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EMEA EDITION

The Future of Risk: Energy

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Leader's insight:
looking beyond the storm

OUR EXPERT

Debbie Bennett
Chief Commercial Officer, UK Energy

The energy sector is facing a perfect storm, with COVID-19 and the low oil price environment, placing significant pressure on firms globally.

Most are focused on the immediate challenges created by the pandemic, with rigs laid-up, cashflow shortages and heightened operational risk challenging resilience right across the sector.

But many are also developing a vison for the future, as the sector comes under increasing pressure to change its energy mix in the coming decades, and embrace the energy transition.

While this pressure is unlikely to result in an immediate sea-change, it has rapidly climbed up the agenda within the c-suite of many oil and gas firms with the COVID-19 pandemic acting as an accelerant. And it is forcing a rethink when it comes to issues ranging from future investments and exploration, M&A and talent, environmental social governance (ESG), to alignment with the 2015 Paris Agreement, and maintaining access to capital.

As a consequence, 2020-2021 witnessed an increase in announcements from oil and gas firms articulating their decarbonisation plans and net zero ambitions.

The analysis in the **Future of Risk: Energy** aims to address many of the challenges the sector will face along the many different glidepath scenarios, drawing on expert insights from across Aon and beyond, and our hope is that the analysis will help firms build resilience for the long-term.

Much as with the current pandemic, there will be both winners and losers; and it will be those who can understand and adapt to the changing dynamics facing the sector in the coming decades who will come out on top.

Leader's insight:
Europe – leading the charge

OUR EXPERT

Henric Gard
Head of EMEA Energy

The energy transition had already begun prior to COVID-19, but the pandemic and evident parallels with the systemic and far-reaching consequences of climate change, has seen it rapidly move up the agenda of major oil companies.

Most major European oil companies have adapted their plans as they prepare for the energy transition and future visions that prioritise decarbonisation are receiving considerable airtime at public and investor events.

Prominent majors including BP, Equinor and Shell are taking the transition increasingly seriously and seem to be ready to transform at pace. Operating models and capital expenditure budgets will need to be revised accordingly.

In the Nordics, we are already seeing strong evidence of this changing focus, with Finnish Neste acquiring the Bunge refinery in Rotterdam - presumably to be able to increase renewable content in their refined transportation fuels.

While the Swedish refiner, Preem, recently made public their decision to shelve a major refinery expansion, to focus future investments on the refining of ever more sustainable transportation fuels.

And while Europe is leading the charge, the recent US presidential outcome suggests a change in policy direction there is likely. This should encourage the major US oil companies to ramp-up their energy transition strategies and join the race. We will undoubtedly find out shortly.

Over time we believe that this will mean a material shift in the asset mix of oil companies, one which will align them more closely with the power industry as well as - in some cases - petrochemicals.

Changes will see new technologies, innovations and solutions emerge, which will create new and complex risk exposures for the sector. This will demand greater adaptation and innovation from the insurance market in order for solutions to align with evolving energy priorities and ambitions.

At Aon we embrace this shift and and our promise to the industry is that we will do our utmost to develop products and solutions that support companies as they navigate the risks – and opportunities – inherent in the energy transition.

"Companies are also developing a vison for the future, as the sector comes under increasing pressure to change its energy mix in the coming decades, and embrace the energy transition. 2020-2021 has witnessed an increase in announcements from oil and gas firms articulating their decarbonisation plans and net zero ambitions."

OUR EXPERTS

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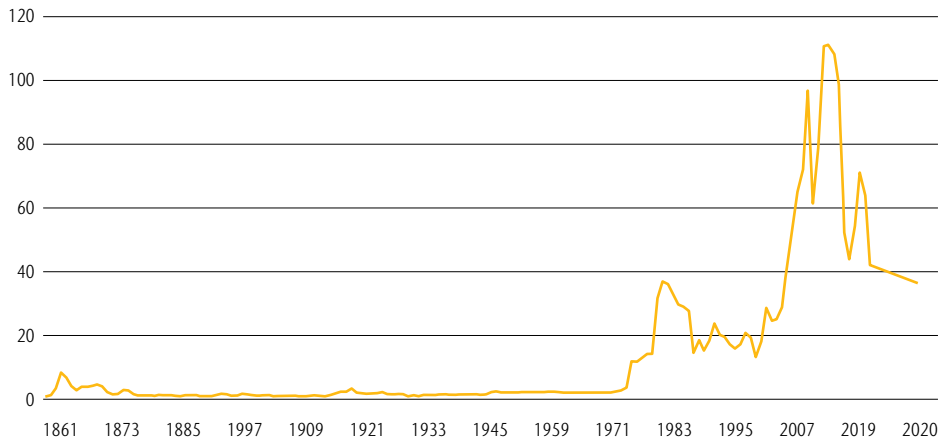
BLACK AND GREY SWANS IN ENERGY

It is hard not to argue that COVID-19 has proved to be a black swan event for the energy sector. Few would imagine that the oil price would fall as precipitously as it did through 2020. And with the potential for an extended global recession and profound socio-economic changes linked to the pandemic, and its resurgent waves, the sector is contending with the makings of a protracted storm.

COVID-19 led to demand for oil falling faster and deeper than at any point in history. This coupled with sustained levels of production and geo political events led to a glut of energy, which saw crude pricing on futures on the West Texas Intermediate fall to USD -40 in April 2020, as the extent of the supply-demand mismatch became apparent.

OPEC ultimately went on to slash production under pressure from the US, but with the effects of the pandemic likely to rumble on for some time, energy markets are likely to face a low-demand environment well into 2021 as many countries start experiencing a second and third wave of the pandemic, with many of the major forecasters in agreement that demand recovery will not return until 2022 or beyond.

Oil - Crude prices since 1861 (US dollars per barrel)



In the immediate-term, energy firms are scrambling to adjust; and many now hoping for a sustained correction as we move further into 2021. Longer-term however, the pandemic may encourage a broader rethink of socio-economic policy, which may come to include discussions around the global energy mix.

Firms will need to prepare for a strong re-emergence of the climate change debate as the global economy recovers, particularly with flights grounded and energy demand dramatically reduced. Producer states and energy firms will hope to see a resurgence in demand as the global economy looks to recover. Consumer nations may re-affirm their commitment to decarbonise.

COVID-19 as a brake or an accelerant

One of the major complicating factors in this calculation is whether COVID-19 will serve as an accelerant towards a more diverse energy mix, or will encourage countries to turn to traditional sources of energy to kick-start the global economy.

The EU has already indicated that its infrastructure spending after COVID-19 – with elements linked to carbon pricing - will be consistent with its existing green agenda. It is unclear where other countries will land. What is apparent is that COVID-19 has highlighted the impact of a globally systemic risks and parallels are already being made with the issue of climate change. In some quarters, COVID-19 is viewed as a potential catalyst for climate action. It is likely to prompt an advance in environmental social governance (ESG) and an acceleration in political decision-making to build environmental resilience. And it is viewed by some as an opportunity to challenge the *status quo*.

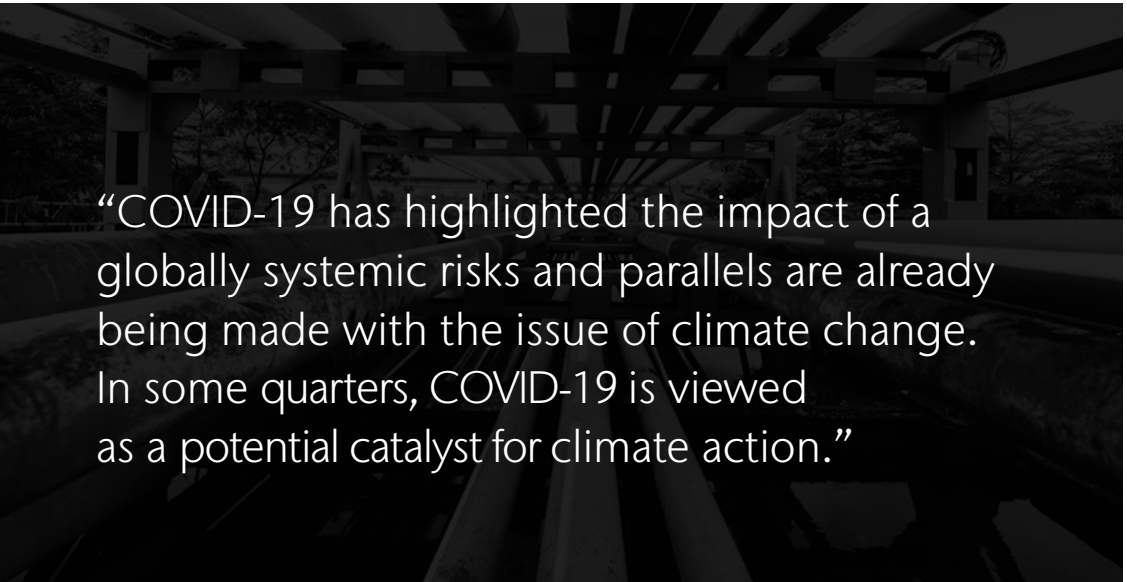
But with countries and firms contending with public health and business resilience challenges, the picture is complex. Already industries hard-hit by COVID-19 - such as the aviation sector - are calling for state support. Countries and investors may be tempted to subsidise sectors including aviation, energy and power in order to get the global economy back on track.

Others may see this as an opportunity to change the focus of state support and how investors deploy their capital. The environmental movement was looking for a potential game-changer in the face of slow adoption of the Paris Agreement. COVID-19 and its aftermath might well provide that impetus. What is clear is that the signals regarding possible changes to the energy mix are contradictory, as COVID-19 brings with it an additional layer of complexity.

While many companies have demonstrated the three crucial hallmarks of crisis response preparedness — leadership, communication and action — the pandemic is testing every business leader in new and unknown ways.

The world as we know it is being completely reshaped. No country or company will simply bounce back or rebound to the way they were before. Consumer behaviours are changing, supply chains are being rewritten, institutions are shuttering, business models are being fundamentally re-shaped, and expectations of governments are shifting. Energy as a sector will be no different.

Black swans are – by their very nature – notoriously difficult to predict. Here we have selected possible black swans for the energy sector, and the global economy more broadly, for the coming two decades. Some might more reasonably be described as grey – or more foreseeable – but we feel they would all have significant and lasting implications for energy.



FUTURE SWANS

5 YEARS

US-China trade conflict deepens, with barriers and embargoes sucking in allies and stymying global trade. Despite efforts to rebound from COVID-19, the world enters into a renewed global recession. The conflict evolves into a broader Cold War, and while it remains predominantly economic, there is potential for security incidents in flashpoints such as Taiwan, North Korea and the South China Sea. Events weigh heavily on the global economy, with implications for energy demand and supply chain resilience.

10 YEARS

A sea-change in US government attitudes towards the issue of climate change - linked to the new administration and a string of high-profile climate-related events – leads to a significant increase in incentives for renewables, a sharp rise in carbon taxation and a bringing forward of US net zero targets. The move obliges energy firms to rapidly change their energy mix, revolutionising the sector in the US and beyond.

Another global pandemic, with potentially more significant and lasting public health and global economic implications than COVID-19, sweeps the globe. The event forces a complete rethink of socio-economic priorities, globalisation and public health security with significant implications for energy and the broader economy.

Under heightened pressure from investors, financial institutions – including banks, insurers and brokers – no longer offer financial support or coverage to the traditional oil and gas sector. We are already seeing trends emerge, aligned to the increasing influence of ESG, however a rapid escalation in pressure would result in a significant increase in on-balance sheet exposures, forcing many more firms to dramatically change their energy mix.

20 YEARS

Climate change effects accelerate, bringing into sharp focus the need to decarbonise. Concerted, international pressure – from consumers and governments - forces energy firms to redirect their efforts and ultimately halt carbon-based operations.

An unexpected geomagnetic storm triggered by a burst of solar energy pummels the earth with catastrophic results, destroying many electrical systems. The event sees the global economy fixing downed systems – including power grids, the Internet, banking, trade and telecommunications - for weeks, potentially years , while completely realigning priorities for the global economy.

COVID-19 and crisis response in the energy sector

OUR EXPERT

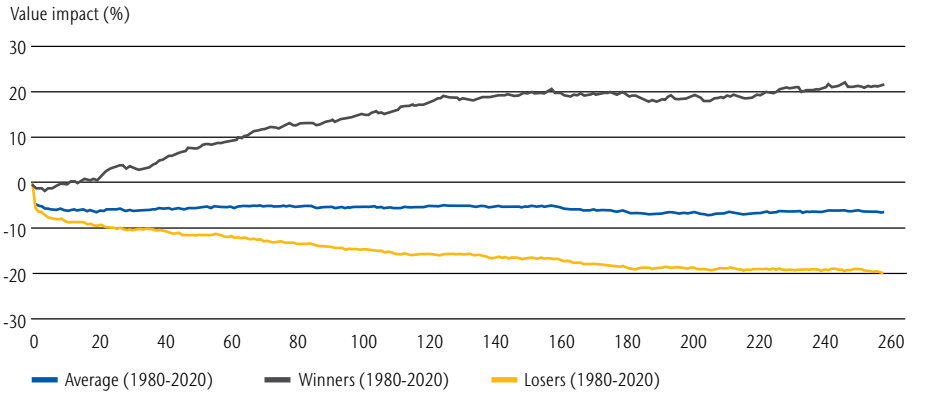
Dr Deborah Pretty
Founder Pentland Anlytics

What is apparent is that there will be both winners and losers from the current pandemic – and energy firms will find themselves particularly challenged by the low price-low demand environment created by COVID-19. How they prepared for and respond to the crisis will determine how they will ultimately perform for the long-term.

Crisis management: flattening the curve

Detailed analysis carried out by analytics advisory firm, Pentland Analytics - which examined 270 reputation crises over a forty-year period - found that organisations that invest in risk preparedness and successfully manage a crisis, experience an increase in shareholder value of up to 20 percent in the year following the event. On the flip side, those that don't, may see their shareholder value depreciate by as much as 20 percent. This is over and above their benchmark stock market index.

