

# Adjusting to change

Energy Market Review 2019







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The following abbreviations are used throughout this Review:

PD	Physical Damage
BI	Business Interruption
OEE	Operators Extra Expense
LNG	Liquefied Natural Gas
PMD	Performance Management Directorate
S&P	Standard & Poor's

## Table of contents

Introduction.....	3
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## Part one - energy industry issues

Carbon Capture, Use and Storage: the challenges ahead for the energy industry .....	06
LNG: the transformation of the industry and its key risks .....	12
Digitisation: the promise of benefits, but also of risk.....	22
Private Equity in oil & gas: have risk managers caught up?.....	27
Geopolitical instability: turning up the heat on the energy industry? .....	35

## Part two – risk management issues

Combining data with analytics: a different view of your insurance programme .....	42
Oil Insurance Limited (OIL): a challenging year .....	47

## Part three – the Energy insurance markets in 2019

Upstream: a gentle market upswing.....	50
Downstream: a traumatised and challenging market.....	61
Liabilities: undercurrents of change .....	72
Construction: drama in the market.....	79
Terrorism & Political Violence: is your cover still appropriate? .....	82
International insurance market round-up: differing drivers .....	84

## Market Capacity Figures

The figure quoted in this Review are obtained from individual insurers as part of an annual review conducted in January each year. They are solicited from the insurance markets on the basis of securing their maximum theoretical capacity in US\$ for any one risk. Although of course this capacity is offered to all buyers and their brokers, the individual capacity figures for each insurer provided to us are confidential and remain the intellectual property of Willis Towers Watson.

## Willis Towers Watson Energy Loss Database

All loss figures quoted are from our Willis Energy Loss Database. We obtain loss figures for this database from a variety of market sources (including a range of loss adjusters), but we are unable to obtain final adjusted claims figures due to client confidentiality. The figures we therefore receive from our sources include both insured and uninsured losses.

## Style

Our Review uses a mixture of American and English spelling, depending on the nationality of the author concerned.

We have used capital letters to describe various classes of insurance products and markets, but otherwise we have used lower case to describe various parts of the energy industry itself.







# Introduction: adjusting to change

Welcome to this year's Energy Market Review. Change is constant, so they say, but this year is proving the old cliché true in a myriad of different ways. As we move further into 2019, we are seeing energy industry insurance buyers, risk intermediaries and insurers having to face up to significant changes in our different business environments. How they adjust to these changes may be critical to their future prosperity in the years ahead.

So what adjustments to change are we highlighting specifically in this year's Energy Market Review? We've split this year's edition into three areas:

- **Adjustments to the energy industry business environment.** How will the industry adjust to renewed pressures to reduce carbon emissions? How are LNG risks best managed, as this sector of the industry continues to grow exponentially? How will the industry mitigate the risks inherent in digitisation? As more Private Equity firms take a leading role in managing energy industry assets, what strategies can they employ to mitigate the risks involved? And finally, how are current geopolitical tensions around the world impacting the industry?
- **Adjustments to current risk management methodologies.** How are new ways of combining data with analytics helping energy companies to manage their risks in a more effective way? And after a difficult 2018, how is Oil Insurance Limited (OIL) adjusting its approach to rating mutualised risk?
- **Adjustments to Energy insurance market trading conditions.** After several years of increased capacity, falling rates and declining premium incomes, we are now seeing a turnaround in almost all our markets. In some, such as Upstream, the turnaround is currently relatively modest; in others, such as Downstream, we are looking at an accelerating rating upswing. What will be the best way for energy companies to respond to these changes? Are there strategies they can form to offset the worst effects of the current market upswing?

From an insurance market standpoint, the key findings of our Review are as follows:

- **Capacity:** while capacity levels have increased marginally in the Upstream market (up from US\$7.75bn to US\$8.10bn) they have actually decreased in the Downstream market (from US\$6.8bn to US\$6.2bn) – the first such decrease since the aftermath of the 9/11 tragedy (see pages 51 and 62).

- **Losses:** Upstream has had another mild loss year, stifling the hardening dynamic in this market. However, land rig and other onshore losses are currently causing insurer concern. In contrast, the Downstream market has had another gruelling loss year, while the recent twin losses emanating from Darwin, Australia are causing serious concern in an already reeling Construction market.
- **Rating levels:** Except where sought after programmes have been extensively re-modelled, or where risk profiles have significantly changed, almost every programme will now be subject to some form of rating increase (with the one exception of the growing energy insurance market in China). In the Upstream and Liability markets, these are generally relatively mild; not so in Downstream and Construction, where the fight to survive for some insurers is now entering a decisive phase.
- **Profitability:** On balance, the Upstream market has continued to generate underwriting profits, although we don't believe it would take much to change this should the current mild loss record deteriorate. For Downstream however, the prospects for this portfolio look bleak unless there is some improvement in what has been a disastrous couple of years for these insurers.

Our message to the energy industry is clear. We have to adjust the ways in which the industry's risks are identified, collated and presented to insurers, in an era where "Big Data" is king. We have to adjust to develop revised strategic risk partnerships with key stakeholders so that the volatility inherent in our insurance markets is mitigated. And we have to be relentless in our pursuit of fresh ideas that produce valuable new products and services for the energy industry.



**Graham Knight is Head of Natural Resources GB, Willis Towers Watson.**



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## Part one - energy industry issues

# Carbon Capture, Use and Storage: the challenges ahead for the energy industry

## Introduction

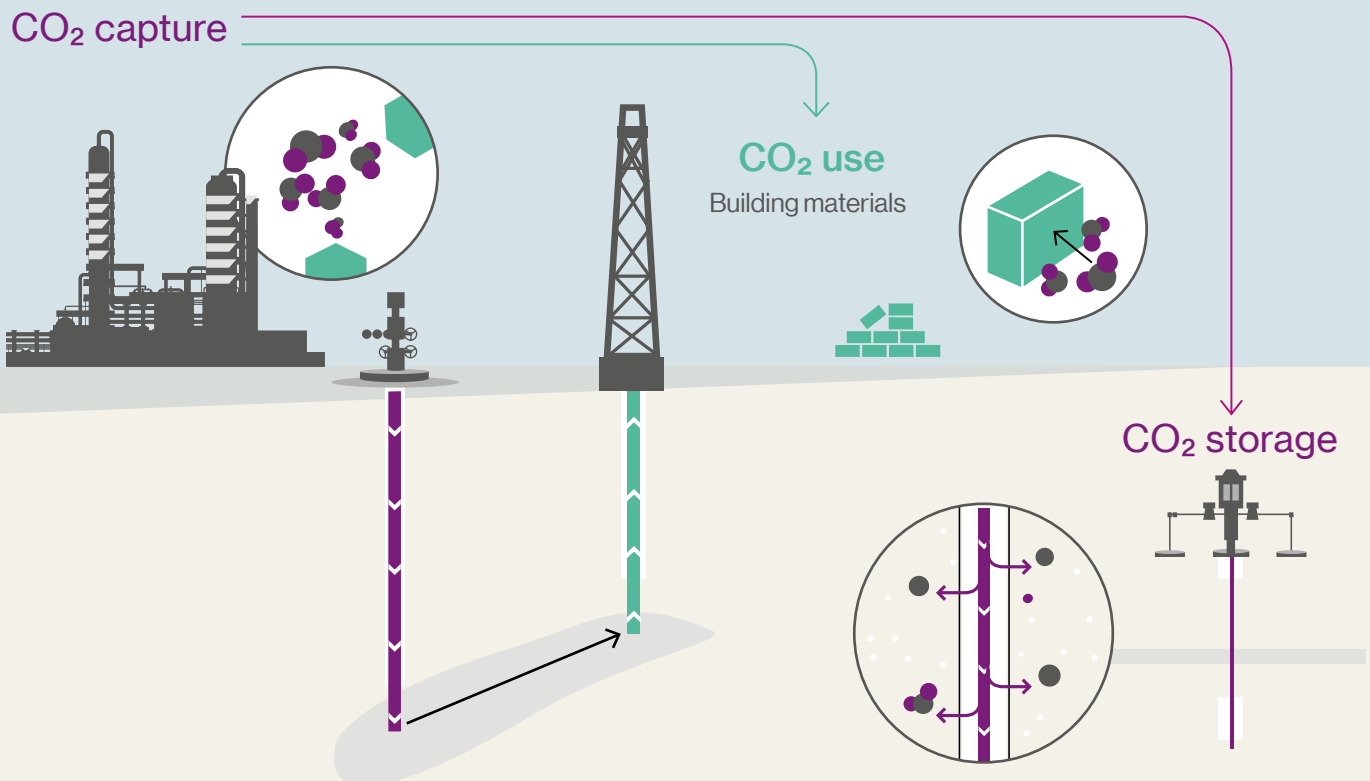
### *What is Carbon Capture, Use and Storage (CCUS)?*

CCUS is essentially a suite of technologies intended to capture carbon dioxide resulting from the combustion of fossil fuel and biomass in power plants and prevent it from reaching the atmosphere. This is achieved either by reusing it in products or by transporting it to a permanent underground storage facility as outlined in Figure 1 below<sup>1</sup>.

### *Why do we need it?*

It is widely accepted that carbon emissions as a result of anthropogenic (i.e. human-related) activities have resulted in the rising global temperatures observed since the Industrial Revolution. Temperatures are forecast to rise further, with significant risks identified. The recent Intergovernmental Panel on Climate Change (IPCC) summary report<sup>2</sup> published at the end of 2018, highlighted these risks and described the key mechanisms which could be deployed to limit global warming to 1.5C above pre-industrial levels.

Fig 1 – How CCUS works



<sup>1</sup> <https://www.bp.com/en/global/corporate/sustainability/climate-change/carbon-capture-use-and-storage.html>

<sup>2</sup> [https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15\\_SPM\\_version\\_stand\\_alone\\_LR.pdf](https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf)





### **Carbon Dioxide Removal critical says IPCC**

Critically the report identified that in all potential mitigation strategies to limit the rise to 1.5C, including drastic reductions in energy demand, there was a requirement for Carbon Dioxide Removal (CDR). CDR is a term used to describe a range of anthropogenic activities, including CCUS, which remove CO<sub>2</sub> from the atmosphere and store it in geological, terrestrial or ocean reservoirs, or in products. Other activities include use of biological sinks, for example afforestation and reforestation. It is clear from the report that CCUS is likely to become an essential component of how climate change will be mitigated in the future.

### **What is the current position?**

It is recognised that a huge global response is needed, but in a fractured political climate, is there the political will to make the necessary changes in the time we have left? Or will it be down to the industry to lead the way?

### **Latest developments in the UK**

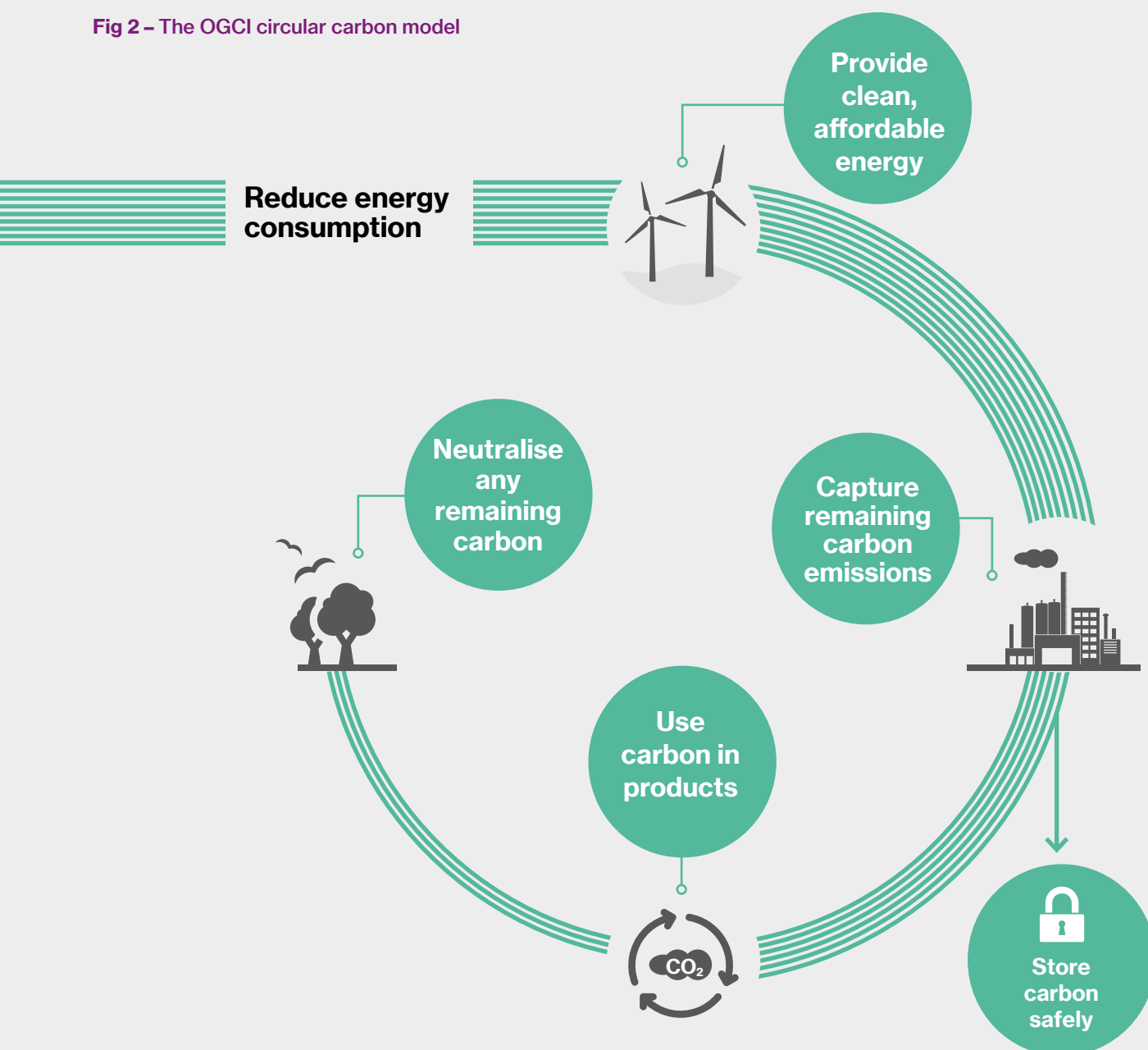
In 2015 the UK Government cancelled its £1bn CCS Competition when it was already several years into the process, much to the understandable dismay of the bidders. However, at the end of last year it appears that the UK Government commitment to CCUS is back on track with the announcement of an action plan to enable the development of the UK's first CCUS project<sup>3</sup>. The stated ambition within the plan is that the first facility in the UK should be commissioned by the mid 2020s, and that the UK "should have the option to deploy CCUS at scale during the 2030s, subject to the costs coming down sufficiently". The document also notes that "no technology can proceed at any price" (although one is left wondering if that price is the Earth in the long run), and that they "expect industry will play the leading role" in the delivery of CCUS. It is likely therefore that fiscal incentives, taxation and legislation will be brought to bear in the coming years in order to ensure that industry plays the part intended by Government.

"It is recognised that a huge global response is needed, but in a fractured political climate, is there the political will to make the necessary changes in the time we have left?"

<sup>3</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/759637/beis-ccus-action-plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/759637/beis-ccus-action-plan.pdf)



**Fig 2 – The OGCI circular carbon model**



Source: <https://oilandgasclimateinitiative.com/policy-and-strategy/#ccus>

### OGCI initiatives

In the intervening period, the oil and gas sector has not stood still, with the Oil and Gas Climate Initiative (OGCI) being announced in September 2014. The OGCI promotes and invests in a number of initiatives aimed at reducing the rise in global temperatures as outlined in Figure 2 above.

Meanwhile BP have recently announced its investment in both the Clean Gas Project on Teesside and also in the UK firm C-Capture<sup>4</sup>, which is trialling its technology at Drax's power station in Yorkshire<sup>5</sup>.

<sup>4</sup> <https://www.bp.com/en/global/ventures/latest-news/media-announcements/bp-invests-in-c-capture.html>

<sup>5</sup> [https://www.drax.com/press\\_release/c-capture-raises-3-5m-funding-round-led-bp-drax-ip-group/](https://www.drax.com/press_release/c-capture-raises-3-5m-funding-round-led-bp-drax-ip-group/)



## Insurable risks

As with the deployment of any new technology, there are risks associated with the development and implementation of the projects, as well as ongoing risks once the processes are up and running. Many of the risks associated with CCUS are not that far removed from a typical Upstream project (apart from that the process of extraction is reversed) and could be considered akin to Enhanced Oil Recovery projects which are now fairly common.

### *Specific risks may lead to gaps in insurance cover*

The risks that would apply are those which are generally anticipated and would include those related to contractual matters, Control of Well, Health, Safety and Environmental (HSE), Property Damage, Business Interruption, Transportation risks and so on. There are some risks which are specific to CCUS and would lead to potential gaps in insurance cover. Some of these are identified in documents prepared and published by bidders for the original UK CCS Demonstrator project which was terminated in 2015<sup>6</sup>. These risks include damage to the reservoir itself, CO<sub>2</sub> emissions/leakages and any associated legal liabilities, and the long-term liability associated with the perpetual storage of carbon and the additional requirements of ensuring the integrity of storage sites.

### *Additional HSE risks*

There are however additional Health, HSE risks associated with the capture, transport and large-scale storage of CO<sub>2</sub>. A loss of containment incident in any of these areas of the process may result in the release of a gas cloud or an uncontrolled release of energy. Harm may be caused to human health or the environment, either by gas inhalation or being in the vicinity of a physical blast, and these are considered in more detail below.

CO<sub>2</sub> is colourless, odourless and naturally present in the atmosphere but at higher concentrations it causes headaches, dizziness, confusions, loss of consciousness and death. Should CO<sub>2</sub> leak from capture sites, pipelines or storage locations, either slowly or as a result of a sudden incident, there are potentially major consequences for human health. Although CO<sub>2</sub> generally disperses quickly in the open atmosphere, it is denser than air so it will accumulate in confined environments including basements, trenches and in depressions in the ground. It is widely attested that humans will suffer from unconsciousness and even death at CO<sub>2</sub> concentrations above 10%.

## BLEVE risks

Additional potential hazards relate to the storage of CO<sub>2</sub> in liquid form, and are related to the Boiling Liquid Expanding Vapor Explosion (BLEVE) phenomenon. This takes place if a vessel containing a pressurized liquid above its boiling point is ruptured; the Global CCS Institute<sup>7</sup> provides details of this phenomena. In the case of a BLEVE involving CO<sub>2</sub>, the effects will be both the blast (due to vapour expansion) and the fragmentation of the container. The causes of the BLEVE in the CCS environment are likely to be through an external fire, external impact, excessive internal pressure and either corrosion or metallurgical failure of the containment.

### *Onshore storage risks*

In the UK, capture and transport locations may come within relatively close proximity to centres of population; however, UK storage sites will be restricted to offshore locations. In other countries however, onshore storage may be a consideration and this brings with it the additional risks of a major release from an underground storage reservoir near populated areas. Leakage could occur through a catastrophic event, such as an earthquake, or through slow leakage as a result of poor site selection, preparation or maintenance. In either scenario elevated concentrations of CO<sub>2</sub> would result at the surface or subsurface, thereby posing risks to human health and the existing ecosystems.

In the UK CO<sub>2</sub> is not currently defined as a dangerous substance under the Control of Major Accident Hazards Regulations 1999 (COMAH) or as a dangerous fluid under the Pipelines Safety Regulations 1996 (PSR), the UK Health and Safety Executive (HSE) published a dedicated section on CCS<sup>8</sup>. The HSE notes that in CCS operations it is likely that CO<sub>2</sub> will be handled close to, or above, its critical pressure (73.82 bar) and significant hazards are associated with this dense phase when pressure is lost suddenly. Where the risks are properly controlled, the HSE expects the likelihood of a major hazard incident to be “very low, as in other similar processes in the energy, chemical and pipeline industries.” However, they will consider extending existing major accident hazard legislation to cover CCS if this is justified by the evidence”. In other words, further legislation may follow.

<sup>6</sup> UKCCS - KT - S10.5 - Shell - 001. Insurance Report. ScottishPower CCS Consortium. April 2011

<sup>7</sup> <https://hub.globalccsinstitute.com/publications/hazard-analysis-offshore-carbon-capture-platforms-and-offshore-pipelines/annex-f-co2-bleve>

<sup>8</sup> <http://www.hse.gov.uk/carboncapture/major-hazard.htm>



**Fig 3 – Potential delivery and investment models for carbon dioxide infrastructure in the UK**

Option	Commercial Structure	Revenue
<b>Fully private</b> <b>Majority private</b> <b>50:50 Joint Venture</b>	<b>Structured as a PPP or regulated asset business [or hybrid]</b>	<b>Revenue from a regulated return, (potentially contingent on performance)</b>
<b>Majority public</b> <b>Fully public</b>	<b>Structured as a regulated asset business</b>	<b>Revenue from a regulated return</b>

Source: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/759637/beis-ccus-action-plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/759637/beis-ccus-action-plan.pdf)

### Groundwater contamination risks

A further risk related to onshore storage would be the potential for contamination of groundwater as a result of CO<sub>2</sub> becoming dissolved in aquifers. This has the effect of increasing the acidity of the water, which can also increase the mobilisation of metals, thereby possibly making the water supply less potable.

## Commercial Risks

### Financial considerations

The critical risks for the oil, gas and power sectors are not necessarily technical but are related to the myriad of commercial complexities involved in the delivery of CCUS in the UK and indeed globally. Not the least of these complexities is one simple issue – how are we going to pay for it?

### Roles and responsibilities

In addition to the cost of developing the technology and the huge infrastructure development cost, the implementation of CCUS will be complicated by the number of potential stakeholders. For example, due to the number of assets required to bring a CCUS project to fruition and the likely multiple owners/operators of these assets, there is considerable complexity in determining the roles, responsibilities and risk apportionment in project delivery and implementation.

### Commercial barriers increase financing costs

A typical project will involve at the very least a power producer or emitter, a carbon capture technology provider, a grid operator, an offshore reservoir holder and a series of investors, as well as a number of different regulators. The barriers - and ultimately the risks - are therefore commercial rather than technical. These commercial barriers add a “risk premium” and increase the cost of financing projects.

The UK government recognises this in their action plan and have commissioned a review into identifying the potential workable delivery and investment frameworks, although this is not due to be published until later in 2019. The delivery and investments models identified so far, and to be investigated further, are summarised in the table in figure 4 on the next page.

The UK government has also published some initial work on the range of possible “business models”, recognising that they need to incentivise Energy Intensive Industries (EII) including iron and steel, cement, chemicals and oil refining to move towards decarbonising their operations; this is considered to offer significant potential to reduce the UK’s emissions. To this end the UK government is reviewing the barriers to the deployment of industrial carbon capture, including options for establishing a market-based industrial carbon capture framework in 2019<sup>9</sup>. An initial piece of work has already identified a number of options, as outlined in Figure 4 on the next page.

<sup>9</sup> <https://www.newpower.info/2018/11/ccus-action-plan-promises-reviews-to-be-completed-by-end-2019/>

**Fig 4 – Options for establishing a market-based industrial carbon capture framework in 2019**

Option	Description
<b>Contract for Difference on CO<sub>2</sub> abatement strike price</b>	Strike price per tonne of CO <sub>2</sub> abated on CO <sub>2</sub> certificate value, contractually agreed in advance to cover expected industrial carbon capture costs relative to business as usual.
<b>Cost-plus open book</b>	Emitter is directly compensated for all properly incurred operational costs through Government grant funding.
<b>Regulated Asset Base (Hydrogen only)</b>	Product price (Hydrogen) regulated to recover capital and operational costs.
<b>Tradeable tax credits</b>	Reductions in tax liability of energy intensive industries with industrial carbon capture, in £/tCO <sub>2</sub> abated. The tax credits may be fixed or may taper down over time. Tradeable to allow realisation of their full value.
<b>Tradeable CCUS certificates, plus obligation</b>	CCUS certificates are awarded per tonne of CO <sub>2</sub> abated and can be sold to other obligated emitters. There are obligations on emitters and/or fuel suppliers to present the required number of certificates.
<b>Low carbon market creation</b>	Creation of a low-carbon market through certification, public procurement and end-use regulations, allowing a price premium for low carbon goods.

Source: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/759637/beis-ccus-action-plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/759637/beis-ccus-action-plan.pdf)

### The verdict: relatively positive risk profile – but legislation might change that

Ultimately, it is considered that, where properly managed, the insurable risks involved in CCUS are relatively low. For example, in the context of appropriate management controls, the HSE expects that the likelihood of a major hazard incident to be “very low, as in other similar processes in the energy, chemical and pipeline industries.”<sup>10</sup>

However, they will consider extending existing major accident hazard legislation to cover CCS if this is justified by the evidence; in other words, further legislation may follow. Furthermore, it should be noted from Figure 4 above that both energy intensive industries (such as the chemicals sector) and fuel suppliers are targeted, so there are significant risks to the oil and gas sector from increasing legislation.

Although there is still much uncertainty as to how CCUS will be funded and implemented, if past experience is anything to go by, industries such as oil, gas and power are likely to be ultimately liable for turning CCUS into a much needed reality.



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*“It should be noted that both energy intensive industries (such as the chemicals sector) and fuel suppliers are targeted, so there are significant risks to the oil and gas sector from increasing legislation.”*

<sup>10</sup> <http://www.hse.gov.uk/carboncapture/major-hazard.htm>



# LNG: the transformation of the industry and its key risks

## Introduction: an industry in transition

2019 is set to be another growth year for the LNG sector. In the changing global energy landscape, as climate change and energy supply diversity become increasingly prevalent, LNG has a key role to play.

Globalisation and geopolitics continue to impact and change the energy market, and we can clearly see the influence of each in the transformation of the LNG industry.

We aim to answer three questions in this article:

- What are the key market changes and influences that have shaped LNG's recent evolution?
- What are the risks that clients in the energy sector face with regard to LNG?
- What can we expect in the future?

## Factors behind the transformation

In our view, four key macroeconomic factors have driven rapid LNG industry growth during 2017 and 2018:

- The US shale revolution;
- Huge demand growth from China;

- Europe's increased dependency on LNG imports; and
- Shifting from coal to gas as an energy source.

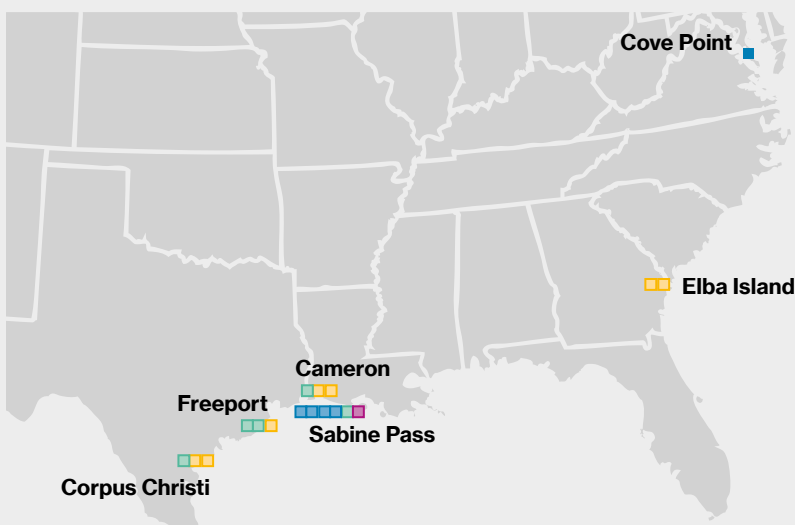
## The US shale revolution

The long anticipated effects of the US shale revolution are now truly being felt in the LNG sector. Access to plentiful, affordable gas supply has attracted a surge of new investment in LNG production and export infrastructure, centred largely on the Gulf of Mexico in order to access huge natural gas capacity in Texas (see Figure 1 below).

### First Wave US LNG Projects expected for 2019

- **Sempra Energy's Cameron LNG:** Train 1 nearing completion, Trains 2 & 3 producing by the end of 2019. Total authorised capacity up to 14.5million tonnes of LNG per year<sup>1</sup>
- **Freeport LNG:** scheduled to come into service later this year. Nominal export capacity of approximately 13.9 million metric tonnes per annum<sup>2</sup>
- **Elba Island LNG (Georgia):** 2.5 million tonnes capacity, final trains scheduled for Q3 2019<sup>3</sup>

Fig 1 – US LNG projects, November 2018

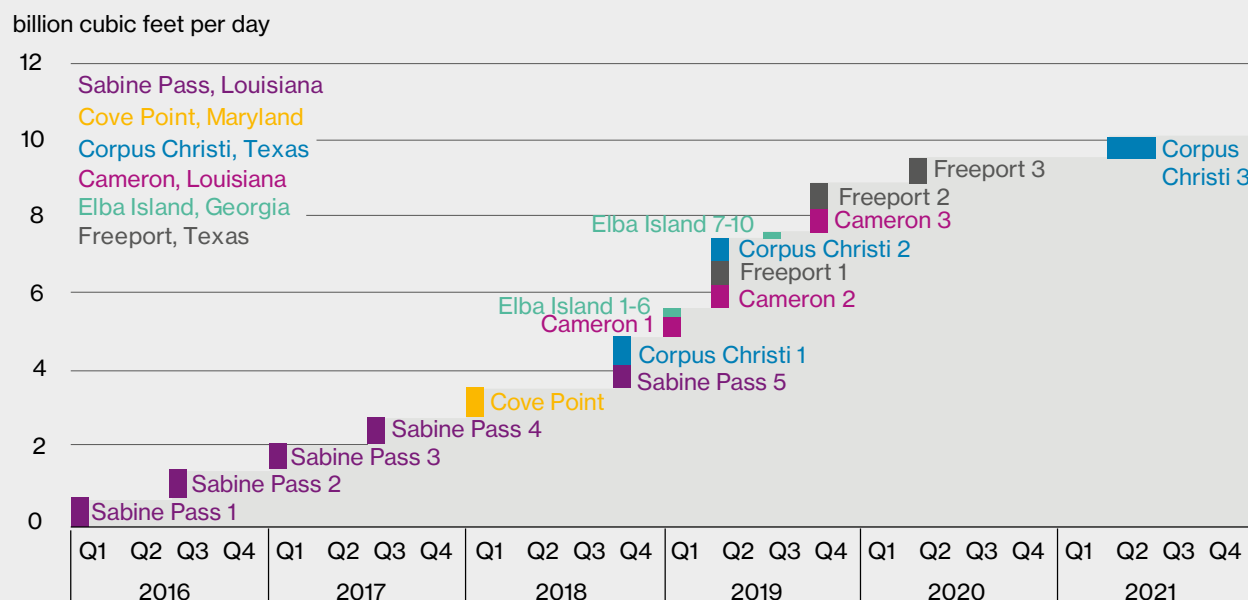


Note: Each square represents one LNG train, with the exception of Elba Island, which will deploy 10 small-scale modular liquefaction units sequentially in two phases

- existing
- under construction
- commissioning
- approved

Source: U.S. Energy Information Administration, company investor presentations (<https://www.eia.gov/>)

**Fig 2 – US LNG export capacity, 2016 – 2021**



Source: U.S. Energy Information Administration, 10th December 2018 (<https://www.eia.gov/>)

2019 will see a major boost to supply as the first wave of US LNG export projects continue to come online (see Figure 2 above). The US Energy Information Administration projects that US LNG export capability will have more than doubled by the end of 2019 with an anticipated 8.9 billion cubic feet per day capacity.<sup>4</sup>

The completion of the first wave of projects will place the US in third place for global LNG export, with Australia in the lead and Qatar second. The US LNG industry has ambitious growth plans, with a second wave of new export projects working towards Final Investment Decisions (FID) in 2019.<sup>5</sup>

As these projects come to fruition, the global impact of the US shale revolution on gas prices, and therefore LNG, will become very clear.

