring models are recalibrated to reflect changes in reference data as well as any newly identified constraints which could impact prices and operational capabilities

Risk managers will play a greater role in bringing clarity to the evaluation and decisions on major new investments by providing input on financial, supply chain, digital, political and emerging risks which could make or break the success of major investment programmes.

Hedging strategies will most likely need to be reviewed and decisions taken by the trading and marketing business leadership as to how they structure their portfolios going forward, bearing in mind market liquidity and availability of suitable arbitrage opportunities.

Risk modelling capabilities and techniques need reviewing to see how they can be enhanced and, in some cases re-architected, as part of improving actionable risk-based insights and strategy execution.

What works well for an asset-centric oil or gas company or an electricity producer will not necessarily be right for a financial institution trading energy products.

The risk management function needs to look at the fitness for purpose of the current risk management structure, processes, capabilities, competencies and systems, as well dedicating adequate budgets allocated to ensure implementation.

Overall, it is time to re-align risk appetite and risk tolerance taking into account the current and future expected state of the market.

This will necessitate the risk committee and risk function working across business lines to understand how the business has changed as a result of Covid-19 and energy market events.

The global political and geopolitical landscape will continue to play a role –perhaps an even bigger role – as we attempt to exit the periods of lockdown associated with Covid-19. Among the many factors likely to have a major influence on direction of the industry are the political fallout from Covid-19, policy positions on decarbonisation (versus the need for economic recovery), debt (public and private sector), war (including trade wars), acts of terror and GDP growth on a wider global scale. Politics will, as we have touched on earlier, be most likely to play a role in the supply chain, sanctions, and granting licences to operate in many parts of the world.

Financial factors driven by geopolitical considerations notably in the Arabian Gulf, the OPEC+ Agreement, the Eastern Mediterranean, and China's moves in the South China Sea are just a few ongoing events to watch. Accessibility to and availability of some critical components within the supply chain may become the victims of future pandemics, shutdowns, sanctions, or seismic shifts in policy.

Risk management plays a vital role in monitoring trends, developing scenarios and informing decision-making, something that will take on greater importance and prominence in future.

Risk managers will need to look at additional sources of information and data, observe trends across a far wider range of other industries and geographies, and work with the Board and C-suite to develop clarity on the risks and opportunities available.

Some estimates put the loss of cashflow to the global upstream oil and gas sector alone at around \$380 billion for 2020. Many major players have made announcements on cuts to their capital and operational expenditure as part of a strategy aimed at reducing spending, increasing liquidity and positioning businesses to manage deteriorating macroeconomic conditions and an uncertain commodity price outlook.

Capital constraints due to the combination of green and ethical investment and the reduced book value of assets will impact ongoing investment. Sourcing funding for investments may well become too big a challenge for some players.

Risk management's role should be in helping to develop scenarios, Key Risk Indicators (KRIs), evaluating uncertainties and risks, stress testing planning and investment assumptions (including project execution capability) and ensuring sound financial risk management practices as part of strategic planning.

Strategic considerations

There will no doubt be new alliances, partnerships and joint ventures between industry players from across the energy value chain. In some cases this is likely to entail working together to leverage each other's competencies as they diversify the scope of their operations to meet the changing global energy picture – and pursue a sustainable future business model.

The trends we can expect to see could include:

- Clean energy technologies as part of de-carbonisation. This includes current renewable power generation, batteries, and hydrogen-producing electrolyzers, for example.
- Utilities partnering with automotive manufacturers to leverage the benefits brought about by the take-up of EVs.
- Big oil partnering with (or even buying-up) utilities or renewables firms to diversify their base of revenue generating assets: to some extent this is already underway.
- The move to embedded electricity production at an individual consumer, or group of consumers, level, with communities partnering with utilities, investment banks or funds, or other enterprises, in low-carbon electricity.
- Innovation and a move towards the greater use of new and emerging technologies and digitisation as a means of reducing staff costs, streamlining the supply chain, improving efficiencies and mitigating the physical risks associated with future pandemics (even with better planning and resilience measures being implemented).
- Diversification of investment and operations with oil and gas companies moving more into traditional utilities (or specific segments of the value or supply chain), other sectors (such as minerals processing), or a shift in focus of refining and petrochemical activities to meet greater demand for specific products.