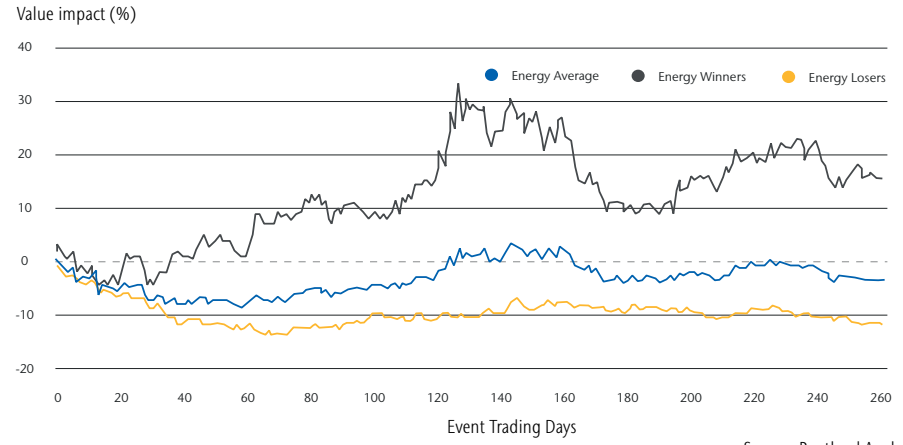
The impact on shareholder value



Source: Pentland Analytics

When it comes to the energy sector, those companies whose share prices do not recover well - the 'energy losers' - see around a 10 percent drop in shareholder value as a result of poor risk preparedness and crisis management. It is a timely reminder for energy firms as they continue responding to the COVID-19 pandemic that investors are re-assessing their senior management teams, their resilience and their ability to generate future cash flow.

The impact on energy shareholder value



Source: Pentland Analytics

What is also striking is the potential upside for those energy firms able to best navigate a crisis. Positive value impact on a one-year horizon could be as significant as a 15 percent increase in shareholder value. As investors evaluate their options through this current crisis, those energy firms that can signal confidence in their ability to delivery strong future cash flows will be the winners.

Pentland Analytics' analysis indicates however that losers tend to outnumber winners two-to-one. The likely value impact of the COVID-19 pandemic on the energy sector will therefore be significant.

The value impact: a breakdown

Energy average value impact

USD 154 BILLION

Energy winners value impact

USD 25 BILLION

Energy losers value impact

USD 179 BILLION

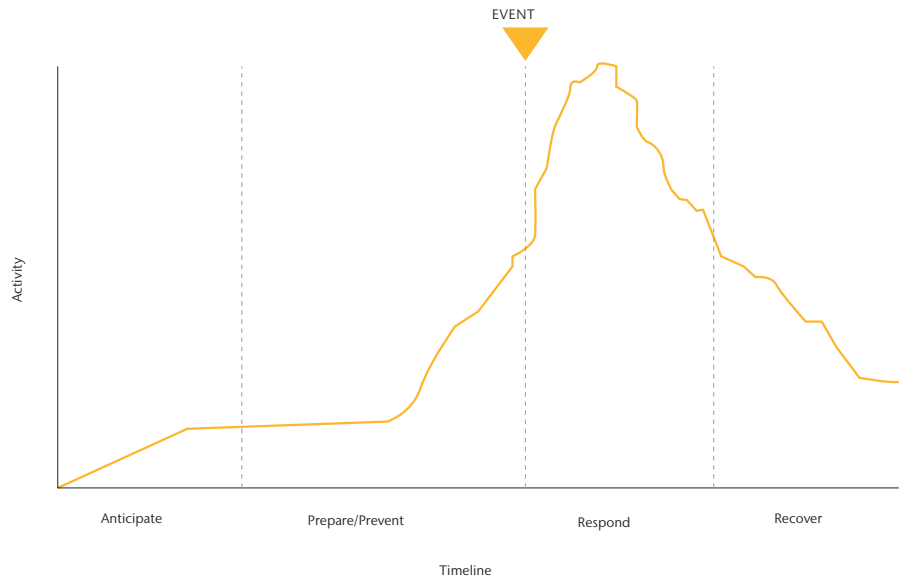
Two factors may affect the conclusions. Firstly, commodity-based businesses tend to be driven not least by the price of the underlying commodity, confounding share price analysis. Secondly, reputation crisis events in the energy sector have traditionally been dominated by fires, leaks and explosions. COVID-19 breaks the mould, being both systemic and global in scope, with the potential to exacerbate commodity market volatility and test resilience in ways that traditional reputation crises have not.

Not one crisis, but a series

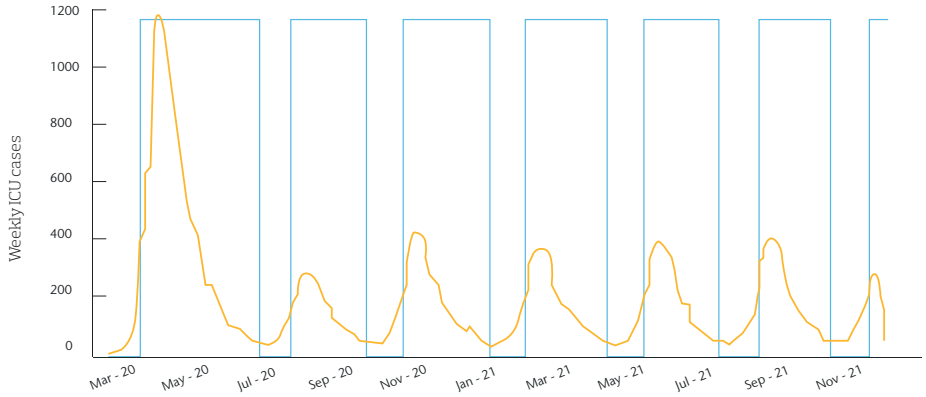
To further complicate the issue, the current crisis is not linear, but will come in waves. This will require energy firms to flex back and forth between React, Respond, Recover and Reshape. All the while, the interconnectedness of the world is amplifying, rather than smoothing, the impacts and ripple effects as the pandemic continues to unfold.

"COVID-19 breaks the mould, being both systemic and global in scope, with the potential to exacerbate commodity market volatility and test resilience in ways that traditional reputation crises have not."

Major crisis event - Typical arc



Crisis event arc for COVID-19 is different



Source: Pentland Analytics

Demand: a buoyant future

OUR EXPERTS

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Despite the narrative in certain quarters, the future of energy appears bright. Global demand continues to rapidly increase, driven by population growth, economic development and rising consumer demand. And the trend is particularly marked among emerging markets, which will account for 90% of energy demand growth between now and 2035, with Asia accounting for around two-thirds of that total until 2025.

China and India will be the most significant sources of demand in the coming decades, while US demand for energy will remain buoyant. Asian oil imports are expected to surpass 31 million barrels a day by 2025, with every major Asian economy dependent on energy imports.

Before COVID-19, economists were predicting that the global economy would double in size by 2050 buoyed by technology-driven productivity improvements. While the pandemic may have knocked this heading off-course, it provides some indication of the likely energy needs to help fuel this development.

And with around 20% of the world's population without access to electricity, and others seeking to accelerate economic development and improve living standards, it is apparent that energy has a positive role to play – particularly when you consider that 87% of fossil fuels is used for transport, electricity and heating.

Our energy future: by the numbers

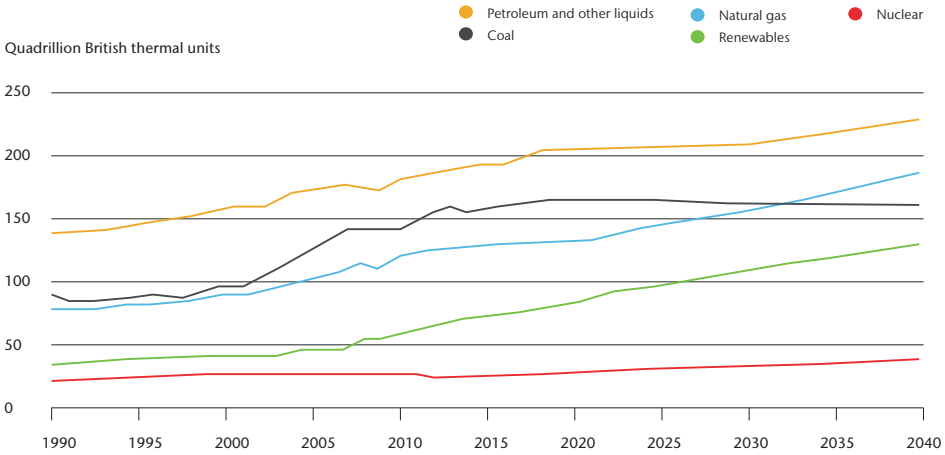
2/3
of energy demand will come from Asia by 2035

20%
world without access to electricity

Global economy will double by 2050

359 million tonnes of plastic entered economy in 2019

World energy consumption by energy source (1990-2040)



Source: McKinsey

Demand for oil is forecast to grow at an average annual rate of just below 1 million barrels a day. Within that, demand for petrochemical products will remain significant, despite a move away from motor fuel and products such as naphtha, with liquefied petroleum gas (LPG) and ethane accounting for about half of all growth.

With few viable alternatives, it is anticipated that global demand for plastics will triple by 2050, particularly as consumers become more comfortable with recycling. Last year 359 million tonnes of plastic entered markets around the world and that figure looks set to rise significantly.

The threat from electric vehicles has also been largely overplayed. According to Deloitte, by 2030 electric vehicle sales will reach close to 100 million annually, but these needs to be considered against a global fleet of 1.4 billion vehicles. If one looks at the US alone and if all new cars sold were electric, it would take 20-25 years to replace the entire US vehicle fleet.

Firms can therefore count on economic development and the limited scope of alternatives to continue to drive increasing demand for petroleum products in the coming two decades.

"We anticipate firms shifting their production to petrochemicals as global demand for plastic and other petroleum products increases."

COVID 19 and global energy demand

The impact of COVID-19 on global energy systems is still highly uncertain.

What seems clear is that the virus has led to severe direct impacts on supply and demand balances within energy markets and will likely lead to knock-on effects in most economies.

Time horizon of impact	Immediate	Medium term	Long term
Impact pathway	**Direct impacts** (demand and supply shocks)	**Knock-on effects** (bankruptsies, job losses, etc.)	**Structural impacts** (fundamentalshifts in the economy; spill-over effects can trigger financial crisis)
Description	Reductions in demand for energy due to current restrictions and behavioral shifts Disruptions in supply due to plant closures (industrial production, trade, etc.) or supply chain disruptions "What if we see more lock-downs, travel restrictions and social distancing?"	Effects of economic shifts and disruptions due to a prolonged period of low demand and supply side constraints "What if these measures go on for a while and we see a wave of bankrupsies, people lose their jobs, and governments shift their budgets to remediation measures?"	Effects on the structures and trajectory of the economy that could be caused by indirect impacts of this crisis "What is this crisis leads to a sustained slow-down or even contraction of the global economy with reduced investment, supply, and demand?"
Examples	Reduced air and road traffic Limited industrial production	Prolonged reduction of industrial production Limited government budgets (taxes, subsideries, etc.)	Stock markets don't recover and credit/investment dry out Global GDP contracts in 2020, grows at reduced rates thereafter Less international trade and travel

Source: McKinsey

FUTURE DEMAND

5 YEARS

The COVID-19 recovery and the coming five years are unlikely to see a substantive change in global energy demand or the energy mix, although the direction of travel is apparent. Global demand for energy – petroleum, natural gas and renewables – will continue to rise as economies seek a route out of the pandemic, with coal the only fuel likely to see falling demand as developed markets turn away from its use. Energy firms can anticipate buoyant demand as the global economy looks to restart.

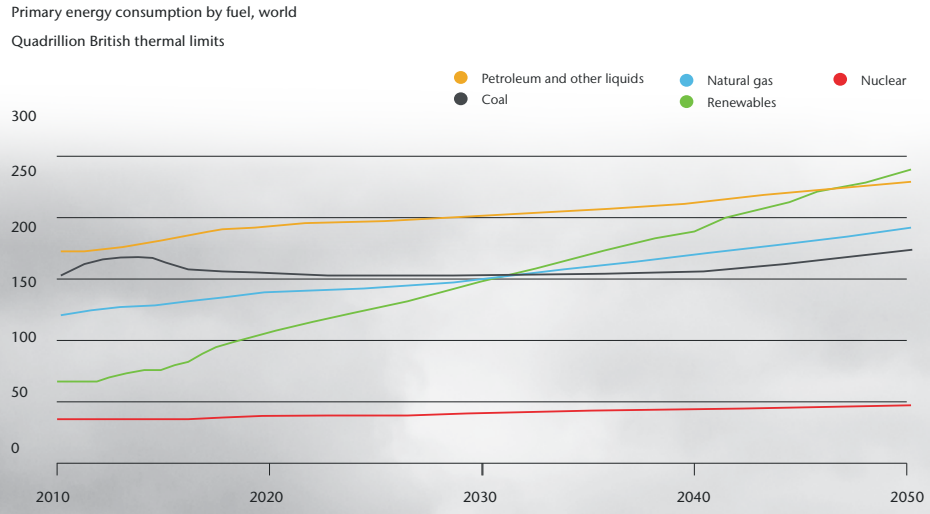
10 YEARS

A tipping point will to be reached, as renewables overtake coal and natural gas to become the second most significant form of global fuel after petroleum. Energy firms who have committed to decarbonise will be looking to this milestone as a signpost and indicator of progress in the energy transition. Demand will continue to rise as a catalyst for future global economic development.

20 YEARS

Global demand will continue to rise as the energy needs of developing economies grow, but sources of energy will have changed dramatically from 2020. Renewables will be on track to outstrip petroleum, with natural gas rising in importance. It is apparent that appetite for carbon-heavy fuels will fall away – to be replaced by renewables and gas – but there will be no sea-change, rather a slow, incremental shift.

IEO2019 projects renewables the most used energy source by 2050



Source: US Energy information Administration International Energy Outlook

Energy and power: growing synergies

OUR EXPERTS

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Director, Global Power & Energy

Mark Potter
Head of EMEA Power

Caroline Good
Client Manager Power

Part of understanding the relationship between the two industries, and how it is changing, is to accept the frontier between oil and gas and power companies is disappearing.

For power companies, the risks are clear. Increased competition and supply will drive prices down; firms tend to operate with small margins in the power space, and this business model may be impacted. The industry may also become less attractive over the next 20 years as governments reduce support and sponsorship previously bestowed upon renewables. Key factors underpinning the future business model will be continued technological advancement, reduced supply chain costs, increased interconnection between electricity markets, social and governmental support internationally and continued innovation.