#### FID 2019 - likely contenders for approval, US<sup>6</sup>:

- Golden Pass LNG (Qatar Petroleum / ExxonMobil Joint Venture)
- Calcasieu Pass (Venture Global LNG)
- Sabine Pass Train 6 expansion (Cheniere)

<sup>1</sup> <https://uk.reuters.com/article/lng-outlook/record-lng-capacity-to-get-green-light-in-2019-amid-strong-demand-idUKL3N1Z21KH>

<sup>2</sup> <http://freeportlng.com/our-business/gas-liquefaction/>

<sup>3</sup> <https://www.lngworldnews.com/us-elba-island-lng-export-project-pushed-back/>

<sup>4</sup> <https://www.aa.com.tr/en/energy/general/us-lng-export-capacity-to-more-than-double-by-end-2019/22681>

<sup>5</sup> <https://www.woodmac.com/press-releases/golden-pass-lng-fid/>

<sup>6</sup> <https://www.woodmac.com/press-releases/golden-pass-lng-fid/>





### *China's meteoric rise*

Global demand has been dominated by the effects of China's economic revolution. Environmental concerns continue to drive a programme to shift the energy source, for both homes and industry, from coal to the more clean burning natural gas. China is currently the world's second largest importer of LNG after Japan. According to S&P, China 'will remain the biggest contributor to LNG demand growth' with the continued implementation of the 'blue sky' initiative and Five Year Plan frameworks for environmental planning and improvement<sup>7</sup>.

The pace of China's unprecedented LNG demand growth is anticipated to slow. A recent report by China National Petroleum Corporation (CNPC), predicts that China's gas demand is expected to increase by 11.4% in 2019; a lower growth figure than anticipated<sup>8</sup>. Investment in the National Development and Reform Commission initiatives to improve South to North pipeline connectivity and storage capacity will eventually help to mitigate its seasonal dependence on LNG, and improve bottlenecks in China's gas distribution network.

### *Europe's European energy reform*

Whilst overshadowed by China's presence as an emerging consumer, gas demand has steadily increased in Europe as domestic supply declines<sup>9</sup>. The lack of accessible, economic European gas sources has underpinned Europe's progressive dependence on imported LNG. In our view, this is set to accelerate due to the following:

- **The Paris Agreement** - initiatives to phase out coal, in particular the decommissioning of coal fired power stations
- **Gas turbine technology** - European assets mothballed due to obstructive fuel supply costs can now be brought back into use with cheap gas supply
- **Nuclear power decommissioning** - supported by the European Commission's decommissioning assistance programme

### *Globalisation and geopolitics*

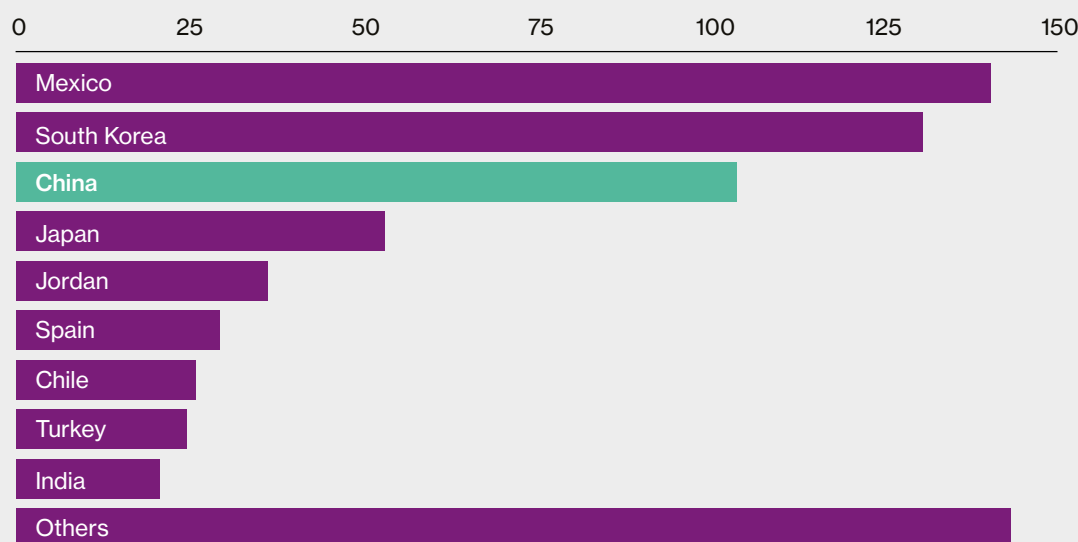
Growth in LNG demand brings with it a web of complex geopolitical issues as the LNG market continues to evolve. World politics are having, and will continue to have, an impact on the distribution of and access to global supply.

<sup>7</sup> S&P Global, Platts Analytics, 30th January 2019

<sup>8</sup> <https://www.reuters.com/article/us-china-cnpc-oil/china-crude-output-seen-flat-in-2019-gas-demand-to-climb-cnpc-idUSKCN1PA0MZ>

<sup>9</sup> <https://atradius.co.uk/reports/european-gas-market-outlook-2018.html>

**Fig 3 – US LNG exports by country (bn cubic feet)**



2017 data

Source: U.S. Energy Information Administration (<https://www.eia.gov/>)

### **The US/China trade dispute**

Perhaps the most obvious place to start is the US/China trade dispute. As shown in Figure 3 above, the US' third biggest export market in 2017 was China, with further growth a key component for investment in US LNG.

Following President Donald Trump's third round of trade tariffs against China in September 2018, China retaliated with their own levies, including a 10% import tariff on LNG<sup>10</sup>.

Delaying the US tariff increase planned for 1st March 2019 has been a positive step, but whilst uncertainty remains, China looks to alternative suppliers and the US increases pressure on alternative buyers.

In the short term, China can utilise Russian supply from Yamal LNG (both CNPC and the Silk Road Fund are partners) and the soon to be operational Power of Siberia pipeline<sup>11</sup>. Looking further ahead, Russia is planning new

capacity to feed the Asia Pacific region. China is said to be interested in investing in Novatek's US\$27 billion Arctic LNG 2 with FID anticipated this year<sup>12</sup>.

Meanwhile, the US turns to Europe. With the expectation of a major production year for US LNG, President Trump and European Commission President Jean-Claude Juncker agreed in July 2018 to open dialogue with regard to increasing exports to Europe<sup>13</sup>.

The EU's status as a future US LNG buyer (as an alternative source to Russian pipeline supply) will take time to materialise. The first step comes from Germany in the form of the country's first LNG import terminal, planned to be located on the Elbe River. Europe is set to play an important role in the absorption of LNG supply as Asian growth stabilises, with European imports expected to double by 2025.

**"Delaying the US tariff increase planned for 1st March 2019 has been a positive step, but whilst uncertainty remains, China looks to alternative suppliers and the US increases pressure on alternative buyers."**

<sup>10</sup> <https://www.bloomberg.com/news/articles/2018-09-17/trump-ratchets-up-tariff-pressure-on-china-with-200-billion-hit>

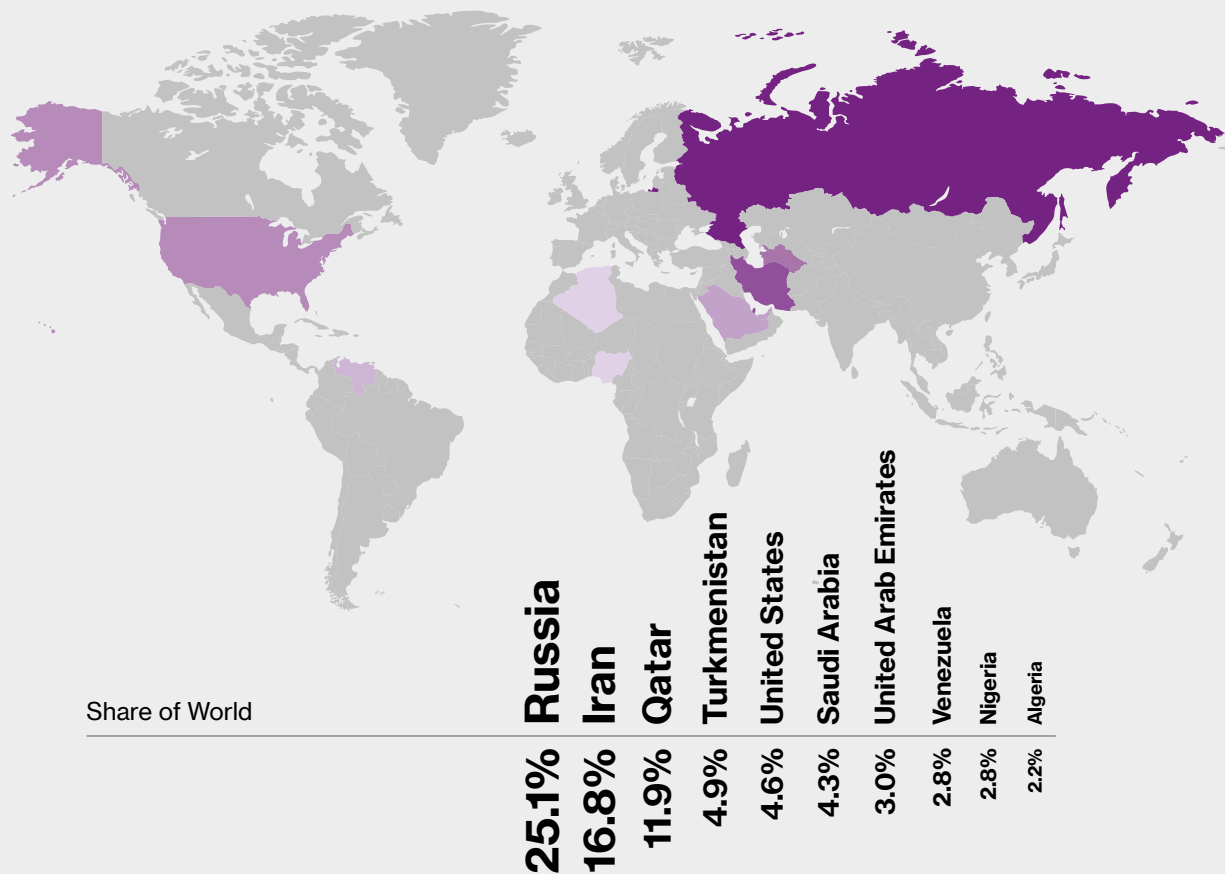
<sup>11</sup> <http://www.gazprom.com/press/news/reports/2017/time-records/>

<sup>12</sup> <https://oilprice.com/Energy/Energy-General/Russias-Looks-To-Build-LNG-Island-To-Supply-Booming-Asian-Market.html>

<sup>13</sup> <https://www.theguardian.com/business/live/2018/jul/25/trump-juncker-trade-talks-tariffs-cars-business-live>



**Fig 4 – Natural gas resources: the world's top 10**



Source: ENI's World Gas and Renewables Review 2018 ([https://www.eni.com/en\\_IT/investors/global-energy-scenarios/world-gas-e-renewables-review-2018.page](https://www.eni.com/en_IT/investors/global-energy-scenarios/world-gas-e-renewables-review-2018.page))

Whilst US LNG is set for a boom year, the US is ranked at fifth place in terms of the world's top natural gas resources, according to ENI's World Gas and Renewables Review 2018<sup>14</sup> (see Figure 4)

### **The fight for the top**

In Qatar, aggressive growth targets and an expected wave of new projects are aimed at revitalising their LNG industry and remaining competitive against the US, Australia and Russia<sup>15</sup>.

After over a decade as the world leader, Qatar has been surpassed by Australia following the start-up of several mega projects<sup>16</sup>. The evolution of the Australian LNG market has been principally backed by Japan, as the largest buyer. Australia will further increase capacity in 2019, with Shell's Prelude FLNG (the first offshore floating LNG facility of its kind). The expectation is for Qatar to respond with an investment and expansion surge in order to re-establish its position as the leading global exporter in the 2020s.

**"After over a decade as the world leader, Qatar has been surpassed by Australia following the start-up of several mega projects."**

<sup>14</sup> [https://www.eni.com/en\\_IT/investors/global-energy-scenarios/world-gas-e-renewables-review-2018.page](https://www.eni.com/en_IT/investors/global-energy-scenarios/world-gas-e-renewables-review-2018.page)

<sup>15</sup> <https://www.reuters.com/article/us-qatar-lng/qatar-signals-lng-price-war-for-market-share-in-asia-idUSKBN19Q0YX>

<sup>16</sup> <https://www.reuters.com/article/us-australia-qatar-lng/australia-grabs-worlds-biggest-lng-exporter-crown-from-qatar-in-nov-idUSKBN10907N>

### **Russia: ambitious growth plans**

As Figure 4 on previous page shows, Russia holds the largest share of proven global gas reserves. Russia has been a later entrant to the LNG game, relying on pipeline exports to Europe, but the success of Novatek's Yamal LNG project in the Russian Arctic (previously deemed too complex to be viable) marks the start of an ambitious growth plan. Not only has Yamal introduced major new capacity, it has created the Northern Sea Route, halving the shipping time from Northern Russia to Asia compared to the conventional trade route. As predicted by the Nikkei Asian Review:

***“as more countries gain ground as gas suppliers and emerging economies become bigger consumers, the energy market of tomorrow may look nothing like it did yesterday”<sup>17</sup>.***

### **LNG operations from a risk and insurance perspective**

We have so far considered market expansion and influencing factors. So how does this affect LNG companies in terms of risk management?

#### ***Increase in exposure to LNG risks***

We are seeing an increased number of energy organisations exposed to LNG risks, whether through an active interest in LNG trading, or asset ownership.

From a trading perspective, organisations manage entry into new business geographies in line with corporate risk frameworks. This involves assessment of a diverse range of risks: health, safety and environment, regulation, anti-bribery & corruption, people skills and knowledge and supplier risk, alongside the nature of the new business operation.

Trading interests often take companies to geographies away from their physical operations, with new territories requiring measurement against company risk strategy and corporate risk parameters. The main risk profile change to a trading company entering a new market will arise from an increased frequency of shipments.

### **Vessel supplier exposure**

With increased shipment frequency comes additional exposure to suppliers of vessels, and an amplified liability exposure at LNG terminals. Mechanisms for managing risk exposure involve detailed analysis of supplier selection, contractual liabilities and insurance obligations.

### **Insurance market appetite**

LNG is attractive to the insurance markets and underwriter appetite remains strong. With the exception of the two recent construction loss notifications at the onshore component of the Ichthys Project based in Darwin, Australia<sup>18</sup>, the LNG plant loss record to date has been favourable and risk management, reliability and safety standards have proven to be robust.

But the scale of large LNG facilities and concentration of high value assets pose aggregation challenges. Securing the coverage limits that a complex LNG facility requires is not an easy exercise and requires multifaceted placement across global markets.

As the insurance market hardens, the operational LNG sector's generally excellent safety and asset management record will stand it in good stead, as to date the loss experience has proven favourable.

AIG's Oil and Petrochemicals Leader, Christian Halm, views the key factor when underwriting LNG risks as:

***“Insured assets [being] managed by experienced operators who have a solid track record and a reputation for striving for world-class excellence in maintenance and loss prevention.”***

This highlights the need for a close relationship between buyers and their brokers, underwriters and risk engineers. Building a successful partnership between asset owners and the (re)insurance markets ensures effective demonstration of asset quality and risk management.

***“We are seeing an increased number of energy organisations exposed to LNG risks, whether through an active interest in LNG trading, or asset ownership.”***

<sup>17</sup> <https://asia.nikkei.com/>

<sup>18</sup> <https://www.insidefac.com/articles/125028/ichthys-lng-project-threatens-14bn-construction-loss>





### Cautious capacity deployment

Capacity deployment is becoming increasingly cautious. Balancing portfolio accumulation and available natural catastrophe coverage is likely to become more problematic as the number of LNG plants increases, assets begin to age and loss ratios become less favourable. Halm further comments that:

***“Premium rates have been considerably lower than in any other hydrocarbon processing industries and operators have benefited from premium rate reductions year-on-year. This low loss frequency was a reflection of the generally lower age of the LNG train fleet, as well as the relatively low number of facilities compared to refineries and petrochemical plants.”***

The Ichthys construction losses notified in February 2019 are described by the Insurance Insider as being, on a combined basis, “one of the largest claims to hit the insurance market in the last five years [and]... also one of the biggest ever for the Energy Construction market”<sup>19</sup>. The losses will hit an already tightening construction market and will likely have a knock on effect on Downstream Energy, possibly accelerating anticipated rating and coverage adjustments to insurers’ LNG portfolios.

### Ageing assets

The majority of LNG facilities are relatively new and have been built to a high standard. As assets age, maintenance and inspection practices are essential in maintaining a good risk record.

Industry loss data shows that transient operations (i.e. not normal steady state) represent a much higher risk. The more often the periods of difficult/unusual operations occur, the greater the chances of a mistake or miscalculation, which could lead to a loss of containment. During these operations, unfamiliar operating procedures have to be used and some, such as cool down/warm up activities, can be laborious and may lead to unacceptably high stresses on the equipment and machinery. Additionally, attritional losses are increasing as LNG train fleets age, and components begin to reach their end of life.

*“The more often the periods of difficult/unusual operations occur, the greater the chances of a mistake or miscalculation, which could lead to a loss of containment.”*

<sup>19</sup> Energy construction market braces for \$1.4bn Ichthys losses” Insurance Insider, 22 February 2019



### *Bringing LNG online*

Several large projects are due to come online in 2019, and with this comes a detailed marketing process to transition insurances from Construction All Risk to Operational.

Demonstrating the testing of key equipment (for example, compressors) at full capacity will be vital to insurers, bearing in mind that risk of equipment failure is increased at higher capacity.

Aggregation and capacity need to be carefully managed to avoid over-exposure (or insufficient available capacity) between markets writing both Construction and Operational risk for a major asset. This is particularly relevant to expansion projects.

### *Protecting the revenue stream*

In addition to high PD values, a large LNG asset will also have very high BI values, given the throughput capacity and anticipated rebuild time. Detailed understanding of the basis of indemnity, any 'nodes' representing critical bottlenecks and a comprehensive underwriting submission are essential in achieving an accurate view of the BI loss exposure. Machinery Breakdown is also a significant risk for plants with very large compressor units, which often have at least 18 months lead time on delivery.

In order to mitigate BI and Loss of Production following a compressor breakdown, the ConocoPhillips "two-train-in-one" reliability concept is commonly implemented, allowing operating capacity up to 75% in the event of a compressor failure<sup>20</sup>.

As almost all liquefaction and regasification plants rely on shipping for export, jetty redundancy and port blockage are also major risks for BI. Integrated projects will have further complexities, such as upstream gas production fields, offshore and onshore processing and extended pipeline systems.

### *Influence of Mother Nature*

Natural Catastrophe (Nat Cat) risk is a key concern with regard to LNG, as import and export facilities tend to be situated at coastal locations (some with inhospitable climates and extreme temperatures).

A topical example is the density of US LNG facilities directly on the hurricane and flood prone Gulf Coast, with all of these facilities (plus other energy related assets in the area) posing high risk exposure to wind storm, storm surge and resultant flooding.

Nat Cat coverage in the Gulf of Mexico has long been subject to stringent accumulation constraints with sub-limits well below full policy limit for PD and BI. As the concentration of LNG projects increases, so does the strain on the limited pool of Nat Cat cover available from the insurance markets at an economically feasible price.

With lenders requirements key to project viability, risk managers may need to look at Alternative Risk Transfer solutions to manage Nat Cat risk, as insurance capabilities struggle to offer adequate capacity at a practical price to transfer the risk.

<sup>20</sup> [https://eprints.usq.edu.au/27901/12/Deo\\_2014\\_whole.pdf](https://eprints.usq.edu.au/27901/12/Deo_2014_whole.pdf)



The key to the LNG liquefaction process is the refrigeration of the natural gas to below its dew point. This refrigeration is typically provided using a series of refrigeration systems, one of which uses ethylene as the refrigerant. This requires a large inventory of liquid ethylene at the plant.

A common Estimated Maximum Loss (EML) scenario for an LNG facility is a vapour cloud explosion following a release of ethylene from the Ethylene Surge Drum on one of the liquefaction trains. Such a release on a world-scale sized plant would result in between 25 and 30 tonnes of ethylene forming a cloud and then exploding once an ignition source has been found.

Our engineering team advises that the blast radius of such an event would be up to 80% damage at 122 m, 40% damage at 217 m and 5% damage at 344m. Depending on the spacing between the liquefaction trains, this is normally large enough to cause extensive damage to one train and any train adjacent to it. Spacing is therefore crucial in determining a facility's EML, which for insurance purposes can reach over US\$1 billion for a major liquefaction facility.

The Machinery Breakdown EML is typically associated with one of the large compressors that run the refrigeration loops. These machines can have a replacement value of approximately US\$100 million and, when they are not operating, can impact production depending on the amount of flexibility and machinery sparing the plant has.

### **Conclusion: reflections on the future of LNG**

As observed by Harry Booth of Markel International's Energy team:

***“Sustainable development means achieving a balance between environmental, social and economic dimensions, and natural gas can offer a solution.”***

At the moment, as an energy source LNG strikes an attractive balance between these three factors and access to resource is becoming easier. With the cost cycle at its lowest point, a surge of investment and planning will seek to meet increasing global demand.

### **Clouds on the horizon?**

Speculation with regard to LNG market over-capacity is already present. This, in accordance with other factors outlined earlier, is leading to theory that there may be future reluctance to embark on new projects or to sign long term contracts. The US LNG boom has sparked a trend towards short term contracts or gas-on-gas contracts based on spot pricing (rather than oil) in order to take advantage of further decline in pricing. With long term contracts key to securing FID for new projects, prospective US LNG exporters will be awaiting a resolution to the US and China trade disputes.

### **New frontiers**

With over-supply predicted, emerging markets are set to play an increasingly important role as traditional markets saturate. As LNG supply starts to exceed growth demand, pricing is likely to be forced downwards on both LNG and pipe imports.

Whilst the market focus for the moment concentrates on US LNG, Figure 5 below illustrates the range of territories, all with differing risks, in the pipeline for both expansions and new facilities:

**Fig 5 – Future LNG projects**

Project	Country	Startup	Volume (mtpa)
Nigeria LNG Train 7	Nigeria	2020	8
LNG Canada	Canada	2023	13
Tortue	Senegal, Mauritania	2021	2.5
Lake Charles	USA	2023	15
Sabine Pass train 6	USA	2023	4.5
Golden Pass LNG	USA	2023	15
Rovuma	Mozambique	2024	15
Qatar Expansion	Qatar	2023	23-30

Source: Markel International Liquefied Natural Gas Presentation, January 2019

**“With over-supply predicted, emerging markets are set to play an increasingly important role as traditional markets saturate.”**

Market movements and emerging risks will need to be carefully managed as Risk Managers develop their own mitigation strategies in these uncertain times. In our view, the key emerging risks to consider in the near future will be:

- **Cyber security:** increasing strategic dependency on LNG with regard to energy security brings with it an increasing exposure to cyber-attack.
- **(Re)Insurance capacity:** capacity will become increasingly stretched as the market seeks to balance huge LNG asset values and EMLs against an increasing number of assets, heavy asset concentrations in key locations and declining loss ratios.
- **Operational quality:** operational standards will become ever more important to underwriters in assessing risks, as new and perhaps less experienced operators enter the market.
- **Ageing assets:** demonstrating rigorous maintenance and inspection to underwriters supported by regular and detailed risk engineering.
- **Political risk:** new trade routes and partners are emerging, and with this will come a heightened awareness of geopolitical risks and exposure to sanctioned projects via increased interconnectivity.

We believe that these five areas of focus will be fundamental in the development of robust risk management strategies for LNG companies. When risk managers and their intermediaries work together to determine the most appropriate responses to these challenges, the industry can look forward to its future with confidence.



**Linda Saunders is a Client Relationship Manager at Willis Towers Watson Natural Resources in London.**







# Digitisation: the promise of benefits, but also of risk

## Introduction

There is a plethora of articles, seminars and workshops available which discuss the digitisation (i.e. the process of converting information from a physical format into a digital one) of the oil, gas and petrochemicals sectors. There are many views on the benefits and how companies need to embrace the coming changes or be left behind. Some cite that the adoption of digitisation and associated technologies will release billions or trillions of dollars in efficiencies and new opportunities<sup>1</sup>, which, if this does occur, will be truly transformative for the sector.

## Will the oil and gas industry lose out?

According to the World Economic Forum, digitalisation (i.e. the process of leveraging digitisation to improve business processes) in the oil and gas sector could be worth between US\$1.6 to US\$2.5 trillion for the industry, its customers and wider society over the next decade<sup>2</sup>. As such, CEOs, CFOs and other senior management of operating companies are concerned that their organisations will either be excluded from, or not equipped to embrace the coming changes quickly enough to realise these benefits<sup>3</sup>. Furthermore, it appears that there is also a belief that a significant portion of the benefits will be from first-mover advantage. Hence, there is a desire to not only adopt the new technologies but to do so quickly.

**“Digitalization in the oil and gas sector could be worth between US\$1.6 to US\$2.5 trillion for the industry, its customers and wider society over the next decade.”**

**Source: World Economic Forum, 2017**

“CEOs, CFOs and other senior management of operating companies are concerned that their organisations will either be excluded from, or not equipped to embrace the coming changes quickly enough to realise these benefits.”

<sup>1</sup> World Economic Forum – Digitisation in the Oil and Gas Industry, January 2017. (<http://reports.weforum.org/digital-transformation/oil-and-gas-on-the-cusp-of-a-digittally-fuelled-new-era/>)

<sup>2</sup> <http://reports.weforum.org/digital-transformation/oil-and-gas-on-the-cusp-of-a-digittally-fuelled-new-era/>

<sup>3</sup> WTW Natural Resources Risk Index – A view from the Boardroom, 2016 (<https://www.willistowerswatson.com/en-GB/insights/2016/06/natural-resources-risk-index-2016>)

### *Little debate on risks*

From all the discussion about the emerging digitisation technologies, there has been precious little discussion and debate about the potential risks to business by adoption of these digital enhancements. This may seem strange, as along with the quoted financial and efficiency benefits there are also statements that offer great hope in terms of improved health, safety and environment, not only for the workforce but also for local communities.

This would indeed be a great outcome. How sure can we be that the industry is prepared?

### *Loss record indicates grounds for improvement*

This is a point that is aptly demonstrated by the recent industry loss record. As shown in the market update section of this publication (Part 3), the sector is still experiencing high loss levels from operating facilities operating under current technology implementation levels. This would seem to suggest that the industry is not yet ready, or sufficiently mature, to take on new technologies without potential further increases, both in the size and number of loss events. Some would say that by implementing digital or autonomous systems the loss experience will improve; but again, how can this view be accepted when the risks have not been properly assessed?

### *Operating risk assessment: more attention and investments required*

So what are some of the risks that digitisation may bring to the process industries from an operational perspective? Some risks will be augmentations of currently well understood risks but there will also be completely new risks that have not yet appeared. In this article we will demonstrate, through some reflection of past experiences and postulation of potential future concerns, that more attention and investment is required to help identify and understand these risks before the industry is too far down the implementation path.

### *Historical adoption of new technology*

The oil and gas industry has always been a keen adopter of technology and innovations to further profitability and safety in the workplace, irrespective of sector (upstream, oil refining or petrochemicals). We have seen the introduction of:

- Automation in oil fields
- The evolution of process controls from pneumatic controls to Digital Control Systems, then to the introduction of advanced control modules
- Linear programmes for more efficient financial optimisation of plant operations
- Centralised Maintenance Management Systems (CMMS) to assist in the more efficient management and deployment of maintenance resources
- Condition-based maintenance techniques, such as vibration monitoring and frequency analysis to enhance the understanding of equipment performance and condition
- Risk Based Inspection (RBI) software
- Enhanced operator activities
- Remote diagnostics from original equipment manufacturers (OEMs)
- In-line blending of products such as gasoline
- Electronic permit to work systems (e-PTW)
- Use of smartphone GPS coordinates to track workers in hazardous situations

### *The challenges remain*

All these innovations have improved the performance and profitability of facilities by their implementations. However, all have presented challenges in the implementation process which have taken time to iron out and embed.

The industry has a track record of adoption but also of somewhat “challenging” implementations. Therefore, caution needs to be taken when considering these new innovations, and given the potentially larger impact to the sector in comparison to those technologies listed above, the potential downside could be equally large.

“Some would say that by implementing digital or autonomous systems the loss experience will improve; but again, how can this view be accepted when the risks have not been properly assessed?”



## Emerging technologies

Building on these past enhancements, the industry is now looking to a new set of technological innovations that will usher in increased profitability and efficiencies. These include:

- Smart equipment, such as valves and pumps and the Industry Internet Of Things (IIOTs)
- Wireless networks, transmitters and controllers
- Machine learning, AI and autonomous systems to enhance analysis, decision-making and control systems
- Predictive maintenance, using condition-based techniques to predict equipment performance and drive down maintenance costs
- Mobile devices such as PDAs that can help to collect valuable process / equipment data during operator rounds
- Robotics and drones
- Cloud computing

The potential benefit of these and other changes have been discussed at length in other industry articles and will not be covered here. Suffice to say that the potential financial benefits signify a step-change that will assist operators remain profitable in an increasingly competitive environment.

## Reducing the interaction of people and operating assets

A more interesting aspect of the new innovations, compared against past technologies, is that they fundamentally change the dynamic between people and the operating assets, moving them “further away” from the day-to-day operations. Many would say that removing humans from the chain of operational decisions and operational environment is a good thing, as it reduces their exposure to dangerous environments or reduces the potential for inefficient decisions being made. And in many cases they would be correct.

However, reducing the interaction of people with the operating assets has several consequences that need to be clearly understood as part of adoption programmes, such as:

- Who is actually running the plant?
- How can operational decisions be validated?
- Will people charged with intervening in upset/emergency situations, or those required to repair/replace equipment, have the appropriate knowledge and experience to do so efficiently and safely when they have less immediate interaction with the plant and equipment?

These are interesting questions that need answering and each in their own way illustrate a fundamental change in the industry risk landscape that needs to be better understood. For example, will the development and use of process control simulators be undertaken with the same level of intensity as the associated new technology implementations?



## Risk considerations from past experience

Traditional risks such as fires, explosions, machinery breakdowns and toxic releases will still be present in the sector as adoption of new technologies takes hold. As has been indicated, many of these new technologies will actually improve risk profiles. However, there are some real heightened risks that will develop as well, such as:

- Speed of adoption
- Transition control and management
- Skills and knowledge of personnel

### *Risk #1 - speed of adoption*

The desire to move quickly on new technology adoption is a key concern given the complexity within the industry and high potential impact if things go wrong. There are well established industry procedures such as Management of Change (MoC) that have been designed to consider changes and the risks these changes can introduce. However, these procedures are time-consuming and could be viewed as a barrier to early adoption. This view could be considered alarmist, but there is some precedent for this concern.

