The new normal?

Energy Market Review

April 2017

Willis Towers Watson

The 21st century has brought a considerable degree of change to the energy, risk management and insurance industries. Do these changes now represent the new normal in these arenas? If so, what might be the implications?

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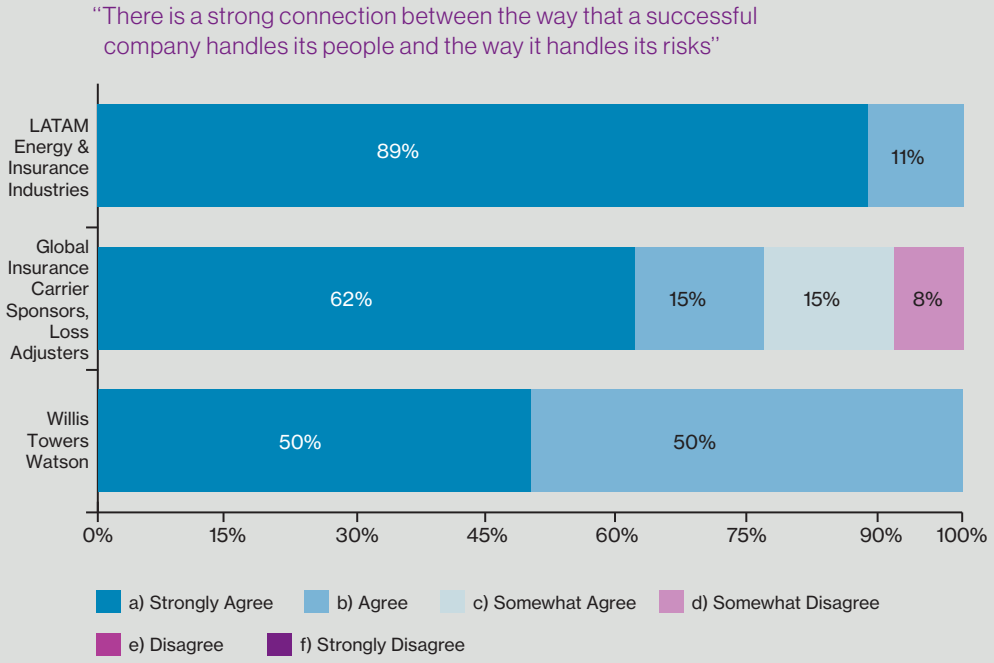
Notes

- 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.

Figure 1 – Question asked at our Latin American Energy Conference in October 2016



At our Latin American Energy Conference in October 2016, we asked our clients if there was a strong connection between the way a company handles its people and its risks. The result was overwhelmingly affirmative.

Source: Willis Towers Watson

Introduction

Welcome to the 2017 edition of our Energy Market Review. The last 12 months have seen some significant changes in the geo-political landscape, particularly in the United States and the United Kingdom but also in many other countries around the world. In overall terms, these global changes are likely to have a significant impact on the energy industry, wherever it is operating.

Our Natural Resources Risk Index, published last year, showed that geopolitical instability and regulatory change was viewed as the most significant megatrend affecting these industries. However, geopolitical upheaval represents only one of a series of challenges facing the energy industry today – low oil prices, cost control pressures, workforce layoffs, onerous legislation/regulation and the escalating risk of cyber-attacks, to name but a few. For energy companies, finding a clear path to managing these challenges is going to be no easy task; most of them look likely to stay and reflect the new normal for the energy industry as we head further into 2017 and beyond.

The first part of our Review is therefore dedicated to six key risk management issues that we think reflect the new normal in the industry. These are:

- **Managing people risk in the energy industry** – breaking down the silos between Risk Management and Human Resources departments is fundamental to managing people risk in a modern, effective way (Figure 1 opposite suggests that our clients agree).
- **Managing offshore dismantling & removal risk** – this is a growing risk for the industry and energy companies may be looking at how to transfer this risk if it is going to be managed effectively.
- **Managing hydraulic fracturing ("fracking") risk** – we include a "deep dive" into the UK fracking industry to identify this industry's true risk profile.
- **Managing high temperature hydrogen attack (HTHA) risk** – our analysis of the energy industry's exposure to this risk shows that this can be a real danger, especially to older processing assets.
- **Managing retained risk** – how energy companies use captive insurance companies in the future will be critical to the effectiveness of their overall risk management strategy.
- **Managing the risks involved in political change** – energy companies need to focus more clearly than ever before on being prepared for political upheaval in the domiciles in which they operate.

At the same time, there may also be a new normal emerging in the global energy insurance markets. The abundance of (re)insurance market capital, the driving dynamic behind market conditions now for nearly a decade, is likely to remain dedicated to the industry – no matter what individual sector loss records produce.

With most insurance carriers continuing to record overall profits during 2016 – despite some exceptions – Energy insurance practitioners are going to have to adapt to today's conditions and find new ways of adding value and generating income. We have included a special feature on the long term effect of excess capital on the market at the beginning of Part two of this Review, but we have also included an insurer's perspective on today's insurance market to provide our readers with an alternative perspective. We conclude our Review with a round-up of current developments in the global Energy insurance markets.

We hope that you enjoy the Review, and as always we would welcome any feedback or comments that you might have.

Robin Somerville is Global Communications Director for Willis Towers Watson's Natural Resources Industry Group and editor of the Willis Towers Watson Energy Market Review.

Energy insurance market summary

Have we reached a new normal in the global Energy insurance markets? While the underwriting climate remains ominous for many Energy insurers' portfolios, very little in the macro-economic environment has changed since last year's publication. Most major insurance carriers continue to report overall Combined Ratios below 100%; the glut of (re)insurance market capital, such a notable feature of the business landscape in this industry for so many years, therefore shows no signs of being deployed elsewhere.

While this remains the case, little can be done by individual insurers to break the overall softening dynamic. As a result, premium income streams continue to be squeezed still further – not only by market competition but also by the limitations in capital expenditure due to continuing low oil prices and the consequent reductions in risk management spend that we highlighted last year.

The main developments reported in this years' Review can therefore be summarised as follows:

- **Capacity:** once again we report increases in capacity for all our major lines of business. Upstream market capacity is up from US$7.56bn to US$7.72bn, International Downstream from US$6.19bn to US$6.5bn and International Liabilities from US$3.2bn to US$3.3bn. While the rate of capacity increase has slowed, the additional increases are doing little to halt the overall softening dynamics in our markets.
- **Losses:** Upstream insurers are being significantly impacted by the deterioration of the 2015 loss record. Just over US$5bn of Upstream Energy losses were recorded by the Willis Towers Watson Energy Loss Database for 2015, the highest loss total for five years. Meanwhile Downstream Energy losses for 2016 now stand at US$2.58bn, up significantly from 2015's total of US$1.91bn.
- **Premium income:** Lloyd's own figures point to a rapidly declining premium income pool for Energy business. From a high of £1.06bn in 2014, in two years Lloyd's premium income from Energy business has declined to just £700m in 2016.
- **Profitability:** while individual Energy portfolios have generally remained profitable during 2016, we believe that should the current loss record deteriorate by only a small degree during 2017 then this might well be sufficient to threaten their viability, at least in the short term. This may be especially the case where underwriting reserves from previous years have already been exhausted.
- **Competition:** competition in all Energy markets remains robust, fuelled by the broadening of leadership options in all lines of business. This competition is emerging not only within London but also in other major Energy insurance hubs such as Dubai, Singapore, Houston and Miami.
- **Outlook:** as of April 2017 we continue to find ourselves in a softening market, albeit a decelerating one. With no capacity withdrawals, we expect this situation to continue into 2017, although there is the possibility that this deceleration may transition into a broader bottoming out of market conditions should individual portfolio loss records deteriorate further late in the year.

So to return to the question: are these trading conditions indeed going to be the new normal for the foreseeable future? If so, that's obviously good news for buyers. But what no one can forecast with any accuracy is how investors will react should Energy portfolios slide into unprofitability – which logic suggests is inevitable if premium income streams decline still further. Will there be a knee jerk reaction to the prospect of one year's worth of bad figures, or will major carriers keep faith with Energy business? Will a few underwriting withdrawals be smoothly compensated for by the introduction of new capacity, or will a trickle eventually turn into a flood? It's not easy to say. It is interesting to note the position taken by AIG, which we include later in this Review.

Given this uncertainty, some buyers may consider that a long term, non-cancellable risk transfer programme, effected with their key risk partners, might now be a sensible consideration. Other will doubtless continue to press for optimum terms and conditions. But history teaches us the market conditions in these lines of business can change rapidly. Should this prove to be the case, buyers will need to ensure that they have the right strategy in place to ensure the continued viability of their risk transfer programmes.

Neil Smith is Willis Towers Watson's Global Product Leader for Natural Resources Lines.

Part one

Six issues to consider in 2017

The intersection of people and risk – lost time and engagement

Introduction: achieving better business results through people

In the year since the merger of Willis and Towers Watson, the "business proximity" of our Risk Management and Human Capital consultants – traditionally separated up until now – has already generated many successful connections between these two domains, undoubtedly to our clients' benefit.

The Willis Towers Watson Natural Resources Risk Index, published last year, analysed the severity of impact and ease of management of the top 50 risks facing the industry. One of the five megatrends identified was Workforce Management and Talent Optimization. Many companies in the energy industry face the challenge of doing more with less, as a shortage of industry-specific skills, less experience due to recent layoffs, lack of international mobility, global competition for talent, the requirement for new skillsets and a volatile industry combine to make talent attraction, retention and engagement a key risk for any company working in this business.

Human capital risk – both "to" and "from"

Moreover, key findings from our 2016 Global Talent Management & Rewards and Global Workforce Studies provide a further insight into addressing the Workforce Management and Talent Optimization megatrend. The human capital risk arena compromises risks both **to** and **from** human capital. Risks **to** human capital include factors that negatively impact workforce readiness and productivity, including:

- Attraction
- Skills gaps
- Lack of ready successors
- Lack of external talent pipeline (full-time and contract)
- Low engagement
- Employee well-being
- Accidents and injury

Risks **from** human capital are the results of those factors on the enterprise, including:

- Critical knowledge loss
- Financial cost of turnover, including productivity loss
- Increasing labor costs
- Other financial risks
- Compliance
- Security, cyber attacks
- Discrimination
- Accident/loss
- Property hazard/damage

New market trends

In addition, some interesting new market trends uncovered in the survey reveal increasing pressure and stress on the workforce and a new definition of leadership:

- **A fast-changing market.** Employee attitudes and preferences about their work experience are changing and are expected to affect talent markets across all industries. The trend towards a "gig economy" has begun, most predominately in the high tech industry, where organizations hire workers on a temporary or contract basis. Along with this, we are beginning to see jobs pulled apart into specific "tasks," completed by a combination of full and contract labor and technology. Organizations complete work by finding the skills and competencies necessary for task success, instead of delegating this work to specific individuals in specific jobs; it's not difficult to envision the energy industry, already comfortable with using skilled contract labor, following suit in the not-too-distant future. Consider the example of a geoscientist with highly-valued skills working on a variety of assets simultaneously for multiple employers. The idea presents a real opportunity for the industry; it could help reduce the impact of market volatility on employers and employees. However, it also raises new concerns about the implications of a shift away from traditional jobs, organizational structure and career paths.

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- **Fast-changing technology.** Rapid technological changes will continue to transform employee experiences, both inside and outside of work. As technological advances such as machine learning and automation cause a shift in the way work is done, this disruption will demand new strategies to attract, retain and engage employees. Specific to the energy industry, consider the knowledge loss recovered by machine learning or some of the future skills and experience needed in the oil patch replaced by robust analytics.
- **A demographic shift.** The industry has seen less of a demographic shift than expected in recent years; however, the "silver tsunami" is still expected to hit shortly. Some "Baby Boomers" (born between 1945 and 1964) may have delayed their retirement due to the down market, but the transition has already begun. Many experienced employees have taken early retirement windows offered by employers to trim headcount; others that are still working are beginning to consider a retirement date now that the market is showing signs of a recovery. It's inevitable that millennials will soon become a larger part of the industry workforce; energy industry employers will need to be strategic about creating opportunities to transfer and capture "Baby Boomer" knowledge. They will need to ensure development plans to prepare millennials for growth and step into the shoes of prior leaders.
- **Expectations of transparency and individualization.** The industry now has three to four generations of employees and it's critical for employers to be aware of varying expectations of these generations for employee rewards and talent programs. Transparency expectations are no surprise given we are more than used "living out loud" on social media. Individualization is also trending as each generation has its own expectation of choice, flexibility and recognition of individual skills and preferences. Consider the 55 year old who wants to better understand her career in the industry because she plans to work for 15 more years. Or consider the 25 year old who would prefer more time off to serve his community to a 5% increase in pay. All of these are important for employers as they consider their Employee Value Proposition.