Oil and gas companies are obliged to invest in power, but they haven't had time to prepare their business for such significant acquisitions. Many are entering a market that is new to them. Majors are used to managing high-profit projects and are now confronted by assets that could take many years to generate a return. There are many complex decisions to make and risks to assess, and selecting the right partners is going to be key across the full value chain.

Insurance challenges

With oil and gas, one hurdle to overcome is a somewhat dated mindset regarding insurance. Energy clients have programmes that are focused on specific and extremely valuable assets (refineries, FNLGs, FPSOs), which will remain on the books for a lifetime and are treated as the core business of the company. This approach will not work with new power acquisitions where asset rotation is key to success.

Oil and gas companies will need to develop the in-house technical knowledge for the power landscape. As they grow in this space, so will the list of associated contractors and subcontractors, and this brings its own set of risks that will need to be addressed.

The power sector's insurance needs are evolving exponentially, as companies try to eliminate fossil fuels from their energy mix and invest in different assets, bringing more complexity to the equation.

From a risk perspective, it will be an immense challenge to aggregate the same protection structures for the two different dimensions of assets. The level of retentions, the singularity of each asset, the strategies and the mechanisms to deal with an increasing hardening market will be a real challenge to address; mixing these two distinct worlds will test the insurance market.

Mutuals like OIL offer a compelling proposition for power companies as they could benefit from the element of unification on offer. Therefore, the commercial market is under pressure to provide attractive alternatives.

In response, the insurance industry will need to be much more flexible than in the past, and it must break down internal silos. Brokers should be willing to mix available capacity and partner with specialist markets to provide the client with the broadest offering and deliver solutions to their changing needs.

CLOSER COLLABORATION

5 YEARS

Projected revenues for the next five-year period will be down due to the volatile global context. Natural catastrophes will continue to occur and will remain uncertain in terms of impact.

The market will have to adapt its value proposition, breaking silos in terms of underwriting rules and adapting current policies to meet client needs.

5–10 YEARS

Long term investments in energy and utilities will be imperative: the new strategic direction towards renewables will bump on the grid bottleneck.

Public and private sector investments in the development of national energy will support market output, representing commercial opportunity.

10 YEARS

On the energy side, decreasing demand will also drive prices and investment down. This could be a risk if companies start to neglect the maintenance investments on the refining infrastructure.

During this period, gas will play an important role as the transition mechanism between fossil fuels and renewables.

10–20 YEARS

No doubt, the energy mix will be different. The asset rotation will be an essential mechanism to guarantee that companies keep capturing the gold.

In this time horizon, we will have “meta-companies”: fully integrated and diversified companies (both in activity and geographically) that will demand a different level of sophistication from the insurance market.

Alternatives: a pathway to decarbonisation

OUR EXPERTS

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James Stretton
Director, UK
Energy

Energy companies are increasingly exploring the potential of alternatives – particularly hydrogen – in order to meet the ambitious targets set out by the Paris Accord.

Currently, around 80% of global fuel demand is provided by fossil fuels. That figure will need to go down to around 50% by 2050, in order to reduce carbon emissions and subsequently keep global temperature increases below 2C.

To make this transition a reality, energy companies are shifting their emphasis from integrated oil companies, to integrated energy companies – with renewables, gas and hydrogen forming component parts of these evolved businesses with the aim to become carbon neutral – and already there is talk of the sector having reached peak oil.

Within the industry, it is apparent that majors will lead this charge globally. They have the funds and appetite, and face mounting investor, regulatory and public pressure to decarbonise. Oil assets will continue to be divested to national oil companies and independents, but it is apparent that where the majors go, others will inevitably follow.

There is a significant role for gas in the future energy mix, thanks to its utility in electrification and the potential for carbon capture. Transportation, heating and industry are all exploring the potential of electrification, while carbon capture from power generation makes gas an attractive bridge to a low carbon future for energy companies.

The sector is already looking to technology to decarbonise, with carbon capture and storage one possible avenue. This would involve capturing exhaust gases from industrial processes and power stations and piping it back underground. There is potential for existing rig and pipeline infrastructure to be repurposed to become injectors, alternatively the CO2 can be stored in saline aquifers still on the drawing board.

> "It seems likely that regulatory changes aimed at meeting the Paris Acord Climate Change targets will be needed to propel hydrogen into a more significant role in the future energy mix."

Others are looking to renewables such as solar and wind to change the energy mix and decarbonise. One of the challenges energy and power companies face with switching to renewables is around the storage of surplus electricity generation.

Hydrogen: an emerging opportunity

One option is to use excess wind capacity to generate hydrogen from sea water through electrolysis, with the only by-product being oxygen, named green hydrogen. The hydrogen would then be piped onshore to power a turbine to generate electricity. The challenge is that this process is limited in its current generation potential, whereas your typical gas-powered power station generates around 1000 MW an individual electrolyser is significantly smaller. Until the technology matures and is able to generate larger amounts of hydrogen cost effectively, it will likely remain a marginal play.

A second option is to make hydrogen from natural gas – a process called reforming. This capability is widely available, but would still produce carbon, which would need to be captured and stored. Thus currently named blue hydrogen.

Hydrogen can also be co-mingled with natural gas and piped into existing networks – something that is already being trialled in the UK.

Currently, hydrogen is not as cost competitive as natural gas and there are losses in efficiency associated with using renewables to generate hydrogen and for the gas to then generate electricity. Finally, gas networks are not set-up for hydrogen, which is less dense and has a lower calorific value than natural gas.

Future pressures

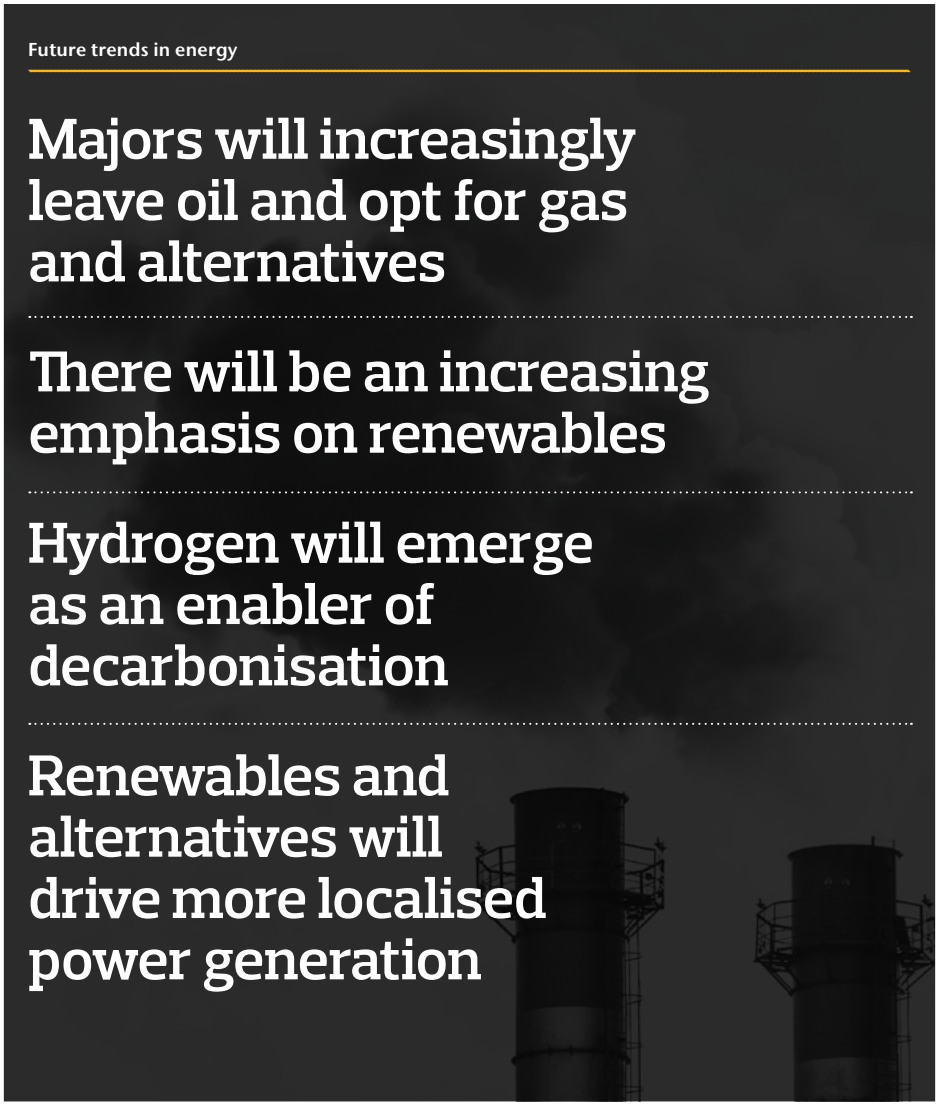
It seems likely that regulatory changes aimed at meeting the Paris Acord climate change targets will be needed to propel hydrogen into a more significant role in the future energy mix. Carbon taxes, energy subsidies aimed at alternatives, or an end to existing energy subsidies will be needed to level the playing field and encourage greater investment in hydrogen.

That said, European majors are setting ambitious net zero targets, which will inevitably include investments in renewables and alternatives such as hydrogen. Already we are seeing divestiture of oil assets and a growing focus on gas and renewables. Increasingly

these companies are working with cities, councils and big business to develop low carbon power agreements for the long-term. Hydrogen will have a role to play in these emerging energy strategies.

Energy firms also need to consider the pricing environment for oil and gas.

Both commodities have been getting steadily cheaper and COVID-19 has further exacerbated the issue, while bringing into stark focus issues of global, systemic significance. Climate change and the need to decarbonise is increasingly being considered through that lens.



FUTURE ALTERNATIVES

5 YEARS

There will be significant divestiture from oil, with larger energy companies turning their attention to gas. Companies will also start to consider blue hydrogen and, where there are possibilities to repurpose existing technology, to drive forward development.

5–10 YEARS

The majors will start to become integrated energy-power companies, ramping-up their gigawatt capacity in renewables. Linked to this will be a land-grab for power operations, with energy firms using their financial muscle to aggressively pursue synergies.

We will also start to see government policy bite when it comes to instigating decarbonisation and meeting the demands of the Paris deadline. Mounting social pressure to respond to climate change is also likely if it appears we will fall short of the targets set out in 2016.

When it comes to hydrogen, this will be the jump-off point for hydrogen-powered power stations (using both blue and green hydrogen) and the more widespread adoption of green hydrogen technology.

20 YEARS

In 20 years we will see a complete evolution in the energy mix, with renewables and alternatives such as hydrogen hitting an exponential growth curve. Already we are seeing offshore wind capacity doubling every year and we can expect similar growth in hydrogen.

Hydrogen will also start to play a part in the electrification of transportation, with technology such as hydrogen solid state batteries for trucking or airlines, helping to drive forward further development and deployment.

Alternatives: exploring the decarbonisation options

OUR EXPERT

Chris Pashley
Senior Risk Consultant, UK Energy

One of the major objectives of the Paris Agreement was to limit global temperature increase to below 2°C of pre-industrial levels. The European Union however has gone further, with the European Commission passing a law aiming for net-zero emissions across the region by 2050.

The challenge is that global energy demand continues to increase by around 2% per year and, according to BP's 2020 Statistical Review of World Energy, almost 85% of 2019 global primary energy consumption is provided by fossil fuels. There will, therefore, need to be a massive shift in our energy consumption to meet the Paris objectives.

Meeting global emissions reduction targets requires the prompt and coordinated action of governments, energy companies and consumers to curtail greenhouse gas emissions and invest in future infrastructure.

Within the energy sector, many of the oil majors are repositioning themselves as energy majors with ambitious targets to significantly reduce greenhouse gas emissions by 2050. Similarly, a number of large national oil companies are considering moves to reduce emissions. It is expected that small producers will follow the transition pathways established by these larger companies.

"Within the energy sector, many of the oil majors are repositioning themselves as energy majors with ambitious targets to significantly reduce greenhouse gas emissions by 2050."

The decarbonisation options

Carbon capture

There are projects for carbon sequestration to capture carbon dioxide from exhaust gases associated with heavy industry processes and electrical power generation and store it underground and, consequently, reduce greenhouse gas emissions. This is an existing technology, with gas injection into oil reservoirs for enhanced oil recovery purposes. In the UK, several energy companies have developed a roadmap to develop the world's first zero-carbon industrial cluster in the Humber region by 2040, which would include carbon capture and storage (CCUS) and hydrogen production facilities.

Low-carbon electricity

Low-carbon electricity can be easily supplied by the shift from coal and oil-fired power generation to gas-fired facilities where there is sufficient supply. This is a process that has been ongoing for several decades. Additionally, renewable energy is already well-established in the energy mix, with existing infrastructure or the ability to operate on a micro-level. However, there are issues with demand flexibility which requires some form of energy storage.

Low-carbon biofuels

Biofuels are considered to be carbon-neutral and can be produced from agricultural crops, waste, inedible crops and forestry products. Agricultural waste and wood material can be burnt directly to produce heat and electricity. Transport fuels can be produced from biofuels, with vegetable oil and animal grease processed to produce biodiesel and bioethanol which can be used in cars or blended with gasoline. The potential for biofuels, other than those produced from waste, will be limited due to the space required to grow crops and the potential damage to the local ecology. However, there is the largely untapped potential of marine biofuels.

Hydrogen

Hydrogen is the most abundant element in the world and there are many commercial uses being developed, which include hydrogen-powered aeroplanes, ships, trains and cars. Furthermore, several countries are considering blending hydrogen with natural gas in their existing gas networks to produce a lower carbon fuel.

There are several established technologies for its production. The electrolysis of water produces hydrogen and oxygen, but is a very energy-intensive process. However, there are several projects considering using renewable energy during periods of low demand to generate hydrogen through electrolysis. This hydrogen can be stored and used for electricity generation during periods of high demand. Other process methods include coal/biomass gasification and steam/autothermal reforming of natural gas. However, to be truly a low-carbon fuel, these would require carbon sequestration.

Future pressures

There are common goals to reduce greenhouse gas emissions and to develop a global low-carbon economy. In order to achieve these goals, governments have a major role in providing the regulatory framework, carbon taxes and economic incentives to achieve the aims of the Paris Agreement. Additionally, investment in high carbon projects need to be discouraged. This is occurring already with many pension and other investment funds divesting from coal-based projects.

Energy producers will continue to reduce carbon emissions through reducing flaring, improving energy efficiencies, and carbon capture.

The other main driver is the consumer, who will require the move to a low-carbon environment to be financially attractive. However, the use of energy efficient equipment, such as hybrid cars, can help reduce greenhouse gas emissions.