#### *Case Study #1: introduction of electronic PTW system*

During the process of introducing a new electronic Permit to Work (PTW) system, a petrochemical company had set a tight deadline to complete implementations in all their facilities. As such, individual facilities were given the basic system that covered the hot and cold permits but did not include associated certificates. Furthermore, there was very little support provided to the operations personnel following the two-week introduction period as the project team needed to move to the next location. This resulted in shift personnel unsure of how to implement specific tasks and various metrics such as approvals and closures were not being appropriately controlled and recorded.

The industry must make sure that due time and consideration is given to risk development. Pauses in implementations are required to thoroughly identify and evaluate risks, emerging or otherwise, and should be seen as a benefit to the overall implementation and system resilience, not a barrier. Furthermore, sufficient time needs to be allocated for full implementation of new systems.

### *Risk #2 - transition control and management*

Like any change activities, the control and management of the transition period from existing to future operating state is a key area where risks to operations can develop. So it is critical that this aspect of a change process is managed

closely, to ensure that risks are identified and controlled before they become damaging. Again, the MoC procedure is an effective means of understanding and evaluating potential risks prior to implementing changes. However, sometimes companies forget to use their own governance process while implementing change.

#### *Case Study #2: organisational changes*

A company introduced several organisational changes that significantly changed the number of employees and introduced some structural organisational adjustment changes at their facility (key factors when implementing digitisation technology). There was a comprehensive management of changes (MoC) procedure that included a section that covered organisational and personnel changes. However, they did not use this procedure and as such were not in full control over their transition risks. When senior management became aware of this, the process was halted and appropriate MoCs were implemented.

### *Risk #3 - personnel skills and knowledge*

Personnel roles and responsibilities are interlinked to technology innovations in two main ways. Digital technology implementations will either replace some of the tasks currently being performed by people, thereby adjusting facility job roles and numbers; or it will fill a gap where organisations cannot find suitably skilled personnel. Either way, through "Future of Work" (FoW) initiatives, which have had as much press as digitisation, employee roles may be re-structured.

In the operations arena, changes in roles and responsibilities are an important aspect of the overall risk environment. Currently there are well-established job functions in operating facilities along with a high level of awareness as to what responsibilities these roles have. In making changes that are suggested by FoW to take advantage of digitisation, many of these well-established roles will change significantly. If this change is not handled carefully, with significant time and resources employed in re-training, then errors will occur and will likely lead to increases in loss events.

#### *Case Study #3: new organizational structure*

A company introduced a new organisational structure within their operating facilities to take advantage of new technology and reduce costs. This process removed the need for a senior layer of the operational shift team. However, the risks from the move were not fully understood, and the changes led to an increase in accidents. The change was then reversed.



## Conclusion: potential future risks

### Cyber

Many of the risks that will emerge from industry digitisation are currently unknown but one that is very much in the minds of senior management is cyber.

This risk has emerged in the form of non-damage impacts to operating facilities, alongside situations where cyber threats trigger more traditional industry hazards (e.g. fire and explosion). It is still early days, as significant work still needs to be carried out to identify credible paths of how both these risk types lead to operational impacts. Once these paths have been identified, the industry can then consider suitable preventive and mitigation measures. Until this happens, increasing the level of digitisation beyond current levels seems somewhat premature.

### Error detection

Another risk that may not be an immediate concern, but given the direction of travel will become more important as automation increases, is error detection and the intervention procedure to apply the appropriate corrective actions. There are cases from other industry sectors where automation implementation is somewhat more advanced, where the lack of error detection resulted in major loss events. These include financial markets where underlying algorithms of automated trading platforms have reacted in unintentional ways to data input, resulting in significant financial losses. Also, in the commercial airlines business there are autopilot systems that have not recognised faulty instrument measurements, resulting in incorrect course corrections and accidents. It is acknowledged that these type of events are not common which illustrates that the automated systems can work well most of the time, but when they go wrong they do so in a big way, much like what is possible in the Oil, Gas & Petrochemical (OG&P) sector. Furthermore, the examples are from well-established systems from many years of development.

“It is acknowledged that these type of events are not common which illustrates that the automated systems can work well most of the time, but when they go wrong they do so in a big way, much like what is possible in the Oil, Gas & Petrochemical sector.”

### Accountability

Finally, with increased automation, who will be accountable for the safe running of facilities? Will it be the operating company or the company that supplies the algorithm/system? These are potentially challenging questions to answer but they really need to be answered before fully automated systems become the norm. There is of course time for this to happen, but it could well be important to tackle the questions sooner than later, as the outcome could heavily influence how automated systems are implemented.

From a risk engineering perspective, Willis Towers Watson is keenly reviewing this situation on a regular basis so we are able to identify, understand and assess these risks from digitisation as it takes hold, providing relevant insight to insureds and insurers.



***Alan McShane is Head of Engineering at Willis Towers Watson Natural Resources GB in London.***

# Private Equity in oil & gas: have risk managers caught up?

*Private Equity (PE) executives are looking differently at oil and gas assets. Have their risk managers caught up?*

## Introduction: recent developments in PE investment

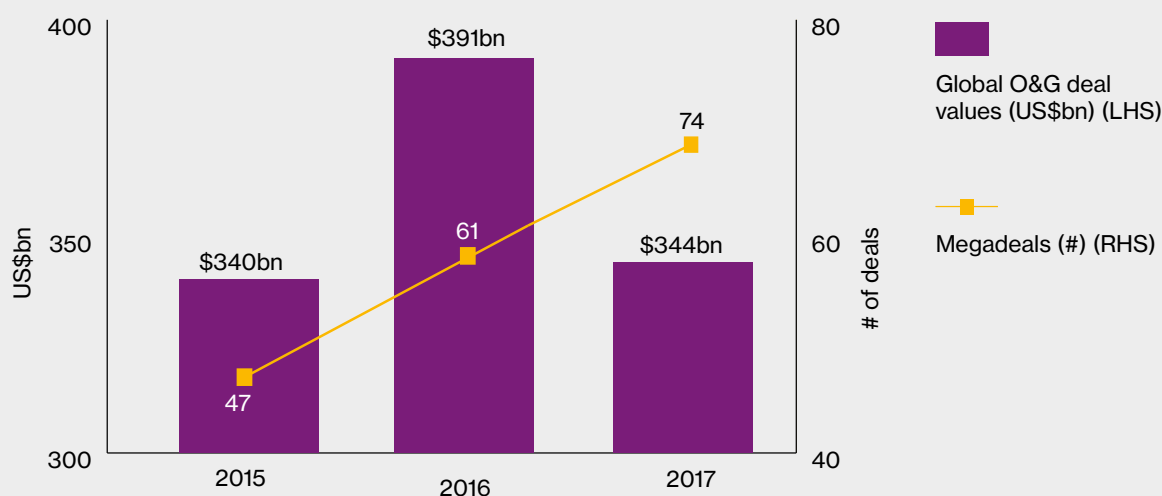
If there is one industry that can benefit from the ever-increasing mergers and acquisitions (M&A) activity, it is surely oil and gas (O&G). Though demand for hydrocarbons continues to grow, the increasing competitiveness of renewables, along with rising global awareness of climate change, is putting the longevity of O&G companies' traditional business models under question. On the supply side, mature basins like the North Sea offer efficiency opportunities to nimbler players, unencumbered by the rigid one-size-fits all operating models deployed by larger firms, which were designed for a very different era of hydrocarbon production. For their part, larger majors and supermajors are happy to relinquish ownership of these assets, having achieved the returns promised on investment capital years, if not decades, ago.

## Deal levels continue to rise

It is no wonder, then, that deal activity in O&G globally continues to remain healthy. Although global deals are down in 2017 from the prior year when measured by both volume and value, a flight to quality is beginning to emerge. The number of megadeals has continued to increase every year since 2014. 47 assets valued at greater than US\$1bn changed hands in 2015. By 2017, this had increased to 74 assets<sup>1</sup>.

*"It is no wonder, then, that deal activity in O&G globally continues to remain healthy. Although global deals are down in 2017 from the prior year when measured by both volume and value, a flight to quality is beginning to emerge."*

**Figure 1 – though global O&G deal values have fallen, the number of megadeals (US\$1bn+) continues to rise**

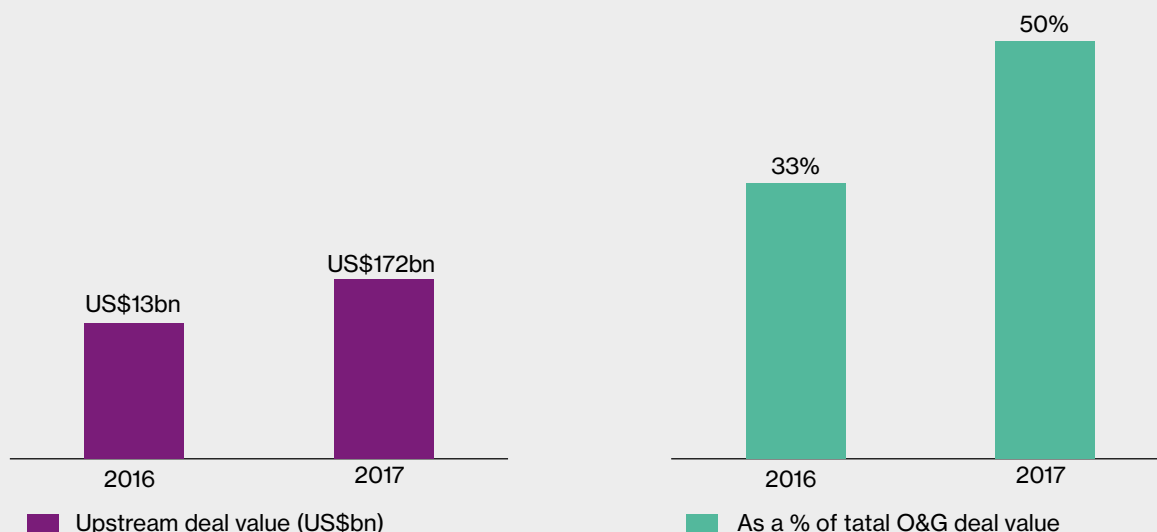


Source: Capitalizing on opportunities: Private equity investment in oil and gas; EY

<sup>1</sup> [https://www.ey.com/Publication/vwLUAssets/EY-global-oil-and-gas-transactions-review-2016/\\$FILE/EY-global-oil-and-gas-transactions-review-2016.pdf](https://www.ey.com/Publication/vwLUAssets/EY-global-oil-and-gas-transactions-review-2016/$FILE/EY-global-oil-and-gas-transactions-review-2016.pdf)



**Figure 2 – Upstream grows its dominance in the O&G deal landscape, accounting for one out of every two dollars of M&A activity in the industry**



Source: *Capitalizing on opportunities: Private equity investment in oil and gas*; EY

The Upstream sector has benefitted the most from this trend. Deal values climbed 30% over the previous year to US\$172bn in 2017, representing 50% of global O&G deal activity, up from 33% in 2016.

### Who's investing?

The investors driving this trend can broadly be divided into three camps:

1. traditional investors, seeking consolidation for scale (particularly prominent in the oilfield services sector, such as Wood Group's acquisition of Amec FosterWheeler);
2. investors seeking to diversify and re-balance their portfolios (such as the GE acquisition of Baker Hughes); and
3. those who look to replicate the successes they've achieved by deploying a strong core competence in other assets, geographies or industries.

It is this third category that PE investment in O&G falls into. Scarcely does a week go by without news of PE interest in O&G assets, mostly around the shale developments concentrated in the Permian basin of the United States, or the late-life fields in the North Sea. Deals such as Siccac Point's acquisition of OMV's North Sea assets<sup>2</sup>, or Diamondback Energy's US\$9.2bn purchase of US shale competitor Energen<sup>3</sup>, are becoming ever more common.

But the PE industry has been here before; between 2007 and 2015, PE averaged 70 O&G deals a year<sup>4</sup>. In that era, the industry saw two levers of value creation. Initially, the returns to be made as a provider of capital to finance exploration-led growth, and latterly as oil prices nosedived and valuations reached eye-wateringly low levels, the enterprise value gains from an eventual price rebound.

<sup>2</sup> [http://www.siccarpointenergy.co.uk/uploads/20161109\\_OMV\\_Press\\_Release\\_Final.pdf](http://www.siccarpointenergy.co.uk/uploads/20161109_OMV_Press_Release_Final.pdf)

<sup>3</sup> <https://www.naturalgasintel.com/articles/115433-permian-players-diamondback-energen-agree-to-92b-merger>

<sup>4</sup> *Capitalizing on opportunities: Private equity investment in oil and gas*; EY

### The example of NGP

Some investment strategies have reflected this thinking, such as that of Natural Gas Partners (NGP), an Irving, Texas-based O&G investment firm, with 360+ transactions to its name<sup>5</sup>. NGP has equity commitments of close to US\$16bn across its first eleven funds (with Fund XI closing at US\$5.3bn in 2015<sup>6</sup>), and is reported to have raised over US\$4bn of its US\$5.3bn target for its twelfth fund<sup>7</sup>.

Many other investments over this period, however, have not been as successful. EnerVest, a Houston-based O&G investor, saw its US\$2bn O&G-focused funds collapse in 2017 when it was unable to fully meet obligations for the debt underpinning the funds' investments<sup>8</sup>.

### Unlocking the value from the current PE wave

With a mixed record of big discoveries backed by PE capital, and a set of underlying fundamentals which are likely to mean that oil prices do not reach the heights they scaled between 2011 and 2013, what is the PE industry doing differently to unlock value from the current investment wave?

The answer lies in operating efficiencies. The low price era has forced firms to brutally optimise their cost base, but PE firms believe that there's more to be done. Views from the industry bear this out.

A global survey of upstream operators, released by Wood Mackenzie in October 2016, a year in which oil prices to date had averaged below US\$43/barrel, reported that cost reductions of 16% - 24% were achieved by the industry in 2015-16 and a further 3% - 7% in 2016-17 were expected. But the same survey revealed that most operators thought that only 7% - 14% of these savings were structural and sustainable in the long run<sup>9</sup>. PE firms reckon they can bring their formidable talent for looking afresh at operating models to seek fundamental value transformation to bear on their newly acquired O&G investments.

<sup>5 & 6</sup> <https://ngpenergycapital.com/about-ngp/>

<sup>7</sup> <https://www.altassets.net/private-equity-news/by-pe-sector/buyout/ngp-said-to-pass-4bn-mark-for-latest-oil-and-gas-fund.html>

<sup>8</sup> <https://www.cnbc.com/2017/07/17/energy-fund-losses-oil-and-gas-investment.html>

<sup>9</sup> <https://www.woodmac.com/news/editorial/upstream-cost-problem/>





### *The risks involved*

But managing oil and gas operations is an unusually risky undertaking. If we look beyond the obvious risks to health and safety from volatile hydrocarbons, we will find that a number of other, equally critical risks with similarly far-reaching consequences are lurking, such as:

- Investment cases are built on exceptionally detailed revenue projections of throughput, and a single day of lost production could put a small but noticeable dent in returns, making the prospect of unplanned shutdowns quite costly.
- Feedstock is sourced on strict take-or-pay contracts, which means that kit must be kept operating at planned levels at all times.
- Product contamination, or deviation from tight specifications in the case of LNG, could set off a chain reaction of outages further downstream leading to damages and even litigation.
- On the softer side, a greying workforce keeps the lights on, while younger talent, put off by the negative public perception of hydrocarbons, gravitate towards careers in solar, wind, energy storage and other more chic corners of the industry.

And all of this is before we consider the risks associated with the fundamental transformation of operating models that PE firms will need to enact in order to build sustainable operational value.

### *Operating risk management: still a work in progress for PE companies*

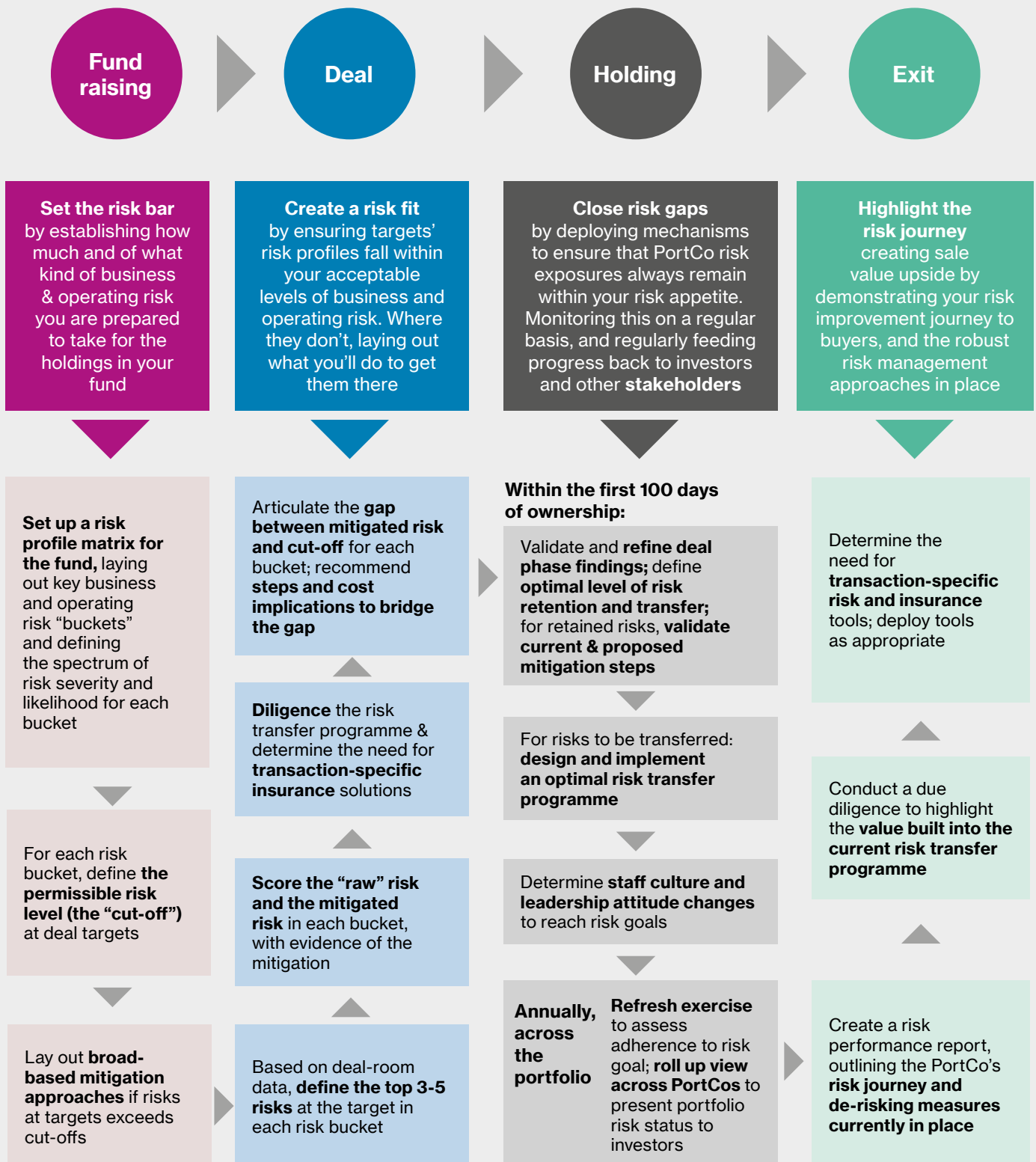
Managing operating risk is, with some notable exceptions, still an area of development for PE firms. The industry does a superb job at identifying, assessing, quantifying and mitigating financial risks. Working closely with the management of the companies that they acquire, PE executives also usually stay closely connected to the way key business risks are being managed, such as competitive threats, demographic changes in key markets, evolving perception of the brand and reputation, changing consumer behaviour and so on.

But the risk implications of an O&G asset's maintenance strategy, shutdown plan, supplier & contracting strategy, workforce plan and other aspects of managing operating risk are usually left up to management. And while management may have the best of intentions, this approach typically results in the status quo of risk being managed for a gradually depleting natural resource with a reasonably predictable production profile, rather than a cash-generating asset in need of fundamental change to maximise its worth within its defined lifetime.

*“Managing oil and gas operations is an unusually risky undertaking. If we look beyond the obvious risks to health and safety from volatile hydrocarbons, we will find that a number of other, equally critical risks with similarly far-reaching consequences are lurking.”*

**Fig 3 – Managing risk across a diverse portfolio**

**A framework that runs through the deal cycle**



Source: Willis Towers Watson



## A new framework for operational risk management?

### *Taking a leaf out of the financial risk management process*

What should the PE industry do to look at operating risk differently? To find the answer, the industry doesn't need to look very far beyond the way it manages financial risk. Risks to achieving Internal Rate of Return (IRR) targets, risks of breaching debt covenants, risks of being able to meet interest coverage ratios – these are identified and planned for, measured using a consistent set of indicators, revisited with regularity, and reviewed holistically across the portfolio. Material movement on these risk measures are reported to investors, successes in meeting milestones are publicised, and failures investigated. In short, financial risks are managed across the deal cycle, from fundraising to exit. A similar fundraising-to-exit approach to operating risk would encompass four characteristics, as outlined in Figure 3 on the previous page:

1. **Setting the operating risk bar** at the *fundraising stage* by establishing what kind of and how much operating risk a PE firm is prepared to take for the holdings in its fund.
2. **Creating an operating risk fit** in the *deal stage*, by ensuring target companies' risk profiles fall below the operating risk bar. Where they don't, laying out what the PE firm will do to get them there.
3. **Closing the operating risk gaps** in the *holding stage*, by deploying mechanisms to ensure that operating risk exposure at investments always remains below the risk bar. Monitoring this on a regular basis, and regularly feeding progress back to investors and other stakeholders.
4. And finally, **highlighting the operating risk journey** at the *exit stage* - creating sale value upside by demonstrating the risk improvement journey to potential buyers, along with the robust risk management approaches in now place at the asset.

### *Fundraising stage*

Start with setting the risk bar at fundraising. PE firms have a lot to say to investors about what makes them stand out when raising capital. Having a perspective on how they'll manage critical risks in operations, especially when it comes to deploying that capital into asset-heavy O&G investments, can add to the arsenal of differentiators. But a point of view itself is insufficient, and must be backed up by a tangible and measurable methodology.

PE firms must start with defining their operating risk appetite - setting up a **risk profile matrix** for the fund, laying out key operating risk "buckets" and defining the spectrum of risk severity and likelihood for each bucket. For each risk bucket, they would then define the permissible risk level (the "cut-off") at deal targets on a numerical scale. And finally, they would lay out broad-based mitigation approaches if operating risks at target investments exceeded cut-offs.

What would a generic risk profile matrix for an O&G focused fund look like? Some of the key risk buckets would likely be geopolitical, cyber, environmental and terrorism. Depending on the fund's geographic focus, the appetite for geopolitical risk might be medium to high (say 5, on a 10-point scale).

If the asset is large and/or onshore, and/or its output forms a material proportion of the inputs into a single country's power mix, the appetite for cyber risk would be quite low (say 3 on 10). This quantified appetite represents the "raw" risk that a firm would be willing to take on, on behalf of its investors, in its O&G assets, before any controls or risk transfer strategies are put into place.

"In short, financial risks are managed across the deal cycle, from fundraising to exit."

### Deal stage

Creating an operating risk fit at the deal stage comes next. Each O&G investment target will have its unique set of risk characteristics, depending on its location, size, design makeup, customer base and other features. With deal-room access comes the ability to scour a target's operating data in detail, establishing a picture of the top 3 - 5 operating risks within each risk "bucket" of the risk profile matrix. Through deal-room data, PE firms are also able to understand and quantify, at some depth, the extent of mitigation measures in place for these identified risks. And finally, where a gap exists between the score on the fund's risk appetite for the bucket, and the actual score on the target, plans can be drawn up to close the gap as a part of the first 100 day plan post-acquisition.

What, again, might this look like in practice? Say our fictitious O&G fund with a geopolitical risk appetite of 6/10 has identified 3 key geopolitical risks at an investment target – the risk of outright confiscation of the asset by the jurisdiction's ruling regime quantified at a 3, the risk of the ruling regime passing onerous taxation legislation specifically targeted at the asset at a risk of 8, and the risk of a physical attack on the asset in the next five years, quantified at a 7. The overall simple average geopolitical risk for the investment, at 6, is higher than the appetite of 5. The fund would put together a plan for the latter 2 of the 3 risks outside of the cut-off, laying out what it would do to bring them back within the cut-off, should the deal be successful. To protect against adverse legislation, the PE firm could transfer the risks to the insurance markets through a specialised tax risk policy. To protect against a terrorist attack, the PE firm could commission a review of the physical features, layout and security arrangement of the sites, combined with specific insurance arrangements to indemnify for the cost of an incident.



### *Holding stage*

With transactions having completed, closing the operating risk gaps are needed in the holding stage. This broadly divides into four steps:

1. With full access now in place to the investment's data and management, the conclusions drawn on the asset's risk profile from the due diligence on the deal must be revisited, revalidated and refined.
2. The individual mitigation plans drawn up for each identified operating risk must be put together, interdependencies and interconnectedness understood and a holistic view prepared for how the full body of operating risk is going to be mitigated through a combination of retention on the balance sheet and transfer to the insurance (or other) markets.
3. The mitigation plans must be deployed into execution.
4. Finally, on an annual basis, the PE firm must create a snapshot of how the asset's operating risk profile compares against the fund's cut-off, for this and other assets in the fund, and assemble a rolled-up view to put forward to investors.

### *Exit stage*

By this time, a PE firm that embarks on this journey would have demonstrated:

- a strong business case to investors, through its focus on managing critical operating risks, having assessed and quantified the kind of operating risk it wants to take on at its funds;
- robust and analytical approaches to assessing risk at each deal target and investment; and
- the development of plans to bring operating risk levels at its investments within its risk appetite, and continually fed back progress to investors.

But it doesn't end there. The exit stage of the deal cycle is all about highlighting the operating risk journey the firm has been on, to create sale value upside. The asset the PE firm is exiting demonstrates arguably far better operating risk management than the one they took over. This must be made apparent in the vendor diligence underpinning the sale process, along with a quantifiable demonstration of the journey that the PE firm has been on to achieve its risk management successes.

### *Conclusion: standing out from the crowd*

PE's interest in O&G is far from over. According to Wood Mackenzie, a further US\$13bn of PE capital could find its way into the North Sea, adding to the US\$12bn already invested over the past two years<sup>10</sup>. As the drive to unlock ever more value from these assets intensifies, concerns around the impact on operating risk profiles will remain at the fore. PE firms that are able to demonstrate to investors how they're protecting value downside through superior operating risk management will stand out from the crowd.



**Arif Kamruddin is Director of Strategy and Business Development for Willis Towers Watson's Global Solutions Group in London.**

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<sup>10</sup> Private equity leads the changing of the North Sea guard; Financial Times; 13-Feb-19





# Geopolitical instability: turning up the heat on the energy industry?

## Introduction: a boardroom issue

In our view at Willis Towers Watson, geopolitical risk is increasingly being recognised by company executives and boards as a concern of paramount importance. Indeed, research from the Cambridge Centre for Risk Studies shows a 40% increase in risk to cities' GDP from geopolitics and security over the past four years, totalling almost US\$140 billion in 2019, the biggest growth of any risk factor<sup>1</sup>. For the energy industry in particular, recent expert testimony to the US House of Representatives emphasised the close intertwining of geopolitics and energy security, noting for example pressure on gas supplies from Russia to Europe, owing to the ongoing conflict in Ukraine<sup>2</sup>. This year is likely to be one where nascent trends of geopolitical instability continue to foster uncertainty and hazards in the energy market landscape.

## Energy industry particularly affected

Energy companies have traditionally been particularly sensitive to geopolitical fluctuations. With assets and people spread across the globe, often in locations with tenuous political and security situations, energy companies have been required to grapple with associated risks to investments and operations.

Energy companies have also historically had fraught relations with governments who seek tight reins on the industry; just consider the fate of Standard Oil<sup>3</sup>. In the 21st century, such existential threats are perhaps less likely to come from government imposition, but instead from shifts in market forces towards cleaner energy creation and consumption, driven by public awareness of the environmental impact of current practices. As much of the world seeks to move away from fossil fuels, energy companies will need to diversify to survive.

## Far distant time horizons

Companies in the energy sector look at time horizons which are far distant compared to those viewed by other sectors. As an industry whose shape was fundamentally imposed on it over a hundred years ago in 1911, it must look similarly far into the future to see the trends that are likely to shape it going forward. The Shell Scenarios team<sup>4</sup> is perhaps the most well-known practitioners of this kind of thinking, putting together models exploring the state of the world out to the year 2100. By comparison, the UK Ministry of Defence's quadrennial Global Strategic Trends assessment, which is partly used to inform long-term defence procurement plans, looks 30-35 years into the future, so it is clear that the energy sector is exceptionally forward-looking.

“Research from the Cambridge Centre for Risk Studies shows a 40% increase in risk to cities' GDP from geopolitics and security over the past four years, totalling almost US\$140 billion in 2019, the biggest growth of any risk factor.”

<sup>1</sup> [https://www.jbs.cam.ac.uk/fileadmin/user\\_upload/research/centres/risk/downloads/crs-global-risk-index-exec-summary-2019.pdf](https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/risk/downloads/crs-global-risk-index-exec-summary-2019.pdf)

<sup>2</sup> <https://www.bakerinstitute.org/media/files/files/a8d62514/ces-medlock-testimony-052218-.pdf>

<sup>3</sup> <https://www.geoexpro.com/articles/2011/11/the-standard-oil-story-iii-the-rise-fall-and-rise-of-the-standard-oil-company>

<sup>4</sup> <https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/meet-the-shell-scenarios-team.html>

## 2019's key geopolitical drivers

In order to understand what the future may be like, it is imperative to understand the present. One of the most effective uses of scenarios is to take an envisioned future state and work backwards to establish signposts that are indicative of that future state. If one of these signposts can be seen today, it means the envisaged future is a possibility. Presented here are four geopolitical drivers of risk seen today which can serve as signposts, although the future they point to is for the reader to deduce according to their own scenario analysis.

### Geopolitical instability

The risks associated with interstate and intrastate conflict remain high. A list of 10 conflicts to watch in 2019, published by Foreign Policy<sup>5</sup>, contains some of the usual suspects, but also some entries which may not have been on everyone's radar:

- Yemen
- Afghanistan
- US-China tensions
- Saudi Arabia, US, Israel and Iran
- Syria
- Nigeria
- South Sudan
- Cameroon
- Ukraine
- Venezuela

Although the list can be debated (for example, tensions in South China Sea is not just a US-China issue, and in our view Libya should make the list), it is noteworthy from two perspectives:

- Firstly, the geographical spread of conflict is not confined to one area, but covers multiple continents
- Secondly, from an energy industry perspective, many of these countries are prime suppliers of oil and gas

This does not just introduce direct risks to assets and people in and around these areas, but may impact the wider industry if supply is interrupted or OPEC decisions are made on the basis of geopolitical instability.