To view the new intersection between people and risk in a little more detail, let's take two areas where people risk can be managed more effectively by energy companies – the areas of lost time costs and effective employee engagement (workforce management/talent optimization).

Total cost of lost time: a game-changing approach to managing employee absence

The total cost of lost time consists of the economic (implicit and explicit) costs of worker injury, sickness and presenteeism [1]. Explicit costs are readily identifiable, such as workers compensation and health care claims and increased premiums. Implicit costs are considered opportunity costs and include loss of production, costs associated with replacing that lost production and possible equipment damage.

The attempt to mitigate the causes and monetary impact of the total cost of lost time has historically been managed by two distinct and separate operations – the Risk Management and Human Resources departments. However, we believe that energy companies should now consider a more holistic approach that removes this historical divide to create an enterprise wide solution.

According to the Willis Towers Watson's 2015/2016 Staying @ Work survey, produced in the USA, an unhealthy workforce is an expensive workforce, as evidenced in a summary chart of its key findings below:

Figure 1 – Willis Towers Watson's 2015/2016 Staying @ Work survey key findings

Workforce risks	Impact on Risk and Health
~50% of Americans have at least one chronic health condition	**Workers Compensation severity** impact **(85%** of claims can be **attributed to lifestyle and chronic conditions),** absenteeism, STD, LTD and medical benefits
~67% of U.S. adults are obese	Lead to **higher healthcare** costs and contribute to **WC incidence and severity**
The workforce is aging: Mean age is **41** and is expected to increase in the near term	Lead to **higher healthcare costs** and contribute to **WC incidence and severity**
Compliance requirements are increasing; ADAAA and Wellness regulations through ACA	**Imapct on wellness programs** and **WC accommodation**; non-occupation and occupational medical event exposure equalizes

[1] Presenteeism is the concept of working while sick or injured and its consequences are productivity loss, exhaustion leading to exacerbated sick time off, decreased engagement and workplace epidemics like workplace infections.

The situation is of course similar in many other areas of the world and is a familiar one to the energy industry. So how can energy companies respond?

Analytics that encompass a broader enterprise view

Today's more sophisticated analytic frameworks use a broader enterprise view to allow a company to identify and design targeted solutions to reduce lost time and improve productivity. Often times the framework starts with a more foundational view – examining performance data to create baseline benchmarks. Additional sophistication is added so that the company's workforce performance relative to external benchmarks and trends over time can be assessed to manage risk. Finally, modern tools and techniques afford us the opportunity to accurately predict risk and by doing so design optimal programs to manage the total cost of loss time across a broad spectrum.

Start with a high quality business hypothesis

Creating and working with sophisticated analytical models is much more than applying algorithms to data. Effective models start with a high quality business hypothesis such as:

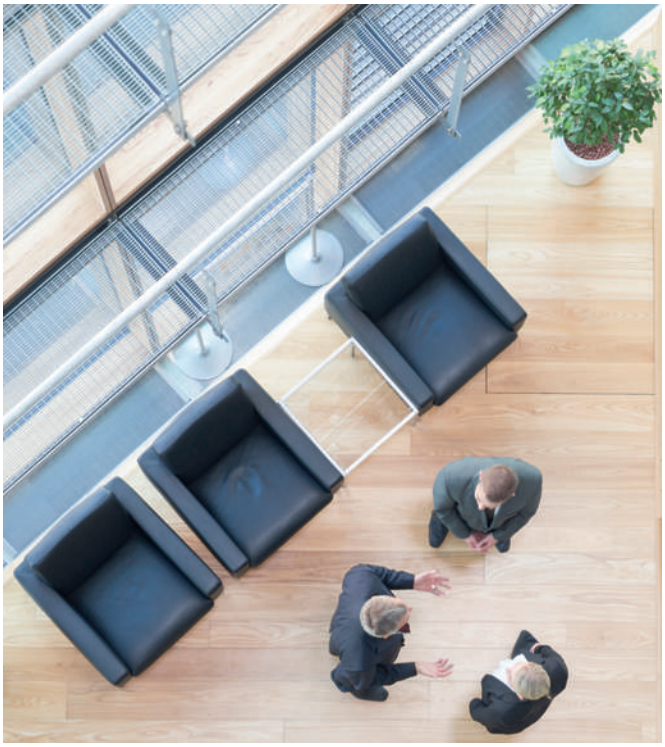
"We have a higher than expected claims and a longer cost-tail on some workers compensation claims versus others."

An effective analytical partner would then work with the business to identify the broad range of data sources that are most relevant to the issue at hand. Examples of this include medical, pharmaceutical, disability and workers compensation claims. A more comprehensive view would include PTO, safety and incidence reports, health risk factors and employee census.

Bringing order to the data

Of course it is likely that some data collected would be valuable whereas other data would not. For example, the model would test if the longevity of cost is due to the type of injury or efficacy of care. With this in mind, the analytical process, in partnership with the business team, brings order to the data. This allows companies to understand what drives the underlying business problem.

The solution should engage leaders in the results and include implications for action. In this example a population of employees that have a higher incidence of claims, more missed days and lower performance might also have opioid prescriptions from several providers that could lead to abuse issues. The goal would be to separate out these issues so that an appropriate mitigation program can be implemented.



A case study – Workers Compensation losses

Consider the following case study. A model was built to study the underlying risk drivers for Workers Compensation losses for a specific company that had some 11,000 employees. The objective was to identify the relative Workers Compensation risk of each employee for the year ahead so that the risk could be identified and managed more effectively.

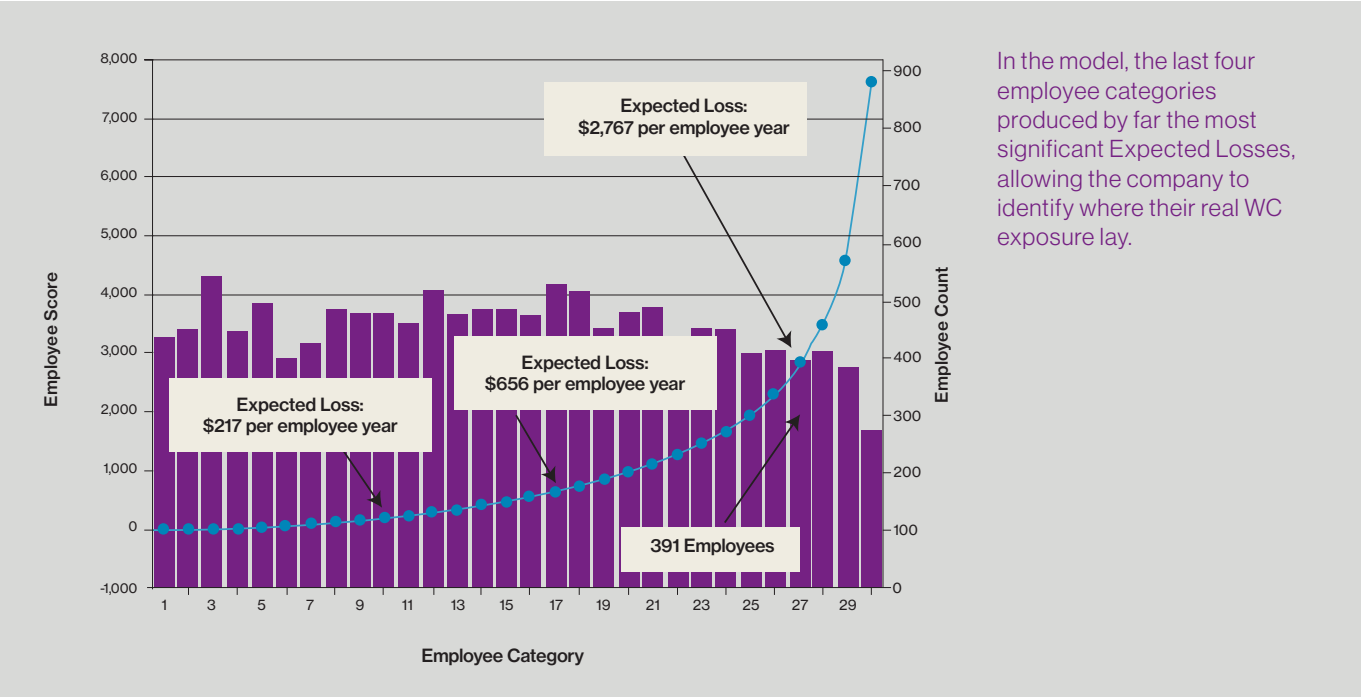
In measuring the risk, we were looking to determine two things:

- the probability of someone getting into an accident; but also
- if they got into an accident, what the size of that accident would be.

The combination of these two measures is particularly useful for the employer.

Willis Towers Watson collected a significant amount of data on these 11,000 employees, from which perhaps some 30 pieces of information were predictive in nature and could therefore be modelled effectively.

Figure 2 – Workers Comp (WC) Expected Losses



Source: Willis Towers Watson

Of these 20-30 pieces of information, there was some information that the employer could do nothing about – an employee having children or getting married, for example. But there was also a significant amount of information that the employer could indeed have some control over, such as whether they had received training or whether they had had bio-screening. So out of the original pieces of information, we identified 10 over which the employer did have control.

The model was applied to the active workforce and the following exhibit was produced (see Figure 2 above).

Figure 2 reflects the output of the modelling process. Instead of 11,000 different results, we grouped the employees into 30 categories of risk so we could manage the results effectively. Each of these 30 employee categories had roughly the same number of employees in them and are reflected in the horizontal axis of the chart.

We then created the two vertical axes which were:

- On the right, the expected loss in dollar terms for each employee (by category)
- On the left, the number of employees in each category

If we plot the expected annual loss from each employee per category on this chart as calculated by the model, we can identify where the real risk lies. For example, the category 10 employees represent only an average risk – these 450 employees are forecast to cost the company on average some $217 each per year (i.e. $97,650 in total). However, further up the scale in Category 27, these 391 employees are each going to cost the company on average $2,767 each year (i.e. $1,081,897). Indeed, the last four categories make up by far the largest part of the overall risk.

Actions taken from knowledge gained from the model

So far we have discussed the output of the model. The next step is to apply the model in a business as usual setting. The model also told us that, all things being equal, if employees receive proper training the company could expect a 15% reduction in risk. If employees received the bio-screening, the company could expect a 2% drop in risk.

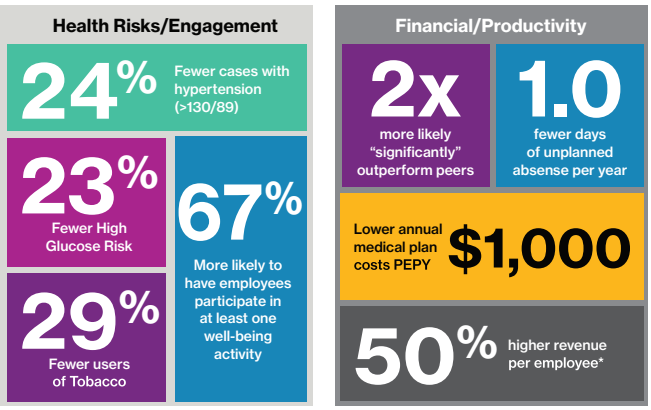
Instead of blanketing these programs across the entire population of employees, we can now surgically target which employees would benefit the most and as such optimize our investment. In this case it was identified that investing $35,170 in these two programs (training and bio-screening) for this population of employees would lower workers compensation losses by $86,169 – a 145% ROI.

While seemingly a small amount in absolute dollars, keep in mind that this was only 3% of the workforce for a single risk type.

Expanding this model to multiple risk types across broader employee populations will expand the monetary returns exponentially.

Why does it matter?

All our research to date suggests that companies with the most effective health and productivity programs have a financial advantage, summed up in the chart below:



Source: Willis Towers Watson 2015/2016 Global Staying@Work Survey, United States.

We've shown that that a sophisticated actuarial analysis of a company's Workers Compensation risk profile can do much to lower overall risks costs – a clear example of the value to be gained when risk managers and HR professionals combine and work together to identify and mitigate a company's people risk.