Conclusions

To achieve the challenging goals of the 2015 Paris Agreement, there will not be a single panacea, but a selection of technologies and initiatives will be required with oil and gas remaining in the energy mix for the foreseeable future. The technologies required to meet the low emission objectives already exist. The challenge is to develop and increase the scale of these technologies, which include increasing the supply of low-carbon electricity, low-carbon biofuels and hydrogen and providing the infrastructure and consumers for these fuels.

Future trends

The current long-term futures price of crude oil and natural gas on NYMEX are around:

WTI Crude Oil US$50/Bbl
Henry Hub Gas US$3/MMBTU

Without any financial incentives, alternative low carbon technologies will be required to compete in these energy price scenarios. However, investors worldwide are rapidly increasing their focus on environmental, social and governance (ESG) factors. Energy companies risk losing significant amounts of investor capital if they do not adapt. Consequently, this would result in increased oil and gas prices and the potential for alternative fuels to be economically viable.

TILTING THE TECHNOLOGY MIX

5 YEARS

Improvements in energy efficiency will reduce primary energy demand.

Traditional oil and gas companies will develop into lower carbon companies through an energy portfolio that includes an increased proportion of natural gas and renewable energies and increased energy efficient operations.

Increased demand for renewable energy.

Contribution of fossil fuels to the energy mix, especially coal and oil, will decline significantly.

5–10 YEARS

Electric and hybrid cars will become more prevalent with stand-alone renewable powered charging stations and more efficient charging.

Bioenergy will remain a niche fuel for commercial vehicles and an additive to existing refined fuels.

Large transport companies (shipping, trains and road-trucks) will start to use hydrogen-fuelled vehicles.

Nuclear energy power stations will see renewed interest in OECD countries.

Carbon sequestration projects will become more common for energy intensive industries.

10–20 YEARS

In order to meet current environmental commitments, let alone any future legislation, it will be necessary for large investment throughout the energy sector to shift to a low-carbon economy.

Development of new technologies

- Water electrolysis will become more commercially viable
- The potential for nuclear fusion will be considered
- Other potential technologies that are yet to be explored

Energy mix

- Renewable energy will replace fossil fuels as the major provider of primary energy demand
- Hydrogen will be a significant energy store for renewable energy projects during periods of low demand
- Hydrogen will be used in specifically-designed power stations, large-scale commercial vehicle fleets and blended with natural gas in transmission and distribution networks

M&A: significant opportunities

OUR EXPERTS

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COVID-19, the low oil price environment and an increasing focus on decarbonisation, are creating unique challenges for energy. Many are turning to M&A to add green assets, strengthen their balance sheets and redeploy capital.

There is significant M&A activity in the energy sector and it seems likely this trend will continue, as the sector faces a number of headwinds that are concentrating minds when it comes to strategic acquisitions and divestitures.

Low commodity prices, the impairment of assets and high operational costs in areas such as upstream energy, are encouraging firms to sell-off non-core assets and focus on areas with higher returns. The pandemic has added further impetus, as energy demand has fallen.

Conditions have created buoyant levels of M&A demand and supply. On the demand-side, there is a wall of capital raised by infrastructure, pension and sovereign wealth funds that is looking for diversified and attractive returns. Many are considering energy, even in the face of divestment pressures that are looking to 'green' the financial system. Stressed energy balance sheets in the face of the low oil price environment and COVID-19 are helping to drive up supply.

Energy is looking a particularly attractive prospect for institutional investors due to the cost of capital differential most financial firms enjoy. Acquirers are employing this differential to pursue energy opportunities underpinned by long-term contracts and strong counter-party credit. Midstream acquisitions such as pipeline networks are helping to pep-up and lock-in returns for the long-term; while allowing energy firms to concentrate operationally and financially on their core specialism/s.

"Firms need to see M&A as an opportunity to strengthen their balance sheet and reposition for the energy transition."

These factors have been further reinforced by moves to decarbonise. In this area M&A activity forms the twin arms of a pincer – with one arm the divestment of carbon-intensive segments of the portfolio and the other the acquisition of – and investment in – renewables. Where these are acquisitions, they are less about pure synergies and more about facilitating a strategic change towards a lower carbon footing.

The transition and a strategic driver

What is apparent is that there will be significant M&A activity linked to the energy transition. Firms need to see M&A as an opportunity to strengthen their balance sheet and reposition for the energy transition. The likes of BP and Shell are already pursuing such opportunities as they evolve their strategy.

When it comes to synergies with areas such as power and renewables, firms need to consider how these will create value. Scale will inevitably be important, but if you are simply buying scale, without considering the underlying capability needed in these combined companies, acquisitions may prove a challenge to integrate. M&A can prove game-changing, but the more successful transactions will be those that marry external capability with that built in-house.

This involves retooling staff and refocusing efforts on areas of the business that can support the energy transition. BP, for example, have done exactly that by developing in-house renewables capabilities and then acquiring Light Source, a developer and operator of solar projects. This has enabled BP - through its financial and operational strength and access to capital – to throw its weight behind Light Source's renewables ventures, fast-tracking the deployment of solar capabilities.

This strategic pivot to decarbonise through the pursuit of energy-power combinations, is also helping firms to stave-off divestment pressure and negative PR linked to more carbon intensive operations. This is particularly true for listed companies which face the more acute pressure to transition and champion their green credentials.

INCREASING SYNERGIES

5 YEARS

Much will depend on the recovery in the oil price. If we don't see oil heading north of USD 60 a barrel, we anticipate greater consolidation, particularly among the smaller players, and the sale of non-core assets in places like South America and Africa.

If we see an uptick to USD 70-100 a barrel, we will likely see consolidation within the fracking sector, with distressed companies in the US and elsewhere being acquired.

Firms looking to bridge into the green sector will also drive a significant level of M&A, which will be a facilitator of a broader corporate strategy.

10 YEARS

We anticipate a deepening of core trends, with transactions linked to, and augmenting, energy companies push to decarbonise. Hydrogen appears particularly promising, with advancements in technology and storage opening-up significant possibilities. With obvious synergies with oil and gas storage and a bridge to renewables, we anticipate interest among energy firms.

More broadly, energy M&A will continue to be linked to commodity pricing and the long-term profitability of operations.

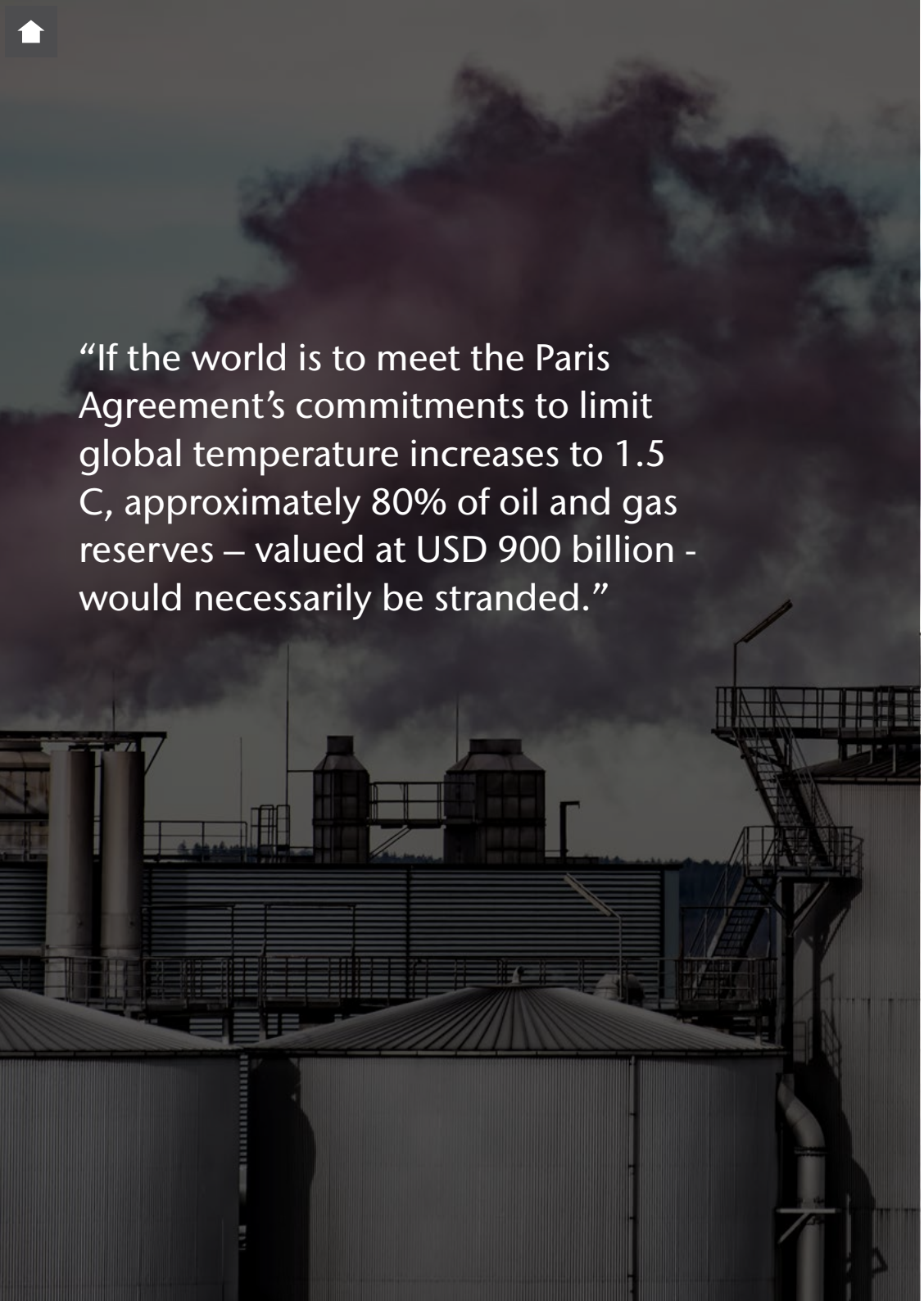
When it comes to trends in the wider M&A space, we anticipate the breadth of involvement and the use of data and analytics to deliver far greater rigour and granularity around transactions. Engagement will be not simply around the deal, but will address underlying capabilities and liabilities, including issues such as talent, cyber, intellectual property and supply chain.

IOC targets for the energy transition

	ExxonMobil	bp	Chevron	Total	Shell	eni	equinor	Repsol	ConocoPhillips	OMV
Net zero operations	—	2050: Net zero emissions target	—	2050: Net zero emissions target	2050: Net zero emissions target	2040: Net zero carbon footprint	2050: net zero emissions target	2050: net zero emissions target	2050: net zero emissions target	2050: net zero emissions in operations
Carbon intensity of products	—	50% by 2050	—	60% by 2050	65% by 2050	55% by 2050	50% by 2050	—	—	60% low and zero carbon products by 2050
Low carbon investment	USD100m over 10 years	2025: USD3-4 bn per year 2030: USD5bn per year	USD100m OGCI Fund + USD100m Future Energy Fund + USD1bn CCS projects in Australia and Canada	2020: USD1.5-2bn per year, notably in Europe	2020: USD2bn per year	2025: EUR 2.6bn	2030: NOK 100bn	2025: EUR 2.9bn	—	2025: EUR500m
Renewable capacity	—	2025: 20 GW 2030: 50 GW	—	2025: 25 GW	—	2025: 5 GW 2030: 15 GW	2026: 4-6 GW 2035: 14-16 GW	2020: 3.7 GW 2025: 7.5 GW	—	—

Source: Globaldata

"We anticipate a deepening of core trends, with transactions linked to, and augmenting, energy companies push to decarbonise. Hydrogen appears particularly promising, with advancements in technology and storage opening up significant possibilities."



"If the world is to meet the Paris Agreement's commitments to limit global temperature increases to 1.5 C, approximately 80% of oil and gas reserves – valued at USD 900 billion - would necessarily be stranded."

Divestment: the decarbonisation imperative opportunities

OUR EXPERTS

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In light of the science and rising levels of public and political pressure, divestment away from energy is gaining ground and it is apparent that the pace has quickened since the Paris Agreement of 2015.

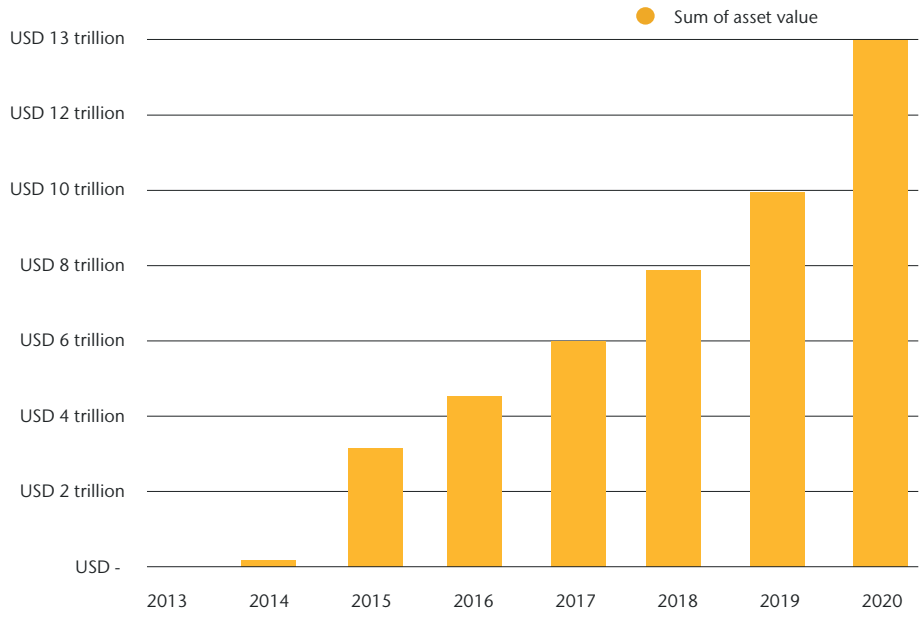
There is now a clear imperative to 'green' the financial system and this push is increasingly evident in the questions being asked by investors - and pension scheme trustees in particular - when it comes to the make-up of their investment portfolio.

Pension funds and other institutional investors are now looking to quantify, understand and mitigate their exposure to climate risk and – in varying, but growing, degrees – are starting to divest away from those industries with a significant carbon footprint.