There are no limits to the opportunities for innovation, growth and upside as we move forward into a bold new future.

Risk management will need to closely align with strategy to help keep businesses ahead of the game, positioning them to benefit from significant and in some cases sweeping changes. This will include ensuring capability, financial adequacy, technical and technological capabilities, and the insights to changing regulations that are needed to drive these initiatives in ways which create sustainable value.

For some it is a good time to take stock and make bold changes. While times are tough why not seize the opportunity to realign, re-shape, redefine your risk appetite and invest in the future? After all, with asset prices at such low levels it may just be the window of opportunity most energy businesses need to reinvent themselves for the future. But there will be risks. It is a matter of whether the risks are worth taking.

A move towards embedding resilience has now become an imperative for energy businesses (as evidenced by the responses to the IRM survey) driven from the top and involving a rethink and realignment of risk-taking along with a re-evaluation and allocation of risk appetite and risk tolerance.

Effective risk management has never been so important for developing appropriate levels of risk appetite and tolerance, measurement criteria and KRIs as part of strategic acquisition and change.

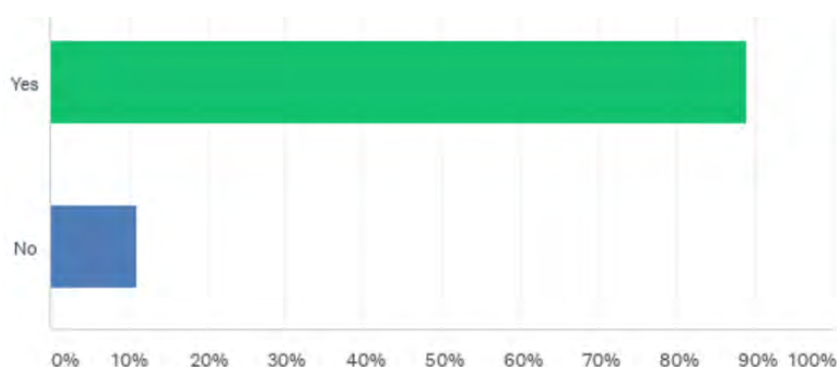


Figure 16: Positive response to the question of risk management initiatives going forward.
Source: IRM Energy SIG energy global industry survey, May 2020.

Regulatory Risks

Regulatory risks across most countries will continue to be high on the risk management agenda. This includes a potential regulatory reshuffle of the supply chain. Contractors or goods coming from specific countries could potentially fall under enhanced sanctions regimes. These changes could force companies to change to more expensive contractors or goods, further squeezing margins. Worse still, it could jeopardise long-term partnerships and potential sources of investment, with the added disadvantage of adverse outcomes for consumers.

For oil and gas producers in the USA, State regulators are already starting take steps to protect the industry.

Risk management's role in the surveillance of regulations, interpreting their impact and advising and communicating changes will be key elements in the future success of energy businesses.

Building more effective, forward-looking KRIs to support the measurement of risks associated with regulatory changes will have a positive impact on viability and success.

For utilities and power producers, the unexpected impact of Covid-19 may usher in an acceleration in the drive towards more aggressive reforms towards a low carbon economy. This may lead to the re-negotiation of contracts, pay-outs to electricity producers and system operators, and the potential issue of stranded assets, with adverse financial impacts for investors.

In some countries, pending debt rollovers and the need to re-finance assets bring greater financial and strategic risks. For example, the owners of fossil-fuelled plants could suffer from limited access to sources of funding driven by the ESG considerations of financial institutions and investors.

The risks associated with these outcomes will need to be planned and mitigated. Foresight and early action will be needed to preserve reputation and protect profitability.

Risk managers have a valuable role to play working hand-in-hand with boards, executives and regulators to position organisations for the changes ahead and to ensure strategic capability, execution, and operational excellence.

Risk management's visibility in the boardroom will become more critical, and more relied upon, often acting as trusted advisors to directors and executive teams.