Engagement – managing your workforce and optimizing your talent

Our second example is Engagement – a key predictor of company financial results. Sustainable Engagement lies at the intersection of Traditional Engagement, Enablement and Energy:

- **Traditional Engagement** – rational, emotional and behavioral attachment to the company
- **Enablement** – a local work environment that supports productivity and performance
- **Energy** – individual physical, interpersonal and emotional well-being at work

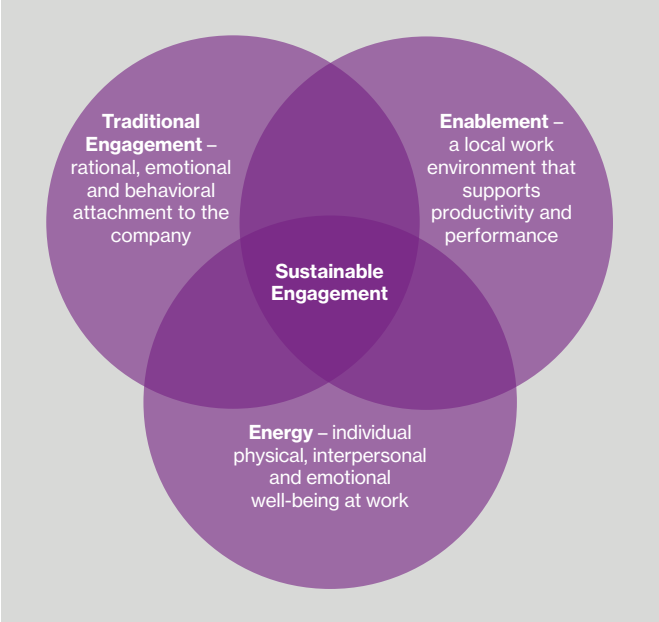
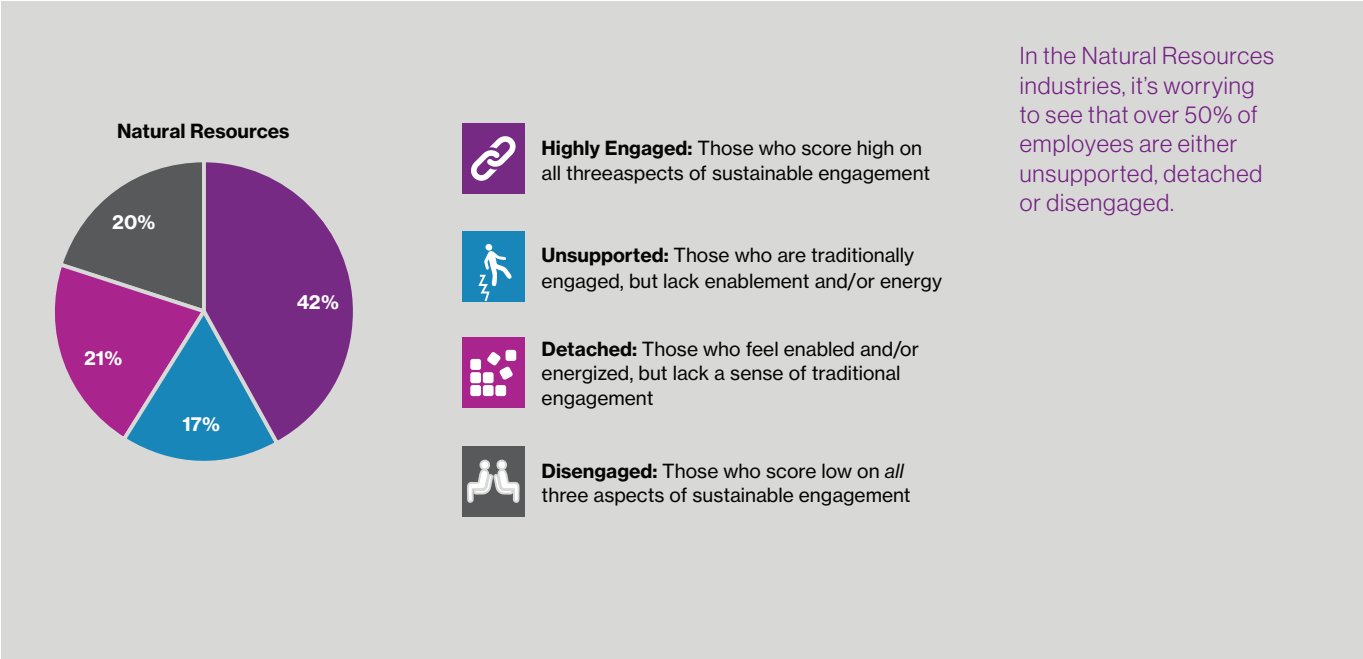


Figure 5 – Global Talent Management & Rewards and Global Workforce Studies (1)



Source: Willis Towers Watson 2016 Global Talent Management & Rewards and Global Workforce Studies

In the Natural Resources industries, it's worrying to see that over 50% of employees are either unsupported, detached or disengaged, as our chart from our Global Talent Management & Rewards and Global Workforce Studies from last year demonstrates (see above).

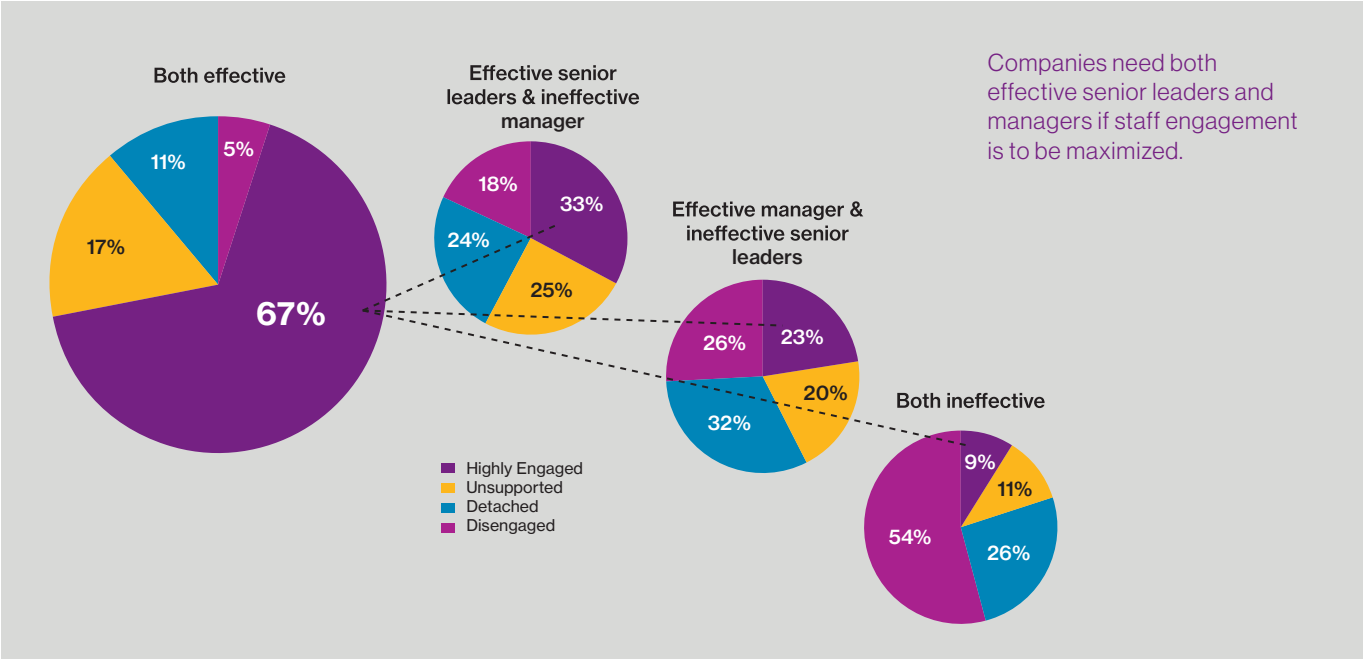
Engagement matters because engaged employees change the bottom line. Companies with high percentages of highly engaged employees report 3 times as much operating margin, 6.5 fewer days absent and 41% lower turnover risk compared to companies with lower engagement scores.

Getting it right starts with an understanding of the top drivers of attraction and retention for your organization. For example, in the chart below career advancement opportunities are a more important factor in why people retain these employees rather than why people join them.

Figure 6 – Global Talent Management & Rewards and Global Workforce Studies (2)

Source: Willis Towers Watson 2016 Global Talent Management & Rewards and Global Workforce Studies

Figure 7 – Global Talent Management & Rewards and Global Workforce Studies (3)



Source: Willis Towers Watson 2016 Global Workforce Study – Global

Leadership

There is a significant opportunity for organizations to develop future leaders (both executives and mid-level managers). Surveyed employees of Natural Resources companies gave a 50% or less favorable rating of executives on their ability to manage costs, develop future leaders and grow the business. Managers received a slightly more favorable rating: coaching to improve performance – 44%, sufficient time to handle the people aspects of the job – 50%, effective at differentiating performance between high and low performers – 52%, removing obstacles to doing my job well – 55% [2]. The bottom line: employees with effective senior leaders and managers are much more likely to be highly engaged, incur less Human Capital risk and drive superior business performance.

The bottom line: employees with effective senior leaders and managers are much more likely to be highly engaged, incur less Human Capital risk and drive superior business performance.

What can be done about it?

The Human Resources department in most companies is tasked with finding the best talent to allow the business to capture market share. In this crucial time, the right HR practices have a significant impact on business results:

- **Best Talent** – companies with best-in-class recruiting and onboarding practices have 20-40% faster time to employee productivity.
- **Winning Culture** – companies with engaged employees have 3 times the operating margin of those that do not.
- **Right Rewards** – companies with the right Employee Value Proposition are 3 times more likely to have a highly engaged workforce and 93% more likely to significantly outperform their peers.

Well-Being – companies with a demonstrably healthier workforce have 24% fewer cases of hypertension and are 2 times more likely to significantly outperform their peers.

[2] Willis Towers Watson 2016 Global Talent Management & Rewards and Global Workforce Study

Figure 8 – Identifying key measures and rolls

Efficiency	Quality	Innovation	Sales & Service	Brand
Critical Roles/Functional Areas				
▪ Production ▪ Manufacturing ▪ Call center staff ▪ Technicians	▪ Manufacturing ▪ Assembly ▪ Service dept ▪ Nurses	▪ Research & Development ▪ Engineers ▪ Tech developers	▪ Sales ▪ Service ▪ Account managers	▪ Marketing ▪ Public relations ▪ Web designers ▪ Communications
Measures				
▪ Goods produced per FTE ▪ JIT delivery met per unit ▪ Overtime hours as % of total hrs.	▪ Error rate per batch ▪ Rework rate per labor hour ▪ Product recalls per batch	▪ Development ideas per FTE ▪ Time to market per unit ▪ Patents per R&D spend	▪ Customer retention per FTE ▪ 1st call rescolutions per FTE ▪ New business closed/labor $	▪ Web hits per online ad $ spend ▪ Customer brand recognition ▪ Social media favorable mentions

Source: Willis Towers Watson 2016 Global Workforce Study – Global

In identifying key measures and the roles with the greatest impact, a company's focus will normally fall into one of five areas: Efficiency, Quality, Innovation, Sales & Service or Brand. From there, the company should identify what key roles or functional areas impact that improvement area. Then, it should identify what measures predict success in those critical roles.

In the pursuit for key talent, the best performing HR departments will also contribute to their companies' KPI. Willis Towers Watson has developed a diagnostic evaluation of 30 factors in 6 areas that identifies gaps and offers improvements in workforce effectiveness and productivity. The four-phase process focuses efforts on the best opportunities to drive results:

1. Identify key measures and the roles with the greatest impact.
2. Determine the critical gaps impacting the measures.
3. Implement solutions to close gaps.
4. Conduct check-ups for continual evaluation and improvement.

With this process, the Human Resources department is able to develop a more thoughtful method of talent attraction that concurrently solves for engagement, performance and retention in a way that also contributes to the strategic priorities of the company.

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Offshore Dismantling & Removal Insurance for the oil & gas industry

Introduction

Worldwide, many oil and gas fields are reaching the end of their productive life; in the years ahead, a significant number of offshore oil and gas platforms and associated property are therefore likely to be decommissioned.

The fall in the oil price and the advent of next generation heavy lift vessels has resulted in the subject of offshore decommissioning receiving considerable coverage in the media recently. This article analyses the potential frequency of forthcoming decommissioning activity and considers the coverage options available from within the insurance market.

Offshore decommissioning: the facts & figures

A recent report by leading trade association The Energy Industries Council (EIC) identified Asia Pacific, the Gulf of Mexico and the North Sea as key future decommissioning markets.