Some organisations have publicly committed to full divestment away from energy. Others have done so partially and away from more polluting areas, such as tar sands. A final group have carried out targeted divestment, while remaining shareholders of energy firms in order to constructively engage with the sector as it navigates the carbon transformation.

According to data from 350.org, an environmental organisation, institutions pledged to divest USD 11 trillion from fossil fuels – on a full or partial basis – in 2020. This is up from USD 52 billion in 2014 and forms part of a broader push away from areas such as defence, gambling and tobacco, which together total USD 20 trillion.

Total value of assets divested between 2013-2019



Source:350.org

Environmental groups and faith-based organisations have led the divestment movement, but it has in recent years gained ground among local government and university endowment funds – and is even beginning to make headway in the corporate pension space.

Around 50% of university endowment funds have committed to some form of divestment and UNISON, the UK's largest trade union with 1.4 million members, has also pushed local government pension funds to divest and more closely consider climate change issues within the portfolio.

Pension funds do however have a fiduciary responsibility to pursue maximum returns for pension contributors. As such, ethical considerations have tended to take a backseat, as their primary responsibility has been the pursuit of returns.

This is changing however, as governments grapple with what must be done to meet the Paris Agreement. Regulators are increasingly asking investors to explain what they are doing in their investment mix to tackle the challenge of climate change. Add in the potential for reputational risk linked to investment decisions, and pension funds are more closely considering the issue of climate change risk.

And from 2022, requirements under the Task Force on Climate-related Financial Disclosures (TCFD) are set to become mandatory, obliging an increasing number of firms and large asset owners to share details with stakeholders regarding their financial exposure to climate change risk. It is apparent that the door is now open for more significant discussions around the issue of climate change risk and divestment.

Implementation of TCFD by country

Adoption of its principles vary, but the FSB Task Force on Climate-related Financial Disclosures (TCFD) will develop voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders.

Source: CISL (2018)

"According to data from the TPI, the energy sector is also falling behind others in its response to the Paris Agreement. Of the 50 energy firms considered by the TPI, 39 were not aligned with the Paris Agreement, 9 had not made disclosures and only 2 had committed to the Paris Pledges, putting the sector well behind other carbon-intensive industries."

Constructive divestment

Within the divestment movement there are groups that are taking a more constructive approach to the climate challenge.

The Church Commissioners in the UK, which manages a USD 10.3 billion investment fund, are shareholders in ExxonMobil for example. Rather than comprehensive divestment, they have instead opted for partial divestment and investor activism that is pushing the firm to engage with the issue of climate change.

Other pressure groups, such as the Transition Pathway Initiative (TPI), are focused on encouraging industry to sign-up to decarbonisation. A significant strand of the initiative is looking at global oil subsidies and financial support, from both governments and banks. Global energy subsidies are significant and the TPI is putting pressure on governments and financial institutions not to fund new oil and gas projects. This could see further sources of financial support for the sector dry up.

According to data from the TPI, the energy sector is also falling behind others in its response to the Paris Agreement. Of the 50 energy firms considered by the TPI, 39 were not aligned with the Paris Agreement, 9 had not made disclosures and only 2 had committed to the Paris Pledges, putting the sector well behind other carbon-intensive industries. As such, it seems highly likely that energy will continue to be a target for divestment and pressure on subsidies and financial support.

Fortunately, there are alternatives to rising divestment. Perhaps the most obvious answer for energy firms is a search for combinations with the power sector and an increase in renewables. Typically, firms with greener credentials are less of a target for divestment, but they do need to pay more than lip service to decarbonisation in the face of possible shareholder activism.

Investors are looking for firms to decarbonise, but also to diversify their income streams. Alternatives such as hydrogen and renewables will do exactly that and there is an opportunity for existing energy infrastructure – such as using petrol station forecourts as electric car charging points or converting LNG facilities to carry hydrogen – to propel the decarbonisation agenda forward.

DIVESTMENT PATHWAYS

5 YEARS

Rising levels of divestment are apparent across Europe, making it increasingly challenging for energy firms – particularly those at the carbon-intensive end of the spectrum - to source capital.

10 YEARS

By 2030 government will need to reflect on commitments made in Paris and milestones reached. It is likely that there will be an acceleration in climate policy, as governments seek to set global temperatures on the right path. This will lead to greater pressure to divest, 'green' the system and meet climate change targets.

20 YEARS

It is likely that we will begin to experience more severe impacts from climate change if we remain on the current 3C pathway, forcing firms to consider the material financial impact of climate change on their balance sheet.

DIVESTMENT – AN ENERGY PERSPECTIVE

OUR EXPERT

Henric Gard
Head of EMEA Energy

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Senior Account Manager, Norway

The divestment challenge has certainly begun to open the eyes of energy firms, particularly those that are publicly-listed. Pressure has led firms to pay increasing attention to sustainability and encouraged increasing investment in green technology.

Energy firms realise that if they don't invest in cleaning equipment, carbon capture, renewables and an emphasis on more environmentally-friendly forms of fuel, they will be forced to do so by investor activism, and regulatory or public pressure - and they would rather do so willingly, than be forced.

And while it unlikely the divestment movement will result in a wholesale move away from oil and gas, firms will be increasingly looking to green their portfolio and explore synergies with power and alternatives - such as hydrogen - to head-off divestment pressure.

Over the coming two decades the old oil majors will inevitably evolve into companies containing a mixture of refineries, petrochemical, exploration and production, and power assets. This will see smaller firms combining to pursue common projects, and cash-rich sections of the energy-power industry building out a broad portfolio of mixed production. By doing so, they can diversify their sources of supply, pep-up their return on equity, stave-off divestment and green their portfolio.

Against this backdrop however, there will remain the economic imperative to support future energy projects – be they new-builds or upgrades – as energy demand continues to increase globally. It seems likely that COVID-19 and future economic downturns will still trump immediate environmental concerns.

"Over the coming two decades the old oil majors will inevitably evolve into companies containing a mixture of refineries, petrochemical, exploration and production, and power assets. This will see smaller firms combining to pursue common projects, and cash-rich sections of the energy-power industry building out a broad portfolio of mixed production."

A major north European steel producer with a significant carbon footprint has managed to secure investment and partnerships by aiming to produce fossil-free steel by the late 2020s. Energy firms are taking note, and some are considering how they can bring green investors onboard in order to increase capital availability through green investments, acquisitions and technology.

Talent: diverse pressures

OUR EXPERTS

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The global financial crisis (GFC) of 2008 mobilised a rapid response across the energy industry. Investment into science, technology, engineering, and mathematics (STEM) studies fell away as capital was redeployed to focus on retaining the knowledge, skills and experience of the mature workforce. Although these efforts enabled some firms to survive, and flourish as competition fell away, the rapid decline in oil prices within the last 2 years has forced firms to take drastic action.

A substantial portion of redundancies were settled with employees nearing retirement. Although these measures were taken to secure immediate financial savings, they have come at a cost; firms have lost critical knowledge and experience from their workforce. As an aging workforce continues to reach retirement and changing operating models – fuelled by regulatory pressures – demand new skills, securing this expertise is critical to the continued development and success of energy firms; but global commercial and sociocultural pressures are a challenging barrier to overcome when attracting and retaining talent across the industry.

Attracting and retaining talent is an immediate challenge for energy firms. As global commercial and sociocultural pressures change in the next 5, 10 and 20+ years, the challenges and opportunities for energy firms will shift significantly.

5 YEARS

Energy firms will need to focus on addressing the immediate skills shortage and experience gap by attracting new joiners and retaining the existing workforce.

"A survey of participants across North America, Europe, Asia, and the Middle East reported that 44% of STEM Millennials and Gen Zs are interested in pursuing a career in oil and gas, compared to 77% in the technology sector, 58% in life sciences and pharmaceuticals, and 57% in healthcare."

As future generations prepare to enter the workplace, the attraction of the energy industry is being diluted by:

- **A global focus on climate change and social responsibility** are core drivers for career decision-making and experts have identified a growing trend. Oil and gas companies are struggling to attract talent, particularly if oil features prominently in the branding. Inspired by Greta Thunburg, schoolchildren and young adults used their collective power to stand united against climate change. Meanwhile, public protests and the proliferation of groups such as Extinction Rebellion have bolstered this message. This global sociocultural movement has had an immediate and direct impact on energy firms; potential joiners feel that they have a responsibility to pursue careers in alternative industries with perceived social commitments.
- Regulators are increasingly focusing on **ESG issues**, and energy firms must take immediate action to meet environmental obligations and demonstrate commitment to diversity, equity, inclusion and climate action. In addition to the climate change conversation, ethical working practices, privacy and data management are increasingly scrutinised by both regulators and the workforce. Commitment and integration of ESG factors is now the hallmark of sustainability. Social responsibilities will need to be addressed with a focus on diversity, equity and inclusion to develop a working environment where employees feel valued and safe.

- **Shifting social values -** new generations are growing in a time of radically shifting sociocultural behaviours. Considerations such as a work/life balance, job satisfaction and job security are all valued increasingly by new joiners and their value is beginning to outweigh salary as core decision-making factors. Although salary remains a core driver for career decision-making, the rise of renewables and decline in hydrocarbon fuel usage is likely to reduce firms' profit margins. With less available capital, salaries may begin to fade and without a financial incentive, new joiners are more likely to pursue a career in alternative industries with additional benefits.
- **Technology** is another core driver for STEM Millennial and Gen Z decision-making. Recent reports indicate that graduates show the most interest in industries that they believe will be most impacted by new technologies. Globally, just 42% believe that new technologies will have a major impact on the oil and gas industry, compared to 73% in the technology sector . On assessing potential career paths, the energy industry pales against the glittering appeal of technology giants in Silicon Valley. This perception translates into attraction, and STEM graduates are increasingly transferring their knowledge and skills to alternative industries.

"According to the GETI, three in ten respondents are doubtful that they will remain with their organisation over the next three years."

Considering the unprecedented talent shortage and employee readiness to switch roles or even sectors, retaining talent is an immediate challenge for energy firms.

Traditionally, the promise of a strong salary directly translated into high workforce engagement, but changing sociocultural values are contributing to employee disengagement:

- **Alternative industries** are increasingly seeking experienced energy employees, as their transferrable skills and experience make for a smoother transition into their industry. Although new joiners are typically more receptive to the promise of benefits packages and access to innovative technologies, the increasingly challenging commercial environment of the energy industry is increasing the appeal of transferring to alternative industries for existing employees. Energy firms are at risk of losing the pivotal skills which have the potential to drive operational change and this departure of top talent could be the difference between success and failure.
- **Career progression** is highly valued. Since the energy industry is undergoing rapid change, and COVID-19 reduces demand, firms are currently in a state of survival. With capital being redeployed elsewhere in the business, investments in ongoing training and development have slowed. GETI reports that 44% of employees in the energy sector say that their company does not regularly invest in their training and development and 32% report no access to training with their current employer in the last year. With limited access to training and development opportunities necessary for employees to upskill, top talent could be motivated to pursue opportunities either with competitor firms, or alternative industries altogether.
- **Relocating -** efforts to attract new joiners are pushing energy firms to operate in new territories. To establish the business and operate effectively in new regions, existing roles are being relocated. Although GETI data suggests that many employees would be willing to relocate, the reality of relocating can be a driver for employees leaving their roles or the industry altogether.

"In the immediate future, energy firms will need to establish future goals and use these objectives to drive the talent strategy, to fill the talent pipeline with the necessary skills, knowledge and experience to navigate new challenges and pursue new opportunities. ESG will impact energy firms' talent strategy, particularly within the next five years. ESG reporting requirements will have an impact on how energy firms select and develop talent, with a spotlight on diversity, equity and inclusion. While firms will need to consider how to structure compensation and benefits to fulfil regulatory and social responsibilities."

10 YEARS

Driven by divestment in oil and gas, and the insurance market shifting away from traditional coverage, commitments to carbon neutrality are pivotal to securing investment and by extension, long-term survival. The shift towards renewables, and the transition toward digitalisation and automation will gather momentum, placing a renewed emphasis on the need for new skills, and providing new opportunities for energy firms to develop their workforce.

- Efforts to reinvent branding and perception is already underway, particularly in the Scandinavian region where activity has involved reinventing brand names, assets and pursuing research projects. For firms which rapidly invest in renewables and commit to 'net zero', their efforts to align with sociocultural values is likely to increase the appeal of the energy industry.
- As the industry shifts towards sustainability, STEM programmes are likely to be revived. The investments made in STEM initiatives will engage new generations by guiding and supporting study and career decision-making.
- Experts predict a net job loss across a 10-year period as new technologies and operations create new opportunities at entry and experienced levels.
- New joiners will be attracted to new technologies and opportunities to fulfil their social responsibilities; their work is contributing to creating a more sustainable world.
- For existing employees, the shift towards renewables will provide new opportunities to develop new skills to boost career wellbeing and safety. Aside from individual career progression, sharing the success and growth of the business will boost employee engagement and loyalty.

Sophisticated and developmental technology is enabling the rapid development of smart cities. Smart cities will provide new opportunities for energy firms to develop their operating models, demanding new skills from their workforce. Energy companies will be competing with alternative industries. Although talent strategies will differ across industries, total rewards will become key as energy companies pivot into other areas.

20 YEARS AND BEYOND

Hydrocarbon fuel usage is likely to fall away and the market share of oil and gas firms which are unable to develop a sustainable business model focusing on renewables, will be limited to select geographies and reduce substantially.

Well-capitalized firms will have pursued opportunities emerging in renewables, and smaller players may fall away from the competition; a wave of transactional activity will restructure the energy industry.

The talent curve is likely to flatten as the current challenges are addressed by the transition to renewables:

- The new technologies and operations will become integral to business models, and firms will seek to fill new roles. The pace of technological development will continue to grow exponentially, demanding new skills from the workforce, which will continue to evolve over time.
- Closer collaboration between the education system and the energy industry could bring alignment to training and education initiatives. STEM initiatives may receive a substantial uptick in investment and support, as changing operations across the energy industry demand new skills in increasing volumes of employees as businesses grow.
- The industry will be increasingly attractive to new joiners, as technology continues to advance, salaries increase, and the role of the energy industry becomes more established as a gateway to fulfil sociocultural obligations.
- Renewables with increasing - and potentially a majority - market share, will stabilise the industry, providing employees with job security as well as opportunities to develop their skills and progress their career. For firms who fail to invest in progression opportunities for their employees, competitors with comparable technology and opportunities and scope, will be more attractive and there may be some exploratory movement in new roles. Building an ecosystem of collaboration across education providers, partners, and even competitors could create a flexible talent pool that can be leveraged in new ways as industry demands change over time.