### Climate change

The physical risks associated with climate change are well documented (rising sea levels, increased severe weather events) yet the geopolitical processes which underpin these risks are less understood. Driven by bodies like the UNFCCC, international agreements on emissions limits are not based just on science, but also on political and economic imperatives.

For example, President Trump's decision to withdraw the US from the Paris Agreement reflected less a concern with the empirical data and more the perceived impact on domestic US politics and economy. The energy sector is not merely a passenger in these processes, but can leverage its position as a technology leader to advise decision-makers whose actions are liable to shape the industry in both the near and far future.

### Cyber

As the world enters the fourth industrial revolution, there is an exponential growth in connected devices. This is not limited to consumer devices such as phones and laptops; indeed the majority of new devices are in industrial settings, used for remote measurement and control of operational systems. This Industrial Internet of Things (IIoT) creates greater efficiency and allows the implementation of automated, AI-driven processes. At the same time, more devices and more connections introduces new attack vectors on a larger attack surface. The inability of industry to control these and apply sufficient security standards generates impetus for governments to introduce regulations and legislation, such as the EU's Network and Information Security Directive (NISD), which impacts the energy industry and carries stiff penalties for infringements.

*"At the same time, more devices and more connections introduces new attack vectors on a larger attack surface. The inability of industry to control these and apply sufficient security standards generates impetus for governments to introduce regulations and legislation."*

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<sup>5</sup> <https://foreignpolicy.com/2018/12/28/10-conflicts-to-watch-in-2019-yemen-syria-afghanistan-south-sudan-venezuela-ukraine-nigeria-cameroon-iran-israel-saudi-arabia-united-states-china-kurds-ypg/>

## Trade

The successes of populist political movements, exemplified by President Trump in the US and Brexit in the UK, suggest that globalisation is losing momentum. In its place are more conservative trade relationships and protectionism, inviting close scrutiny of the trade policies of some of the world's biggest economies. Among these uncertainties and shifts, business opportunities will realign as some markets open up for participation while others become more restrictive. For the energy industry in particular, the recent mixed fortunes of South American politicians (for example Jair Bolsonaro in Brazil and Nicolás Maduro/Juan Guaidó in Venezuela) is likely to shape oil and gas trade policies on that continent over the coming years.

## What risks do these drivers manifest?

These drivers have directly-linked risks; consider, for example, the risk to business operations through improperly secured cyber systems. Importantly however, the linkages between the drivers create second and third order effects which introduce additional risks to companies and organisations.

## Regulatory landscape

The energy industry is especially susceptible to new regulation, largely driven by climate change imperatives. The general public has woken up to the threat of climate change and is demanding action from policymakers. Already, several countries have committed to restricting sales of new road vehicles powered by internal combustion – for example full bans in Norway by 2025, the UK by 2040 and China at an unspecified near-future date – which will dampen the appetite for oil and petroleum. The shipping industry, prescient of likely regulation to come, is likewise searching for alternative sources of propulsion and will be a declining user of oil-derived products while aviation, despite greater technological challenges to adopting alternative energy sources, is also subject to more stringent regulation to limit emissions. The energy industry is well aware of these trends, but governmental action, which has until recently been half-hearted, is increasingly likely to be committed to change that will fundamentally impact the industry.

## Supply chains

A diversified international supply chain presents significant risk. With regards to the IIoT, which is becoming as entrenched in the energy industry as it is almost every other industry, the cyber security shortcomings of many devices has left companies operationally exposed. Even if a company has comprehensive oversight of their own systems, there are few frameworks to determine if suppliers and sub-contractors maintain equivalent standards. Unless identified and mitigated, a vulnerability in a suppliers' device introduces this vulnerability to a company's own systems. Moreover, geopolitical tensions can affect supply chain capacity. Recently, several Western countries invoked national security as grounds to ban Chinese networking equipment manufacturer Huawei from supplying products to critical national infrastructure. Such bans, fuelled by geopolitical considerations, are liable to affect the energy industry supply chain.

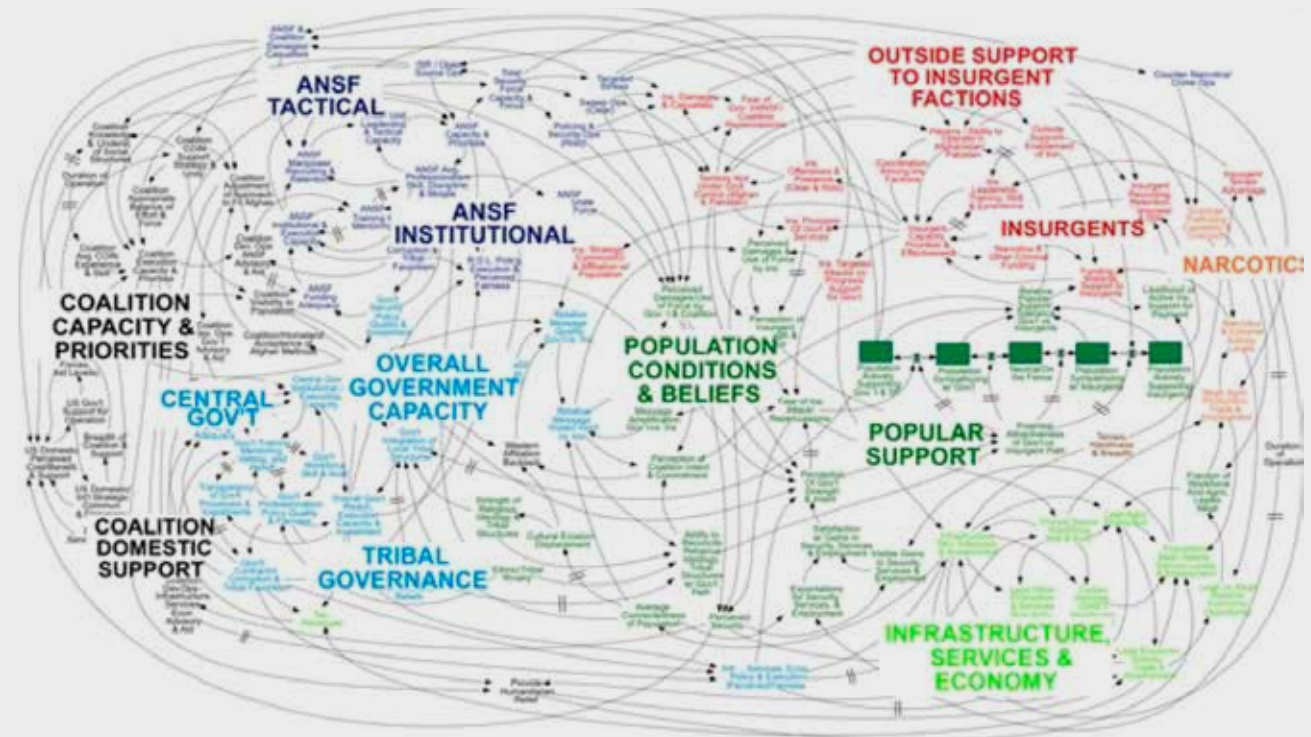
## Workforce availability

The energy industry requires access to a highly skilled workforce. The core of energy industry workers comes from engineers and scientists who are in increasingly high demand. This is partly a problem of supply, with insufficient people being educated in the subjects and trained in the skills to meet the needs of the industry, especially as these needs shift away from drilling holes. However, workforce availability is also affected by geopolitical exigencies: security turmoil creates unsafe areas, the political will to embrace migration is decreasing, and we will soon begin to see the first 'climate refugees' displaced by environmental changes caused by climate change. These factors may impact industry's ability to hire local talent, transfer personnel to international locations, or transport workers to operational field sites.

“Workforce availability is also affected by geopolitical exigencies: security turmoil creates unsafe areas, the political will to embrace migration is decreasing, and we will soon begin to see the first 'climate refugees' displaced by environmental changes caused by climate change.”



Fig 1 – US military's spaghetti diagram of the Afghanistan insurgency



Source: New York Times  
<https://www.nytimes.com/2010/04/27/world/27powerpoint.html>

## How should energy companies manage geopolitical risk?

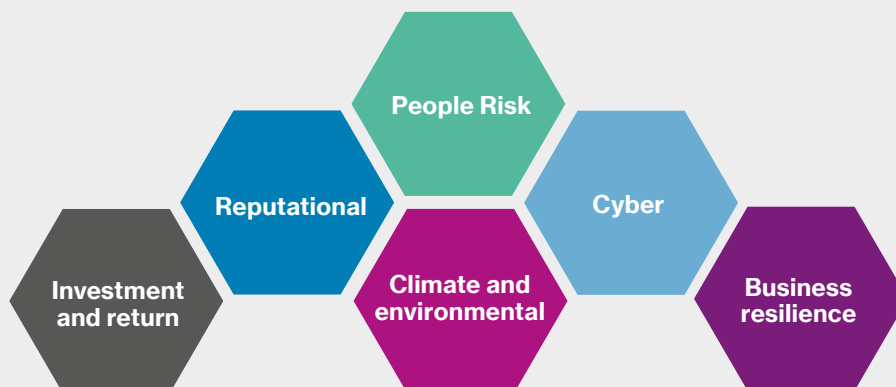
### Taking a holistic approach

The key to managing geopolitical risk is to take a holistic approach and understand the linkages between risk drivers. Drivers and risks are in a 'many-to-many' relationship, where one driver can cause multiple risks, and one risk is caused by multiple drivers. Sometimes these causalities are not direct, but manifest as second- or third-order effects, and some risks only manifest through a particular combination of drivers. Making sense of such a complex picture is not easy, as the US military's infamous spaghetti diagram of the Afghanistan insurgency illustrated (See Figure 1 above).

### Distinct lenses

A more useful method to think about these issues is through distinct lenses. Lenses can help isolate risks to view them more clearly, to then be recombined into a holistic picture. For the energy industry, six particularly useful lenses might be: investment and return, people, business resilience, climate and environment, reputation, and cyber (see Figure 2 on the next page). These capture the core geopolitical drivers, some of which have been elucidated above, and can be expanded into a mesh of interconnected risks.

**Fig 2 – Six distinct risk lenses for the energy industry**



Source: Willis Towers Watson

### **Useful analytical tools**

In order to evaluate the potential impact of these risks, it is also possible to utilise analytical tools such as VAPOR from Oxford Analytica, which turn qualitative findings into quantitative assessments. By assigning monetary value to risk percentages (likelihood multiplied by consequence), these tools turn the risk from intangible problems to tangible opportunities that can be understood in business terms, without deep geopolitical expertise.

No one credibly claims to be able to predict the future, but by employing lenses to observe geopolitical signposts, it is possible to illuminate potential futures and manage the risks contained therein.




**Andreas Haggman is an emerging risk analyst heading up our newly-established Emerging Risks research hub at the Willis Research Network.**

“By assigning monetary value to risk percentages (likelihood multiplied by consequence), these tools turn the risk from intangible problems to tangible opportunities that can be understood in business terms, without deep geopolitical expertise.”







An aerial night photograph of a large industrial facility, likely a refinery or chemical plant. The scene is illuminated by numerous bright lights, creating a complex network of glowing lines and structures. In the foreground and middle ground, there are large storage tanks, distillation columns, and a dense network of pipes and walkways. Some areas show smoke or steam rising from the ground. The background shows more industrial buildings and parking lots with some vehicles. The overall atmosphere is one of intense industrial activity.

## Part two - risk management issues

# Combining data with analytics: a different view of your insurance programme

## Introduction: the traditional single view of risk

These days data on many aspects of the performance of energy companies is widely available, but many companies miss the insight contained within the data and as a result make sub-optimal decisions. So how are leading energy companies combining data with focussed analytics and deep industry knowledge to view risk in a different way in order to make better quality risk financing decisions?

### *Too simplistic?*

Traditionally, energy companies have insured their risk exposures on an individual basis with reliance placed on historical losses to assess risk, usually by considering each class of insurance in isolation. Premium, market capacity, deductible and insurable limit were the main drivers, with only limited analytical decision support undertaken to assess placement outcome and pricing. This single view of risk does not take into account the true nature of risk, which is more complex and includes dependencies within and between risk exposures that can now be better understood by combining data with modern analytical capabilities.

### *Too complex?*

In addition to buying insurance as individual lines of cover, the various insurance lines are often bought with different renewal dates, with many local policies stretching across different geographies as well as varying levels of deductibles and limits. This complex structure of cover makes it difficult for key decision makers such as Treasurers and CFOs to understand precisely how their company is protected in the event of a series of losses, and as result may lead them to underestimate the true value of insurance as a hedge.

## *Differences from other hedging strategies*

This is in stark contrast to the value that energy companies perceive from transferring risk by purchasing hedges in commodity markets, interest rate and currency markets. Due to the binary nature of such structures (there is only a pay-out if an index or a currency falls below a pre-agreed value) they are often viewed by Finance functions as simpler to understand than insurance.

Moreover, layers of hedges across different risk types may be bought to protect the organisation from scenarios that are deemed too risky without transfer of risk to the external market. It is this simplicity that is regarded as particularly attractive by CFOs and Treasurers, compared to the perception that insurance is more complex to understand and hence use as a hedge for effective risk transfer.

## Looking at risk through a different lens

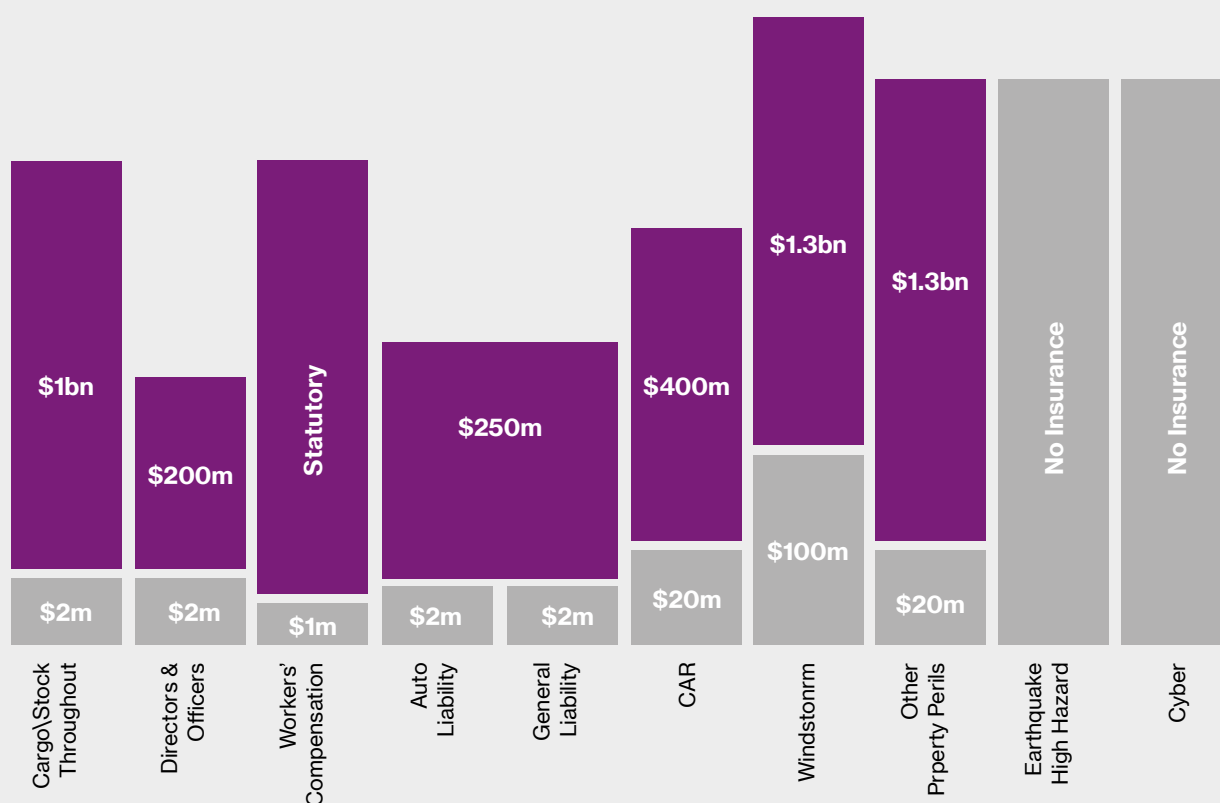
### *Common insurance structure*

How then should these different points of view be reconciled? A good place to start is a common representation of the insurance structure that is purchased by the organisation. The structure is often depicted as a series of bars or towers, where the height of each bar approximates to the amount of cover bought, and may look like the example as in Figure 1 overleaf.

“This single view of risk does not take into account the true nature of risk, which is more complex and includes dependencies within and between risk exposures that can now be better understood by combining data with modern analytical capabilities.”



**Fig 1 – A typical insurance programme structure**



Source: Willis Towers Watson

### ***Does this structure work when the company is under stress?***

Whilst this depiction is helpful for understanding exactly what amount of cover has been purchased for each line of insurance, it is less helpful when seeking to understand the protection afforded to the organisation in times of financial stress. For this to become easier to understand, we need a different viewpoint.

### ***Retained risk and expected cost***

One viewpoint that CFOs and Finance teams will be familiar with is one that identifies the trade-off between risk and return. For our purposes we will amend this slightly to show the trade-off between retained risk and expected cost. This view has been designed so that it is easy to see the merits of different financing strategies as well as their impact of the organisation's bottom line.



Fig 2 – Establishing the efficient frontier



Source: Willis Towers Watson

In Figure 2 above:

- The horizontal axis shows the expected **annual cost** of the insurance strategy, which is made up of the premium spend and the cost of the retained losses.
- The vertical axis shows the **amount of retained risk in a 'bad year'**.

The objective is to reduce the amount of retained risk and at the same time reduce the expected annual cost and move to a more efficient programme, closer to the edge of the cloud in the above diagram.

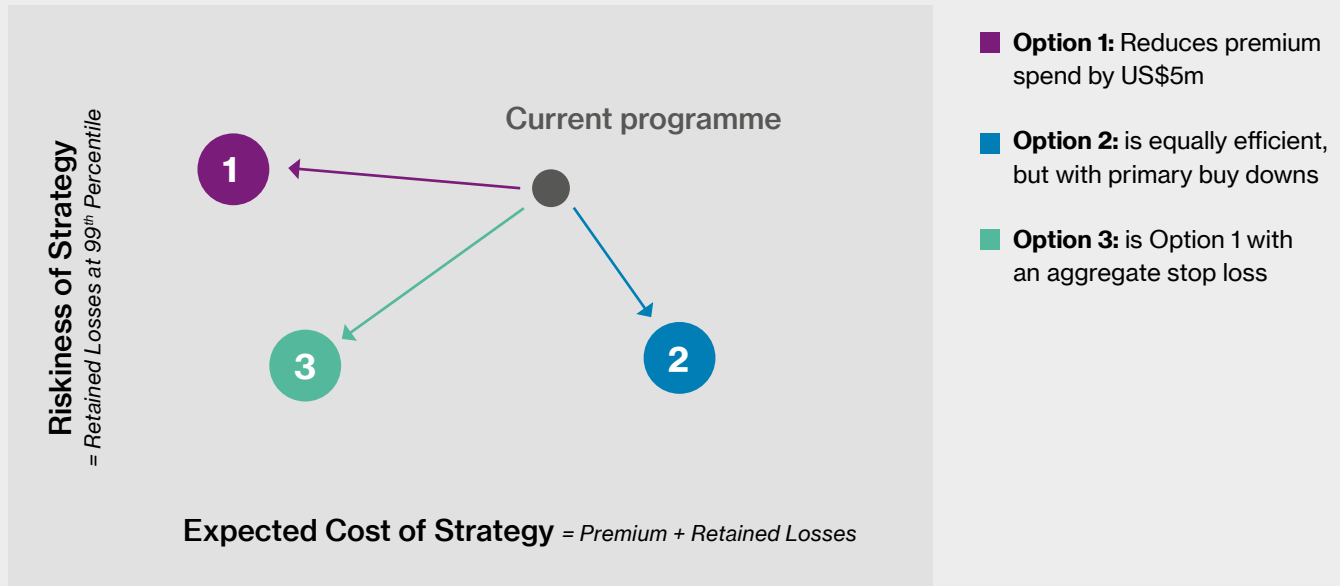
### ***Towards the efficient frontier – and a better understanding of risk***

By combining data, industry knowledge and modern analytics, a better understanding of the company's risk exposures and their variability may be obtained. This insight will often reveal a very different picture from the traditional siloed view of considering different classes of risk in isolation. A significant benefit of this approach is to show where concentrations of risk occur as well as where there are currently inefficiencies in the transfer of risk off the balance sheet.

### ***Combining analytics with industry data to identify trade-offs***

As a result, many leading companies are now beginning embrace combining analytics with industry data to better understand risk at a portfolio level, and hence to understand the trade-off between the cost of retaining vs the cost of transferring risk.

**Fig 3 – The path to efficiency**



Source: Willis Towers Watson

This deeper understanding of the correlations of risk helps to identify ways to reduce volatility by measuring the effects of diversification, and may be used to develop alternative strategies. These strategies may then be assessed and compared using the lens of riskiness versus expected cost shown above.

### Transferring volatility: a path to efficiency

This path to efficiency was highlighted to a recent client in the following diagram and shows three different options, all of which are more efficient than the current strategy. They represent an annual cost saving to the company, as well as significantly de-risking the balance sheet at the same time.

### Advantages of optimization

The proposition for companies here is clear:

- Firstly, they will spend only what they need to on insurance - and not a penny more.
- Secondly, they will effectively and efficiently protect the company against the insurable risks that matter most to them.
- Finally, in our experience, optimization leads to a 10-30% reduction in risk and/or insurance cost savings.

## Methodology

In practice, this is carried out in 6 distinct steps:

1. Set key metrics for insurable risk
2. Define cost and risk profile of current insurance programme
3. Identify alternatives to optimise the cost/risk profile
4. Define insurable risk tolerance
5. Identify optimal insurances to stay within risk
6. Adjust programme as risk profile changes

## Transferring volatility: parametric solutions

### Developing tailored cover

The increased availability of data and use of analytical methods is also leading to the development of alternative forms of risk transfer, such as parametric solutions, which can transfer financial volatility arising from weather related events or natural catastrophes away from company balance sheets. By understanding the variability inherent in risk exposures that are not necessarily insurable, it is possible to use analytics to develop tailored cover based on measurable factors such as volume of rainfall, wind speed, footfall and temperature.

### Decision making audit trail

Another important benefit of using an analytical approach is the creation of an audit trail of decision making for risk financing. By considering current risk exposures, the efficiency of both the existing risk transfer programme and of alternative structures, it can be shown that an objective and robust approach has been followed that takes into account the interdependencies of risk, and consideration of the merits of different strategies before a decision is taken.

### Benefits of this approach

More generally, companies that use this approach find that they can:

- Change the nature of conversation about risk
- Increase focus on the portfolio of risks rather than individual types of risk
- Recognise the value of transferring risk above their risk tolerance
- Save money through the process of optimising their insurable risk financing
- Improve their corporate governance with an audit trail of risk financing decision making

## Conclusion: time for a new conversation?

To conclude, a couple of recent examples will help to show the breadth of questions that can be answered by this approach.

### Large European public utility

This client recently approached us with two critical objectives:

- To confirm the adequacy of captive premiums to cover long term retained losses. Here the analytics demonstrated appropriate premium charges and an outcome of the optimization carried out was to reduce the captive premiums charged to the business units by over 50%.
- To identify and prioritize options for reducing Total Cost of Risk (TCOR). The most impactful option was to increase annual aggregate Physical Damage and Business Interruption PD/BI retentions for the captive, with a significant reduction in the TCOR.

### Global Energy Company

This client carried out a comprehensive risk optimisation exercise to better understand their total risk exposures and to identify the key drivers of risk, by geography and class of risk. The risk profile of the company was quantified, which demonstrated significant inherent risk in a single business unit. As a result, the company decided to sell off the highest risk business unit, and optimized insurance program for remaining business units.



**Andy Smyth is Senior Partner in Willis Towers Watson's Structured Risk Solutions division in London.**



# Oil Insurance Limited (OIL): a challenging year

## *2018 - a challenging year*

During 2018, OIL financial performance did not produce the same strong results of the last ten years. After several years of below average/expected losses, OIL sustained Losses & Loss Expenses of US\$783 million against Premiums Written of US\$379 million<sup>1</sup>. After combining these results with Net Investment Losses of US\$251 million, the Net Income Loss for the year was US\$676 million. The last time OIL sustained this level of insured losses dates back to 2008. This time period is consistent with OIL's modelled results which forecasts losses of this magnitude to occur statistically once every eight years or approximately 12% of the time.

While OIL's GAAP Losses & Loss Expenses totaled US\$783 million, actual case reserves were US\$911 million with Loss Expenses of US\$4 million and a net downward IBNR adjustment of US\$132 million. Refining losses made up a significant portion of the total case reserves for the year.

## *US\$450 million dividend for 2018*

Earlier in the year, OIL declared and paid a US\$450 million dividend to its Shareholders. In doing so, OIL has paid dividends totaling US\$1.8 billion since 2013 and billed US\$2.1 billion in premiums over that same period. The recent distribution was made possible by OIL's continued and very strong financial position that allows it to absorb a bad loss year without materially or negatively affecting its financial strength. This was acknowledged by Standard & Poor's when it upgraded OIL's rating from A- Stable to A Stable in 2018.

## *OIL welcomes Braskem*

In addition to its financial performance, OIL welcomed Braskem SA, a global petrochemical company, from Sao Paulo, Brazil as its newest member with no members electing to leave the mutual. Braskem is OIL's first ever South American member. Marathon Petroleum Corporation acquired Andeavor (both OIL members) to become the US' largest crude oil refinery processing over 3 million barrels per day. As a result of this shareholder activity, the total number of shareholders remained constant at 54 with total insured assets growing to over US\$3 trillion.

## *US\$400 million limit sustained*

Lastly, OIL analyzed the merits of increasing its US\$400 million per occurrence limit in 2018 and concluded that, while it financially was in a position to increase its product offering, it was best to revisit this topic in 2019.

## *Prospects for 2019*

Looking forward to 2019, OIL is expected to deliver its first set of data analytics to its membership at the company's March 2019 AGM. Willis Towers Watson has helped play a role in shaping what that information looks like and has shared loss information with OIL from WELD (Willis Energy Loss Database) to supplement OIL's already significant 46 years of loss data compiled since its formation. In the past, OIL historically shared specific and unfiltered loss information with its members, but due to anti-trust concerns stopped doing so in the early 2000s. This new initiative goes back to that concept, but this time individual loss occurrence information is replaced by anonymous robust comparative information that will help shareholders better understand how they are performing in the mutual relative to all other shareholders.



**George Hutchings is SVP & COO of Oil Insurance Limited and based in Bermuda.**

*OIL is a Bermuda based energy mutual that offers its members up to US\$400 million in net property, control of well and sudden & accidental 3rd party pollution coverage. Should your company have an interest in learning more about OIL, please contact your local Willis Towers Watson representative or Joe Seeger, EVP & MD on [Joe.Seeger@WillisTowersWatson.com](mailto:Joe.Seeger@WillisTowersWatson.com).*

<sup>1</sup> All data contained within this article is sourced from Oil Insurance Limited





A close-up, low-angle shot of an offshore oil rig's steel structure. Several large, vertical steel pipes, some painted yellow and others in a reddish-brown, dominate the frame. They are connected by dark, heavy-duty bolts and flanges. The background shows a turbulent blue sea with white foam from the waves crashing against the lower parts of the rig. The lighting is bright, suggesting daylight.

## Part three - the Energy insurance markets in 2019



# Upstream: a gentle market upswing

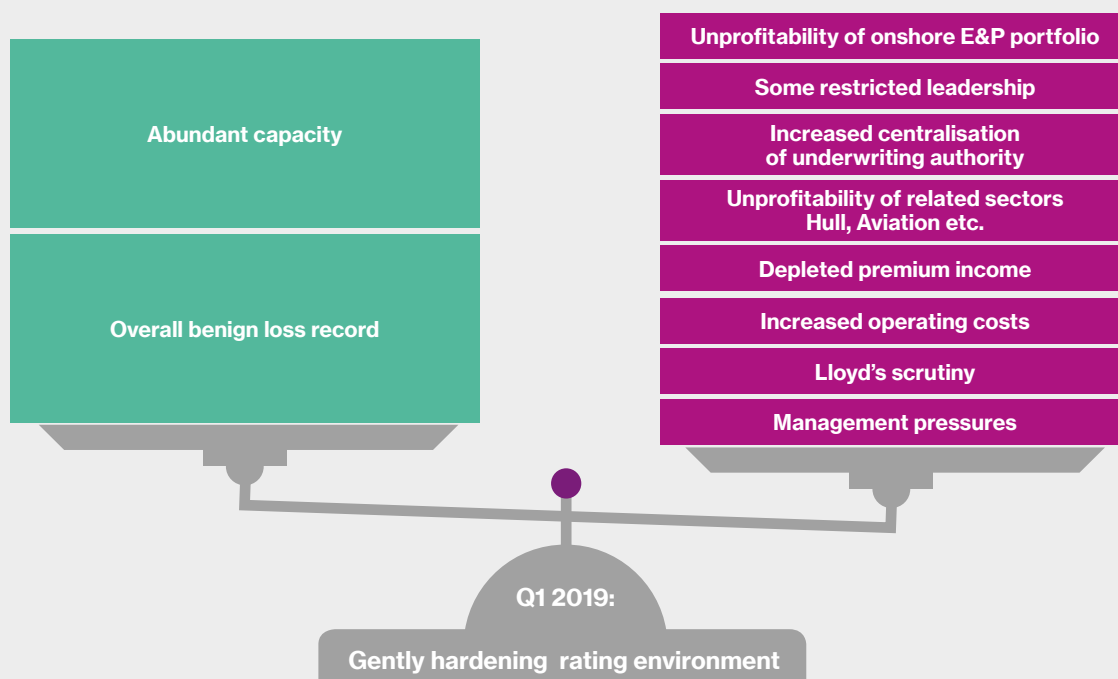
## Introduction

### *A gentle acceleration of the hardening dynamic*

Towards the end of last year we released a supplement to our 2018 Review<sup>1</sup> in which we described conditions in the Upstream insurance market as basically flat. We explained that the continued presence of abundant capacity, together with an essentially benign loss record, was being balanced by the drive for underwriting profitability, especially in Lloyd's, following poor overall underwriting results in other classes.

However, nothing stands still for long in the Energy insurance markets and we can now sense a small but noticeable change in the overall underwriting environment in the Upstream sector. Despite all the macro factors – capacity, losses, overall underwriting profitability – still pointing to favourable market conditions, we must instead report that the market has, almost imperceptibly, moved closer towards a harder trading environment for buyers.