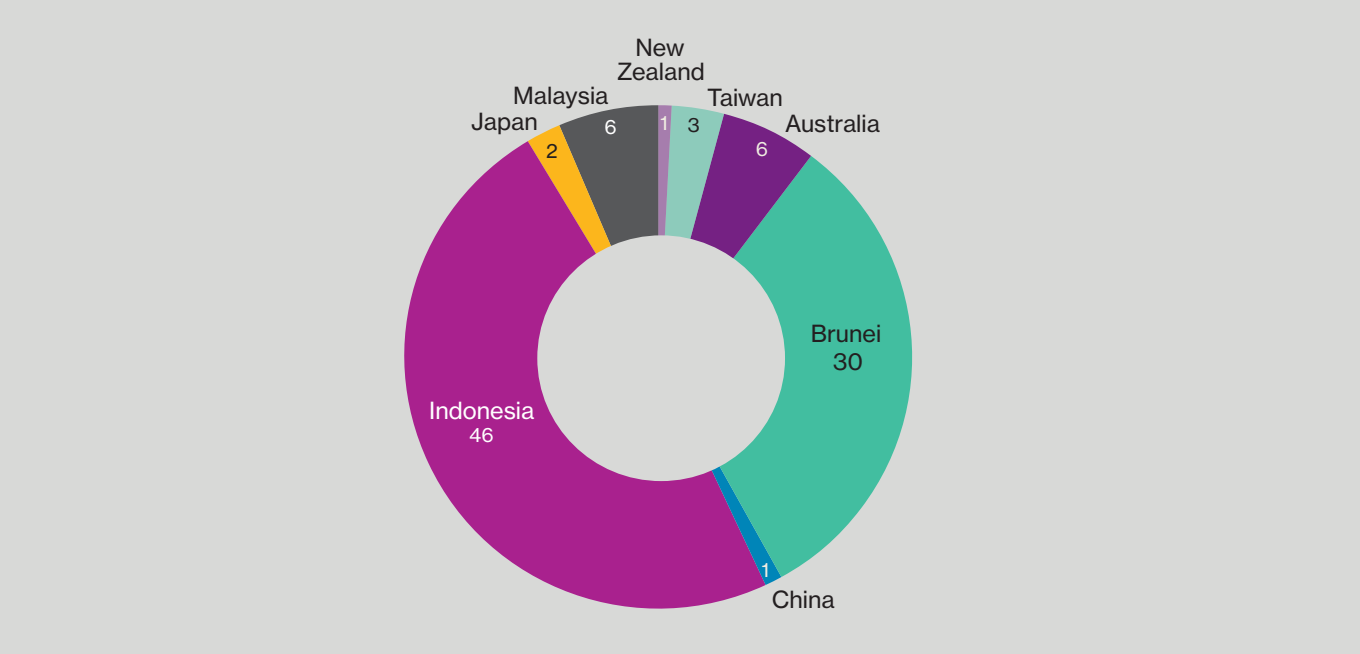
Asia Pacific

Historically, the EIC estimate that nearly 100 offshore platforms have been decommissioned in the Asia Pacific region since 1975.

Looking to the future, the Asia Pacific region has significant potential as a decommissioning market. For example, the EIC highlight the following statistics:

- 48% of Asia Pacific offshore platforms are older than 20 years
- 12% of Asia Pacific offshore platforms are older than 30 years
- 50% of Indonesian offshore platforms are operating at over 20 years of age

Figure 1 – Structures decommissioned in Asia Pacific since 1975



Source: OGJ / EIC

Figure 2 – Number of structures removed in the Gulf of Mexico since 2000

Source: BSEE / EIC

Gulf of Mexico

The chart above indicates that the Gulf of Mexico represents a buoyant market place for offshore decommissioning risks.

Historically, smaller platforms in the region have either been re-used or formed part of the "rigs to reefs" disposal methodology. In such instances, platform operators have often left risks to fall for consideration under their Operational insurance arrangements.

However, over the next 10 years it is anticipated that floating deep water structures will represent significant decommissioning risks in the region. During this period, the EIC estimate that over 20 deep water structures will be decommissioned. Clearly, the removal of deep water TLPs, FPSOs and Spars will represent a very different insurable risk from the smaller, shallower water projects.

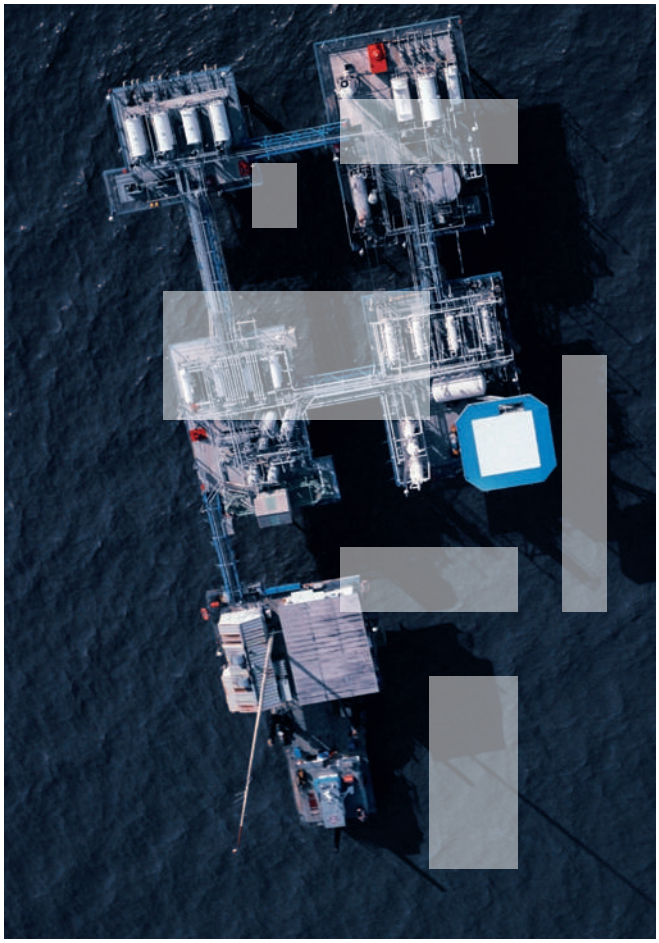
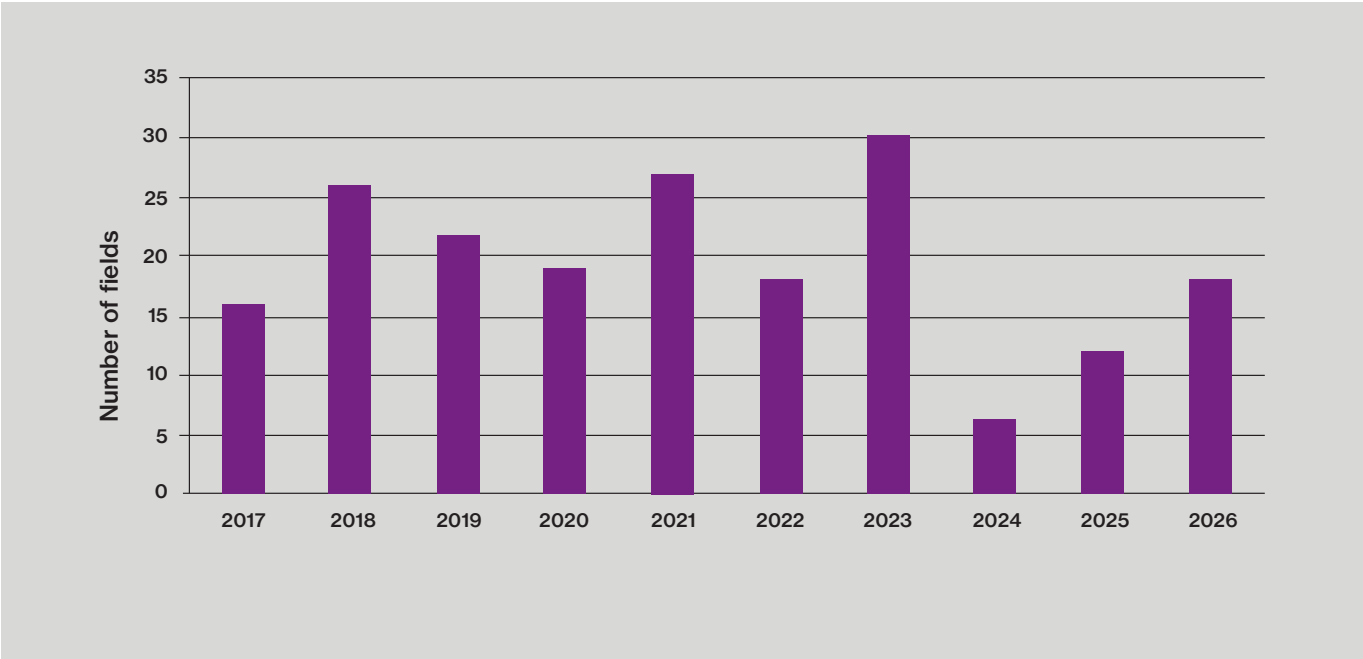


Figure 3 – Estimated 'cease production' dates of UK North Sea fields



Source: OGA / EIC

North Sea

In the North Sea there has already been significant decommissioning activity. Well publicised decommissioning projects have included Total's Frigg Field and the Statoil and ConocoPhillips Ekofisk Fields, while media coverage is currently focussing on Shell's forthcoming Brent Field removal programme.

Figure 3 above indicates that a significant number of UK North Sea fields will cease production over the next 10 years.

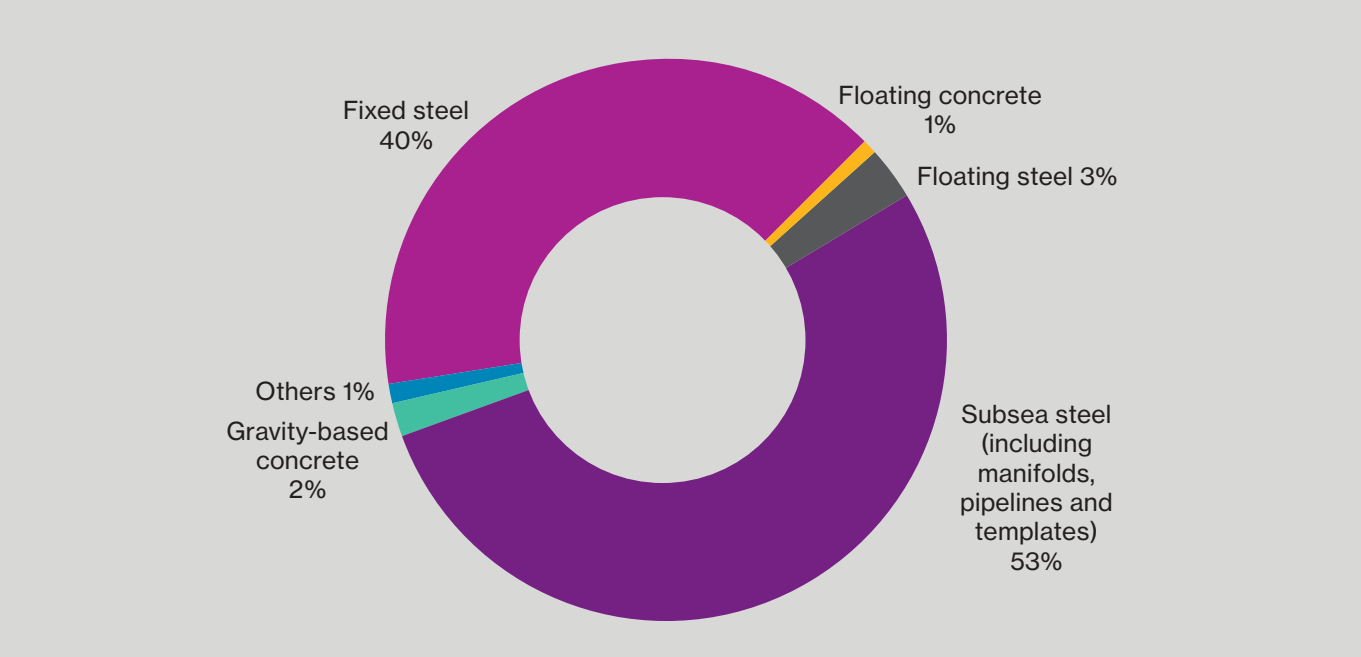
Figure 4 overleaf indicates the nature of assets currently operational in the North Sea. From the chart it can be seen that forty per cent of the assets are fixed steel installations. It is these assets which will represent the main exposure, in the form of a removal of wreck risk, in the event that a jacket or topside is lost during decommissioning activity.

Fifty-three percent of the assets are subsea installations including manifolds and templates. Whilst such subsea assets represent a reduced removal of wreck risk, a significant exposure may still exist in the form of contractual liabilities. For example, are the wells and associated manifolds, templates and flow lines tied back to existing live assets? If so, does this expose the operator of the decommissioned asset to a significant contractual liability via a proximity agreement with the owners of the existing assets?

Legislation

The extent of definitive legislation, in the countries faced with aging offshore oil & gas installations, will dictate the frequency of future decommissioning projects. For example, in the UK there is a general presumption that all offshore installations will be re-used, re-cycled or disposed of on land. Similarly in the US, legislation identifies "idle" platforms and requires same to be decommissioned within defined timeframes. Such definitive legislation, imposing a clear responsibility to act, is not currently commonplace across the Asia Pacific region; however, recent developments in a number of countries in the region indicate that such legislation will gradually evolve.

Figure 4 – Current operational offshore installations in the North Sea



Source: OSPAR / EIC

Insurance considerations

A number of major oil & gas operators and certain leading market underwriters have already expressed the view that the various different exposures arising out of these specialised projects demand a bespoke broad form policy wording. Before analysing such a policy wording, let us consider how some of the existing oil & gas related policy forms may respond to offshore dismantling & removal risks.