"Within 20 years, the development of technology is likely to accelerate the transition to automation. As business models change and roles become increasingly automated, different skills will be needed. In preparing for this transition, energy firms will need to explore whether these new skills are already available within their teams, whether any training will be needed to develop existing skills, or whether new talent will need to be hired. When looking ahead to 20 years' time, digital readiness will be the difference between success and failure."

Energy firms' readiness to reskill, coupled with motivation to learn and belief in the ability to change, will be essential for continued success as the industry navigate rapidly changing sociocultural, economic, political and commercial pressures. Identifying the skills needed to pursue commercial ambitions will enable firms to augment their talent strategy and develop an inclusive, equal and diverse workforce, and leverage the benefits of rising patent values arising from a diversified team.

Within five, 10 and 20+ years, changing operating procedures and processes will have an exponential effect, extending across the supply chain. Leadership will need to be the champions of change. With commitment to innovation, diversity, equity and inclusion at the highest level, energy firms will be well positioned to create human capital structures that align workforce behaviours, skills and values to those which support long-term sustainability.

The politics of carbon pricing

OUR EXPERT

Mark Jeavons
Senior Investment Consultant,
UK Retirement Solutions

The 2015 Paris Agreement signed in 2016 set the benchmark for climate action and since then 73 countries and 398 cities have committed to being net zero by 2050. But the international consensus reached in 2016 is built on brittle foundations.

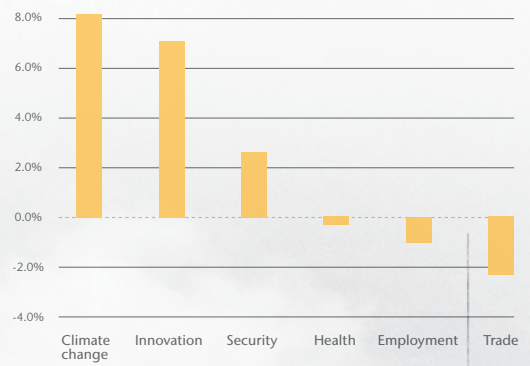
Commitments are nationally determined and at present don't add up to the 2 Celsius commitment established in Paris. Instead they are closer to 3-3.5 Celsius. They are also subject to political volatility and what is apparent is that there are no guarantees that the policies outlined in 2016 - or more recently - will be implemented.

While predicting individual government commitments to Paris is virtually impossible, what is apparent is that global commitments to climate action are significant and growing. And commitments at the political level are increasingly echoed by central banks, regulators and financial markets, which are placing increasing emphasis on climate action.

Commitments have served to increase governmental, regulatory, legal and public pressure to reduce CO2 emissions. Internationally energy firms are facing a combination of measures that are encouraging them to decarbonise at least segments of their portfolio.

Carbon pricing is one area that is already gaining ground and is likely to become increasingly significant in the years ahead.

Annual growth in EU regulation by topic since 2000



Source: Global Regulation database, Schroders

CARBON PRICING EXPLAINED… BY THE WORLD BANK

Instead of dictating who should reduce emissions where and how, a carbon price gives an economic signal and polluters decide for themselves whether to discontinue their polluting activity, reduce emissions, or continue polluting and pay for it. In this way, the overall environmental goal is achieved in the most flexible and least-cost way to society. The carbon price also stimulates clean technology and market innovation, fuelling new, low-carbon drivers of economic growth.

There are two main types of carbon pricing: emissions trading systems (ETS) and carbon taxes.

An ETS – sometimes referred to as a cap-and-trade system – caps the total level of greenhouse gas emissions and allows those industries with low emissions to sell their extra allowances to larger emitters. By creating supply and demand for emissions allowances, an ETS establishes a market price for greenhouse gas emissions. The cap helps ensure that the required emission reductions will take place to keep the emitters (in aggregate) within their pre-allocated carbon budget.

A carbon tax directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or – more commonly – on the carbon content of fossil fuels. It is different from an ETS in that the emission reduction outcome of a carbon tax is not pre-defined but the carbon price is.

The choice of the instrument will depend on national and economic circumstances. There are also more indirect ways of more accurately pricing carbon, such as through fuel taxes, the removal of fossil fuel subsidies, and regulations that may incorporate a "social cost of carbon."

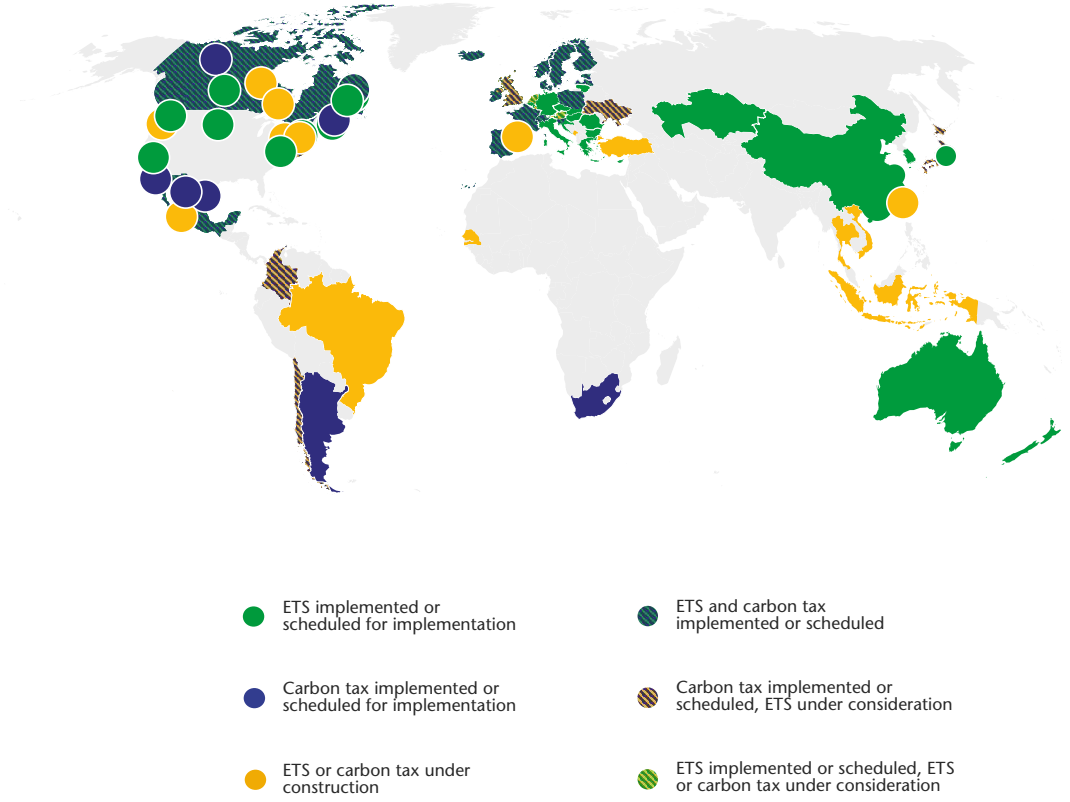
Source: The World Bank

Globally, carbon pricing is currently set at around USD 2 a tonne – which is unlikely to have any material impact on energy firms - but is already at USD 30 a tonne in Europe. In order for governments to meet the ambitious targets set by the Paris Agreement however, carbon taxes will need to increase to USD 240 a tonne.

While such a number is some way off – and may never be reached in the coming two decades – it provides some indication of the potential pressures energy firms (and other industries with significant carbon footprints) could face if the climate debate hardens and the application of carbon tax gains greater traction.

"While carbon pricing is gaining ground and global acceptance, there is still no international agreement on the price of carbon, with the topic set to be on the agenda for COP26 in Glasgow in 2021."

The rise of carbon tax: an emission trading system (ETS)



Source: World Bank

CARBON PRICING ON 5, 10 AND 20 YEAR PATH

5–20 YEARS (AND BEYOND)

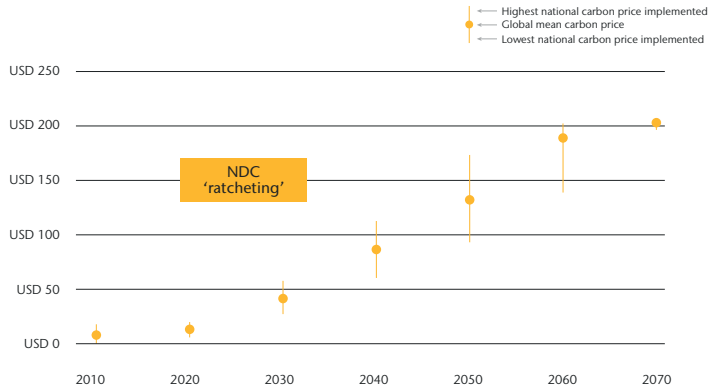
According to data from Shell's Chief Climate Change Advisor, progress towards a viable price for carbon globally is "muted at best and certainly not commensurate with the task at hand."

Nevertheless, over the coming two decades nationally determined contributions are likely to ratchet-up significantly, according to data from the Shell Sky Scenario.

Direct carbon taxation is likely to be only part of the picture, with other pressures and measures – such as divestment and border tariffs - helping to define and increase carbon pricing in the coming decades.

This will begin to have an increasingly significant impact on the energy sector, which will need to more closely consider balancing their emissions through reforestation, carbon capture and storage.

Carbon prices in Sky, $/tonne CO^2



Source: Shell Climate Change

Current carbon pricing levels by select countries, blocs and territories

Korea

USD 30 PER TONNE

British Columbia

USD 30 PER TONNE

California

USD 20 PER TONNE

New Zealand

USD 20 PER TONNE

Supply chains: the need for global resilience

OUR EXPERTS

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Oil and gas companies contend with the constant challenge of a volatile supply and demand market. As COVID-19 continues to erode demand for oil and disrupt global trade, the industry is taking stock of what little it can control, and supply chain management is in the spotlight.

It makes sense that the upstream market felt the pain of the pandemic first as a result of massive oversupply and vastly reduced demand. Operators couldn't shift their product, so naturally, they have stockpiled, and this shift in supply and demand is reflected in the price of hiring a vessel. Current hire rates for VLCCs are extortionate because companies are using these vessels to store their product offshore. Lower demand and depressed pricing will keep oil stocks high, so firms need to ensure that insurance covers these new ways of working. They also need to manage the increased risk of significant storage levels.

Oil and gas companies will be affected differently, dependent on where they are in the supply chain: E&P companies face very different risks to integrated oil companies who, in turn, have an alternative risk profile to refiners, and so on. Large integrated companies have more control over their costs and can reduce their capital expenditure and continue to diversify. In contrast, the expenses smaller E&P companies incur do not necessarily track commodity pricing. Refiners and petrochemical plants are suffering heavily but may be able to mitigate their exposure if they can adapt and switch their product mix to those that are more in demand.

In addition to the oil and gas supply chain, the industry also relies heavily on supply chains for equipment and services to extract the oil and refine it. Chartering costs, workforce availability, third party contractors, logistics, factory closures and equipment supply all feature on the current list of supply chain woes for the energy industry.

Greater flexibility

Supply chain disruption impacts a company's ability to manage cashflow and liquidity, and this has implications throughout the value chain. It is, therefore, prudent for oil and gas companies to focus some of their risk management efforts on exploring how they can better utilise their balance sheets to insulate themselves in the future. One option could be to reverse the trend of "just in time" and deploy cash to stock to de-risk the business, increasing inventories to 15-30 days rather than 10-15 and creating back-up supply chains for critical parts. In the current oil & gas liquidity crisis this approach will be a challenge however in time we expect a shift to increasing inventories, to provide greater resilience to supply chain disruption.

Firms are responding to the short and long-term issues posed by supply chain disruption in a variety of ways. There has been a ruthless amount of cost-cutting in pursuit of operational efficiency across the industry. However, firms are also investing in their supply chain to mitigate risk. Many are diversifying supply chains and their contractor base while some are choosing to move parts of production closer to home.

In the longer-term, the benefits of greater equipment standardisation in the industry are clear: it offers a consistent approach; suppliers know what to deliver, and it is consequently easier to insure. In the same vein, consistency in the deployment of contractors offers similar reliability to operations. M&A activity is also likely to increase as firms battle cashflow issues and wrestle for market share.

Technological stimulus

The race to replace humans with robotics influences every part of the supply chain: autonomous vessels, driverless trucks, temperature controls and blockchain all provide greater transparency over exactly what happens to the product. It also reduces human error and risk, redeploying the workforce to more high-value activities.

Nevertheless, successful automation of the supply chain is reliant on third parties possessing compatible technology and using it correctly – this involves an inherent cyber risk as firms have no choice but to interface with external systems. Interconnectivity is also an emerging risk for non-damage business interruption.

Given they are operating in such a fast-paced environment where oil and gas companies fixate on the bottom line, technology companies in the supply chain may also struggle to remain current and relevant.

Risk transfer

The vast disruption to business caused by COVID-19, which is not covered in most traditional insurance policies, has alerted many companies to the need to review risks beyond buying insurance. When clients take a broad look at their risk exposures and potential consequences, they could be surprised by their vulnerability to events that aren't, or can't be, insured.

"Last year energy clients said their top three emerging risks were: commodity price risk, economic slowdown and accelerated rates of change in market factors. Respondents couldn't have been more on the money."

Aon's Global Risk Management Survey is published every two years, and regularly 30 out of the 50 top risks are uninsurable – these are new and emerging risks that clients are most concerned about, but where insurance products aren't keeping pace. Last year energy clients said their top three emerging risks were: commodity price risk, economic slowdown and accelerated rates of change in market factors. Respondents couldn't have been more on the money, and there is significant opportunity for innovation in the insurance market as clients' risk profiles continue to evolve in this extremely challenging market.

When firms are concerned about accelerated rates of change in market factors, a majority of the time, they are still thinking about insurable risk, which is only a minor part of the risk environment. There needs to be a greater awareness and acceptance that traditional insurance only covers so much. Firms need to look beyond risk transfer; the first step is to review risks and understand them. Risks identified for clients include dependence on legacy software, critical third parties and environmental exposures.

Perhaps the most important paradox is the way in which the greatest risks (e.g., cyber, climate change and pandemics) are linked to important opportunities for the insurance industry to demonstrate its social purpose and confirm its relevance and offer more prevention and stronger protections.