Fig 1 – Recent pressures on 2018's flat underwriting environment, March 2019

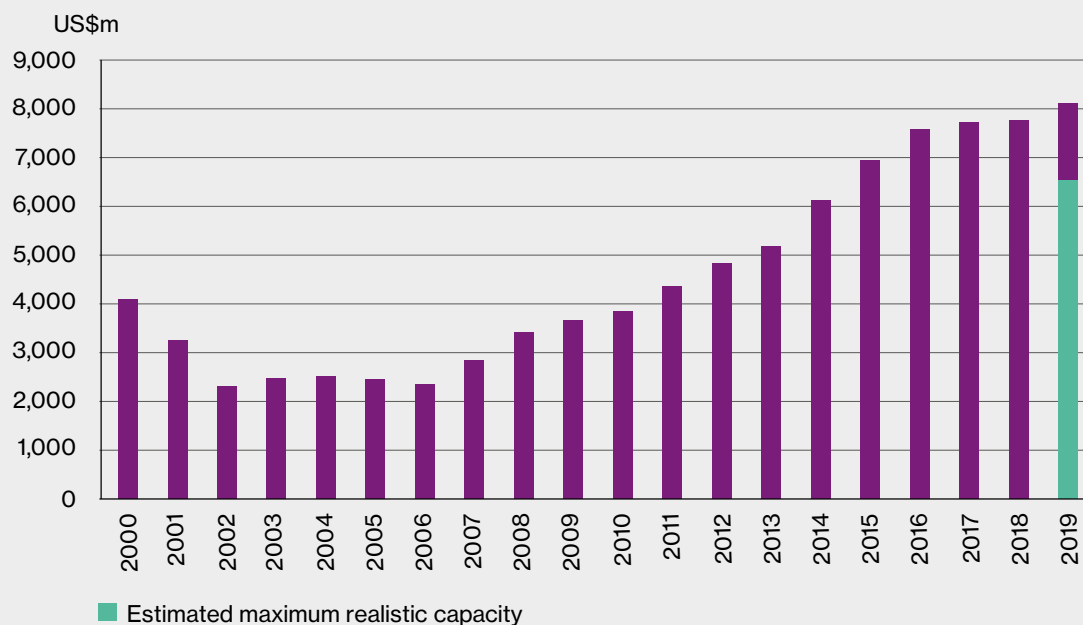


The flat market environment that was evident towards the latter half of 2018 has evolved into a more challenging one for buyers. Within the context of an overall gently hardening dynamic, the market has fragmented, with insurers taking different positions on various lines of business.

Source: Willis Towers Watson

<sup>1</sup> <https://www.willistowerswatson.com/en/insights/2018/11/energy-market-review-november-2018-update-winds-of-change>

**Fig 2 – Upstream Operating insurer capacities 2000-2019 (excluding Gulf of Mexico Windstorm)**



**The decade closes out with official Upstream capacity still at record levels. But does this tell the whole story?**

Source: Willis Towers Watson

### Why?

Why should this be the case? What has happened during the last few months to enable insurers to tilt the balance of market dynamics further in their favour? How long will this last, and what can buyers do to offset this overall hardening trend?

As ever, let's start by examining the overall trends and then see how the market has fragmented in recent months to leave a complex landscape for buyers and their brokers to navigate through in 2019.

### Capacity

#### *Another increase...and no withdrawals*

As many readers will undoubtedly be aware, the history of the Upstream market in the 21st century has been dominated by the extraordinary increase in overall underwriting capacity levels. Since the immediate aftermath of the tragic events of 9/11 – and a minor blip following the hurricanes of 2005 – the market capacity trajectory has been remorselessly upward. Although the rate of increase has tailed off somewhat in recent years, there has been no sign of any decrease in capacity, nor indeed of any significant underwriter withdrawals from this class.

As a result, Figure 2 above still shows another record overall capacity level for 2019, with just over US\$8 billion now in play. And as we have said many times before in this Review, until more attractive havens for capital materialise, we don't think that there will be any significant reduction in this figure in the immediate future. Moreover, our maximum realistic capacity figure, which indicates the capacity level that may be available in practice from the market for a given programme, remains at US\$6.5 billion as it was for 2018.

### *But how much of this is truly available?*

So on the face of it, all seems well from a buyer perspective. However, these overall figures only tell part of the story. First of all, this level of capacity will only be available to the most well-known and trusted buyers with assets in recognised and familiar locations such as the North Sea. Secondly, we are finding that insurers are now under much less pressure to underwrite for premium income and so no longer feel that they have to participate on every programme they are offered; they are therefore deploying their maximum capacity on fewer and fewer occasions. Thirdly, all manner of other underwriting considerations will in reality limit available capacity still further – type of operation, location, claims record, loyalty to exiting leadership and so on. And as we shall see as we explore the different areas of the portfolio in more detail, insurers are taking a different approach to other regions and sub-classes of business.

### **Losses**

#### *Favourable loss record enters its third year*

From a catastrophic loss perspective, there is no doubt that the Upstream market continues to benefit from a remarkable run free of major disasters. Indeed, Figure 3 overleaf shows that the last three years have produced only one major disaster of note, being a significant loss offshore West Africa in 2016 that unusually involved a large Loss of Production Income loss. Aside from this, the record has really been extremely favourable from an underwriting perspective; indeed, so far in 2018 our database has only recorded two losses in excess of US\$50 million. Even if further losses that have been incurred last year but have yet to find their way onto our database are taken into account, there is very little chance of them making any significant difference to the overall benign scenario.

*“On the face of it, all seems well from a buyer perspective. However, these overall figures only tell part of the story.”*





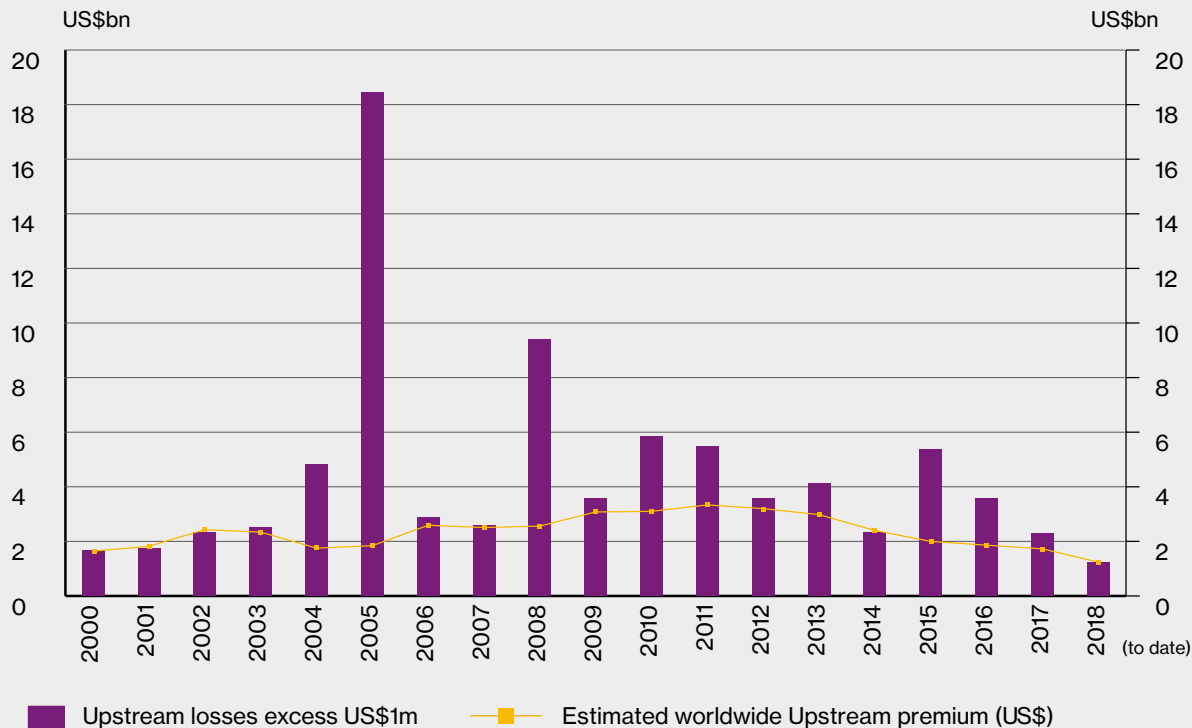
**Fig 3 – Upstream energy losses excess of US\$50 million, 2016-18**

Year of Loss	Type	Cause	Region	PD US\$	OEE US\$	BI US\$	Total US\$
2016	MOPU	Mechanical failure	Africa	620,000,000	0	900,000,000	1,520,000,000
2016	Rig	Mechanical failure	North America	83,500,000	0	95,000,000	178,500,000
2016	Pipeline	Anchor/jacking/trawl	Africa	100,000,000	0	0	100,000,000
2016	Platform	Fire + explosion/VCE	Latin America	95,367,316	0	0	95,367,316
2016	Well	Blowout + fire	Australasia	0	70,000,000	0	70,000,000
2016	Pipeline	Terrorism	Africa	65,000,000	0	0	65,000,000
2016	Platform	Piling operations	Asia	51,000,000	0	0	51,000,000
2016	SSCS	Anchor/jacking/trawl	Middle East	50,000,000	0	0	50,000,000
2017	Well	Collapse	Europe	42,000,000	151,737,600	35,451,000	229,188,600
2017	MOPU	Faulty work/op error	Africa	135,000,000	0	0	135,000,000
2017	MOPU	Faulty work/op error	Asia Pacific	132,000,000	0	0	132,000,000
2017	Vessel	Pipelaying/trenching	Latin America	128,500,000	0	0	128,500,000
2017	Well	Unknown	Europe	72,000,000	0	24,000,000	96,000,000
2017	Well	Blowout + fire	Europe	0	80,000,000	0	80,000,000
2017	Pipeline	Impact	Africa	70,500,000	0	0	70,500,000
2017	Pipeline	Corrosion	North America	60,000,000	0	0	60,000,000
2017	Platform	Fire no explosion	Africa	52,000,000	0	0	52,000,000
2017	Well	Blowout + fire	Africa	0	50,000,000	0	50,000,000
2018	Plant	Earthquake	Asia Pacific	270,000,000	0	0	270,000,000
2018	Pipeline	Heavy weather	North America	51,000,000	0	0	51,000,000

**The Upstream loss record continues to defy gravity from a catastrophe perspective. But does this take into account the attritional effect of minor E&P losses?**

Source: WTW Energy Loss Database as of March 1 2019 (figures include both insured and uninsured losses)

**Fig 4 – WELD Upstream Energy losses 2000–2018 (excess of US\$1m) versus estimated Upstream premium income**



**2017 was a relatively benign year for the Upstream insurance market - at this stage, 2018 looks likely to produce an even lower overall loss total.**

Source: WTW/WTW Energy Loss Database as of March 1 2019 (figures include both insured and uninsured losses)

### Overall total at record low

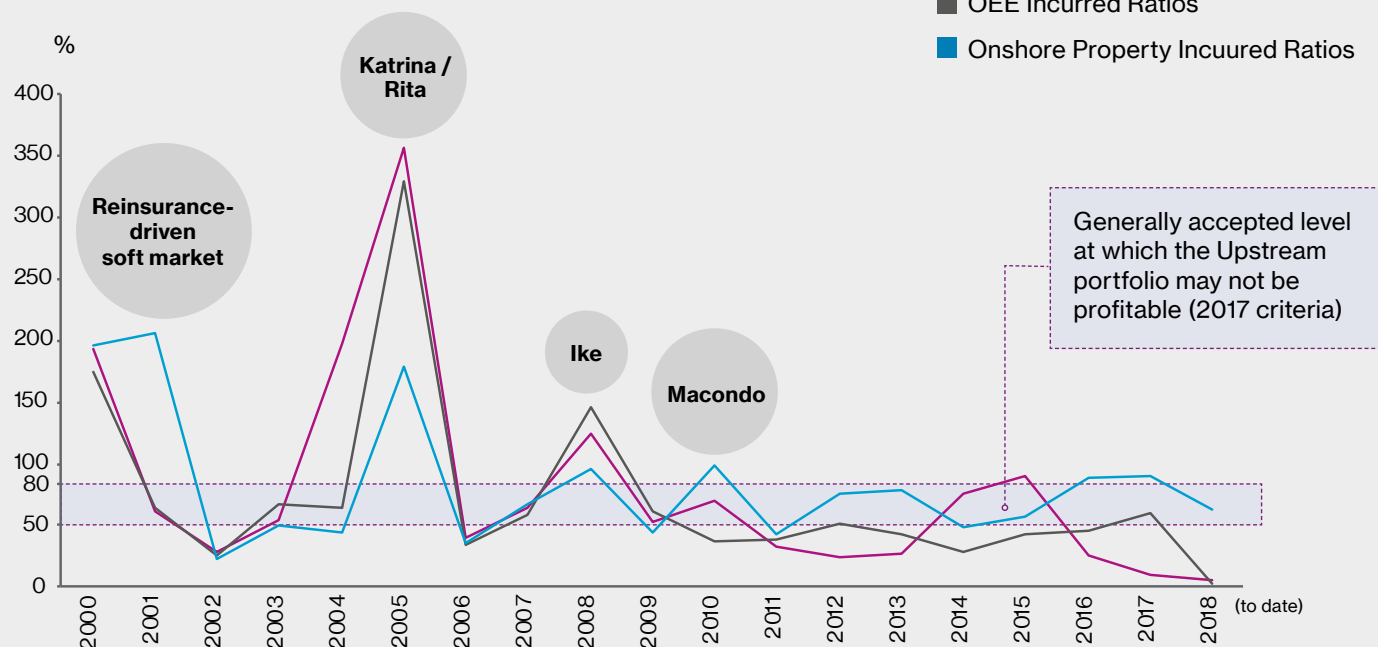
Furthermore, Figure 4 above shows that the benign nature of the recent Upstream market loss record is not just confined to the catastrophe arena. Although we must take into account the potential for our database figures for 2018 to deteriorate further, we can see from this chart that the overall 2018 total excess of US\$1 million is currently the lowest we have ever recorded for this class. It really is remarkable to consider that only four years ago our database was recording losses in excess of US\$5 billion; to date, we only have just over US\$1 billion recorded for 2018. And while the estimated premium pool continues to decline, the fact remains that at present it seems to be still sufficiently robust to keep the overall portfolio profitable.

In summary then everything seems to be pointing in the right direction for Upstream insurers. So why are we talking about a gentle hardening in overall rates? Let's take a look at some of the factors on the other side of our "see-saw", as outlined in Figure 1 earlier.

**Fig 5 – Upstream Market Profitability 2000 - 2018**

Lloyd's Incurred Ratios (Premiums v Paid & Outstanding Claims)

■ Offshore Property Incurred Ratios  
■ OEE Incurred Ratios  
■ Onshore Property Incurred Ratios



**Profitability levels in Upstream look to have improved – until the recent poor loss record for Upstream/Midstream Onshore Property is also considered.**

Source: Lloyd's Market Association Quarterly Loss Report Q4 2018

"Offshore Property" – combination of ET/EC/EM/EN Audit Codes

"OEE" – combination of EW, EY and EZ Audit Codes

"Onshore Property" – EF audit code

## Factors contributing to the hardening process

### **Profitability: positive news impacted by Onshore portfolio and operating costs**

Figure 5 above shows Lloyd's Incurred Ratios (Premiums Received versus Paid and Outstanding Claims) for the Upstream portfolio over the last 18 years. In order to take into account operating and reinsurance costs, to make a true profit we believe that insurers must generally record Incurred Ratios below 50% to guarantee an underwriting profit, and in any event be at least under 80%. This is why we have shaded the area between 50% and 80% in purple on our chart:

- Above this area, insurers have likely recorded an overall portfolio loss;
- Within this area, it is possible that they may or may not have recorded a portfolio loss;

- Below this area, it is likely that they have recorded a portfolio profit.

If we look back over the last five years or so (the figures for 2018 are still too immature at this point in time to be germane) we can see that:

- Offshore Property has made money for insurers for the last three years with Incurred Ratios at well under 50%, although this was not the case in 2014/15;
- Operators OEE has been very close to 50% for several years in succession prior to finally breaking through the 50% barrier in 2017;
- Onshore Property (which includes all onshore Upstream assets such as land rigs, pipelines and processing plants) has consistently lost Lloyd's money since 2011 and indeed in virtually every year since the beginning of the century.



**Fig 6 – Land rig losses excess of US\$1 million, 2016-18**



**The recent land rig loss record has startled those insurers who specialise in underwriting this area of the Upstream portfolio**

*Source: WTW Energy Loss Database as of March 1 2019 (figures include both insured and uninsured losses)*

So although it is correct that the Upstream portfolio as a whole has been making money from insurers in recent years, it can now be seen that this is by no means the case across the board.

Meanwhile, we understand from our conversations in the market that operating costs as a percentage of their overall premium income are continuing to rise; so with so little premium coming into the market (see Figure 4 earlier) it can be seen that securing an overall underwriting profit is perhaps not quite so straight-forward as it might first appear. And all the while, Upstream underwriters continue to feel the scrutiny of their managers and senior Lloyd's executives, as their business plans come under renewed scrutiny and the pressure to "hold the line" on rating levels intensifies.

### ***Land rigs: a blot on the Upstream risk landscape***

In many ways, land rigs are something of an anomaly in the Upstream market. By definition they operate onshore; their values are small by Upstream asset level standards; losses tend to be low level and frequent rather than high level and catastrophic. But they have always been an integral part of the Upstream portfolio and several Upstream leaders have taken a long term view that, written in bulk and under insurer facilities, money can be made over time. However, Figure 6 above that 2018 has been a particularly bad year for land rig losses, with nearly US\$150 million dollars' worth of losses excess of US\$1 million reported to our database to date. It is our understanding that the recent upturn in E&P activity has increased utilisation rates, especially in the US, which may well account for this recent upsurge in loss activity.

### *Whole Onshore E&P book affected*

Be that as it may, it is our experience that the Upstream insurers in London that have been impacted by this development have taken a strong position on this particular line of business and are currently imposing more significant rating increases on land rigs and other associated areas of the Upstream portfolio such as Onshore Extra Expense (OEE) and Onshore Pipelines. For such small underwriting limits, it might be thought that other markets around the world might be able to step in and provide London with some competition; however unlike other lines of business London remains pre-eminent in the Upstream arena. Furthermore, we understand that a great deal of the Facultative Reinsurance (Fac R/I) capacity that has supported this portfolio in the past has now withdrawn following these recent losses, and another leader who used to play a major role in this class of business has recently indicated that they will no longer participate in this class without certain minimum premium stipulations. As a result, some brokers have found it difficult to drop existing leaders from their underwriting facilities and replace them with more competitive insurers. As a result, buyers have in the main had little choice other than to accept the rating increases demanded by the leaders.

### *Concentration of underwriting leadership expertise*

At the same time as the pressure mounts on the Upstream portfolio London continues to dominate this sector; indeed to emphasise the point, in recent months we have seen several major insurers withdraw underwriting resources from cities around the world and redeploy them back to London at the same time as some prominent regional insurers have recently withdrawn from the market.

Furthermore, unlike in previous years we do not detect any appetite from the following market to challenge the existing Upstream leadership or indeed to take advantage of the recent market upturn to compete more vigorously for increased premium income and market share. There is no doubt that the new underwriting climate, prompted by the Lloyd's Decile 10 initiative<sup>2</sup>, has encouraged underwriters to take a more conservative line than in the past.

### *Greater confidence to hold out for rating increases*

As a result, the established market leaders seem now much more confident in pressing for rating increases across the board, irrespective of risk quality. While there has been some talk in the market about some of the major composite insurers taking a higher leadership profile, to date we have not seen this actually materialising in the form of serious competition to the existing leadership, most of which is based in Lloyd's.

### *Chinese market emerges as a major player in region*

However, the one area of the world where this dynamic generally does not seem to apply is in China, where we have seen the local insurance market recently go from strength to strength, backed by strong reinsurance treaties into the London market. These insurers are restricted by their reinsurance treaties to underwriting Chinese business only; what will be interesting in the future is the extent to which they will continue to rely on international reinsurance protection as capital levels increase and individual insurer self-confidence continues to grow.

### *The impact on rating levels*

It is very difficult to be specific on the extent of the overall rating upswing, but in very general terms we can divide the portfolio into three distinct areas:

- The most popular business is characterised by excellent loss records, a reputation for leading underwriter loyalty and significant premium income. These programmes are attracting the bare minimum of rating increases, some of which are being offset by improved terms and conditions involving recognition of advantageous claims records and premium income volume.
- The core Upstream portfolio, mainly featuring offshore assets, is attracting more significant rises, although the extent of these rises continues to be offset by the amount of capacity that is still currently in play.
- The Onshore Exploration & Production portfolio, particularly but not exclusively from North America, is attracting more punitive rating increases, especially for programmes which have recently suffered a loss. These buyers have had very little choice but to accept these rises or elect either to self-insure or to purchase higher deductibles - a strategy which insurers tend not to reward with significant premium credits.

*"In recent months we have seen several major insurers withdraw underwriting resources from cities around the world and redeploy them back to London."*

<sup>2</sup> <https://www.lloyds.com/market-resources/market-communications/market-bulletins/market-bulletins> (Y5232)

### *Offshore Construction - premium income opportunities but challenges remain*

Upstream insurers have of course welcomed the recent oil price increases over the last two years or so and in particular the way in which these price increases have triggered a new round of offshore construction projects around the world, bringing much needed premium income. However, the recent influx of new projects has not been without its challenges; the Lloyd's Incurred Ratio for Offshore Construction has recently nudged 30%<sup>3</sup>, bringing it worrying close to loss-making levels. Furthermore, the share of this portfolio taken by the commercial insurance market has continued to reduce, as increased captive participations across the various co-venturers has often meant that the only share available to the market has been that of the leading underwriter. As a result, the potential for volatility in this sector of the market has definitely increased, with some leaders offering terms at significantly higher levels than were the norm only a few years ago.

What's more, a large proportion of the new projects feature significant subsea tiebacks and other underwater assets – technology which has proved to lead to underwriting losses in the past. No wonder some insurers continue to look on this part of the portfolio with a degree of trepidation, and should a major project require the participation of the majority of the Upstream market, the buyers concerned should continue to expect to be offered robust terms, especially given the sector's recent loss record.

### *Gulf of Mexico windstorm - a static market, but a loss may change everything*

Once again, despite an active hurricane season in the Gulf of Mexico, it appears that the sector of the Upstream market that underwrites Gulf of Mexico windstorm (Gulf Wind) has escaped paying any major losses in 2018.

As some readers of this Review will recall, coverage and capacity for these risks has been limited by overall aggregate for many years, particularly since the impact of hurricane Ike in 2008. As a result, the same insurers that have written this portfolio for many years continue to do so, while those who have not built up a book of Gulf Wind business continue to avoid it. We could speculate that Upstream insurers are reluctant in this underwriting climate to start writing this book without the benefit of any back year premium to then be immediately faced with the consequences of having to pay for a major loss.

So buyers could expect a relatively stable market in 2019. That being said, should 2019 actually produce a major Gulf Wind loss, we think buyers can expect an interesting market dynamic as the existing market finds its efforts to impose rating increases in the wake of the loss limited by the arrival of fresh competition from other parts of the Upstream market. We would anticipate that several insurers who do not currently participate in Gulf Wind programmes may be keen to take advantage of the loss and the opportunity of taking a share of the resulting premium increases. That being said, Gulf Wind protection remains a notoriously volatile product and predicting the extent of any change in rating levels in the aftermath of a major loss is by no means an easy task.

### *Cyber - two into one won't go!*

The Upstream insurance market's attempt to formulate a market-wide, effective risk transfer vehicle for cyber risk continues, albeit at a pace that perhaps some buyers are finding somewhat frustrating. As this Review went to press, a new cyber policy wording was being reviewed by the London Joint Rig Committee, although we understand that progress to date has been slow. The root of the challenge is in finding a way to combine Berkley/AXA XL's CABBE policy form, which is designed for a single targeted insured event and provides a limit up to the single largest scheduled asset, with other market products from insurers such as QBE, Munich Re and Brit, which provide cover for a multiple Insured cyber-attack with a sub-limit. The difficulty is that so many insurers have different agendas when it comes to cyber risk; some have invested a great deal of time and money in employing specialists to underwrite their portfolio, and quite understandably do not wish to see years of investment be compromised by a composite product which does not reflect their own outlook.

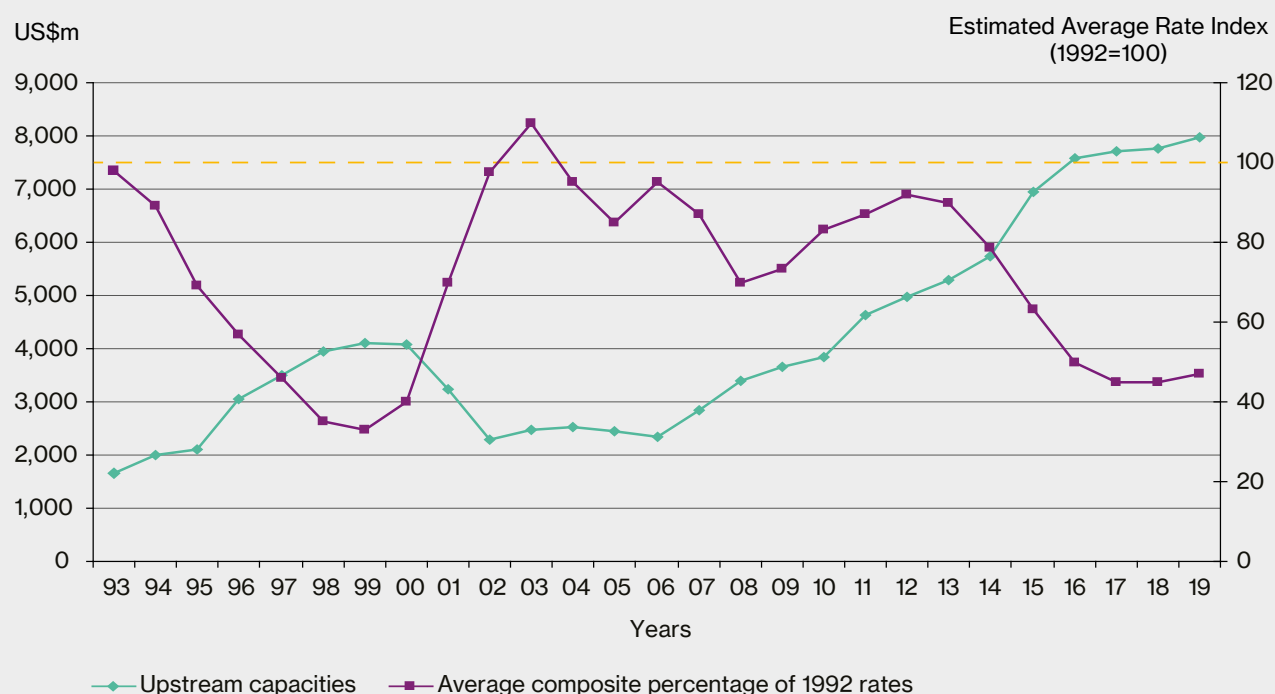
Meanwhile some buyers have had little option but to purchase the limited amount of cover on offer – particularly those energy companies who are members of Oil Insurance Limited (OIL) who require the knowledge that their excess of OIL "wraparound" cover includes some form of cyber protection, given that the OIL form is silent on this issue.

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<sup>3</sup> Source: Lloyd's Market Association Quarterly Loss Report Q4 2018 EC Audit Code



**Fig 7 – Upstream capacity versus rating levels, 1993–2019 (Excluding Gulf of Mexico Windstorm)**



**The market remains awash with capacity. But the recent retreat to the core leadership is enabling the market to negotiate modest rating increases.**

Source: Willis Towers Watson

## Outlook – hardening but not hard!

So what can buyers expect from the Upstream market as we head further into 2019? Our chart outlined in Figure 7 above shows the correlation (or sometime lack of correlation) between official underwriting capacity and average rating levels over 26 years since we began keeping the data. In very general terms it shows that as underwriting capacity has significantly increased since 2006 to its present record high, prices have generally reduced, following the economic laws of supply and demand.

### *The return of the “false equilibrium”*

But now, once again as in the period 2008-14, we are seeing the recurrence of the phenomenon known as the “false equilibrium” – increasing prices at a time of increasing underwriting capacity. Having flattened out in 2017, the gentle market hardening is defying the laws of gravity once more. The last time this occurred was when a series of underwriting losses, beginning with hurricane Ike in 2008 and continuing during the next few years with

major losses such as the Deepwater Horizon tragedy in 2010 and the Gryphon A loss in 2011, coincided with a period of a limited number of Upstream leaders.

Now we are seeing the same thing again, but this time the pretext is more general – the new underwriting mood in London has been prompted by the need for underwriting discipline across the board as the Lloyd’s Decile 10 initiative makes its impact felt across Upstream just as much as any other line of business. With leading underwriters under such public scrutiny, and with realistic alternatives few and far between, it is hardly surprising that a combination of insurer management and the Lloyd’s PMD has been able to prevent any rating reductions being applied to almost every programme<sup>4</sup>.

Of course there are exceptions and there is no doubt that by restructuring programmes and by persuading insurers to take into account additional premium income coming into the market, there will be some programmes that will defy the market norm. But in our view they will be few and far between.

<sup>4</sup> <https://www.lloyds.com/market-resources/market-communications/market-bulletins/market-bulletins> (Y5232)

### **Not yet a truly hard market**

Having said that, in our opinion this is still not a truly hard market. Bearing in mind today's capacity levels, we are a long way from a scenario whereby a buyer and its broker have to shop around for cover at differing terms. And from our chart it should be clear that the current modest upswing in rating levels still only brings the market back to where we were three years ago, where rates were as low as they had been for the past 16 years or so.

### **Conclusion: twist or stick?**

How should buyers best navigate what is a complex Upstream market environment? There is no doubt that striking the optimum deal with a resolute market in 2019 will present an interesting challenge, whether a buyer's programme is regarded comparatively favourably by the market or whether it is negatively impacted by a poor claims record or risk profile.

For most buyers, the choice will come down to a simple decision. Those who enjoy casinos will be familiar with the options available to the blackjack player – to stick or to twist. A similar dilemma awaits risk managers who want to be delivered with optimum terms.

### **Twist – but will this pay off in the long term?**

The first option is to “twist.” Often the choice for so many buyers, particularly National Oil Companies (NOCs) that need to externally validate that they have chosen the most competitive approach, this involves continuing to tender their programme on a regular basis to defy attempts by the market to insist on rate rises. In a softening market, this is often a wise choice as there are plenty of willing alternatives ready to augment their premium income stream with fresh business. However, in this underwriting climate this approach may not produce the results promised by the tender process. And if the programme subsequently fails or is subject to a major loss, the potential for a significant rating upswing is very tangible.

### **Stick – but will loyalty be rewarded?**

The second is less exciting on the face of it, and that is to “stick”. Those buyers who have forged long term relationships with leading insurers whom they regard as key strategic risk partners may take the view that they would prefer to stick with the insurers that know them best and whom they view as bona fide stakeholders in their business. In these circumstances, they believe that their relationships will protect them in the event of a major market upswing and capacity withdrawal. Of course, should this not materialise then it might be possible to argue that such an approach prevents these conservative buyers from securing optimum terms.

Which approach will prove to be right? Of course, that will depend on a myriad of factors. But one thing's for certain – navigating this unusual market environment will not be easy. Given this market's inherent volatility, it remains very finely balanced, and it would not take a significant deterioration of the loss record to instigate a much more pronounced rating upswing.

With the market as a whole fracturing into different segments, and taking different views on different sectors of the portfolio, buyers are going to need all the help they can get to maximise their position as insurers' resolve is put to the test later in the year.