Traditional Operational & Liability Insurances

Concern exists as to whether or not the removal of wreck cover provided by Operational Physical Damage underwriters is designed to respond to a loss during a dismantling & removal exercise. Such Operational removal of wreck cover is primarily designed to respond when a vessel impacts with the platform or when there is an explosion on board the platform. *But is such Operational removal of wreck cover really designed to respond to losses arising from objects dropped during the dismantling of a platform?*

At English marine insurance law, to be deemed a wreck the property insured has to cease to be a "thing of the kind insured". A platform that is shut down, decommissioned and being dismantled offshore may already be deemed to have ceased to be the thing it once was, thereby calling into question whether Operational Physical Damage removal of wreck cover could actually be triggered.

The residual value of the property being removed is often low. Accordingly, sub-limited removal of wreck cover, often linked to the value of the insured property, also calls into question the adequacy of Operational policies for these high profile dismantling & removal projects.

Operators' Extra Expense (OEE) cover would respond to a control of well and seepage, pollution & contamination loss during the plugging and abandonment of a well. *But could a standard OEE policy form really be expected to respond to such losses in the event that a plugged and abandoned well was damaged during the removal of the entire platform?* Clearly such coverage would require express negotiations with the OEE underwriters. Even if the OEE underwriters were prepared to extend the Operational coverage, would an Assured wish to expose their annual Operational policy loss record to such additional risks?

Standard Operational Liability insurances provide Third Party liability cover. *But do such policies adequately address the contractual liability exposures arising out of dismantling & removal activity?* For example, do Operational Liability policies provide cover for strict, "no fault", Second Party liabilities arising out of proximity agreements entered into with the owners of surrounding platforms, pipelines and other subsea assets?

Furthermore, if the decommissioning project involves disconnection activity at another party's property then it will be noted that standard Operational Liability wordings routinely exclude damage to property being worked on.

Oil Insurance Ltd.

The policy form offered by industry mutual Oil Insurance Ltd. (OIL) is designed for operational risks and does not specifically address risks unique to platform dismantling & removal projects.

In respect of insured property, OIL's Removal of Debris cover is linked to damage being sustained by the platform. However, it is understood that, in certain circumstances, OIL may be prepared to agree that the Removal of Debris cover would respond if say a topside module was dropped during the dismantling of a platform.

It is also understood that, in certain circumstances, OIL may be in a position to agree to provide coverage in respect of proximity agreement risks. However, it would be advisable for Members to carefully consider the non-owned property sub-limit in the OIL form. In particular, it would be advisable for Members to clarify the application of the sub-limit with OIL and to also consider the sub-limit in relation to their percentage ownership interest in the project. It should also be noted that any proximity agreement coverage provided by OIL would not extend to contractual liabilities for consequential losses such as loss of use.

It will be noted that the OIL policy form would not cover the cost of extending the engagement of project vessels following an incident offshore.

Furthermore, heavy lift contractors may seek to be named as an Other Assured under the operator's policy. However, OIL resists granting such Other Assured status to contractors and sub-contractors.

Offshore Construction Insurance

Policy terms and conditions within the Offshore Construction markets are understandably driven by platform design, construction and installation criteria, with such factors not being as relevant during the dismantling & removal process. Accordingly, Offshore Construction policies are not considered an appropriate basis upon which to insure dismantling & removal risks.

Protection & Indemnity Insurance

Vessel contractors will have their own Marine Liability cover in place, such as Protection & Indemnity (P&I) coverage. Contractually, platform operators may seek access to such P&I coverage.

However, any contractually negotiated access the platform operator may secure to such a P&I policy is likely to be restricted. In particular, the P&I insurance would only be expected to respond if there was a clear liability on the part of the vessel.

It is unlikely the P&I insurance would respond if a claim was solely the responsibility of the platform operator and not the vessel contractor. For example, in the event of damage to surrounding property a claim may be made against the platform operator under a proximity agreement. Or a claim may be made against the platform operator by government authorities in respect of the wreck removal of a lost topside or jacket. In both examples the responsibility under contract, as between the platform operator and the vessel, may well rest with the platform operator.

It is also extremely unlikely that the P&I insurance would respond if, during the removal exercise, there was a loss caused by a pre-existing fault with any preparatory and shut down work on the platform.

Furthermore, P&I underwriters are unlikely to provide removal of wreck coverage in respect of the platform itself due to standard "contract work" exclusions in their policy forms.

Decommissioning Liability Insurance

Historically, certain underwriters have offered a form of Decommissioning Liability insurance. As the name suggests, such policies primarily offer Liability based coverage compared with a broader "All Risks" form of cover.

Numerous potential differences can exist between the coverage provided by a Decommissioning Liability policy form and a broader "All Risks" based form. Examples of such potential differences include the following issues.

- *Does the actual terminology of the removal of wreck clause under a Decommissioning Liability policy provide coverage beyond a statutory obligation to act?* Certain platform operators have sought "All Risks" decommissioning removal of wreck insurance in order to provide themselves with cover that enables them to be seen to be acting promptly and freely in the event of a high profile incident, thus assisting in protecting their reputational risk.
- Similarly, with regards to managing reputational risk, *does the removal of wreck clause under a Liability policy provide the platform operator with the freedom to promptly and voluntarily remove the wreck of the property of others, including contractors, in the event of a major incident?*
- Decommissioning Liability insurances may require an insured occurrence to first commence on a specific identifiable date during the policy period. *How would such coverage respond in the event of a "pre risk" proximate cause occurring before the inception of the policy but not manifesting itself until the dismantling & removal phase?* This is particularly relevant in the event of faults occurring during the shutting down of a platform or during preparatory work on the platform which may take place well in advance of the heavy lift phase.
- *Will the Decommissioning Liability insurance respond to potentially significant additional costs faced by platform operators in the event that the engagement of heavy lift vessels has to be extended following an incident offshore? Or is such Decommissioning Liability coverage solely restricted to instances where the platform operator actually charters a vessel?*
- In the event that the platform operator is faced with entering into an onerous proximity agreement, in respect of surrounding property, *does the Decommissioning Liability insurance provide coverage for such direct Second Party risks or is the coverage linked to Third Party risks?* Even if a Decommissioning policy form does provide contractual liability coverage, in respect of Second Party property, it is critical to recognise that specific proximity agreements and the like will undoubtedly be deemed to be material circumstances requiring clear and accessible disclosure to underwriters.

Offshore Dismantling & Removal Insurance: a tailored solution

A specific group of Lloyd's and Companies market underwriters have, for some time now, been committed to providing a tailored solution for this emerging risk category. These underwriters support a broad form Offshore Dismantling & Removal Insurance policy wording.

Why is the policy form entitled Offshore Dismantling & Removal Insurance? The name reflects the fact that the coverage is designed to track the offshore dismantling & removal process and the corresponding contracts. Physical Damage, Liability and OEE exposures during the earlier routine shut down of a platform and the plugging & abandonment of decommissioned wells would be addressed by existing Operational insurance programmes. So from an insurance perspective, the term Decommissioning Insurance can be misleading.

Furthermore, whilst Offshore Dismantling & Removal underwriters will consider extending coverage to encompass onshore disposal, most companies will already have an annual Comprehensive General Liability insurance programme in place in relation to onshore risks. It is the high profile and often complex offshore dismantling & removal activity which requires tailored insurance coverage in order to ensure gaps in cover between the offshore Operational insurance and the onshore Liability cover are appropriately addressed.

So, what are the main features of an Offshore Dismantling & Removal policy form?

Assureds

The Principal Assured under the Offshore Dismantling & Removal policy will be the platform operator and their partners. The policy recognizes Other Assureds as being contractors and sub-contractors to the dismantling & removal project. The Offshore Dismantling & Removal policy is not designed to relieve the contractors of their contractual responsibilities to the platform operator. Accordingly, any Liability insurance policies which contractors may be contractually obliged to arrange are deemed to be underlying. However, the Offshore Dismantling & Removal Insurance will always provide primary coverage for the platform operator and their partners.

Policy period

The policy period runs concurrently with the dismantling & removal contract until the property is safely unloaded at the contractor's dock. If required, underwriters are prepared to consider additional cover onshore. As mentioned above, shutting down activity on the platform, including early preparatory work, could take place many months ahead of the actual dismantling & removal campaign. However, the effects of any faults in such initial preparatory work may not be felt until the heavy lift campaign commences. Accordingly, the insured perils expressly include latent pre-existing causes, during any preliminary preparatory work, which do not manifest themselves until the dismantling & removal exercise commences. Alternatively, depending upon the timeframes involved and the Assured's perception of the risk, the policy inception date can commence at a time so as to encompass all preparatory removal work under the main policy period.

Main areas of coverage

Detailed below are the main areas of coverage under an Offshore Dismantling & Removal policy.

Liability risks

- Cover is provided in respect of liabilities incurred at or under statute, international convention and common law.
- The policy is also designed specifically to address contractual liabilities faced by the platform operator and their partners, following negotiations with the dismantling & removal contractors.
- The policy also provides the operator and their partners with additional contractual liability cover in respect of declared contracts, such as proximity agreements with surrounding platforms, pipelines and associated subsea property.
- Cover includes seepage, pollution and contamination risks from events first commencing during the policy period.
- The Liability section of the form includes bespoke coverage for expenditure to avert or minimise Liability losses recoverable under the policy.

Removal of wreck

The policy responds:

- when the Assured is legally/contractually liable for removal costs; or
- when the wreck interferes with the Assured's normal operations; or
- when the wreck interferes with the normal operations of others.

Other points to note:

- Cover includes the cost of securing or destroying a wreck if such action is preferable to removal.
- Coverage expressly includes "Dropped Objects", thus ensuring that traditional removal of wreck cover is extended to encompass the risks unique to the dismantling & removal of platforms.
- The removal of wreck cover applies to both property of the Assured and to the property of others.
- Coverage is triggered on an "All Risks" basis.

Extra Cost and Expense Cover

- Cover is provided for the platform operator and their partners in respect of their liability for the extra cost and expense of completing the dismantling & removal exercise, following damage to:
  - the property being removed; or
  - to contractors' property; or
  - to Second or Third Party property.
- In particular, this element of cover is designed to address potentially significant additional vessel costs that the platform operator and their partners may be faced with under contract.
- Extra Cost and Expense cover is provided in accordance with an any one occurrence sub-limit which is negotiated per project.

Contract objects

- The policy provides Total Loss cover in respect of the property being removed.
- Coverage is triggered on an "All Risks" basis.
- Should the value of the property being removed necessitate full repair and replacement cost cover then extended coverage can be negotiated with underwriters.

Limits, deductibles & premium

To date, Primary market capacity has been sufficient to meet the requirements of major operators who have purchased coverage on this policy form. However, if required, additional capacity is available from within the Excess Liability markets. Appropriate policy limits can be assessed on a project by project basis.

Coverage will be subject to a minimum per occurrence deductible in the region of £350,000 depending on the risk factors of each individual project.

Premiums vary from project to project and are dependent upon a number of factors, including the following:

- Project period
- Removal methodology
- Estimated contract value
- Level of contractor's responsibility
- Extent of contractual liabilities
- Policy limit and deductible
- Extent of First Party property risk

It is particularly important to identify any idle periods within the overall scope of work, in order to arrive at an equitable premium.

A risk matrix approach

A risk matrix accompanies the policy form in order to clearly identify the various different exposures. The risk matrix also identifies which specific sections of the policy form respond to each different loss scenario. This approach enables clients to tailor the width of coverage they require depending upon their individual buying philosophy.

For example, certain clients may wish to secure the broadest possible coverage in relation to this often high profile and complex risk category. Alternatively, the buying philosophy of certain clients may be to achieve the lowest possible premium rather than secure the broadest possible coverage. Accordingly, by linking the risk matrix to the specific policy clauses the prospective client has clarity regarding the width of coverage they ultimately elect to purchase.

Furthermore, the risk matrix approach enables clients to work with their broker to assess their exposures and insurance options before they conclude their contractual negotiations with all parties associated with the project.

Conclusion

The development of this class of insurance will largely be dictated by the buying philosophy of the policyholders.

- Do Assureds consider these projects to be complex risks, both logistically and contractually?
- With increased media attention, are these projects considered to be high profile?
- If so, do Assureds require a policy form designed to help manage potential reputational and contractual exposures?
- Or are Assureds prepared to leave the exposures to fall for consideration under existing policy forms that were designed for the operational phase of a platform's life?

David Hallows is an Executive Director of the P&C Natural Resources Division at Willis Towers Watson in London and has arranged coverage for some of the largest offshore oil & gas dismantling & removal projects carried out to date.

Fracking – today's key questions answered

Introduction – background to UK fracking industry

The process of hydraulic fracturing (or "fracking") to release and exploit natural gas trapped in shale rock is a controversial practice, both in the UK and other parts of the world. However, the UK government has embraced the potential to develop the industry and has made relatively swift advances in policy and legislation designed to promote fracking and ease its passage into a mainstream industrial process. The UK government argues that fracking will provide significant economic benefits to the country, providing a cheaper, more secure energy source and much needed employment.