To navigate these paradoxes, industry executives must embrace creative thinking, bold action, and continuous innovation —especially when it comes to technology and data. As challenging (and cost-intensive) as the upcoming investments will be in the near-term, they are necessary for long-term success. The upside for individual firms — as well as the entire industry and society as a whole — is well worth the effort. Those firms capable of profound change will be those that enjoy the biggest upside in terms of dramatic growth and sustainable profitability.

FUTURE PROOFING

5 YEARS

Current circumstances could lead to the increased digitalisation of workstreams.

Greater diversification into green energy by integrated oil companies, with a corresponding need to develop new supply chains.

5 –10 YEARS

The increased dominance of integrated oil companies will strengthen their ability to create greater efficiencies in the supply chain, elevating disparities within the industry.

10 YEARS

The longevity of equipment will increase as the industry continues to evolve and this will impact supply chains and timelines as the need to approach suppliers for replacements reduces in frequency.

3D printing could also potentially offer low carbon and cheaper parts to the oil and gas industry.

10 –15 YEARS

Oil and gas companies will have to evolve their supply chains to meet new demands. The growing middle class in India and Africa will demand more energy stability. We will also see the evolution of model fossil fuels and the renewables supply chain in order to unlock new sources of power.

Decommissioning: future liabilities

OUR EXPERTS

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Due to the huge number of offshore oil and gas fields developed over the last few decades, a growing number are now approaching the end of their operational life and we expect decommissioning to increase and evolve at a rapid pace in the coming 10-20 years. The decommissioning industry is focused on developing cost-effective methods to retire installations that were in some cases not designed for removal, while working within often complex regulatory frameworks.

While it is possible to draw comparisons between construction and decommissioning coverage and projects, construction all-risk (CAR) insurance tends to focus on the repair or replacement of project works following a physical loss or damage to the asset. The aim of decommissioning coverage is to restore the site to the condition it was in before construction started - or the most environmentally sound alternative. Consequently, while removal of wreck, damage to third parties, pollution and liability exposures are to be considered from a risk perspective, firms must also take into account potentially significant environmental and social factors.

Conditions mean there is already a global initiative to reduce costs associated with decommissioning, with the UK working towards a 35% cost reduction target. Apart from potential tax breaks, there is little monetary incentive to spend more on decommissioning, and as such operators are looking for ways to reduce costs.

Some assets are so old and large that there are very few vessels capable of moving them, with decommissioning costs consequently very high. Other sites are in challenging environments or are particularly sensitive from an environmental perspective. Companies are looking to technology to help reduce costs through innovation, developing methods to carry out substantial work offshore and in a shorter space of time.

> "Companies are looking to technology to help reduce costs through innovation, developing methods to carry out substantial work offshore and in a shorter space of time."

Geographical variation

Firms entering into decommissioning need to closely consider operational and environmental requirements set out by the state, with significant variation depending on the territory. The North Sea, Australia and the Gulf of Mexico, are perhaps the most mature markets, with decommissioning plans required by governments a relative formality. In less developed markets however, there is scope for more onerous demands. And in a number of jurisdictions, NGO pressure is a significant concern – with some lobbying for complete removal from the seabed, even when it may be more beneficial for the environment to leave particular infrastructure *in situ.*

A significant component of more mature regulatory regimes is the requirement that energy firms retain adequate funds on their books to cover decommissioning costs. With companies facing potentially significant future liabilities linked to decommissioning, they need to evidence there is sufficient security set aside to cover these costs. This tends to take the form of a guarantee or a capital allocation, which limits liquidity. Insurance options are available to reduce the impact of these capital constraints on financial performance and firms are increasingly turning to the insurance market to limit their financial obligations.

Uncertain future

When considering future risk, firms must contend with political decisions that can affect their obligations when it comes to decommissioning redundant offshore assets. Decommissioning can be complex and costly, and financial projections are based on what the regulatory environment dictates at the time. If the political landscape changes, this could alter exposures and consequential cost significantly. A changing regulatory environment could also mean an increased financial obligation and a need to obtain more security.

If there is a deep and prolonged fall in oil prices due to COVID-19, this could negatively affect the economic value of assets and bring decommissioning activity - and cost - forward. Energy

firms have already reduced activity, with some shutting down offshore assets, to avoid financial challenges. If assets are no longer profitable, decommissioning could be brought forward from 10 years to 5, or even sooner. The question is whether the industry can move at the speed required to meet the evolving obligations. When there is very little discretionary money on the budget, the onus will be on decommissioning specialists to provide commercially innovative solutions.

Risk transfer

Firms are generally proactive in meeting the long and short-term challenges decommissioning poses. In terms of the impact on balance sheets, firms can't avoid their financial obligations, but there may be scope to reduce it by collaborating closely with the relevant authorities and local jurisdictions. They should also utilise financial instruments to provide security and team-up with an experienced broker to maximise risk transfer opportunities.

There are insurance products for removal of wreck, physical damage, third party liability, and plug and abandonment (P&A) in the conventional energy market. There are also insurance solutions for off-balance-sheet surety provisions that can provide a way to meet those demands and these vary significantly dependant on jurisdiction, operator and timing.

There is also a huge amount of innovation currently underway to add value. The decommissioning market is relatively young, and - there is scope for considerable evolution in how things are currently done. P&A and decommissioning cost overruns are areas where Aon sees considerable opportunity for product innovation, which would help reduce the contingency placed in decommissioning budgets and free-up balance sheet capital.

DECOMMISSIONING: A GROWING IMPERATIVE

5 YEARS

The impact of COVID-19 is likely to be significant. Conditions may force firms to curtail their investments, resulting in the decommissioning of certain assets being brought forward.

Innovation in risk transfer will predominantly be focused on products like cost overrun, which would help to reduce balance sheet costs and increase liquidity during a particularly challenging period for the industry.

5 –10 YEARS

Emerging markets regulation linked to decommissioning will become more aligned with developed markets – with increased standardisation, consistent regulation and greater cost certainty for firms.

10 YEARS

There will be significant technological advancements, including decommissioning hubs, more vessels capable of handling assets, and more competition as the decommissioning needs of the sector grow over the coming decade.

There is the potential for significant cost reductions relating to cement alternatives for P&A, which will help to deliver long-lasting seal solutions.

10 –20 YEARS

Decommissioning will be firmly part of the installation's lifecycle - with all assets having clear plans for decommissioning from the outset – aiding long-term budgeting and projections.

CYBER: A COMPLEX & CONNECTED TRANSITION

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Officer,EMEA Cyber

David Molony
Director, EMEA
Cyber

Energy firms face an array of cyber exposures – ranging from attacks on operational engineering, to the theft of intellectual property (IP) – with vulnerabilities across the supply chain open to exploitation by hacktivists, state-level actors and rogue employees.

And it is apparent that the move to change the energy mix and the pursuit of margin growth in an ultra-low oil price environment, will create new and complex cyber exposures for firms grappling with the need to update, evolve and create efficiencies throughout their operations.

Downstream, refiners and distributors are turning to smart analytics to match supply and demand and increase margins. But by introducing technology that enables real-time monitoring and distribution, firms are connecting the downstream network to the internet and - by extension - cyber risk.

The issue is further complicated by downstream networks that are often old and in hard-to-reach locations – such as dug under cities. This complexity - and the capital outlay needed for new smart systems - will inevitably mean that digital transformation will be pursued in a phased approach.

"Securing engineering systems has become the single most significant challenge facing Chief Information Officers across the energy sector."

Upstream, the engineering challenges are comparable, as firms consider how to build better and more efficient drilling and exploration operations that maximise output and profitability. Again, IT systems are helping to transform operations and bolt-on to existing engineering systems; all through internet-based systems.

By connecting to the internet and utilising technology systems that are coming online at different speeds and stages, firms are however opening themselves up to significant vulnerabilities. As a result, securing engineering systems has become the single most significant challenge facing Chief Information Officers across the energy sector. Firms will need to carefully balance their pursuit of digital transformation with an exponential increase in cyber exposure.

Operational technology environments

ATTACK VECTOR – PHISHING

Typical vulnerabilities – employees facing social engineering scams

Impact – theft of operational details or controls, or insertion of malware

ATTACK VECTOR – MALWARE

Typical vulnerability – external hardware or removable devices, internet or intranet connection

Impact – infection of operational technology resulting in outages, slowdowns and the compromise of system controls

ATTACK VECTOR - DENIAL OF SERVICE AND BOTNET ATTACKS

Typical vulnerabilities – operational technology with internet connectivity, or cloud services

Impact – outages of operational technology, servers and databases

ATTACK VECTOR – ADVANCED PERSISTENT TREATMENTS

Typical vulnerabilities – coordinated attacks to exploit operational system vulnerabilities and backdoors

Impact – ability to introduce malware and gain control of operational systems

ATTACK VECTOR – HUMAN ERROR OR ACTION

Typical vulnerabilities – accidental or deliberate deployment of malware or code injection

Impact – infection of operational technology by malware resulting in slowdown or system failure

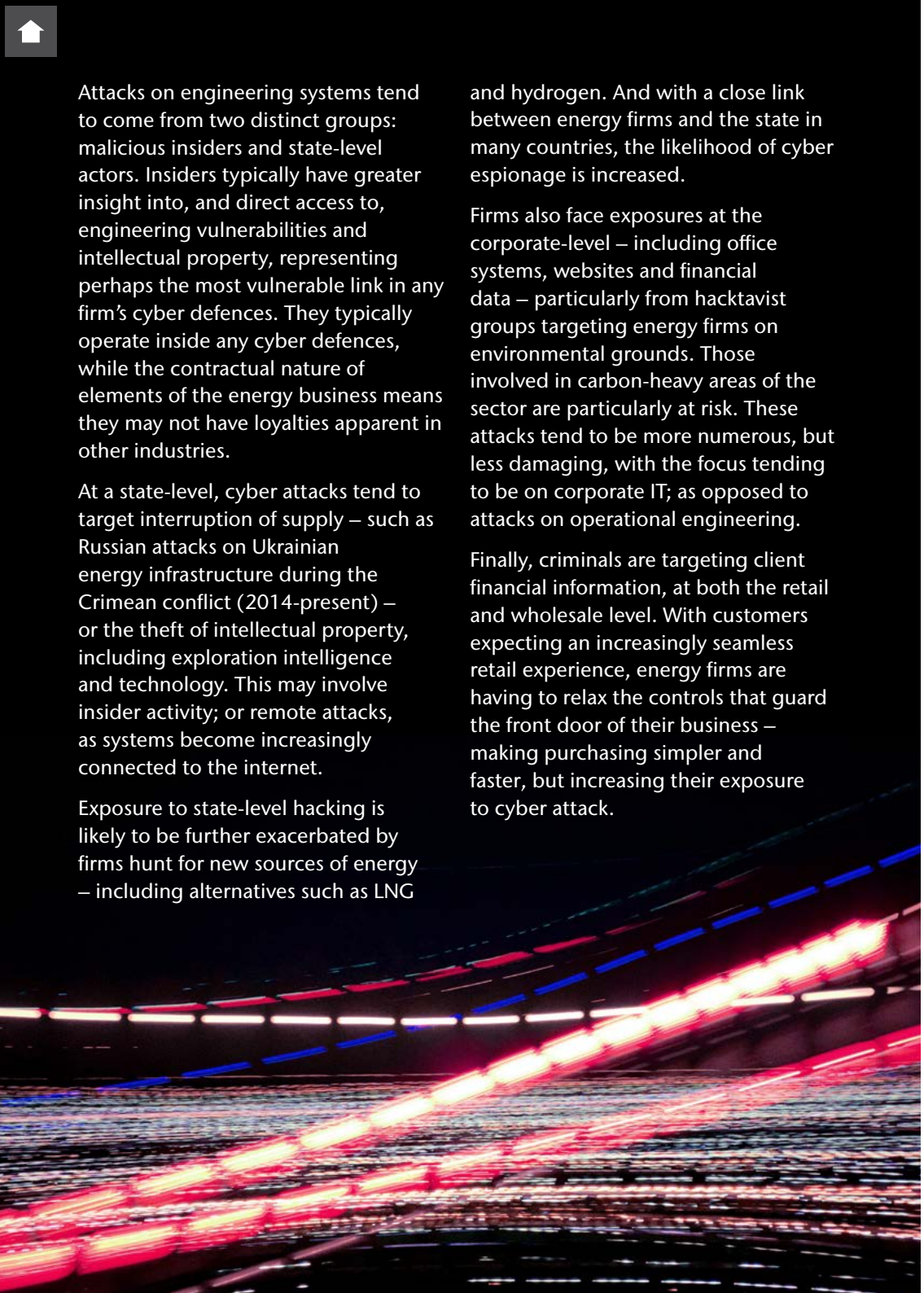
Attacks on engineering systems tend to come from two distinct groups: malicious insiders and state-level actors. Insiders typically have greater insight into, and direct access to, engineering vulnerabilities and intellectual property, representing perhaps the most vulnerable link in any firm's cyber defences. They typically operate inside any cyber defences, while the contractual nature of elements of the energy business means they may not have loyalties apparent in other industries.

At a state-level, cyber attacks tend to target interruption of supply – such as Russian attacks on Ukrainian energy infrastructure during the Crimean conflict (2014-present) – or the theft of intellectual property, including exploration intelligence and technology. This may involve insider activity; or remote attacks, as systems become increasingly connected to the internet.

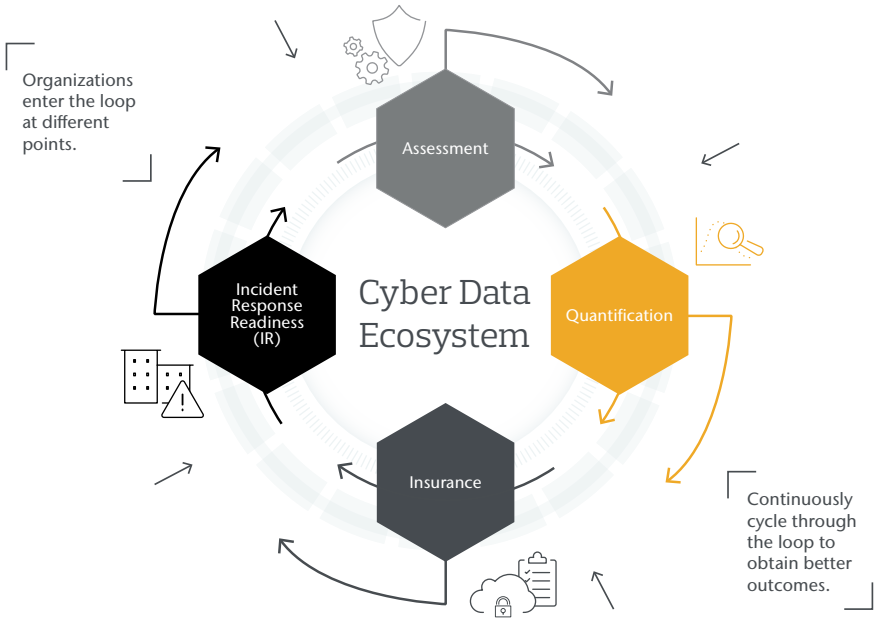
Exposure to state-level hacking is likely to be further exacerbated by firms hunt for new sources of energy – including alternatives such as LNG and hydrogen. And with a close link between energy firms and the state in many countries, the likelihood of cyber espionage is increased.