**Richard Burge is Head of Broking for Upstream at Willis Towers Watson in London.**



# Downstream: a traumatised and challenging market

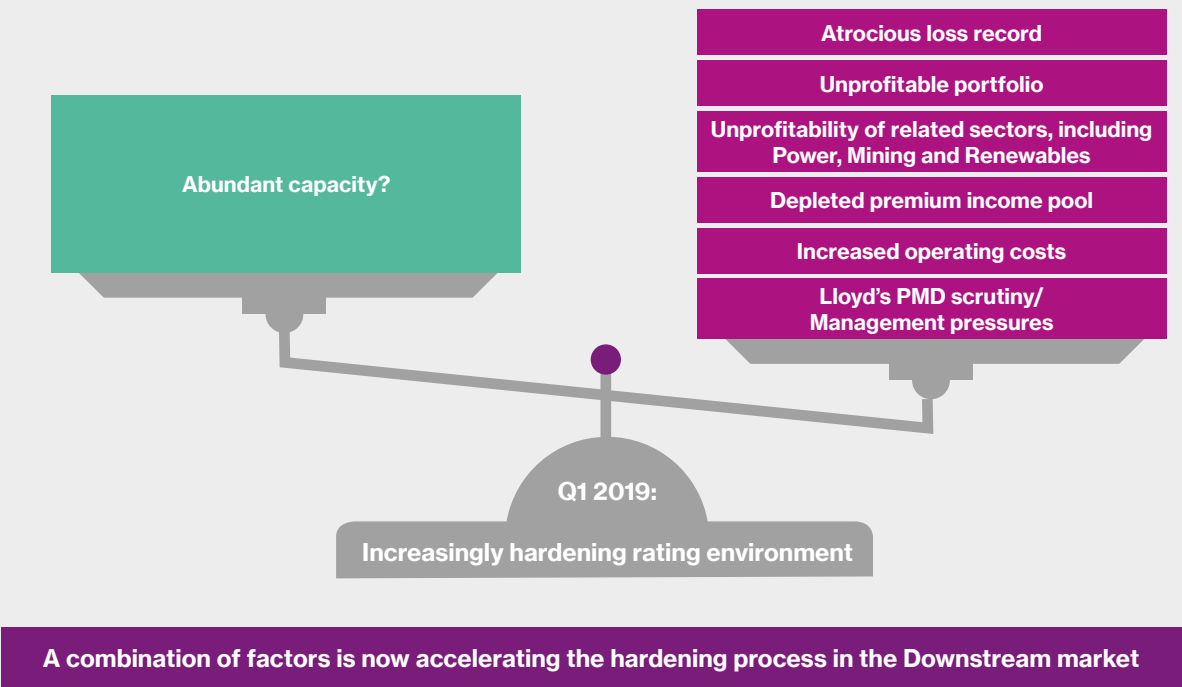
## Introduction

### A traumatised and challenging market

In our “Winds of Change” market update that we published in October 2018<sup>1</sup> we showed how the Downstream market was reacting to a range of different factors that were producing real and significant change in this market. It’s worth repeating these factors again as we move further into 2019 as they are not only all still in play but if anything have become even more pronounced following the January 1 renewal season.

As demonstrated in Figure 1 below, we have seen an increasingly hard market developing. The abundant market capacity that has oversaturated this market with excess supply for many years now has been offset by a “perfect storm” of other factors – an atrocious loss record, a depleted premium income pool and increased operating costs, not to mention negative underwriting results from other parts of the Heavy Industry Property portfolio, coupled with the rigorous attentions of the Lloyd’s PMD and indeed their own management.

Fig 1 – Downstream: an increasingly hard market

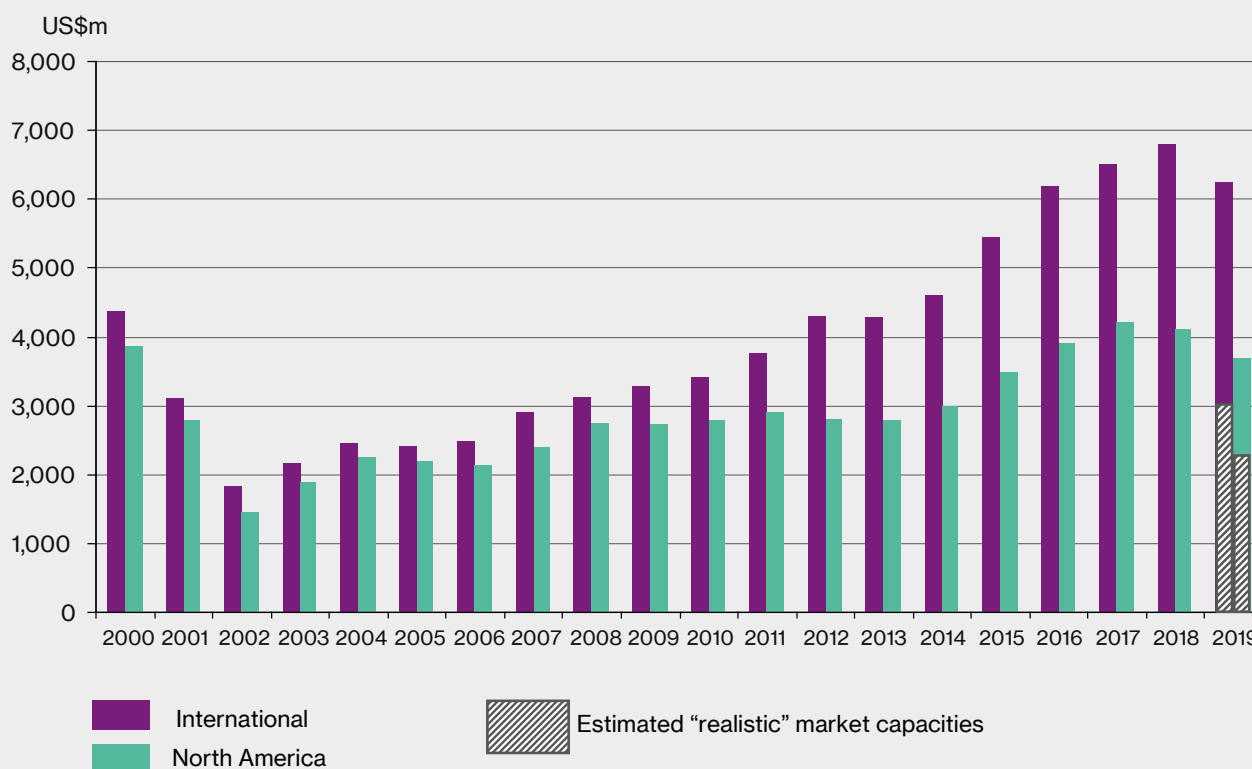


Source: Willis Towers Watson

<sup>1</sup> <https://www.willistowerswatson.com/en/insights/2018/11/energy-market-review-november-2018-update-winds-of-change>



**Fig 2 – Global Downstream insurer capacities 2000-2019 (excluding Gulf of Mexico Windstorm)**



**This is the first year the capacity has actually fallen in the Downstream market since 2002 – a sign of a significant market turnaround**

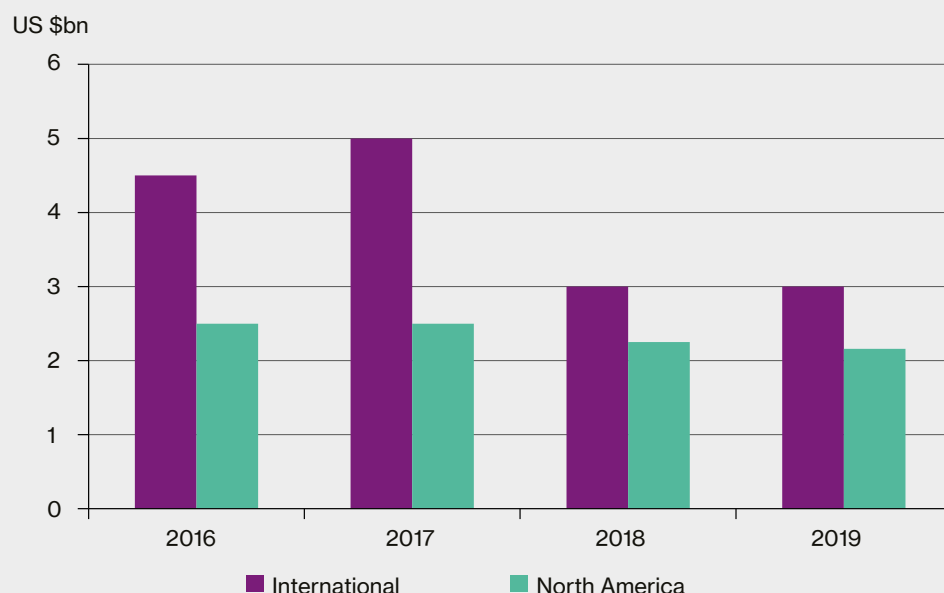
Source: Willis Towers Watson

So why has the situation for buyers deteriorated still further since October 2018? How are programmes being impacted? And, perhaps more importantly, how can buyers offset the worst effects of the hardening process in this market to negotiate optimum terms and conditions?

### Capacity – the first reduction for 17 years

A glance at our Downstream capacity chart for 2019 (Figure 2 above) shows why conditions have become so challenging in this market. For the first time since 2002, in the immediate aftermath of the 9/11 tragedy, overall theoretical underwriting capacity (as provided to us by the market) is actually down – to just over US\$6 billion for International business and just under US\$4 billion for US business.

**Fig 3 – Realistic maximum Downstream market capacity levels, 2016-19**



**Realistic capacity levels declined during 2018 and remain at significantly reduced levels compared to 2016 - 2017**

Source: Willis Towers Watson

### **Major insurers pull in their horns**

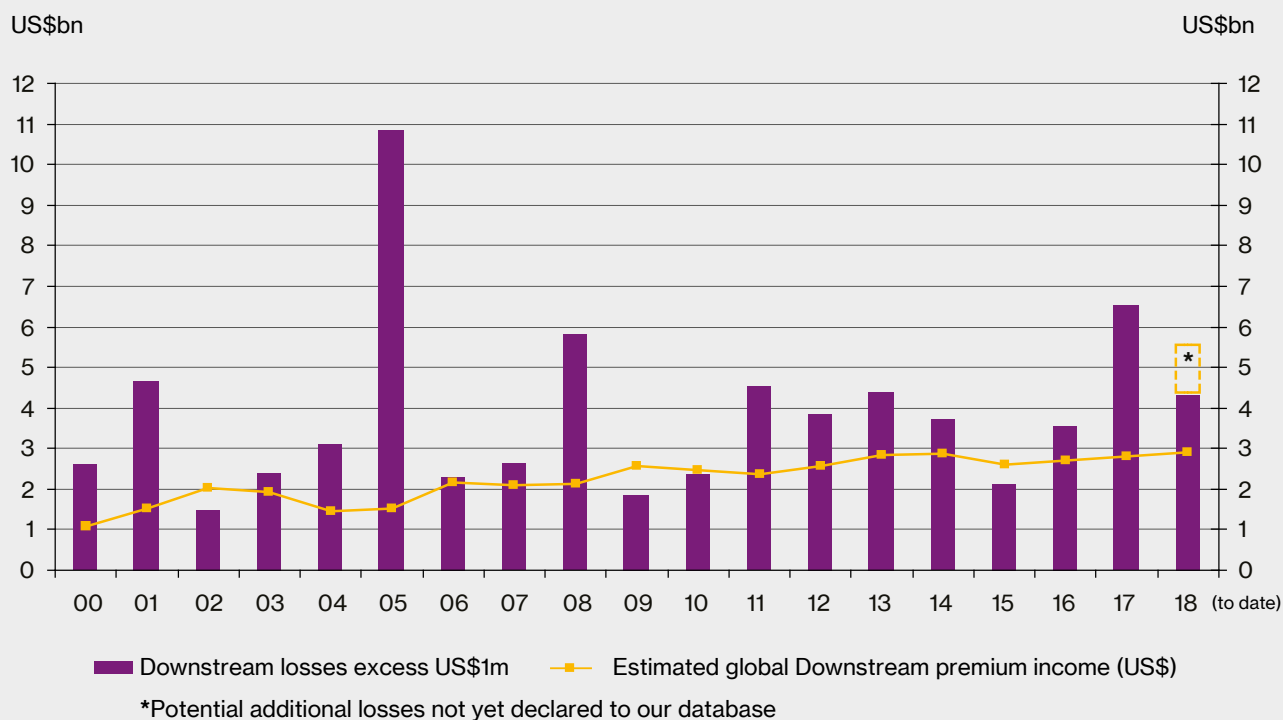
The reason for this contraction lies not so much in any major market withdrawals, but more in the fact that some major insurers have decided to abandon the strategy of offering (at least in theory) significant capacity way in excess of what their competitors can offer and instead are refocusing to offer a more realistic amount. In any event, we found that during the period when they were offering this inflated capacity the number of times it was actually deployed were very few indeed. These insurers are still able to offer a significant line; however, because their focus is now on underwriting profitability rather than premium income generation there is no need for them to advertise a higher capacity level to generate increased sales. So while in the past a certain major insurer might have offered, for example, a 25% line on some less-favoured programme simply to secure the associated premium income, without this business driver this line is likely to be scaled back to say 15% in 2019.

### **Realistic capacity without regional markets remains at US\$3 billion**

As a result of this market contraction, we believe that in general terms the maximum realistic market capacity for any one programme has remained at US\$3 billion for International business and US\$2 billion for US business, as stated in our October 2018 update (see Figure 3 above). However, one statistic does not cover the full range of potential outcomes in this market; available capacity does indeed depend on how much local market interest can be generated for a given programme.

*“For the first time since 2002, in the immediate aftermath of the 9/11 tragedy, overall theoretical underwriting capacity (as provided to us by the market) is actually down.”*

**Fig 4 – WELD Downstream losses 2000 – 2018 (excess of US\$1m) versus estimated global Downstream premium income**



**The 2017 loss record was truly catastrophic for the Downstream Energy market - and 2018 may not be much better**

Source: Willis Towers Watson/WTW Energy Loss Database as of March 1 2019 (figures include both insured and uninsured losses)

### Regional markets boost available capacity

So while buyers based in regions such as the Middle East and the Asia Pacific region can take advantage of being able to access additional local market capacity, the same cannot be said for regions such as Western Europe where no such domestic market exists.

For example, we are aware of several Australian LNG buyers that purchase capacity in excess of US\$4 billion which they access by approaching regional insurers based in Singapore; the same capacity is not available to European refiners.

### More capacity always available – at a price

Furthermore, additional capacity can always be accessed by the buyer from certain major (re)insurers, even up to the full theoretical market capacity figure. But especially

in 2019, this capacity is only available at a price, often an uneconomic one. We think that it would be misleading for us to advertise additional capacity which in all likelihood will prove to be uneconomic to purchase.

### Losses

#### A dreadful 2017 – and 2018 isn't looking great either

As can be seen from Figure 4 above, the 2017 Downstream loss record has been dreadful – the worst non-hurricane affected year since the turn of the century. It seems that 2018 will be a little better, but not much – at this stage we do not believe that all the losses occurring in 2018 have made their way onto our database, which is why we indicate a contingency for an additional US\$1 billion of losses for last year. In any event, the 2018 loss total has already once again exceeded our estimate of the total global premium income for this class.



Figures 5 and 6 outlined on this page and the next show brief descriptions of the major Downstream losses (in excess of US\$50 million) for the last two years. Two factors should perhaps be noted: first, the preponderance of North American losses compared to other parts of the world and second, the significant proportion of these losses arising from Business Interruption (BI).

Meanwhile the recent losses reported only a few weeks ago in Darwin, Australia, while likely to fall on the Construction insurance market, will have done nothing to soothe the current Downstream market apprehension.

**Fig 5 – Downstream losses excess of US\$50 million, 2017**

Type	Cause	Region	PD US\$	BI US\$	Total US\$
Refinery	Fire no explosion	Middle East	1,200,000,000	550,000,000	1,750,000,000
Chemical	Fire no explosion	Europe	267,000,000	311,000,000	578,000,000
Chemical	Fire + explosion/VCE	Europe	125,000,000	300,000,000	425,000,000
Petrochemical	Fire + explosion/VCE	North America	90,000,000	275,000,000	365,000,000
Tank farm/terminal	Windstorm	Caribbean	210,000,000	57,600,000	267,600,000
Oil sands	Fire no explosion	North America	130,000,000	105,000,000	235,000,000
Refinery	Fire + explosion/VCE	Africa	40,000,000	180,000,000	220,000,000
Petrochemical	Supply interruption	Middle East	10,520,000	162,000,000	172,520,000
Refinery	Fire + explosion/VCE	Eurasia	83,500,000	83,500,000	167,000,000
Petrochemical	Windstorm	North America	50,000,000	110,000,000	160,000,000
Refinery	Windstorm	North America	128,600,000	11,400,000	140,000,000
Refinery	Fire no explosion	Asia Pacific	125,000,000	0	125,000,000
Petrochemical	Windstorm	North America	48,500,000	74,400,000	122,900,000
LNG	Windstorm	North America	118,000,000	0	118,000,000
Petrochemical	Faulty work/op error	North America	61,000,000	50,000,000	111,000,000
Refinery	Fire no explosion	Asia Pacific	100,000,000	0	100,000,000
Chemical	Mechanical failure	North Africa	3,000,000	80,000,000	83,000,000
Pipeline	Pipelaying/trenching	North America	65,000,000	12,000,000	77,000,000
Tank farm/terminal	Windstorm	North America	64,000,000	1,000,000	65,000,000
Pipeline	Windstorm	North America	10,000,000	52,000,000	62,000,000
Chemical	Fire + explosion/VCE	Europe	55,000,000	0	55,000,000
Oil sands	Fire + explosion/VCE	North America	53,112,000	0	53,112,000

**Our database has recorded no less than 22 losses in excess of US\$50 million in 2017**

Source: WTW Energy Loss Database as of March 1 2019 (figures include both insured and uninsured losses)

**Fig 6 – Downstream losses excess of US\$50 million to date, 2018**

Type	Cause	Region	PD US\$	BI US\$	Total US\$
Refinery	Fire + explosion/VCE	North America	500,000,000	705,000,000	1,205,000,000
Refinery	Fire + explosion/VCE	Europe	397,267,000	405,000,000	802,267,000
Petrochemical	Fire + explosion/VCE	Middle East	80,400,000	410,000,000	490,400,000
Refinery	Fire + explosion/VCE	North America	105,000,000	235,000,000	340,000,000
Chemical	Fire no explosion	Europe	42,500,000	112,500,000	155,000,000
Chemical	Ice/snow/freeze	North America	19,876,326	107,372,496	127,248,822
Oil sands	Supply interruption	North America	75,182,000	40,000,000	115,182,000
Chemical	Explosion no fire	North America	20,000,000	94,500,000	114,500,000
Chemical	Explosion no fire	Eurasia	47,000,000	59,000,000	106,000,000
Petrochemical	Mechanical failure	Latin America	10,860,000	92,500,000	103,360,000
Gas plant	Fire no explosion	North America	50,000,000	38,000,000	88,000,000
Refinery	Fire no explosion	North America	4,000,000	83,095,897	87,095,897
Tank farm/terminal	Collision	North America	13,150,000	41,100,000	54,250,000

**The 2018 major Downstream loss record, may not end up as severe as 2017 - but is still significant**

Source: WTW Energy Loss Database as of March 1 2019 (figures include both insured and uninsured losses)

## Profitability

Regardless of how 2018's figures will eventually play out, this level of loss activity, when combined with the reduced premium income pool affecting so many lines of business, has generated underwriting losses across the underwriting spectrum. From London to Miami, from New York to Dubai, from Zurich to Singapore the story has been the same – consistent underwriting losses which have brought Downstream portfolios all over the world under increasing scrutiny from regulators and management.

Figure 7 overleaf shows only Lloyd's figures, but there can be no doubt that the recent Incurred Ratios (premium income versus paid and outstanding losses) displayed in this chart are not only indicative of this class across the board, but may have also been exceeded by insurance company results elsewhere. 2017's Incurred Ratio of 90+% has now been followed by 2018's 60%, a figure which also signals another underwriting loss for the Lloyd's Downstream portfolio.

## Rating levels

No wonder underwriters are in an unforgiving mood, worrying about the effect that poor underwriting results for the last three years might have on the long term future of their own portfolios. Rating adequacy is therefore now their overriding priority, with double digit rating increases now the norm.

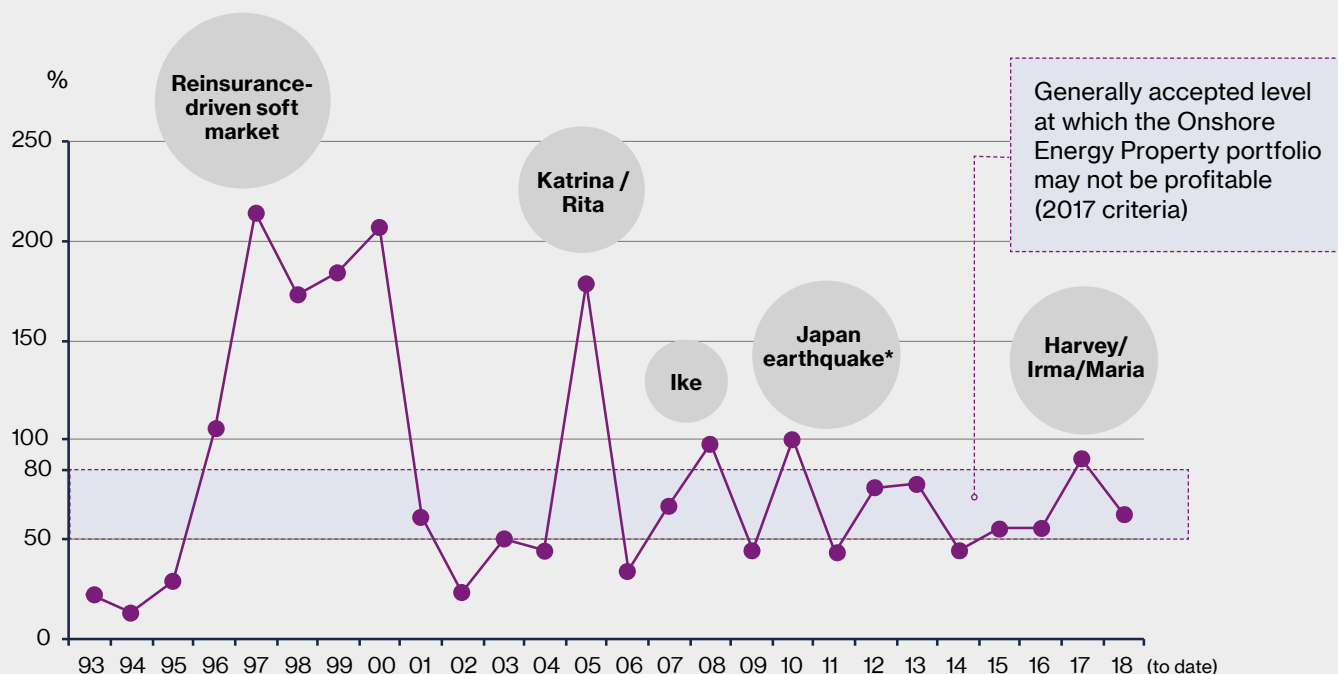
### Management pressures raise the bar

Encouraged by the first rating increases that they had ever negotiated towards the end of 2018, insurer management reaction has now been to encourage their underwriters to push for even higher percentage rating increases, as well as scaling back on unprofitable business.

This development has recently led to one extraordinary situation recently where one insurer's opportunistic renewal price for a primary US\$500 million limit was actually in excess of the full quota share price which the previous year's programme had been placed at.

**Fig 7 – Lloyd's Onshore Energy Property Incurred Ratios, 1993-2018 (as at Q4 2018)**

Incurred Ratios (Premiums v Paid & Outstanding Claims)



**Lloyd's Onshore Energy Property portfolio remains stubbornly in potentially unprofitable territory**

Source: Lloyd's Market Association Quarterly Loss Report Q4 2018 - Audit Code EF

\*Some Japan earthquake losses were claimed on programmes incepting in 2010

Furthermore, we are seeing a marked willingness from several insurers to walk away from business if their own terms cannot be agreed; in the previous softening era this was generally something that they were very reluctant to do in view of the loss of premium income that this would involve.

#### **Insurers differentiate in favour of quality business**

Of course, it is simplistic to talk about a simple percentage increase that is now applying across the whole Downstream portfolio. Although in general terms rating increases are at least in double digit territory, there are always exceptions to the rule, especially when it comes to the market's appetite for well-regarded business.

For example, we recently renewed one major Physical Damage (PD) only programme that had been heavily over-subscribed in the previous year for a smaller percentage increase than the norm, for the simple reason that its over-subscription in 2018 demonstrated that the rating increase could be limited to single digit territory. While the terms

offered by the leader were below their underwriting rating threshold, we saw several insurers actively consider this programme for the simple reason that they liked the risk and its associated premium income.

#### **Loss impacted programmes may be in serious trouble**

On the other hand, we are aware of some loss-impacted programmes that are finding it difficult to secure any interest at all from the market as insurers seek to scale back to their core business. As we mentioned in the Upstream section of this Review, those buyers that had sought out the best price in the previous softening market with scant regard to insurer loyalty are finding today's market conditions particularly challenging. We understand that in some extreme cases these buyers are having to settle for increases of as much as 100%.



### *The broker's challenge – putting it all together*

In this complicated underwriting environment, with insurers taking increasingly independent lines on rating levels, producing an overall “blended” rate is becoming increasingly challenging for brokers. With all vestige of a subscription market well and truly erased, brokers are having to use all their intelligence and expertise to access a range of different insurers and ensure that a consistent product is finally offered to the buyer.

### *A return to individual underwriting*

In summary, within the overall context of increasing rating levels there are a wide variety of possible outcomes to renewal negotiations. One trend that has been particularly noticeable is the re-emergence of underwriting each piece of business on its own merits, rather than applying a broad brush rating outlook to a variety of different risks within the Downstream portfolio.

### *Selling capacity for premium income?*

Furthermore, the Downstream market is now much more aware of the value of each dollar of underwriting capacity. Whereas in the past if brokers needed a small increase in line to get a particular programme home they could simply ask for a small increase from each insurer that was already participating in the programme, in 2019 insurers are quick to insist that either they are happy with their existing line or that any additional participation would have to come at a price.

### *Regional v central: no longer such a critical issue*

In previous editions of our Review we have often commented on the variation in underwriting approaches taken by the different regional markets participating in the Downstream portfolio. One of the interesting features of this hardening market has been the increasing centralisation of underwriting authority, as individual underwriters around the world respond to the same management diktats that apply globally as well as regionally.

### *Regional rating anomalies smoothing out*

As a result, while every generalisation has its exceptions, we are finding that roughly similar terms can be negotiated for a given programme from insurers across the world. Whereas once a major composite insurer could produce radically different terms in say Miami or Dubai compared to London, now we are finding this to be much less the case.

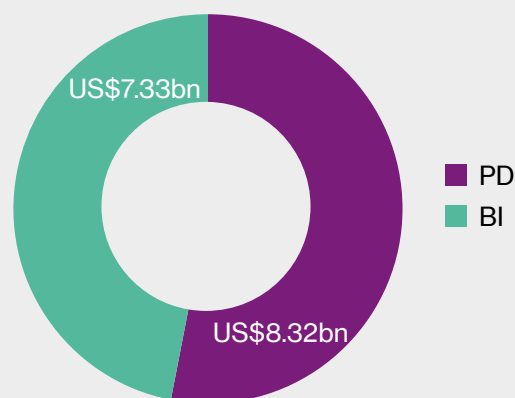
### *A more centralised market?*

Indeed in some regions such as the Middle East, we have seen a much more severe centralisation of underwriting authority, as some insurers have recalled their Downstream operations to London while others, such as Qatar Re, have ceased trading altogether. While any withdrawal of underwriting expertise is not yet in evidence in other major Downstream markets such as North America and Singapore, we are still finding that insurers in these markets are now producing terms which are relatively consistent with those offered by their London counterparts.

The major exception to this development is China where, as we reference elsewhere in the Review, the local insurance market continues to build its capability and to challenge the international markets competitively for Chinese business.

**Fig 8 – BI losses as a percentage of whole, 2015-18**

Downstream losses 2015-18 (Total: US\$15.65bn)



**BI losses are a worryingly high percentage of the total Downstream loss record over the last four years**

Source: WTW Energy Loss Database as of March 1 2019  
(figures include both insured and uninsured losses)

## The problem with BI

### *BI losses nearly half the total*

Figure 8 on the previous page shows the proportionate split of Downstream losses reported to our database over the last four years between PD and BI losses. It shows overall insured and uninsured losses, totalling approximately US\$15.6 billion, against an estimated global four year premium pool of approximately US\$8 billion. It can be seen that BI losses amount to nearly 50% of the total incurred – an alarming proportion of overall losses, given the extent to which BI is insured in the commercial insurance market (the insurance mutual OIL has always excluded BI from its risk transfer product).

### *Insurers on the hook – with no way out*

Given the rapid recovery of commodity prices evident during the last three years or so, it's easy to see why insurers are worried. At present, coverage for BI is provided for a specific indemnity period, typically 36 months, excess of a waiting period, typically 60 days. In the event of a loss, insurers agree to reimburse the buyer for the actual loss sustained up to the time limit stipulated by the policy, regardless of quantum.

### *Sheer quantum of losses has rocked the market*

What has alarmed the insurance market in recent years is that the actual losses sustained by the buyers (and successfully claimed under their insurance policies) have often been much greater than may have originally been envisaged, perhaps in part due to the rapid (and possibly unexpected) recent increase in commodity prices. As a result, the sheer quantum of BI losses has come as something of a shock, compounding the gloomy atmosphere in the market and attracting the urgent attention of senior insurer management. The result of the impact of these BI losses is therefore likely to be an even greater pricing upswing than for the PD element of the programme.

### *The insurers' solution - Actual Declared Value (ADV)?*

What might the market consider doing to dilute this upswing? One possible solution would be for future programmes to be placed on an ADV basis. Under an ADV policy, the buyer would calculate the overall annual revenue derived from the asset in question, taking into account the seasonal variations which are an inevitable feature of downstream energy operations. That annual number is then divided by 365 to produce an average daily indemnity amount. A reasonable margin – say 20% – is then applied, providing a reasonable degree of leeway and thereby reducing the possibility of under-insurance on the part of the buyer.

### *Providing certainty for the insurer...*

On this basis, the insurer is in a much more confident position – they will know that no matter what the actual indemnity value is at the time of loss, there is a maximum dollar limit in place in the policy which cannot be exceeded. As a result, the insurer will be more confident in providing cover while the buyer would be provided with sufficient BI cover at a reasonable price.

### *...but uncertainty for the buyer!*

Of course, this sounds wonderful in theory. But this solution would hardly be welcomed by the buyers. The big disadvantage from their perspective is that if their BI calculations are incorrect, then even a 20% leeway from the erroneous figure would not enable them to be indemnified correctly. It is difficult to suggest that any buyer would voluntarily submit to insuring on an ADV basis – unless they were sufficiently confident that the average BI daily indemnity declared at inception was accurate.

The reality is that a great many buyers, especially those that have not sustained losses recently, are unlikely to have the means or the wherewithal to transform their data collection recording methodology to the degree required to ensure pinpoint accuracy in the event of a loss.