Emerging Risks

Perhaps the most evident change for the person on the street is the global energy transition which is arguably best illustrated by the move towards renewable power generation and the push by governments and the automotive industry towards EVs. As this shift takes hold, driven by consumer behaviour and regulation, energy businesses are racing to evolve their strategies and business models in a bid to exploit the upsides presented by this revolutionary change in our century-old reliance on fossil fuels.

Transition will be neither easy nor cheap.

This change alone best illustrates a risk-risk trade-off: big oil sees significant drops in demand and consumption², while utilities see increased demand and consumption for electricity along with opportunities to expand their retail reach – and revenues - through the demand for charging stations. Public electric vehicle charging stations infrastructure investment over the next 10 years is estimated at \$174 Bn, creating upside opportunities for the sector for new business lines and service offerings.

But the story does not end there. Challenge and change drive innovation. In meeting the challenge of replacing lost fossil fuel revenues, big oil is already starting to seize this window of opportunity by embarking on strategies of diversification. In so doing there will be challenges on a number of fronts, including the need to recruit the required expertise and talent to drive such strategies.

Obviously, Covid-19 will have an as yet unknown impact on doing business. Remote operation and diagnostics for assets and plants is nothing new. But the need for human intervention – from design to construction and commissioning to routine maintenance – does not change. There are limitations on replacing people with machines or technology. If constraints and lockdowns, with curtailed global travel continue indefinitely, we can expect widescale disruption, including plant shutdowns, project delays and even project cancellation.

² As this paper is addressing the energy industry in relation to energy operations and risks, the opportunities associated with hydrocarbons and their use in petrochemical and broader consumer applications are not a point of discussion for this paper.

And geographic diversification will not be much different for emerging risks and new challenges. The new normal will mean that energy companies need to become adept at dealing with different cultures, juggling the demands and expectations of communities in developing nations and regions, handline the divergent expectations of the ESG-oriented investor community, as well as reassessing supply chain and third-party risks.

Building resilient organisations capable of overcoming the challenges of grey rhinos, black swans and just plain bad luck, should be the ultimate objective of every risk management professional in the energy industry.

As a profession, risk management will need to engage more actively with a wider and more diverse range of stakeholders in the quest for competitive advantage and strategic success. Horizon scanning exercises and scenario planning should be high on the agenda of the risk management department and should be closely linked to the strategic planning process.

New methods in ascertaining potential risks and uncertainties will need to be deployed by risk managers as part of succeeding in developing robust and resilient businesses equipped to deal with the future.

Reporting of emerging risks will also need to be implemented and specific management processes defined to ensure effective oversight of emerging risks.

Operational considerations

The obvious operational risks relate to the costs and logistics of restarting plants. With many countries under different levels of lockdown the availability of key personnel and know-how is challenging. Those plants decommissioning are also affected.

For those operating throughout lockdowns, the risk associated with the movement of human capital have become significant. For example, shifts currently on site could stay and work unaffected, providing they have access to the necessary materials. This is neither ideal nor sustainable as staff rotation will be needed. Add into the mix the low oil prices which has made production less attractive and some companies have reduced shift hours so that those working on site do so for longer with less pay.

Extending shifts may be an option, but the logistics involved could prove problematic. With air travel disrupted, the timetable for rotation could be longer than intended.

Key staff could fall ill, which would lead to a lockdown of site operations. This would compromise production and carry the additional costs of staff repatriation, disinfection and further social distancing measures.

In this respect risk managers and executives will be working hard to develop innovative approaches to developing continuity and protecting reputation as part of the “new normal”.

Measures and procedures will need to be developed taking into account pandemic modelling, supply chain and rostering in developing effective responses to physical operations. This is especially true for supply chain where many suppliers will have been hit by the lockdowns leading to significant delays to receiving equipment or spares. Risk managers also need to be aware of the fact that there will be an increasing pressure to reshuffle the supply chain by governments looking to safeguard their economies by implementing regulation limiting use of suppliers or producers of certain goods or material from certain countries.

Digital risk management has already received much more attention during the pandemic. Cyber and digital risks will remain one of the key areas of focus given the combination of the move towards new and advanced technologies (including IoT), the need for grid security and the move to remote working and working from home (WFH) which many are predicting as being the new normal.