Firms also face exposures at the corporate-level – including office systems, websites and financial data – particularly from hacktavist groups targeting energy firms on environmental grounds. Those involved in carbon-heavy areas of the sector are particularly at risk. These attacks tend to be more numerous, but less damaging, with the focus tending to be on corporate IT; as opposed to attacks on operational engineering.

Finally, criminals are targeting client financial information, at both the retail and wholesale level. With customers expecting an increasingly seamless retail experience, energy firms are having to relax the controls that guard the front door of their business – making purchasing simpler and faster, but increasing their exposure to cyber attack.



Building resilience: the Cyber Loop



Source: Aon

Risk transfer

The just-in-time nature of engineering system replacement and the age and complexity of existing infrastructure is making for challenging risk transfer conversations, particularly around system resilience and continuity. Upstream, the major concern remains the potential for property damage from a cyber attack. Downstream, it is the potential for business interruption and resultant loss of income. As downstream may also include "direct to consumer" services, this can create an enhanced privacy risk and additional liability that is unlikely to be covered by traditional lines of insurance. What is apparent is that the insurance market is more comfortable dealing with property losses from a cyber event, although coverage continues to evolve, and we are seeing growing interest in areas such as environmental liability.

CYBER PATHWAYS

5 YEARS

Firms will need to extend cyber risk management – which has typically been a strength at the corporate level - into the engineering space as operational and IT systems converge. This will involve protective monitoring and security, with thousands of data points to assess and mitigate exposure. This will require a corresponding investment in smart analytics to ensure appropriate oversight and response to an otherwise overwhelming level of operational data.

5 -10 YEARS

Energy firms may find it increasingly challenging to secure cyber coverage as insurers respond to increasing environmental social governance (ESG) pressures. This will be particularly true of European insurers and for the more carbon-intensive areas of the sector.

Markets and clients will have to come to an understanding regarding the efficacy of stand-alone cyber products in industries, like energy, where business is predicated on technology controlling and manipulating the physical environment.

As disparate products combine, and anticipated increase in losses lead to greater understanding of risk factors and costs, more capacity should become available and a clearer approach to transferring cyber risk should emerge.

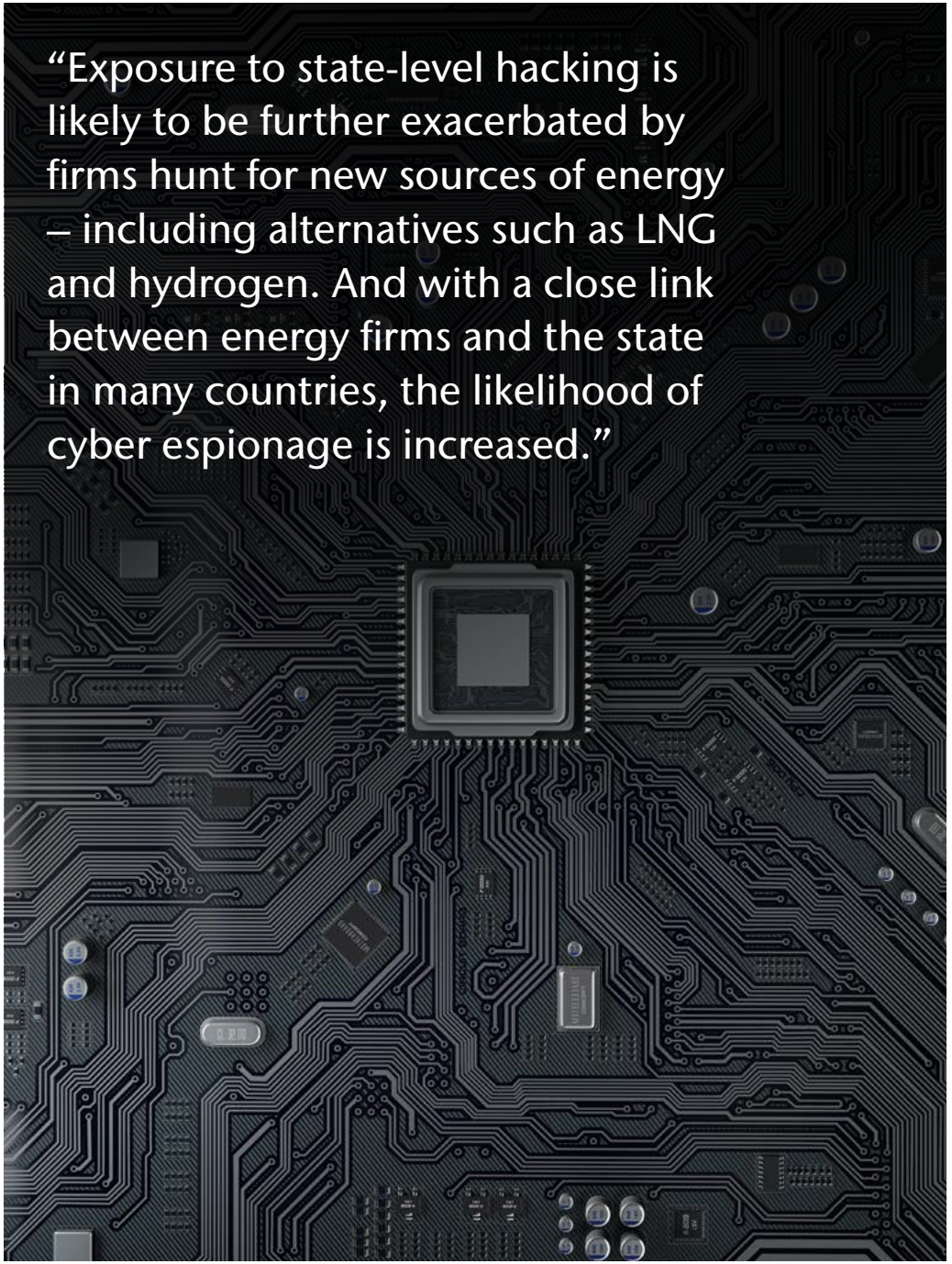
10 YEARS

An increasingly automated supply chain will drive efficiencies but will inevitably expose operational engineering to cyber attack. In response, firms will need to invest in real-time threat and incident management, with an increasing emphasis on intelligence-led cyber response - both online and across engineering systems.

10 -20 YEARS

The energy transition will have a significant impact on the risk transfer options available for the sector – and if ESG concerns at insurers intensify, it may bring about a crossroads in coverage availability.

Those firms that have a demonstrable handle on their evolving operational exposures - and with the appropriate green shift credentials – will continue to access coverage; but it is likely that availability, limits and scope of coverage will prove challenging for firms with less insight into their operational exposures and at the more carbon-intensive end of the industry spectrum.



Geopolitical risk – facts on the ground

OUR EXPERTS

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Energy firms face a complex array of geopolitical risks as they navigate emerging markets, environmental activism and state-level interventions - and this complexity is only likely to deepen in the coming decades.

People exposures are broad-ranging and firms will need to keep a close eye on evolving risks. Terrorist groups – particularly those with a national, as opposed to international agenda – have targeted oil and gas firms as an outlet for economic, environmental and social grievances.

Groups such as the Niger Delta Avengers, which carried extensive attacks on oil facilities in Nigeria in 2016; or the National Liberation Army (ELN) in Colombia, which has systematically targeted state energy infrastructure; view attacks on infrastructure as a means to force political and economic concessions, from both the state and energy firms.

International terrorist organisations such as Al-Qaeda and Islamic State have also targeted international energy, with incidents such as the In Amenas attack in Algeria in 2013 providing some indication of the seriousness of potential incidents. And while we have seen the collapse of Islamic State and the blunting of Al-Qaeda's capabilities, the threat posed by Islamist terrorism is likely to remain significant for years to come.

Upstream and midstream operations in often politically-challenging parts of the world will remain a concern for firms, with remote facilities and on-site personnel particularly hard to secure.

Energy firms: in the crosshairs

GROUP	NUMBER OF ATTACKS IN 2020
Far Left	173
Far Right	2
Global Islamist	63
National Islamist	8
Nationalist/ Separatist	22
Single Interest	25
Unknown/ Not recorded	82

Source: The Risk Advisory Group

Kidnap and ransom is often aligned with terrorism; with terrorist and criminal groups turning to abductions to fund their activities. Expats are particularly vulnerable, but groups also target local nationals working for energy firms. The economic impact of COVID-19 has further exacerbated the issue, and Aon has seen a sharp rise in kidnap and ransom cases globally.

Broader civil unrest may also impact firms. Even before the COVID-19 crisis, Aon's Risk Maps pointed to 3 in 5 countries globally facing the potential for strikes, riots and civil commotion - with significant business interruption implications.

COVID-19 is likely to exacerbate the issue and where industries are particularly badly-hit, or where government responses are perceived to have been weak or excessively economically damaging, there is likely to be a public – and potentially violent – backlash.

Socio-economic grievances are likely to dominate the narrative, and firms need only consider unrest in Hong Kong, Paris and Santiago in 2019, to understand the potential extent and longevity of such incidents.

Energy firms are also likely to find themselves the target of environmental activism. Climate events and greater public support for climate action – including demonstrations – will likely mean energy firms will need to consider whether their offices or downstream operations could be a target of environmental activism.

Political violence – at a state or sub-state level - is also an area of concern, particularly in the Middle East where the conflict between Iran and Saudi Arabia looks set to deepen. Attacks on Saudi Aramco's Abqaiq and Khurais facilities and attacks on shipping in the Straits of Hormuz in 2019 provide some indication of the complex exposures energy firms face.

It is also likely that the use of more novel forms of attack will increase, whether that is the use of proxies (such as the Houthis in Yemen), technology (such as drones) or cyber terrorism (such as the Shamoon attack on Saudi Aramco and RasGas in 2012).

Firms operating in regions with the potential for political violence will need to closely monitor their exposures – and consider potentially new and novel vectors of attack. For many, the threat alone may be sufficient to dissuade them from investment, with countries like Libya – with significant energy reserves – likely to be passed-up for less challenging locations.

The politics of intervention

When it comes to political risk, the challenges are closely linked to energy pricing, protectionism and currency fluctuations; with COVID-19 further complicating the picture. Energy producing nations have found their finances severely impacted by the pandemic, increasing the likelihood for political interventions in the economy, and should a low oil price environment persist long-term, the temptation to do so is likely to increase.

"Energy producing states such as Angola and Nigeria have been severely impacted by the pandemic and may be tempted to revisit long-standing arrangements with energy firms, such as power purchase agreements. In some instances countries may be unable to meet their established obligations due to the challenging energy market and might seek to re-engineer agreements or introduce tariffs to shore-up their finances."

Energy producing states such as Angola and Nigeria have been severely impacted by the pandemic and may be tempted to revisit long-standing arrangements with energy firms, such as power purchase agreements. In some instances countries may be unable to meet their established obligations due to the challenging energy market and might seek to re-engineer agreements or introduce tariffs to shore-up their finances.

Protectionism - which Aon already highlighted as an issue in its 2019 Risk Maps - is also likely in the face of the pandemic and the ongoing China-US trade war. This may see markets closing to imports, as well as trade and currency restrictions. Currency restrictions are particularly likely where there is a high likelihood of sovereign default - such as in Argentina - or where there is a history of currency controls. This can make the repatriation of profits and currency convertibility a challenge for energy firms, and we would encourage firms to consider how political risk coverage can help them navigate some of these challenges.

Some countries have also introduced emergency powers to respond to the crisis, and there may be a temptation to exploit law-making by decree to re-write and reframe long-standing obligations to international energy. In countries where there is a high concentration of power in the executive, the potential for highly personal decision-making may lead to changes that could persist well beyond the pandemic.

Finally, there is the vulnerability of equipment leased for exploration and production, which is particularly vulnerable to expropriation and default in the face of COVID-19 and the low oil price environment. If you add into that mix other complexities – such as a civil war in the case of Libya – it is apparent that upstream operators are facing something of a perfect storm.

Contract default and/or currency inconvertibility:
Angola, Argentina, Ecuador, Ethiopia, Nigeria and Zambia

Expropriation:
Argentina and Gabon

Civil unrest and/or political violence:
Algeria, Chile, Egypt, Iraq and Lebanon

COMPLEX EXPOSURES

5 YEARS

Countries will still be navigating the fall-out from COVID-19. Its economic impact will not be evenly felt and those countries and sectors worst-hit by the pandemic and the downturn will see the most significant increase in politically-motivated interventions, civil unrest and acts of terrorism.

Rising protectionism and the vulnerabilities of supply chains will encourage a rethink of globalisation, which in some instances will involve near-shoring. The realities of the energy sector will likely limit its impact on the sector, but countries such as Canada and the US may place greater emphasis on domestic supply.

Environmental activism is likely to become more entrenched and potentially militant. Economic disparities are likely to result in greater unrest targeting large corporations, and energy firms will likely be among those in the crosshairs.

10 YEARS

The China-US trade war is likely to be further entrenched, with potentially significant implications for firms caught up in the conflict. Tariffs imposed by either side may deepen, with a potential knock-on effect for energy firms and producing states.

Personalities will continue to play a significant role in international politics, as will the stability of regimes in key oil producing nations. Underlying economic and political grievances have the potential to challenge the existing order. While the Arab Spring of 2011 largely failed to bring about democratic change, the potential for a re-emergence of democracy movements – and all that this will mean for incumbent regimes - remains. The potential for civil unrest is significant, as is changes to the existing order.

Energy firms that have traditionally been comfortable dealing with country elites, may see those change in the coming decades in the face of social, economic and environmental pressures – and their seat at the table diminished if the green agenda gathers pace.

About Aon

Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.

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