Despite the potential economic benefits, the debate over the environmental impacts of fracking is raging around the world. The major concerns relate to water use, water contamination and disposal of fracking fluids and "produced" water. Concerns over induced seismicity have also been raised. Various non-government bodies opposed to fracking often cite these concerns in order to try and prevent fracking developments going ahead; however, recent claims as to the nature of the potential damage caused by fracking have been challenged.

For example, Friends of the Earth were recently taken to task over an anti-fracking leaflet by the Advertising Standards Authority (ASA) following complaints by Caudrilla; the ASA said that it has told FoE not to make claims about the likely effects of fracking on the health of local populations, drinking water, or property prices "in the absence of adequate evidence" [1].

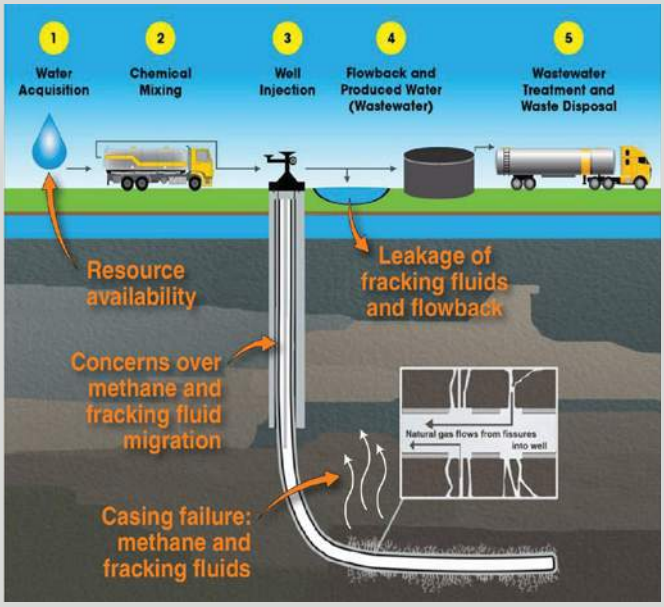
So what are the risks in reality? This article explores some of these public concerns and also considers how the UK regulatory framework is addressing these issues. Although the material is solely UK-based, it is hoped that readers from other parts of the world will also find it interesting as much of it may well be applicable in your region, either now or in the future.

The key concerns that have been raised with regard to fracking are:

- the availability of water resources and sustainability of supply; and perhaps, most vocally;
- the potential contamination of these resources with chemicals from fracking fluids and/or methane, via a series of potential pathways.

The key concerns related to the impact of hydraulic fracturing operations on the UK potable (safe to drink) water supplies are illustrated in Figure 1.

Figure 1 – Key concerns arising over the potential impact on UK water resources from the hydraulic fracturing process



Source: Base figure from U.S. EPA. 2015. The hydraulic fracturing water cycle. http://www2.epa.gov/hfstudy/hydraulic-fracturing-water-cycle

Availability of water resources

Does fracking use unsustainable volumes of water?

Many media reports suggest that fracking uses huge volumes of water. However, the actual amount used in a well varies enormously depending on the geologic conditions. A typical well can use around 9,000 to 15,000m^3 over its useful lifetime, with most of this being used during the fracturing phase.

In the UK, the fracking company Cuadrilla estimates that its well at Preese Hall, near Blackpool, used around 900m^3 for drilling the well and 9,000 m^3 during the fracturing phase. To put these volumes in context, the Royal Society (https://royalsociety.org/) estimates that the amount of water needed to operate a hydraulically fractured well for a decade is equivalent to the water used by:

- A golf course in a month
- A 1,000-megawatt (MW) coal-fired power plant in 12 hours.

By comparison, 3,365,000 m^3 of water is estimated to be lost every day in the UK through leakage from water companies' pipes [2].

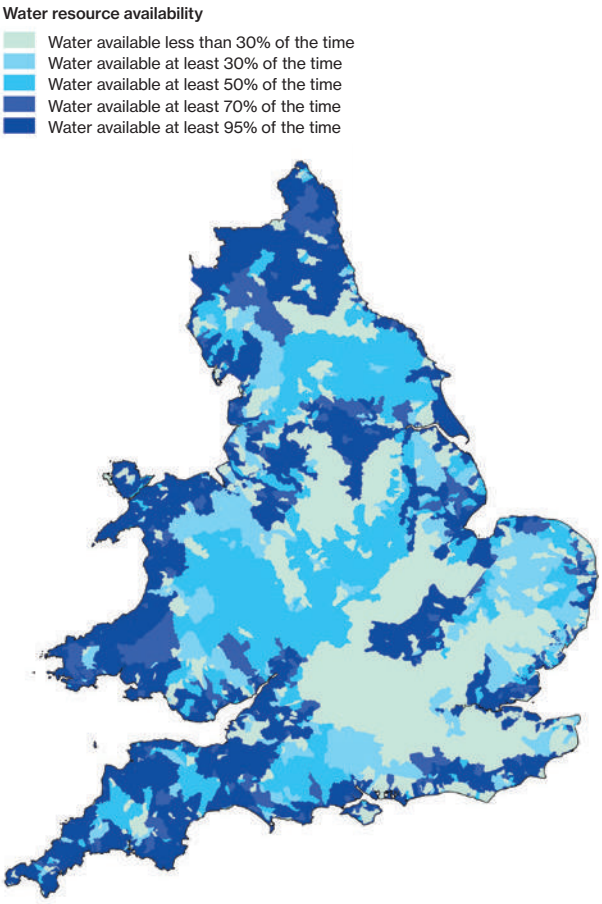
Where will the water come from for UK fracking?

Like other industrial facilities, shale gas companies may source water directly from the local water supply company; these water companies have a statutory duty to assess the amount of water available before they supply to industrial operations. Alternatively shale gas operators may apply for a groundwater abstraction license, which will be scrutinised by the regulator, in this case the Environment Agency, to ensure that the resource is sustainable.

How sustainable are the UK water resources?

Figure 2 shows the percentage of time that water would be available under a new abstraction licence across England and Wales. It also shows that resources are far less available in central and south-east England than in the north and west of England and Wales. With the potential for climate change to impact water resources further, particularly in south-east England, it is possible to envisage that it may be difficult to obtain a new abstraction licence for fracking activity in those areas.

Figure 2 – Water resource reliability: Percentage of time that water would be available for abstraction under a new licence



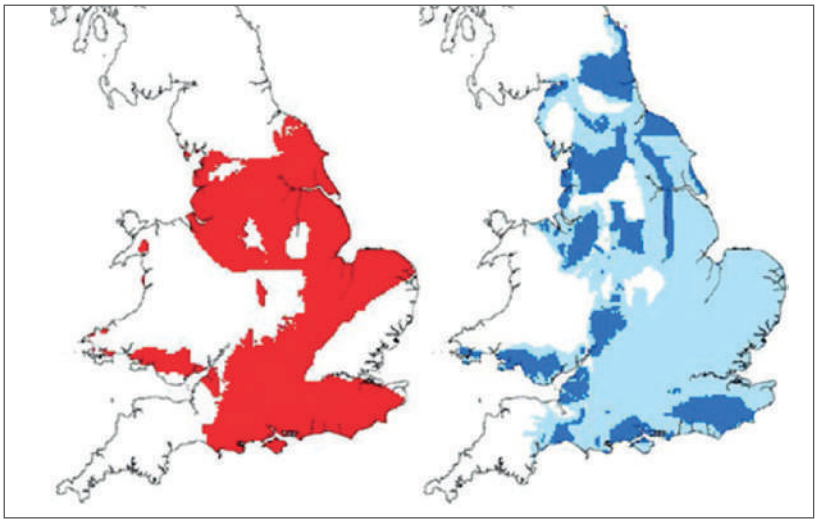
Source: The case for change – Reforming water abstraction management in England, Ofwat/EA 2011). © Crown copyright. All rights reserved. Environment Agency 100026380. 2011.

However, it is important to remember that the fracturing process is not continuous, with the fracturing events themselves only lasting a few weeks. This allows the industry to work with regulators and water utilities to time fracturing activities to avoid periods when there is likely to be reduced availability of water resources, particularly due to seasonal variation.

Overall, the amount of water likely to be consumed by the fracking industry has not given cause for concern to the UK government departments, regulators and scientific bodies who have looked at the evidence. The existing regulatory framework is considered generally sufficient to ensure that use of water resources is sustainable and can be managed in the same way as any other industrial activity.

[1] https://www.theguardian.com/environment/2017/jan/04/friends-of-earth-ticked-off-claims-anti-fracking-leaflet
[2] Ofwat 20102011 Ofwat.gov.uk.

Figure 3 – Full extent of potential shale gas source rocks in red, Principal Aquifers in blue, extent of aquifers shallower than 400 m (pale blue).



Shale gas source rocks **Principal aquifers**

Source: http://www.bgs.ac.uk/news/docs/aquifersAndShales_FINAL.pdf

Contamination of water resources

Can fracking at depth contaminate aquifers by allowing migration of methane and fracking fluids?

Concerns have been raised that both methane and fracking fluids could migrate from depth and potentially contaminate groundwater in aquifers. Various scare stories emanating from the US have fuelled the debate.

However, the reality is that the shale gas formations usually lie thousands of metres below the surface, while aquifers used for potable supply exist at much shallower depths. Often impermeable rock formations are present between them, as shown in Figure 3. The fractures created during the process are limited in size and their ability to propagate any distance is limited; consequently they have little potential to create preferential pathways for the migration of gas and fracking fluids.[3]

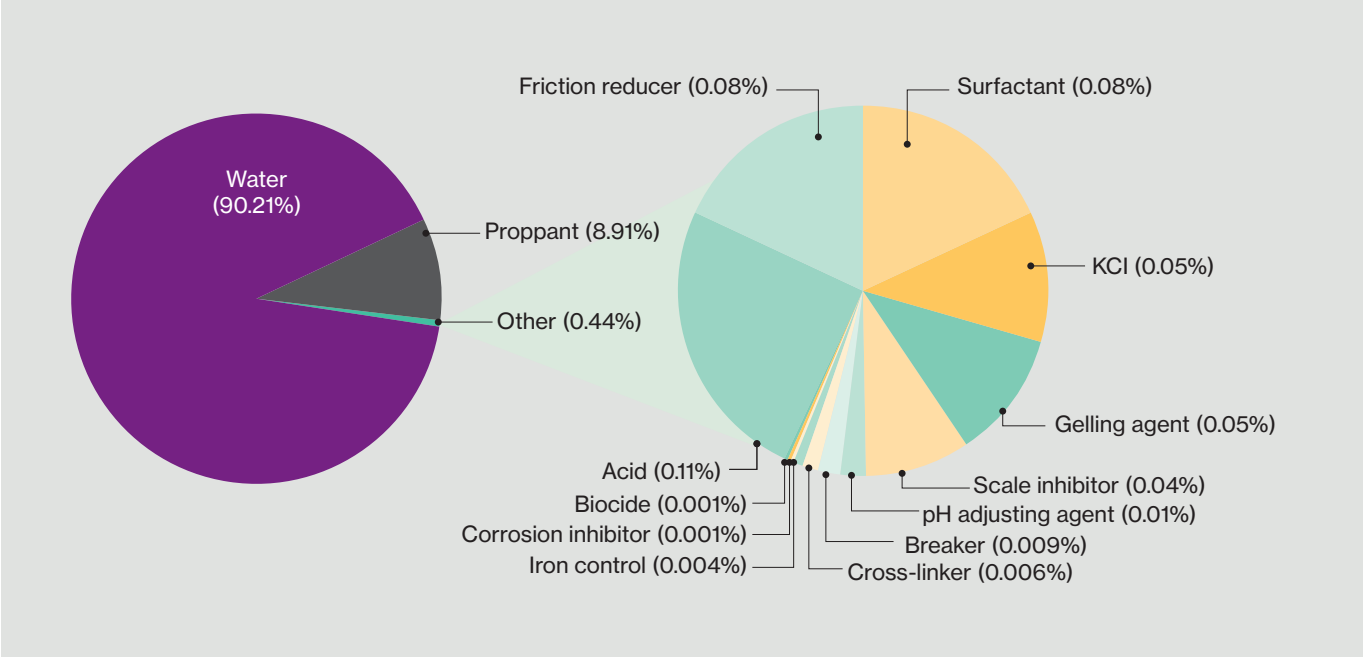
In the UK, the geological conditions are such that the shale gas formations exist at depth, and impermeable formations often are present between these strata and the shallow aquifer. In order to allay concerns, the British Geological Survey (BGS), in conjunction with the Environment Agency, has produced a series of regional maps showing where key aquifers coincide with potentially exploitable shale gas formations.