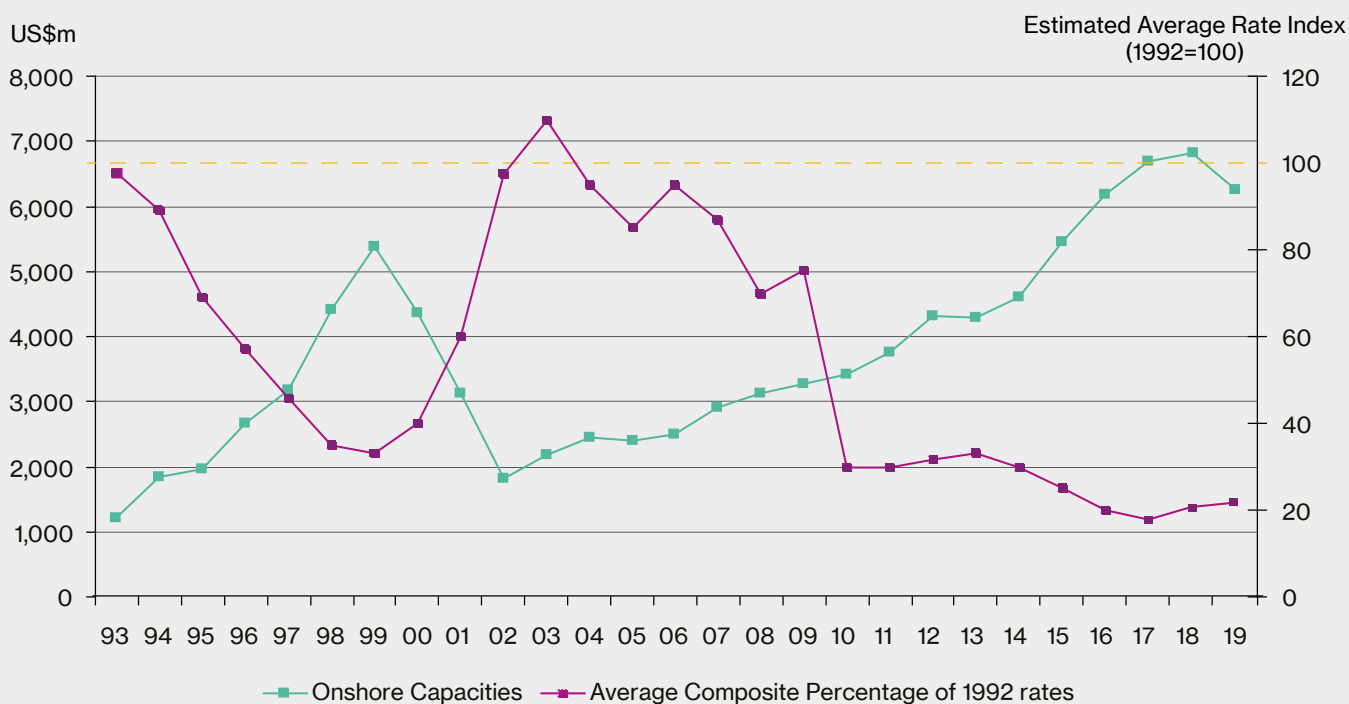
### *The broker's solution – better underwriting information from the outset!*

Like so many aspects of life at the end of this decade, data is increasingly king. Those buyers who have the ability (maybe with the help of their risk advisors or their engineers) to produce state of the art underwriting information, particularly with regard to their BI exposure, are likely to reap the benefit of limiting the current rating upswing, as well as ensuring that they will be properly indemnified in the event of a loss – without the need for punitive solutions such as ADV being imposed on them by the insurance market.

### *Might there be a knock-on effect on Contingent Business Interruption (CBI)?*

Be that as it may, given the current market conditions it is clear that pressure will continue to be brought to bear by insurers to reduce sub-limits for critical additional coverages such as CBI. One further advantage of conducting a detailed business interruption analysis as referenced above may therefore be that sufficient data is produced to persuade insurers to maintain existing sub-limits – or even increase them.

**Fig 9 – Global Downstream capacity versus estimated average rating levels, 1993–2019  
(excluding Gulf of Mexico Windstorm)**



**With the recent contraction in supply, the Downstream market is trying to recover – but from a 2017 floor of record low rating levels**

Source: Willis Towers Watson

## The outlook for 2019

Our final chart (Figure 9 above) shows the correlation between supply (total theoretical underwriting capacity) and average Downstream market rating levels over a 26 year period. It can be seen that usually prices drop as supply increases, but in by no means a uniform fashion. What is also clear is that the Downstream market is as historically volatile as its Upstream counterpart, although this has smoothed out significantly during the course of this decade as capacity has remorselessly increased year by year.

## Is this upswing really significant?

That is, until now. As we described at the beginning of this chapter, capacity levels are finally declining and rating levels are increasing. As a result, we are seeing a fresh dynamic on this chart – but what will this mean for the buyer?

Perhaps not as much as the insurance market would like to think. Our chart indeed shows that rating levels have increased – but if we read across from 2019 back to 1999, we see that the rates of twenty years ago – at the bottom of what was then considered to be one of the softest insurance markets of all time – were still some 30% higher than they are today. The modest rating increases imposed by the market today may be welcomed by the insurance community, but in the very long term they hardly amount to a significant volte-face in overall insurance market dynamics.



### *No return to past volatility*

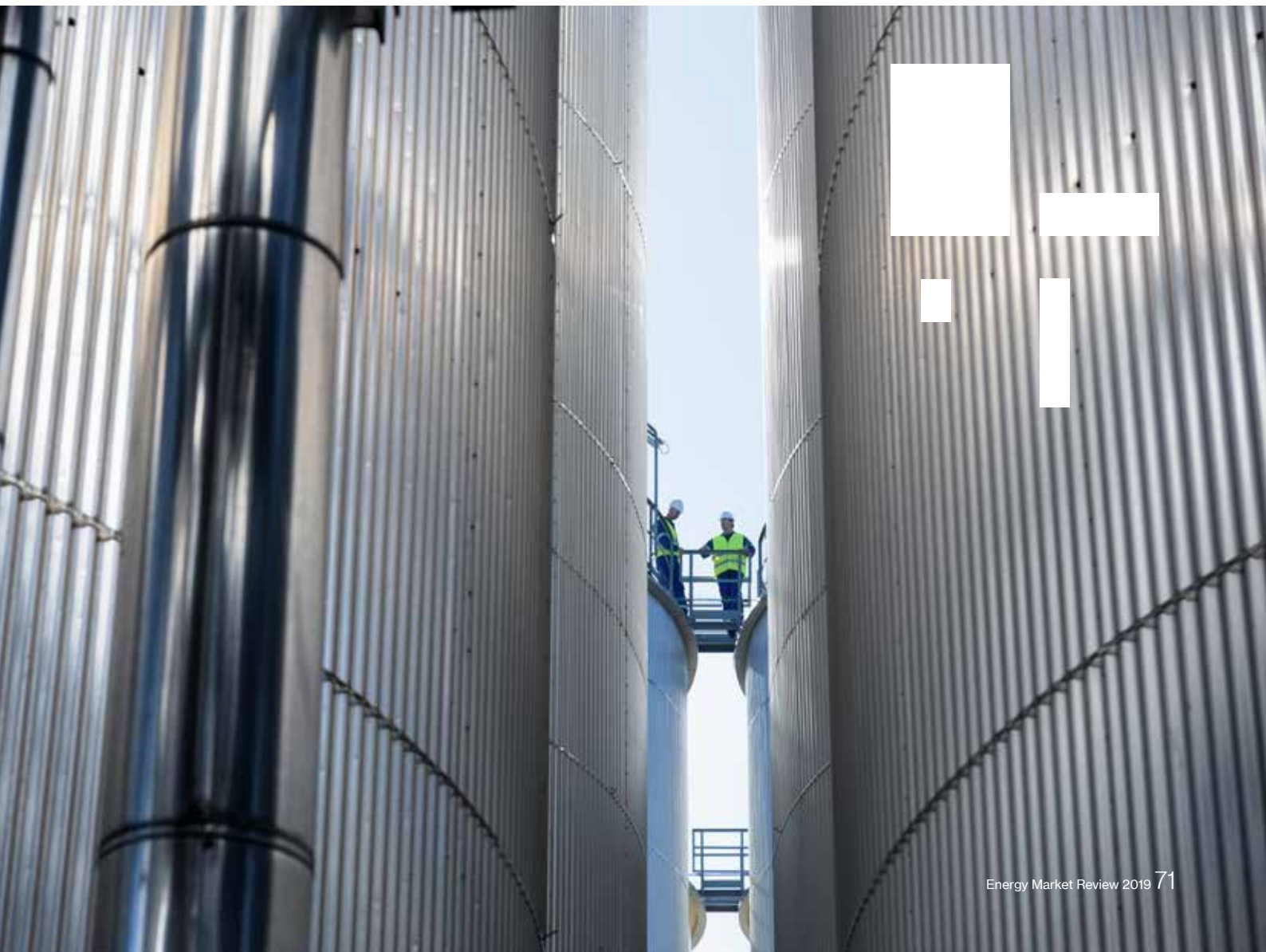
Our own view is that the recent decline in overall underwriting capacity levels is not set to increase significantly. The Downstream market can still offer at least US\$3 billion to most buyers, sometimes more with the help of regional capacity (see Figure 3 earlier). While it is true that the onward softening process of the last 10 years has finally been brought to a close, the Downstream insurance market still offers buyers excellent value for money.



**Steve Gillespie is Head of Downstream broking at Willis Towers Watson Natural Resources in London.**

One strategy which may prevent this from being the case in the future would be for buyers to carry on searching for optimum terms without regard for developing better and more detailed underwriting information or developing sound business relationships with key insurers. These insurers will no doubt be hoping that the actions taken to date will enable them to be still standing as we move into 2020. And if they are, then they will still be holding the advantage at this critical stage of the underwriting cycle.

*“While it is true that the onward softening process of the last 10 years has finally been brought to a close, the Downstream insurance market still offers buyers excellent value for money.”*





# Liabilities: undercurrents of change

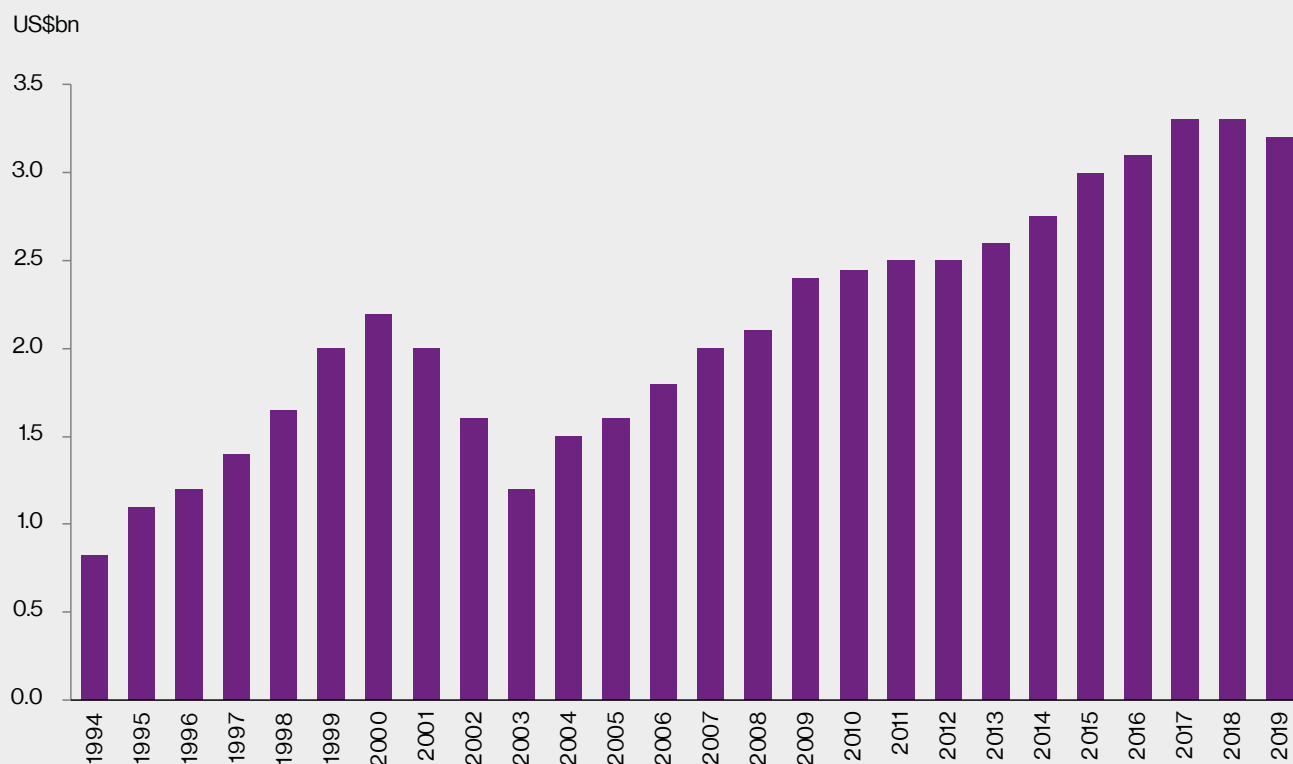
## International Liability

### Introduction - what lurks beneath?

Anyone who has learned to surf or is familiar with beach safety may remember an important lesson: the most dangerous rip currents lie beneath the flat water.

This is a particularly fitting analogy for the current state of the Liability market: superficially all is calm (as per Figure 1 below) - global Liability market capacity remains virtually unchanged at US\$3.2 bn and there were no dramatic changes to treaty reinsurance costs at Q1 2019.

**Fig 1 – Global International Liability market capacity, 1994 - 2019**



Source: Willis Towers Watson

### *Five undercurrents to beware of in 2019*

The reality is somewhat different. Beneath this relatively calm exterior, there are five undercurrents driving a strong change to underwriter sentiment:

#### **1. The Lloyds Performance Review/10th Decile**

**initiative<sup>1</sup>.** As described earlier in this Review, the Lloyds Performance Directorate has instigated a much more rigorous budget approval process for 2019, requiring syndicates to remediate the bottom 10% of their books and imposing premium income restraints on underperforming businesses. The net result: for many Liability syndicates, the volume of premium they are permitted to write in 2019 is less than the prior year and increases, where granted, are limited. While this does not show up as a change in their line size, and does not therefore affect total market capacity, the reality is that it is driving a much more selective approach, with syndicates letting go of less desirable programmes or books of business. The same approach has leached into London Company market insurers, many of which have parallel Lloyd's capacities, and are also seeking to remediate their books.

#### **2. Deteriorating loss ratios.**

After a period of relatively benign years, loss ratios are deteriorating, with claims from different casualty sectors impacting the results of many global carriers. In the United States, results for US Auto and Workers Compensation have been poor. More specific to the Energy and wider Natural Resources sector, there has been a spate of events in the past few years resulting in some significant pay-outs and loss reserves, most particularly relating to wildfires, tailings dams, pipeline pollution and Exploration & Production wells.

Moreover, over a period of years pricing has generally not kept pace with the inflationary increase in damages/awards; this slow "creep" is as bad, if not worse, than any single major event. Tied with the general release of reserves over recent years, this development means that there is now very little in the way of Incurred but Not Reported (IBNR) funds in the bank which will in itself begin to dictate underwritings direction for some.

#### **3. Investor activism.**

With the ever increasing focus on environmental concerns, insurers are under pressure from investor activists to demonstrate their sustainability credentials. This will increasingly dictate their underwriting appetite; as an example, certain carriers no longer insure oil sands/fracking activities, while others are not permitted to insure energy clients that have over a certain percentage of their activities related to fossil fuels.

While there is still sufficient capacity to cover the needs of most clients, we see this as an increasing trend which will put pressure on the availability of capacity for the less environmentally friendly natural resource sectors in the future. We predict a specialist market emerging to cater for these types of risk, which will provide continued solutions but may result in reduced market choice and capacity.

#### **4. Mergers and Acquisitions.**

The series of Mergers and Acquisitions over the past few years caused little immediate effect on capacity; however, some changes are starting to become evident as insurers strive for synergies. For example, one of the most notable developments in 2019 has been the closure of Ironshore's International Liability team, two years after its acquisition by Liberty Mutual, with a loss of US\$50m of capacity.

In the main, such losses have been offset by increases in capacity from some of the more strategic Energy/Natural Resources Liability insurers (such as Zurich and WR Berkley); as a result, top line market capacity has not been not dramatically affected.

#### **5. Retrenchment.**

Not only are underwriters scrutinising pricing and capacity, they are also reviewing how and where they participate on any given placement. We have seen a number of well-known major insurers reduce their primary line sizes (or pull out of primaries for certain activities altogether, such as pipelines and refineries). The days of a primary US\$100m layer being written by one insurer are long gone, as primaries become smaller and more prone to quota sharing. This represents a return to the old insurer's mantra that if there is a major loss, never be the only insurer on the placement. A positive outcome of the trend is that primaries are becoming more sustainable and less susceptible to the whims of a single insurer, who may change their underwriting philosophy at short notice.

*"With the ever increasing focus on environmental concerns, insurers are under pressure from investor activists to demonstrate their sustainability credentials. This will increasingly dictate their underwriting appetite."*

<sup>1</sup> <https://www.lloyds.com/market-resources/market-communications/market-bulletins/market-bulletins> (Y5232)



### *A sea change in market conditions?*

The net result of all these elements is a tangible hardening of conditions in the Lloyd's and London company market. Single digit percentage increases are the norm for renewals; for risks that are considered to be sub-standard, have poor loss ratios or are in a particularly risk exposed activity class (such as midstream/pipelines, electricity transmission in arid regions and tailings dams of a certain construction type) the renewal increases can be significantly larger.

The positive news is that much greater focus is now placed on risk quality, consistency and strength of client relationship. Buyers that can differentiate themselves by providing quality information, demonstrating good risk management practice and leveraging their long term relationships are able to obtain more preferential renewal terms than their peers.

### *Oceans apart*

It must be recognised that the rate of change varies in the differing regional Liability markets. In the Continental European market, conditions remain relatively benign whereas in Australia and Canada there are definite signs of similar hardening pressures as exhibited by the UK based markets. Whilst domestic buyers who purchase modest limits based outside these regions may be relatively unaffected by the above conditions, any major energy or natural resources industry client requiring substantial limits will need to be aware of these drivers and the changing market conditions.

### *Navigating the tide*

At every Q4 renewal season over the past few years there has been speculation about a potential hardening market, fuelled by natural catastrophe results, treaty costs etc. This is the first year that we have seen some tangible change in certain geographic sectors of the global Liability market.

This is not a cause for panic; more a cause for preparation. Many brokers (and indeed underwriters) may have never experienced a changing market. The right broker selection can pay dividends now more than at any other time in terms of having a strategy, knowing the right markets in the right regions, the ability to leverage their long

standing relationships and profile the client in the best way. From the provision of Authorisation for Expenditure values, methods of tailings dam construction, contractual exposures and the ability to articulate exposure changes, other than by just revenue, a technical approach to the renewal process has never been more important, as insurers seek greater understanding and justification for their underwriting decisions.

### *Summary - preparation is key!*

In summary, for anyone about to venture out into renewal waters: prepare well, pick your timing, have a plan and know your exit strategy. More than ever, a seasoned broker will be an invaluable guide to see you through the turbulence and bring you safely back to shore - without undue cost to life, limb or renewal budget.



***Mike Newsom-Davis is Head of Liability, Natural Resources at Willis Towers Watson in London.***

*“Many brokers (and indeed underwriters) may have never experienced a changing market. The right broker selection can pay dividends now more than at any other time in terms of having a strategy, knowing the right markets in the right regions, the ability to leverage their long standing relationships and profile the client in the best way.”*



## North American Energy Liability

### 2019 – the market begins to turn

The market for Energy Liability in North America, which had generally tried to find a way to correct years of premium softening and middling results in 2018, looks to be finding its way to do so in 2019. 2018's catastrophe losses to the market were not as pronounced as in previous years, but single events focused insurers on the ability for the class to sour insurers' expected results.

Insured exposures to the risks in the energy and natural resources industries continue to dominate Liability renewal discussions and outcomes. The market pushed very hard for renewal increases at the end of 2018 and at the start of the new year. Flat to single digit percentage increases were seen for clients with clean records and static exposure change, driven by:

- Strength/quality of insureds operations
- Exposure information
- Year over year changes
- Differentiation
- Quality of risk management
- Market relationships

Even buyers with reduced or reducing exposures could find the process not as might be expected, and insurer's clients with losses will see harder renewals.

Other than rate and premium increases, one may feel as if this is a repeat of the renewal process for a number of years; and there is not much evidence to refute this. Non-capacity risks will fare better than those requiring larger limits.

### Capacity – is \$25m the new \$50m?

Realistic Excess Liability capacity has shrunk as we have moved further into 2019; we believe this equates to about 10% less than that available in 2018. This arises out of certain insurers:

- Withdrawing their line for energy business
- Pulling back and waiting for the rating correction believed needed
- Reducing available capacity down from prior levels offered

This has been seen especially where total capacity is reduced from participants in merged or acquired transactions. We note that these actions apply to Liability markets considering North American Energy in Europe, Lloyd's and Bermuda, as well as to domestic North American markets.

### Developments in Lloyd's affecting the North American market

We have mentioned elsewhere in this Liability chapter the action Lloyd's has taken in the overall and granular performance review of its syndicates<sup>2</sup>. The attention given by Lloyd's to the poor underwriting results from certain segments has been embraced by a broader range of insurers, reaching as far as North America. In particular, we observe that some have curtailed or stopped underwriting Canadian Upstream and Midstream Energy Liability business (predominantly in western Canada), yet we also hear of other insurers believing that the hardening market conditions there presents an opportunity.

<sup>2</sup> <https://www.lloyds.com/market-resources/market-communications/market-bulletins/market-bulletins> (Y5232)



### *Loss experience*

While the North American loss experience within the Liability market was not marked by numerous high impact events in 2018, the number of initially smaller losses seems to be increasing in quantity and size, hastening the erosion of underwriting results. However, large catastrophic losses in 2018 have impacted initially a broad number of Liability underwriters, magnifying the perceived inadequacy of rating and pricing, particularly in this class. Underwriters continue to monitor Energy exposures relating to pipelines, rail, increased onshore drilling and the concomitant commercial automobile usage. The risks of most concern appear to be those arising from the trimming of sustaining capital expenditures as well as delayed maintenance and turnarounds and of course the risk of loss from cyber failure/attack. Buyers have to present what each is doing with respect to environmental governance, clearly outlining their approach to sustainability. Liability insurers will now inevitably focus on the buyer's discipline in this area.

### *Legal developments arising from Joint Venture losses*

In 2019, the market will have to deal with the recent Texas Supreme Court decision regarding the treatment of defence costs incurred in connection with a loss sustained arising from a Joint Venture<sup>3</sup>. Pertaining to the April 20, 2010 Deepwater Horizon disaster, the Court maintained that while the Excess Liability wordings available to one of the joint venture partners involved with the operations of the Macondo field did scale the limit/amount of liability payments payable from insurers, the same expected scaling did not apply to certain defence expenses incurred by that partner (see *Anadarko Petroleum Corporation v Houston Casualty Company, et al.*).

The case is understandably complex, but even now insurer expectations are that the wording is meant to scale the applicable limit for all indemnity and defence. Insurers are loathe to admit their wording could be taken any way other than scaling all recoveries; this decision will likely precipitate a review, with the outcome a change to the London market wording or a completely new Liability form/policy for energy risks. The reaction may also involve changes within wordings pertaining to other lines of coverage.

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<sup>3</sup> *Anadarko Petroleum Corporation v Houston Casualty Company, et al.*



## Marine Liability

### Increased M&A activity

While 2018 closed with incumbent insurers no longer willing to offer discounts unless there was a clear reduction in exposure, the threatened market reaction to a background of historic low rates, combined with an acknowledgement of the scale of losses from the 2017 hurricane season and certain shipyard accounts, was seen in some, but by no means all, lines of business. This continuing pressure on profit margins led to an increase in M&A activity during 2018, with AIG, Axa, Hartford, Axis and China Re all making headline acquisitions.

### Withdrawals prompted by Lloyd's PMD

Lloyd's PMD ensured that the 2019 business plans of all syndicates were strenuously analysed. In order to be given permission to trade in 2019, many managing agents chose to either exit from or shrink certain Marine lines, including the Standard Syndicate, AmTrust, Barbican and Advent.

### More turmoil ahead – but are rating increases justified?

As we move into 2019, while the market would like to give the appearance of being leaner and fitter, RSA's announcement that they are placing their Logistics and Port & Terminal portfolio into run-off<sup>4</sup> indicates that there is some potential turmoil ahead. But even with a background of continuing low investment returns, increasing exposures and loss costs (such as those related to removal of wrecks), we believe that rate increases for well-performing Liability placements are still hard to justify. Despite this, we believe that most of the Marine portfolio will see some level of increase in 2019.

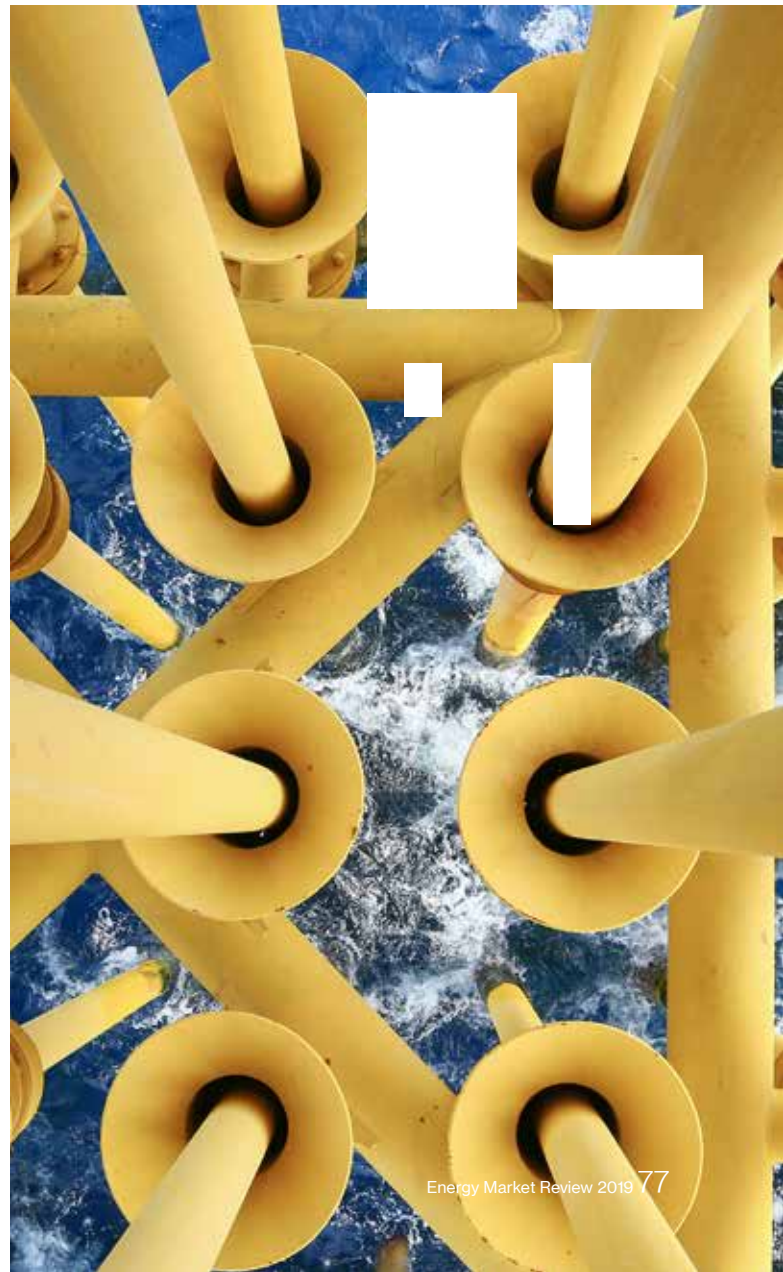
Renewals for Port/Terminal Property and associated exposures will, more than ever, be influenced by location, record and quality of risk management - all things being equal:

- clean/non-Natural Catastrophe (Nat Cat) exposed locations should expect flat to 5% rate rises;
- clean Nat Cat exposed locations should expect 2.5% to 12.5% rate increases; whereas
- those locations that have been hit by the 2017/18 Nat Cat events will be viewed on a case by case basis.



**David Clarke is an Executive Vice President for Willis Towers Watson's Liability practice based in New York.**

*"The threatened market reaction to a background of historic low rates, combined with an acknowledgement of the scale of losses from the 2017 hurricane season and certain shipyard accounts, was seen in some, but by no means all, lines of business."*



<sup>4</sup> <https://www.rsabroker.com/system/files/Ports%20%26%20Terminals%20Solutions%20Fact%20sheet.pdf>

## Environmental International Liabilities (EIL)

The global EIL market in 2019 remains a niche sector across the world. London is the main centre for underwriting of such risks outside of the USA, while additionally there are well developed markets in Australia and the EU. Capacity continues to be readily available within the EIL sector, with 16 insurers now offering EIL products alongside conventional lines (Casualty/Property/Marine/ Financial Lines). £250m of capacity is readily available in the London market.

### *Recent Brazil tragedy highlights potential environmental risk for energy companies*

Environmental incidents are continuing to occur around the world; many remain uninsured if they are caused by gradual pollution or are as a result of legacy issues. The human tragedy following the recent dam failure in Brazil overshadows the clean-up obligations that will follow this disaster. It also highlights an urgent need for business around the globe to consider how legacy liabilities can affect future business performance.

Per- and Polyfluoroalkyl Substances (PFAS) are becoming a pollutant of concern and we are expecting to see this excluded from future placements as the negative effects of this compound are investigated further.

### *Market news*

Recent developments in the EIL market in London can be summarised as follows:

- Axa's merger with XL Catlin has created the global mega carrier AXA XL and we are already seeing the symbiotic effects of the merger in the development of a very strong underwriting practice in London and across the world.
- CFC Underwriting Limited has opened an Environmental desk under the expert guidance of Wayne Harrington.
- Allianz have added to the team in London, with Kate Carret joining from QBE. Chris Strong continues to lead with pragmatic expertise.
- Channel Syndicate have boosted their team following the flagship hire of Nick Bennison from Marsh and they have now added three underwriters to further drive the growth of this vibrant Lloyd's Syndicate.

## *Evolving legislation around the world*

EIL is still the niche sector it has been for the past 30 years but we are seeing legislation evolve at an increasing rate in recent years:

- Biodiversity and Natural Resource Damage (NRD) is one element of coverage that is now commonly being included in legislation outside of the USA and EU. It is a common principle in Australia and New Zealand and has been for nearly a decade.
- The development has been the assumption of NRD into law into the Asia Pacific region and parts of Africa.
- Mexico and Columbia are two countries where EIL insurance has become a fundamental component of operational permits.
- M&A activity in the UK energy sector is buoyant but many projects are being delayed or deferred until the Brexit position is finalised.