Digital risk management across the organisation will need to be reviewed. Enhanced operational cyber security, fraud detection and prevention and oversight will be needed as part of staying vigilant.

Third party agreements and service levels will also need to be closely reviewed. The renegotiation of agreements with vendors and third-party stakeholders will need to be conducted to ensure fitness for purpose and as part of ensuring risks are kept within manageable levels.

Methods and tools

Risk management is not a static science. It should be reviewed, refined and improved to ensure fitness for purpose and effectiveness as part of a well-managed, well governed enterprise.

The already referenced changes, from regulatory to market and strategic risks, will need to be revised and updated. In many cases, new processes and measurement criteria, including new or enhanced KRIs, will be needed just to stay in the game. Some businesses may go to market for software to support implementation and the consistent application of risk management processes across the business. For others the focus will be on recruiting more skilled risk professionals to work alongside the first-line risk takers in the business and the risk management function.

For organisations without strong KRIs or for those with a lack of meaningful, up to date KRIs, rising to meet the challenges of the new future will require a little more effort and investment.

There already exists a wide range of data sources, resources, consultants and technologies with the experience and capability to support the future success of energy companies.

The question for many will be: *“Where do we start?”*

Looking for quick wins is always a good place. Often the first step is the hardest. Just as often the solution is right there in front of you. If your main challenge is in understanding the shape of regulatory change, start with the readily available information available from regulators – not only in energy but across sectors such as finance and central bank data.

There are many sources of data which can be meaningfully used in developing strong forward-looking KRIs such as GDP, interest rates, exchange rates, production levels (of various commodities), shipping data, trade data, electricity and gas consumption, energy mix data, customer payment, to name a few. The trick is in integrating the data points and measurement criteria for a specific risk in a way that provides timely insights into trends.

When looking for hard data on prices (historic and forecasted) and likely trends for use in planning, strategy and execution, market operators provide an array of clean, validated data, while subscription based service providers also provide greater commentary and insights which can be used across departments and functions to provide a consistent and more accurate view.

If your immediate focus is on pandemic planning and building stronger business continuity capabilities, look towards organisations such as your regional or national government health departments and agencies, and global NGOs such as the World Health Organization (WHO) for relevant information and perspectives. Relevant data could include (using Covid-19 as an example), numbers of cases (new, recovered, severe, deaths), by location, number of tests carried out per day and infection (R values).

Any reference data you use will need to be put into context to suit your specific use cases and will need to be further described and deployed across the business and matched with the risks specific to your own situation. It is no use trying to look at another organisation's KRIs or risk register and doing a simple copy and paste, the likely outcome of such an approach would be failure. Effective KRIs combined with a structured risk reporting capability drive early action and improve the potential for success. Well-structured and properly monitored KRIs will deliver accurate and timely actionable insights which business managers and board members alike can rely on when it comes to delivering success.

Bringing all of this together and making it work to benefit your business is part of professional risk management.

Bright spots?

One possible bright spot is the near collapse of global consumption. Most airline travel is paused, lockdowns are keeping people off the roads, carbon and nitrogen emission levels are in significant decline – in fact, they have almost collapsed.

That said, we cannot always have it all.

The global pandemic has also drastically forced changes to routines, behaviours and even liberties for businesses with deserted streets becoming commonplace.

Will the world's population suddenly realise we can perhaps live without our gas guzzlers after all? Or will most of us simply decide the risk of contracting a potentially lethal disease is just too high to take and abandon public transport to buy affordable combustion engine vehicles?

There is a consensus among experts that by the end of 2020 demand growth will start to rebalance the markets and the supply glut will recede. There are lingering doubts about LNG's commercial viability, so the impact of sustained low LNG prices will be interesting to watch, especially the effect this has on coal and its future role in the production of electricity.

And with a US Presidential election coming this November bets will be on as to which direction US policy will take and how that may drive the behaviour of markets, and the viability of the energy industry as we know it.

If you like to find out how to get involved with the IRM's Energy SIG, please visit
<https://www.theirm.org/join-our-community/special-interest-groups/energy/>



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