Figure 4 shows the overall coincidence of potential shale gas source rocks and Principal Aquifers in England and Wales. We can see from the map that the majority of Principal Aquifers are shallower than 400m and are therefore separated from the shale gas formations by a considerable thickness of strata.

The Bowland Shale, which lies across the north of England, is a key target for shale gas development (and includes Cuadrilla's Preese Hall site). The BGS estimates that 92% of this formation is at least 800m below the Principal Aquifers that are actively used as potable supply.

[3] Davies, R.J., S.A. Mathias, J. Moss, S. Hustoft, L. Newport. 2012. Hydraulic fractures: How far can they go? Mar. Petrol. Geol. 37:1–6.

Figure 4 – Typical constituents of fracking fluid



Source: Adapted from Authur et al. (2009)

The Chalk aquifer of the South Downs is above part of the Weald Basin, which has been identified as prospective for shale oil. In this area, the uppermost shale oil source rock (Kimmeridge Clay) is at least 650m below the Chalk aquifer.

The conclusion for UK regulators and the government is that risks to potable supplies are low via migration of methane and fracking fluids from depth along fractures stimulated by the hydraulic fracturing process. However, one has to recognise that, like any industrial operation, the potential exists for surface releases from pipe or tank leaks. Therefore it is useful to understand the composition of chemicals used in hydraulic fracturing.

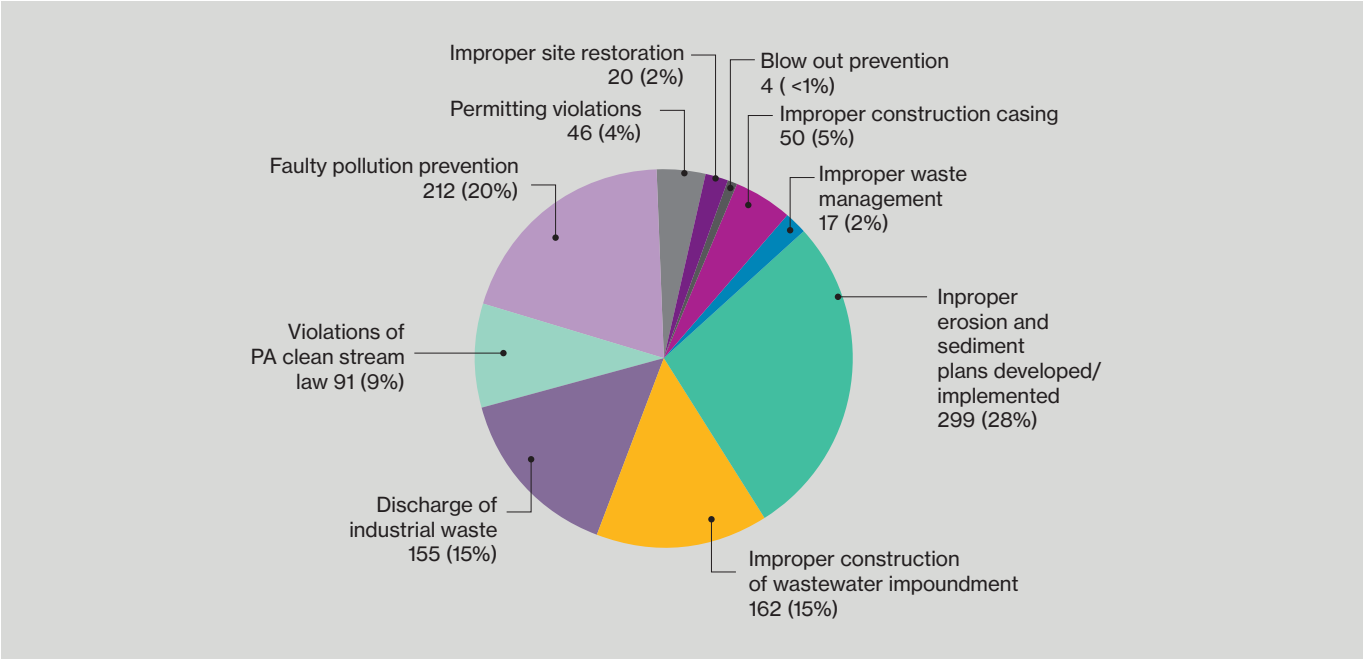
So how could fracking activity contaminate water?

Potential risks do exist – environmental exposure to fracking chemicals could potentially occur from:

- Releases from the storage, handling, and transport of chemicals used in the process
- Releases from the storage, handling, transport, and disposal of wastewater resulting from the process
- Casing or cementing failure and blowouts in the well, which could allow leaking of fracking fluids and methane.

Concerns have been raised that both methane and fracking fluids could migrate from depth and potentially contaminate groundwater in aquifers. Various scare stories emanating from the US have fuelled the debate.

Figure 5 – Causes of actual violations related to hydraulic fracturing and environmental protection in Pennsylvania.



Source: Pensylvania Land Trust Association's webpage, based on PADEP records from 1/1/2008 through 8/20/2010

What is the composition of fracking fluid?

To determine the magnitude of risk, it is necessary to consider the typical composition of the fracking fluid. Figure 5 highlights the constituents of a typical fracking fluid, with over 90% of the fluid consisting of water. A further 9% is the proppant (which is usually treated sand to keep fractures open), and less than 1% consists of chemical additives (Arthur et al. 2009).

The components of the fluid have different roles. The proppant keeps the fractures open, and polymeric thickeners are included in the fluid mixture to transport the proppant. Bactericide is included to minimize polymer degradation and scaling. Friction reducers (e.g. polyamides) are used to allow pumping at high rates. Breaker fluids, acids, oxidizers, or enzymes are also used to degrade the polymer for post-fracturing fluid recovery, and surfactants can also be included to reduce surface tension in the treatment fluid and improve fluid recovery.

In the UK, operators are required to disclose the ingredient list and maximum concentrations to obtain a permit. The ingredients must be non-hazardous, as defined by the Groundwater Directive 2006 (2006/118/EC). A plan for environmental monitoring of those chemical components must be agreed to as part of the permit.

What is "flowback," and how does it differ from produced water?

Flowback is a water based solution that flows back up to the surface during and after the completion of hydraulic fracturing. The fluid contains clays, chemical additives, and dissolved metal ions (expressed as total dissolved solids, or TDS). Most of the flowback returns in the first seven to ten days from the commencement of fracking, while the rest can occur over a three to four week period. The volume of flowback recovered ranges from 20% and 40% of the volume initially injected into the well. The rest of the fluid remains absorbed in the shale formation.

In contrast, "produced water" is naturally occurring water found in shale formations that flows up to the surface throughout the entire lifespan of the gas well. This water contains high levels of TDS, often as a result of minerals that have leached from the shale, including barium, calcium, iron and magnesium, among others.

How are waster products treated differently in the UK compared to the US?

In the US, some operators store the flowback in open pits, where a proportion of the solids settle out, allowing the water to be reused or to await final disposal. In the UK, contained systems for storage, handling, and transport of chemicals used in the process and both the flowback and produced water will be required in order to comply with the environmental permit. Some on-site treatment with re-use of the water is envisaged, with remaining residues being transported to a suitably licensed waste treatment and/or disposal facility.

Within the UK regulatory framework, the waste products of fracking operations are classified as mining waste, and so must be treated in accordance with the Mining Waste Directive 2006 [4]. However, the waste is expected to be managed through the environmental permitting regime and the development of a waste management plan. Despite the potential for reuse of the water, there will still be significant quantities of waste materials that require disposal. In the US, deep well injection takes place in order to dispose of the fluids, regulated by the Environmental Protection Agency (EPA) through the Underground Injection Control Program (UIC). It is this process which is thought to be the primary cause of induced seismicity related to hydraulic fracturing [5].

Deep well injection of waste will not be permitted in the UK and wastes must go to an appropriately licensed waste disposal facility. If naturally-occurring radioactive material (NORM) is present above a certain threshold, treatment at a standard waste water treatment facility may be precluded, and the operator must obtain a radioactive substance licence. Dewatering often produces a filter cake containing NORM, which needs to go to a landfill, and only a limited number of facilities are licensed to accept radioactive waste above certain levels.

Perhaps the biggest technical and commercial challenge facing the UK fracking industry is the treatment and disposal of the flowback, produced water, and related materials. This challenge represents an opportunity for the water industry to capitalise on its assets, expertise and experience to service the wastewater disposal needs of the fracking industry.

Could groundwater be contaminated from the area around the borehole?

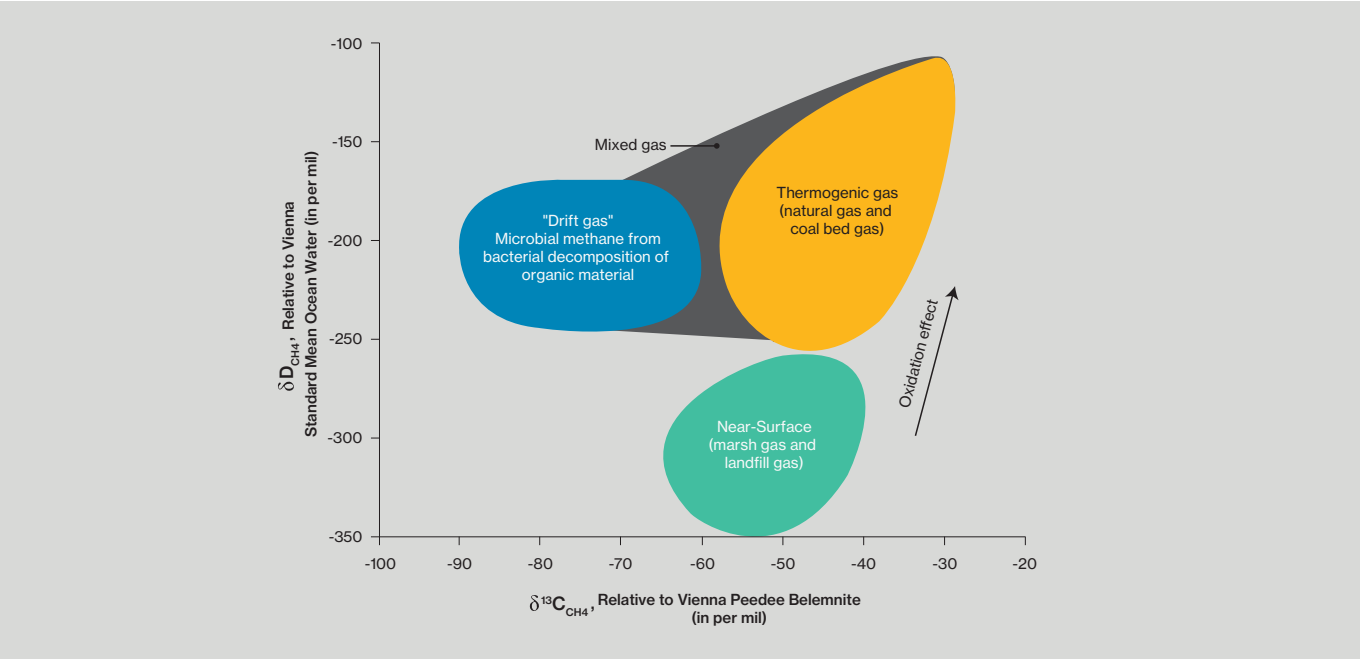
Concerns have been raised regarding the possibility of contamination of groundwater occurring from around the borehole and this is not an unreasonable concern. However, these risks can be mitigated. A standard well construction usually has up to three sets of casing installed, with cement in between.

The UK Onshore Operators Group well integrity guidelines[6] state that operators should ensure that groundwater is adequately isolated by cement casing and that the surface casing should extend to sufficient depth below the bottom of any aquifer to provide adequate isolation. In the UK, site safety and well integrity are monitored by the Health and Safety Executive (HSE), with specific reference to the Borehole and Site Safety Regulations 1995 (SI 1995/2038) (BSOR) and the Offshore Installations and Wells (Design and Construction) Regulations 1996 (SI 1996/913) (DCR), which also apply to onshore drilling. These specify that there must be no unplanned escape of fluids from the well.

The HSE requires that the operator set up a Well Examination Scheme and appoints an Independent Well Examiner, who reviews the proposed and actual well design and operations to ensure compliance. UK Onshore Oil and Gas (UKOOG) industry guidelines require that seismic monitoring be used to assess any potential impact on well integrity.

[4] Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries, and amending Directive 2004/35/EC. For more information, see Practice note, Mining waste: summary).
[5] https://earthquake.usgs.gov/research/induced/myths.php
[6] Industry Guidelines | UKOOG.

Figure 6 – Plot of carbon and hydrogen isotopes for methane can indicate the origin of the gas



Source: https://pa.water.usgs.gov/projects/energy/stray_gas/presentations/2_1030_Revesz.pdf

In the US, although there have been claims of contamination related to well integrity and safety, the actual number of incident claims is low. For example, Figure 5 on page 32 shows that fewer than 1% of actual violations by fracking operators in the State of Pennsylvania are related to failure of blowout prevention, and only 5% are related to improper construction casing.