***James Alexander is Environmental Practice Leader for Willis Towers Watson responsible for developing the practice in London.***

*“Environmental incidents are continuing to occur around the world; many remain uninsured if they are caused by gradual pollution or are as a result of legacy issues. The human tragedy following the recent dam failure in Brazil overshadows the clean-up obligations that will follow this disaster.”*



# Construction: drama in the market

## Introduction

### *Drama in the market!*

For an industry known for its slow pace of change, the last few months has seemingly rewritten the rulebook in the Construction insurance market. In about of pre- and post-January 1 turmoil, there have been large scale withdrawals from writing Construction business and there is the potential for more to come. And just recently, we have had the impact of two major LNG construction losses emanating from Darwin, Australia to digest.

### *Some context*

It is important to examine the context and recent history of the Construction market to help make sense of what is playing out before us. The insurance market had grown strongly over the past 10 years, with plentiful capacity provided by a mix of traditional and new carriers, supported by capital markets looking for solid returns from new growth areas. Not surprisingly these dynamics, when taken together, did result in a soft market; however, insurance is very cyclical. While for many younger underwriters a hard market is something that they have not yet witnessed, for the more experienced practitioners it creates an opportunity to demonstrate their unique, stand-out skills in challenging conditions.

## The catalyst for change

### *HIM and California wildfires*

The first winds of change (literally) arrived in 2017 with hurricanes Harvey, Irma and Maria (HIM), together with unprecedented number of typhoons in Asia. Insurers very quickly implemented rate increases for construction projects in the affected areas but with no discernible changes outside of these geographies. In fact, outside of those affected by region, the international Construction market had not seen any tangible change in rates or conditions for many years.

Understandably, these losses, together with the claims produced by the California wildfires, prompted insurer and reinsurer reviews across the highlighted regions and it became clear that further sizeable claims would cause significant financial difficulties for some insurers.

### *Lloyd's review*

While many insurers and Lloyd's syndicates were relieved that they missed the large losses, it prompted a more stringent business review from Lloyd's across all of its affected syndicates<sup>1</sup>, referred to extensively elsewhere in this Review. In some cases, this has now been extended to all insurance classes.

### *Technical losses*

More significantly has been the notification of a number of technical losses and potential claims that were reported during 2018. Estimates vary from US\$5 – 7 billion and range in type, from collapses in hydroelectric dams to the latest LNG losses referenced earlier.

<sup>1</sup> <https://www.lloyds.com/-/media/.../i...reviewer/market-presentation-may-2017.pdf>





## Today's Construction market

### *Biggest change in market conditions for decades*

These claims, together with changes in underwriting practices at many of the global Construction markets as well as stricter legislation in Lloyd's, has produced what has been described as the biggest changes in the Construction market seen for decades. Many of these insurers do not consider a 5% to 10% rate increase across the board to be sufficient; instead, they are adopting not only a short term strategy of rate and deductible increases, but also a longer term plan of coverage restrictions and a more sustainable underwriting approach to increase profit margins rather than just rely upon premium income.

### *The "Exiteers"*

Over the past few years any adjustment in capacity has mainly been through mergers and acquisitions that have occurred between companies; for example, ACE and Chubb and XL Catlin and AXA. However, lately we have seen more dramatic reductions through the closure of certain Lloyd's syndicates (Beazley, Hardy, Talbot) who have left the Construction sector due in part to changes in Lloyd's governance. Tokio Marine & Nichido Fire Insurance Co. Ltd., in Japan, that owns the Lloyd's syndicate Kiln, was the first insurer to re-structure its construction underwriting, severely changing its appetite in the sector with a major reduction in capacity and closure of underwriting operations in Singapore. Qatar Re, a wholly owned subsidiary of Qatar Insurance Company, exited the sector as quickly as its original entrance, lasting only 18 months.

### *Further cuts to underwriting capabilities affecting other major hubs*

In addition, other major changes are occurring and it is almost hard to predict when and where this situation will ever end. At the time of writing major insurers at Starstone, RSA and Zurich have made serious cuts to their underwriting activities, reducing their capacity, reducing their appetite for certain risks and have even taken the more disappointing strategy of reducing resource through redundancies or asking key staff to re-apply for jobs. All of the market changes have also had a major impact in a complete change of profile at regional hubs that have played a big part in the last five years, notably Dubai, Singapore, Sydney and, more recently, Miami.

### *The “Remainers”*

On a more positive note, there are new insurers that have emerged, notably Aviva who started writing International Construction business in 2018, Berkshire Hathaway who have also opened up a London operation and Rokstone, an MGA writing on behalf of other insurers.

Furthermore, in an ever – developing world investment in new construction projects will always be high on the agenda of national governments, both in developed and developing regions. The recent increase in oil prices, together with a “must have” need for better infrastructure and transportation, will always require solutions and protection from losses that may affect the financial dynamics of this investment. It is therefore important to appreciate that key underwriters, such as Munich Re, Swiss Re, Allianz, SCOR, AIG, Chubb and Starr, remain committed to providing Construction-related insurance products, despite the potential for tough negotiations on terms and conditions compared to the last ten years.

In addition to those markets who have remained involved in the sector, other dynamics are still very relevant, such as the high capitalisation of certain markets such as Japan, Korea and, more significantly, China. It is also considered by some that the original underwriting centres of excellence in London, Munich, Zurich and Paris will be playing a more centralised role in order to provide more coordination and governance around underwriting strategies.

### *The future*

#### *Challenging conditions set to remain throughout 2019*

During 2019 we believe that the current market volatility will be sustained; underwriting guidelines will continue to be strictly controlled by both the leading treaty reinsurers and the senior management of each insurer, given the overall desire for improved, more sustainable returns. There is no question that the recent closures and restrictions in underwriting have cast a shadow over the Construction insurance industry and the concerns over more closures cannot be under-estimated.

### *Reduced capacity*

The global market capacity for Construction has reduced as a result of this volatility, with an estimated PML capacity now standing at approximately US\$4.25 billion. This is still more than sufficient to accommodate most PML requirements, except for some of the increasing natural resources industry projects such as Liquefied Nitrogen Gas (LNG) plants and other petrochemical assets.

### *More focus on coverage*

We also predict more focus on coverage, with a tightening of conditions; deductible levels are also expected to increase to a level that might require the managing buyers' expectations; all on top of anticipated rating increases of up to 25% over the next 12 months. However, the major reinsurers that have historically provided lead positions and major capacity for the construction industry will undoubtedly continue to do so, although the recent depletion of underwriting capability at Zurich should be seen as a serious possibility that could occur to any such insurer.

### *How long...?*

The big question is: how long will the market continue to harden for? Low interest rates in the financial sector have already seen new capital enter the insurance markets as a more viable form of investment. With rates increasing, should investment returns from other financial sectors remain unstable, it is a strong possibility that this capital will help feed capacity. This might result in a more competitive market and then the cycle could change once again.



**David Warman is Deputy CEO & Global Construction Practice Leader at Willis Towers Watson in London.**

*“There is no question that the recent closures and restrictions in underwriting have cast a shadow over the Construction insurance industry and the concerns over more closures cannot be under-estimated.”*





# Terrorism & Political Violence: is your cover still appropriate?

## *Terrorism and Political Violence activity*

The majority of attacks and events in Europe and North America have occurred in city centres, where mass casualties or government protests have been the target rather than infrastructure. However, acts of violence and terrorism against energy facilities are not new - the majority of attacks continue to be seen in Africa, Central Asia, Latin America (namely Colombia) and the Middle East where historic and on-going conflict continues. However, in the last few years the attacks have taken on renewed significance, especially for oil processing and distribution facilities, as key oil-producing regions have increasingly become destabilized by conflict and civil unrest.

## *More capacity for Liability and Political Violence risks*

After years of considerable growth, capacity for Terrorism Property within the global insurance market has remained relatively stable at circa US\$4.5 billion; however, in the last few years, market capacity for the additional perils of Terrorism Liability and Political Violence has seen growth to circa US\$1.9 billion and US\$1.7 billion respectively. During this time, further and rapid growth in capacity has been witnessed for Cyber Terrorism Physical Damage to circa US\$600 million as well as Chemical, Biological, Radiological and Nuclear Terrorism to circa US\$1.3 billion<sup>1</sup>. It is, however, now the case that the capacity growth in these additional perils is beginning to flatten and stabilise in line with the overall Property Terrorism market capacity.

## *Minimal impact of Lloyd's closures on Terrorism market*

The performance reviews and additional scrutiny of business plans undertaken by Lloyd's at the end of 2018<sup>2</sup> resulted in some syndicates closing their Marine or Property lines. Whereas some markets' Terrorism treaty cover may have previously been purchased alongside these classes in combined treaties, the impact on the Terrorism market as a result of these closures has been minimal due to alternative combined treaty programmes being available to roll Terrorism treaty coverage into. The reviews also did not have any major impacts to direct market capacity, with only two syndicates, being Advent 780 (whose Terrorism team were acquired by BRIT 2987) and The Standard 1884, put into run-off. In addition, AIG's Terrorism capacity is not expected to greatly reduce in 2019, despite reducing their line size in other classes. However as AIG continue to tighten underwriting principles we expect that their capacity will not be as easily available for those more challenging risks and long term agreements.

## *Pricing update*

In line with the minimal impact of the Lloyd's and AIG performance reviews on capacity, rating and pricing, we do not expect to see any dramatic change through 2019. Generally reductions are being negotiated, but only to about 5%; however, rates are increasing in line with the heightened risk in certain countries and regions where stabilisation and security is deteriorating.

<sup>1</sup> Source: Willis Towers Watson

<sup>2</sup> <https://www.lloyds.com/market-resources/market-communications/market-bulletins/market-bulletins> (Y5232)



The Terrorism and Political Violence market has continued to experience losses in the energy industry, although the majority are deemed small and not catastrophic. While these losses continue to be paid and may have some impact on renewals for those directly affected insurance buyers, this is not expected to have any major impact on general market capacity or pricing, other than as a result of the changes caused by any shift in the security environment in those regions.

### ***Is your cover still appropriate: insurance considerations?***

It is clear that the energy sector remains a key target for Terrorism and Political Violence as it remains vital to infrastructure globally. As the market and the risk landscape continue to change, insurance buyers in the energy sector should consider whether the coverage they currently purchase is appropriate. This includes, but is not limited to, whether buying through government pools provides sufficient coverage for the risk presented, or whether a full standalone Terrorism and Political Violence policy or Difference In Conditions/Difference In Limits/Excess policy would provide more appropriate coverage. The flexibility to alter limits and deductibles, compared with “All Risk” property coverages, where other losses and different risk factors may force higher retentions or provide blanket limit levels that may not be applicable to specific Terrorism and Political Violence perils, should also be considered.

### ***Is your cover still appropriate: cyber-attack considerations?***

In addition, insurance buyers should consider whether the perils they currently have coverage for are appropriate for the changing risk environments in which they operate. Cyber terrorism remains a headline topic for the Terrorism and Political Violence market, especially within the energy sector; trying to establish whether the cyber peril is best suited within this marketplace given that focus remains on only responding to resultant physical damage following a cyber-terrorism event.

While market capacity has rapidly grown in recent years, it is still not as readily available or as broad in coverage as insurance buyers would hope. In general, insurers will only cover a cyber-attack that fits the standard market definition of Terrorism in that it has to be politically, religiously or ideologically motivated with no coverage for other malicious cyber-attack.

Nevertheless, one consortium of Lloyd's Syndicates has for the last few years continued to offer US\$200 million of primary capacity for PD and BI following malicious cyber-attacks whether or not politically, religiously or ideologically motivated - specifically focusing on the energy, power and heavy industry sectors. This consortium can also extend its coverage to include similar extensions as may be found in the more traditional cyber insurance market, including Business Interruption in the absence of physical damage along with mitigation expenses and guidance, incident response and extortion coverage, and legal liability coverages.

While insurance buyers may already have some coverage for cyber-attacks under their “All Risk” property insurance policies (although blanket Terrorism exclusions may apply) and can also obtain coverage under a “stand-alone” Terrorism insurance policy, they may want to consider exploring such an alternative for additional certainty and breadth of coverage.



***Amelie Keeble-Buckle is an Associate Director in the Financial Solutions - Terrorism & Political Violence Practice at Willis Towers Watson.***

***“As the market and the risk landscape continue to change, insurance buyers in the energy sector should consider whether the coverage they currently purchase is appropriate.”***



# International insurance market round-up: differing drivers

## Beijing

### *Upstream – a competitive market, but watching international developments*

We are likely to see a modest increase in Upstream capacity levels in 2019, due mainly to increased participations by a handful of Chinese insurers. Some Chinese insurers have improved their Energy reinsurance treaties while others are taking reviewing their Upstream portfolio expansion strategy. The Chinese market now can offer approximately US\$450m of capacity available for risks with Chinese interests; otherwise the realistic amount of capacity available is severely reduced. Lloyd's China also has the ability to increase the overall capacity level. The majority of Chinese Upstream insurers can offer underwriting security at Standard & Poor's (S&P) or above.

Rating levels offered by the Chinese Upstream market are generally slightly more competitive than international markets. However, they are very keen to follow the hardening trend globally although it is still possible that their portfolio will be profitable for the last fiscal year.

Some insurers may well be feeling the effects of a reduced premium income pool during the course of the Q1 2019 renewal season. However, at the time of writing it would be misleading to suggest that the entire Chinese market will continue to be competitive in terms of rating and price levels; they have one eye firmly on developments in the international market outlined elsewhere in this Review.



**Su Ke is Deputy Head of the Energy Department, Willis Towers Watson CRB China.**

### *Downstream – becoming more cautious in light of recent typhoon losses*

Underwriting capacity in the Chinese Downstream Market remains abundant in 2019, as there was little change in terms and conditions of non-marine reinsurance treaties during the January 1 renewal season. A recent placement of a major complex shows the total working capacity of major insurers has increased – as much as RMB 40 billion (US\$5.89 billion) on a Total Sum Insured basis.

General rating levels for Downstream business in China are lower than other countries in Asia. Rating reductions are still possible due to the degree of competition between markets and brokers and the buyer desire to control costs.

Meanwhile the underwriting philosophies of some of the major players have slightly changed to become more cautious following several typhoon losses in 2018, but only for the provinces affected, for example Guangdong. For refining and petrochemical risks, the focus has switched to underwriting profitability rather than pure premium income generation.

For complicated placements, more buyers (including cedants) are now more aware of the need to seek assistance from brokers and consultants.

**Eric Wang is Head of Downstream Energy, Willis Towers Watson CRB China.**



## Dubai

### *Refocussed appetites*

The Middle Eastern reinsurance market for oil and gas business has undergone a process of change throughout 2018 and beginning of 2019, with many reinsurers refocusing their appetite towards risks of this nature as a consequence of poor underwriting results in the sector (regionally). These regional results, compounded by insurers' wider natural catastrophe experience further afield, has impacted what has been a competitive market place for a number of years.

### *Tighter underwriting discipline*

As with other regional marketing hubs, the general shift away from market softening and tighter underwriting discipline has become a dominant factor of the Middle East reinsurance market. However, the Middle East remains a key reinsurance market place, despite some of the trends mentioned herein.

### *Back to the centre as run-offs increase*

A number of reinsurance branches across the Dubai International Financial Centre (DIFC) and wider Middle East have refocused their efforts back to centre in terms of underwriting authority following a number of high profile Energy losses in the region and a general change in attitude toward the Property & Casualty and Energy appetite in the region.

Reinsurers and reinsurer branches in run-off in the region include but are not limited to HDI Bahrain branch, Aspen Re DIFC, Partner Re DIFC, Qatar Re DIFC and Lloyd's Talbot DIFC. However, the region has been bolstered by ratings movements for reinsurers, including Trust Re and ARIG.

### *Retrenchment of capacity*

Whilst new capacity has entered the fold including Berkshire Hathaway Specialty Insurance (BHSI) in Dubai, retrenchment of Energy capacity from the region has taken place to a degree with the reinsurers mentioned above participating widely on energy risks in the region. This has led to brokers having to actively replace double digit percentage of incumbent capacity.

### *Selective underwriting approach*

Added to the exit of capacity from the region, for the capacity which remains (which still remains a key reinsurance marketing hub) there exists a more selective underwriting approach amongst the reinsurers and in some cases authority for the Energy sector sitting within Head Office rather than branches in the Middle East and further afield. This results in risks being referred from branch underwriters to their respective levels of authority in London, Europe or the US.

### *Focus on risk quality*

Risk quality remains a key theme in this marketplace, where increasingly, detailed underwriting information, not limited to up to date risk engineering, and an active risk recommendation strategy focussed towards progression of recommendations amongst clients, have become a pre-requisite for underwriters to view risks from this sector positively.

All of these factors put a greater onus on brokers and clients in terms of the access point for reinsurance capacity, be it regionally through the DIFC and Middle East market or through traditional marketplaces such as London.



***Will Peilow is MEA Regional Leader, Downstream Natural Resources GB at Willis Towers Watson.***

*“The Middle Eastern reinsurance market for oil and gas business has undergone a process of change throughout 2018 and beginning of 2019 with many reinsurers refocusing their appetite towards risks of this nature as a consequence of poor underwriting results in the sector.”*

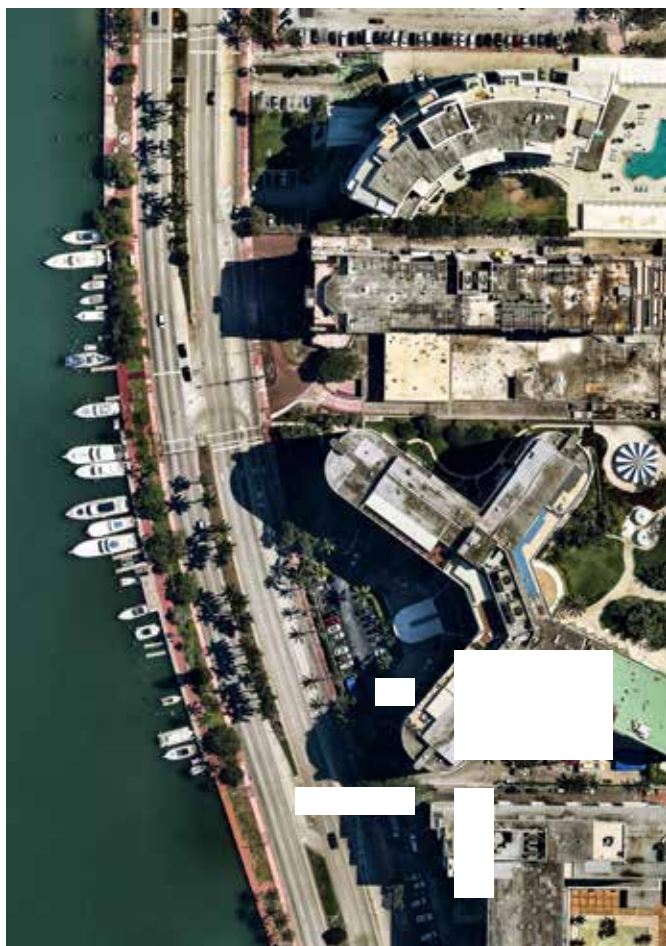


## Miami

### *Reduced Lloyd's footprint*

The composition of the main Downstream markets in Latin America/Miami remain pretty much unchanged. Interest in the value chain all the way up to midstream risks is available, with more appetite for the latter. The Lloyd's outfits that are represented in the region have either reduced their participation or are no longer writing these risks. Programs will continue to be placed with a mixture of regionally available capacity and the London markets; the mix will depend on complexity, exposure and client preference. Upstream risks will more likely be placed via London, as regional and Houston markets will offer reduced capacity, especially for Offshore risks.

As in other regions, the general trend among leading markets is to push for rate increases, driven mostly by global trends than by the specific results of their regional Downstream portfolio. Programs requiring capacity above US\$500 million have experienced increases, even with loss free records. Other terms and conditions have remained unchanged and for now clients are tending to compromise on price rather than looking at alternatives such as modifying their terms and conditions.



### *AIG reopen Miami energy operation*

The overall regional underwriting philosophy remains in sync, with global direction set out by different insurers. The major exception is AIG, which has reopened their Miami operation following the acquisition of Talbot; however, its capacity level and market appetite remains to be seen. Meanwhile Axa Corporate Solutions has recently signalled its interest in the Downstream class.

### *More volatility expected in Downstream*

As fundamentals in the Latin American Oil & Gas sector remain strong and the industry continues to expand, the insurance market dedicated to these segments is expected to have a dynamic 2019. With clear Upstream opportunities in Brazil, with the next round of Pre-Salt blocks, as well as Argentina with Vaca Muerta, the market can expect increased activity. Colombia and Mexico should continue their modest investment in the Upstream sector. However, in the Mid-/Downstream arena, we should expect some increased volatility in the market.



**Mark Kabierschke is Energy Regional Industry Leader, Latin America at Willis Towers Watson.**

*“As in other regions, the general trend among leading markets is to push for rate increases, driven mostly by global trends than by the specific results of their regional Downstream portfolio.”*

## New York

### *Supply contraction evident in US market*

US Energy market capacity is stable, but could be viewed as contracting as markets are reducing their shares and a couple of insurers have withdrawn from the market. Rating increases are at least at single digit level for every programme; accounts with natural catastrophe exposures and/or losses need to be negotiated firmly to obtain reasonable renewals as insurers' opening prices are starting from a very high level by recent underwriting standards.

There has not been much change in underwriter movements/ or underwriting philosophy; in any event, "line underwriters" are powerless to make decision beyond a certain point. Many final decisions on renewals are being elevated to higher and higher levels within the insurer hierarchy, often ending up with the Global Head.

### *A more consistent market later in 2019?*

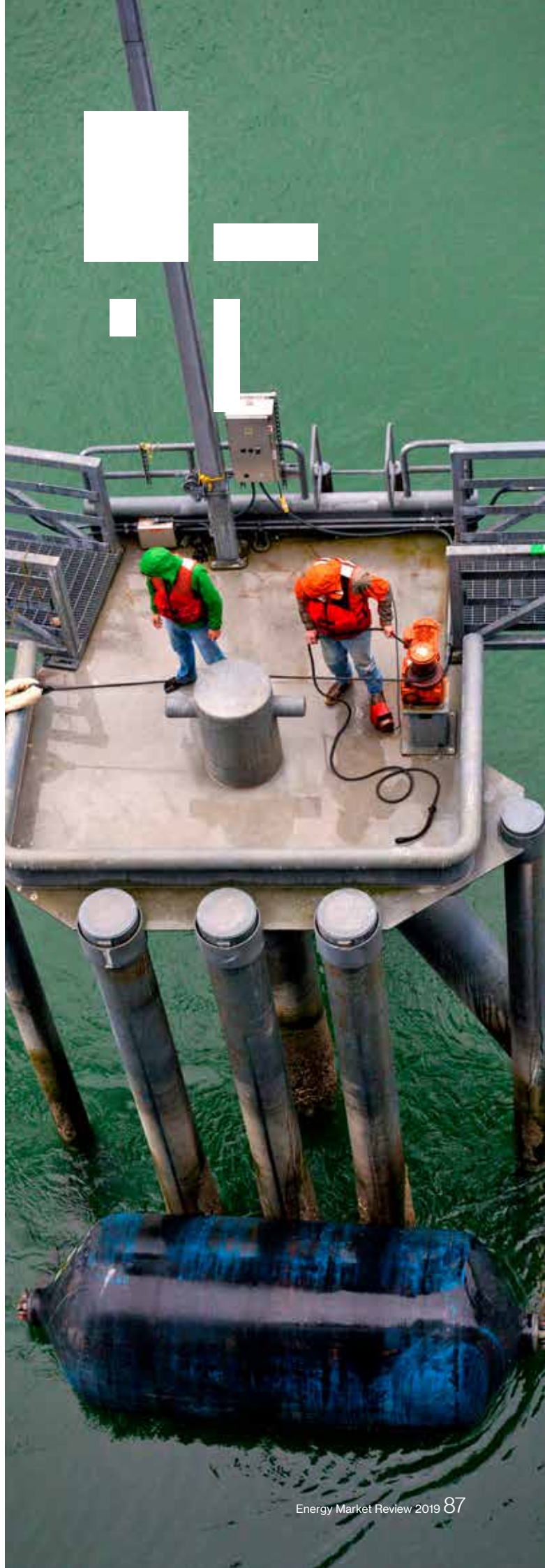
In terms of the outlook for the remainder of 2019, we believe we may see a more consistent market in second and third quarter of this year. In their enthusiasm for change, some insurers may have "pushed too far" in the early going and have lost a significant proportion of their market share. If this trend continues we may see the rate of market hardening flatten out and a reduced number "edicts" from senior management.

Meanwhile buyers continue to look to analytics and modelling to assist in differentiating their programme in the insurance markets. Relationships still matter, as do face to face meetings.



**Paul Chirchirillo is Head of Chemicals and Downstream USA at Willis Towers Watson.**

"Rating increases are at least at single digit level for every programme; accounts with natural catastrophe exposures and/or losses need to be negotiated firmly to obtain reasonable renewals as insurers' opening prices are starting from a very high level by recent underwriting standards."





## Oslo

### *Increase in Upstream capacity accessed through Norway*

The Upstream market capacity which can be accessed by our Nordic network of offices increased during 2018. Our estimate of the theoretical maximum capacity which is accessible directly by our Nordic offices for any one risk is US\$3.5 billion, including locally based Managing General Agents (MGAs) underwriting on behalf of Lloyd's syndicates.

### *Gentle hardening evident in Nordic markets – but upswing may be less pronounced*

Notwithstanding this, the status quo for 'clean', like-for-like renewals is flat to +5% rate increases, with +2.5% increases typical at the time of writing for the very large programmes (perhaps a touch more for clients with a more modest premium spend). In general, the Nordic markets offered more modest reductions during the recent prolonged softening market, and our expectations are that on the flip side of the coin, if we are to witness a period of hardening, any rate increases will also be more modest and slower to be introduced when compared to the London market.

### *Beazley close Oslo office*

In terms of underwriter movements, after consultation Beazley closed their Oslo office in February this year<sup>1</sup>. The London underwriting team have assumed responsibility for the underwriting of the Oslo portfolio run off, and Beazley will accordingly not be binding any new business or renewing any business through Beazley Solution Limited Oslo. Other than this development, the market is relatively stable, with little movement to report in terms of personnel.

### *Energy industry upturn welcomed in Nordic region*

Looking further ahead into 2019, the energy industry in the Nordic region is looking forward to improving trading conditions later in the year. Buyers are starting to drill more wells and developments which had been previously shelved are now starting to move again. M&A activity is high; we are aware that there is significant Private Equity money looking for suitable opportunities and a number of start-up companies looking for quality assets in which to invest the Private Equity money they are backed by (as outlined in

more detail elsewhere in this Review). We therefore expect improved conditions for Upstream insurers in the months and years to come, as activity picks up and some of these new companies who are currently sat on the sidelines enter the market seeking insurance coverage.

As an example, Norway is looking forward to 'first-oil' at the giant Johan Sverdrup field currently scheduled for November 2019<sup>2</sup>. At plateau production this field will likely be producing 25% of Norway's entire daily production output with an expected production rate of 660,000 barrels of oil per day<sup>3</sup>. Johan Sverdrup is one of the five largest fields ever discovered on the Norwegian continental shelf. The recent placement of operational insurance coverage into the commercial market for the Johan Sverdrup assets was very significant; what is noteworthy is that this was one of the largest placement in terms of limit and total capacity requirement ever attempted in the Upstream market. It involved truly eye-watering numbers, with the majority of the Joint Venture (JV) now insured in the commercial market.

### *Changes to JV ownership in Denmark*

In Denmark there have been significant changes to the JV ownership of the DUC assets, with Total becoming operator in 2018 having acquired Maersk Oil<sup>4</sup>, subsequently also buying Chevron Denmark. Noreco, via its wholly owned subsidiary Altinex, announced it is to acquire Shell Denmark's upstream assets<sup>5</sup>. The hugely significant Tyra Gas Field Redevelopment project is underway with shut-in of production at Tyra anticipated in November 2019<sup>6</sup>.



**James Locke is an Executive Director at Willis Towers Watson AS, Oslo.**

<sup>1</sup> <https://www.postonline.co.uk/lloydslondon/3887136/beazley-to-close-oslo-branch-next-year>

<sup>2</sup> <https://www.offshore-technology.com/projects/johan-sverdrup-export-pipeline-north-sea/>

<sup>3</sup> <https://www.offshore-technology.com/projects/johan-sverdrup-export-pipeline-north-sea/>

<sup>4</sup> <https://www.businesswire.com/news/home/20180308005528/en/Total-Completes-Acquisition-Maersk-Oil-Issues-97522593>

<sup>5</sup> <https://www.noreco.com/news/2018/q4/extended-notice-noreco-acquires-shells-danish-upstream-assets>

<sup>6</sup> <https://www.offshoreenergytoday.com/denmark-approves-3-36b-tyra-field-redevelopment/>



## Singapore

### *Downstream market capacity impacted by recent loss record*

We can safely assume the working capacity for any single downstream risk in the Asia Energy markets is short of US\$2 bn. Given the large losses for the last two consecutive years, we doubt if anything close has been deployed just out of Asia in 2018. Most of the active Lloyd's syndicates have either stopped writing Downstream business completely or are simply deploying watching lines on renewal business.

### *Downstream BI covers particularly hit*

Most credible lead markets are looking and pushing for rate increases even on loss free accounts. Some are getting flat renewals only as a part of a larger portfolio or as a part of a larger relationship network. BI covers have been worst hit as typical Asian waiting periods/rates on large risks have been woefully inadequate compared to other parts of the world. There are no reductions available, and loss making risks have seen close to 50% rise in BI rates. Where possible and based on Chinese interest, Chinese markets can be competitive; hence they are offering improved pricing on a blended basis.

Meanwhile Munich Re CIP has recently closed their Singapore office and will now be underwriting Asian risks out of their Munich office. There is a reduced appetite by insurers such as AIG to lead business as we understand that they are looking to restructure their portfolio.

### *Full-blown Downstream hardening uncertain at this stage*

Looking further ahead into 2019, we feel it is a little early to definitely comment at this stage. The market is still in the grip of the largely negative figures in terms of underwriting profits for 2018, with Combined Ratios very close to the late 90s. Most treaties have gone for flat renewals, or with marginal discounts made on very profitable portfolios. The first quarter performance might well be the key indicator as to whether this "cusp" will translate into an actual hardening market for the rest of 2019. Most buyers that are tendering in 2019 are looking at renewals on a flat basis.

## *Upstream capacity reaches US\$1 billion*

The working Upstream capacity in Asia is circa US\$1 billion, dominated by company markets and a selected number of Lloyd's syndicates. Zurich, Allianz and Swiss Re remain the most competitive and credible insurers in setting terms for any Upstream business in the region, including Australia. Canopus and Markel at Lloyd's are driving the Lloyd's Singapore platform in leading or supporting Upstream business competitively.

### *Gentle hardening process in Upstream mirrors London dynamic*

We are generally seeing rises between 5% to 10% on most Upstream renewals, although a flat renewal is available for programmes that renewed having been on a long term deal of say 2 to 3 years. We are experiencing an increase in the number of Offshore Construction projects coming to market but we also expect significant rate increases to get these projects 100% placed.

### *A nervous Upstream outlook for 2019*

In our opinion, both buyers and insurers are nervous with the ongoing market developments, as buyers are generally finding the reasons behind the recent hard stance taken by the market difficult to digest. Insurers are worried about losing market share but are maintaining discipline for now. We are expecting a number of Offshore Construction tenders that have been secured by brokers at the beginning 2019 to struggle to achieve 100% placement, thereby driving competitively quoted prices much higher.



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