While there is a potential risk of contamination associated with well failure of some description, the UK has adequate regulations, practices, and procedures in place to mitigate that risk. With these in place, fracking should be considered in the same manner as any other industrial process or activity in terms of its impact on water resources.

So why has there been litigation related to contamination of methane and fracking chemicals in the US?

Methane has been found in water wells in the US. However, the natural presence of gases and other contaminants in drinking-water wells is not new; in fact, there are a number of other potential sources of methane in the environment.

Most elements occur as mixes of stable isotope forms, and the ratio of one isotope to another varies according to the source from which the gas is formed, as illustrated in Figure 6 above. This applies to methane, the origin of which can often be determined through fingerprint analyses.

There are two main types of methane gases, biogenic and thermogenic, which as indicated in Figure 6 can be distinguished by stable carbon isotopic differences:

- Biogenic gases, including methane, are produced by bacteria. They generally form in near-surface anaerobic groundwater environments, such as peat bogs, wetlands, and landfills. “Drift gas,” also biogenic, is produced as a result of bacterial decomposition in the sub-surface.
- Thermogenic methane is formed during the thermal decomposition of organic matter at depth under high pressure and is associated with coal, oil and gas fields.

[6] Industry Guidelines | UKOOG.

What should the UK fracking industry do in light of this?

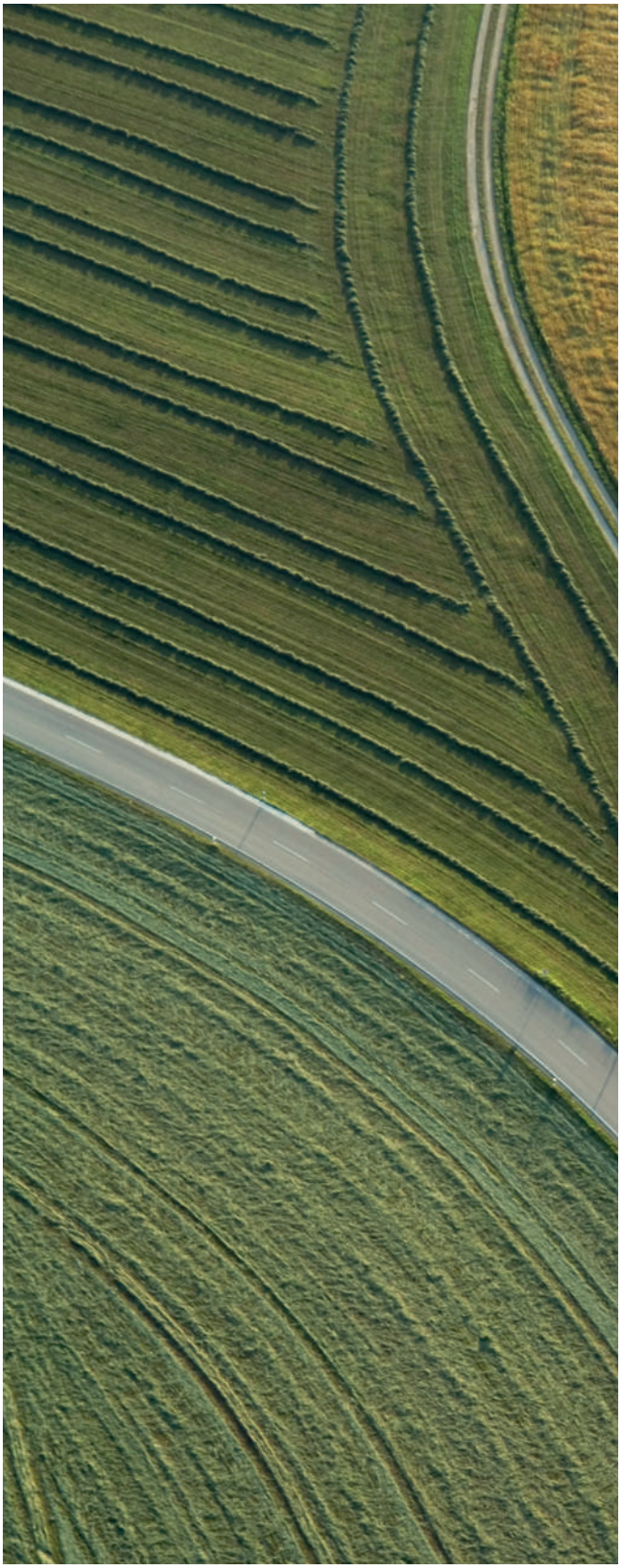
In the UK, it will be critical for the fracking industry to undertake adequate baseline sampling and analysis to "future-proof" itself against regulatory scrutiny and issues on post-operational permit surrender, and against unfounded allegations of contamination.

In assessing the provenance of chemicals in environmental media, effective baseline delineation is crucial, and this includes more than just the isotopic composition of methane. A number of chemicals that have commonly occurring sources, such as heavy metals, salts, and hydrocarbons, have been cited as evidence of contamination from fracking activities in the US, but have been proven to arise from other sources. The use of more advanced investigative techniques, such as chemical fingerprinting, should be considered for determining the actual sources of contaminants and providing adequate baseline data.

Conclusion – fracking debate should be based on sound analysis

In conclusion, the UK shale gas industry is in its infancy, and a significant amount of exploration and testing is needed to accurately assess the viability of the UK shale gas resource. The process to obtain the necessary licences, permits, planning permission and other consents is lengthy and ensures that the UK onshore oil and gas regulations are among the most protective in the world. This regulatory regime will serve to mitigate potential harm to the environment in the same way as it does any other industrial process. In the debate as to whether fracking should be prevented due to concerns over risks to groundwater, decisions should be made on the basis of factual information and sound scientific analysis.

The UK has adequate regulations, practices, and procedures in place to mitigate that risk. With these in place, fracking should be considered in the same manner as any other industrial process or activity in terms of its impact on water resources.



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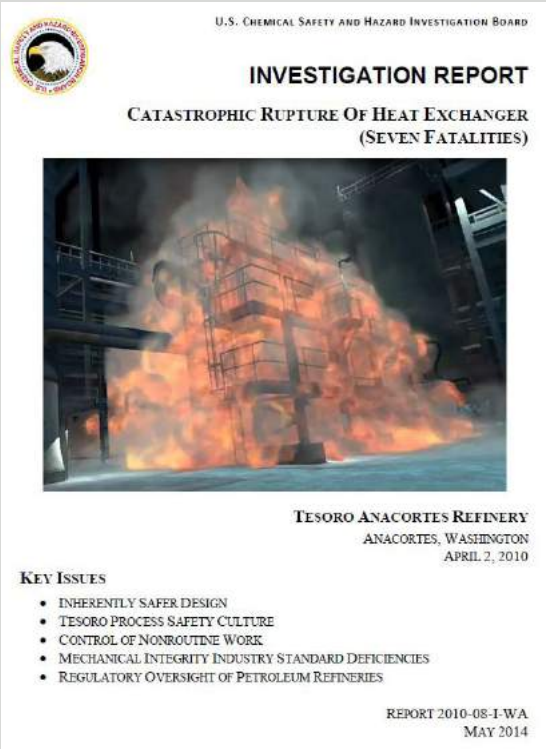
Are you sitting on an HTHA time bomb?

Introduction – the dangers of HTHA

High temperature hydrogen attack (HTHA), also called hot hydrogen attack, is a problem which concerns steels operating at elevated temperatures (above 400°F / 204 °C) in hydrogen environments, in refinery, petrochemical and other chemical facilities.

Figure 1 – Tesoro Anacortes refinery investigation report



U.S. Chemical Safety and Hazard Investigation Board

INVESTIGATION REPORT

Catastrophic Rupture Of Heat Exchanger (Seven Fatalities)

Tesoro Anacortes Refinery
Anacortes, Washington
April 2, 2010

Key Issues

- Inherently Safer Design
- Tesoro Process Safety Culture
- Control of Nonroutine Work
- Mechanical Integrity Industry Standard Deficiencies
- Regulatory Oversight of Petroleum Refineries

Report 2010-08-I-WA
May 2014

On April 02, 2010, HTHA resulted in a catastrophic failure of a forty-year-old heat exchanger at the Tesoro Refinery in Anacortes, Washington, resulting in seven fatalities. The US Chemical Safety Board (CSB) investigated and released its final report into the incident on May 1 2014.

The CSB also issued a further Safety Alert on the topic of "Preventing High Temperature Hydrogen Attack (HTHA)" as recently as August 11 2016, so it continues to be a significant topic.

What, then, are the key messages of the 160-page CSB report for refinery operators? Let's start by describing what actually happened.

The Tesoro Anacortes tragedy

The April 2 2010 incident occurred in the naphtha hydrotreater (NHT) unit of the Anacortes refinery. Naphtha is raw gasoline; hydrotreating is a process that removes sulphur, nitrogen, and oxygen impurities from petroleum feedstock such as naphtha by selectively reacting it with hydrogen in the presence of a catalyst.

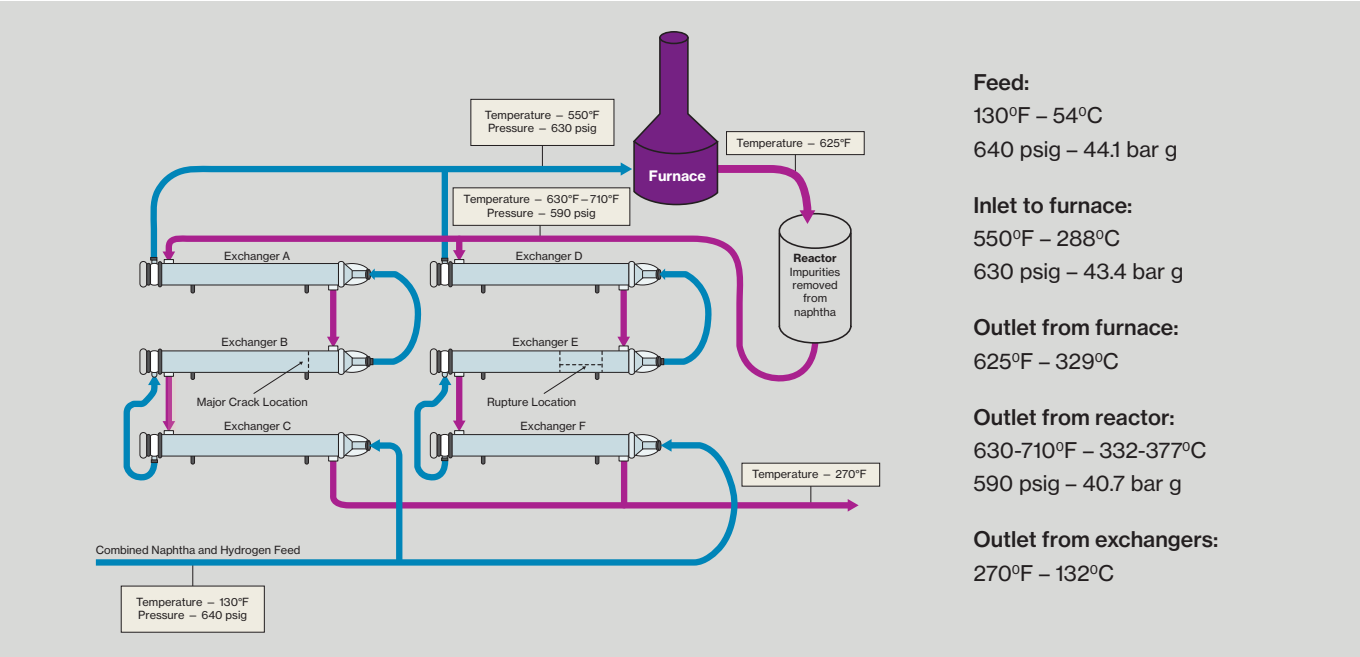
The NHT unit at Anacortes was originally constructed by the Shell Oil Company in 1972 with a rated capacity of 24,800 bpd (~164 m^3/h) of naphtha feed. Modifications and upgrades resulted in a rated capacity at the time of the incident of 40,550 bpd (~269 m^3/h), a 64% capacity increase. Tesoro acquired the Anacortes refinery from Shell Oil Company in 1998.

For the catalyst in any given NHT unit to perform its purpose, the mixed naphtha and hydrogen feed to the reactor needs to be heated to typically 625 °F (329 °C) at around 600 pounds per square inch gauge (psig, ~41 barg). To conserve heat, much of the energy in the hot reactor effluent is recovered by heat exchange against incoming feed in a series of feed-effluent exchangers.

It was one of these exchangers, E, that failed. It burst open along a weld seam, instantaneously enveloping the whole area (including the unfortunate process operators who were working there) in a mist of naphtha and hydrogen, which almost certainly auto-ignited at the high temperature.

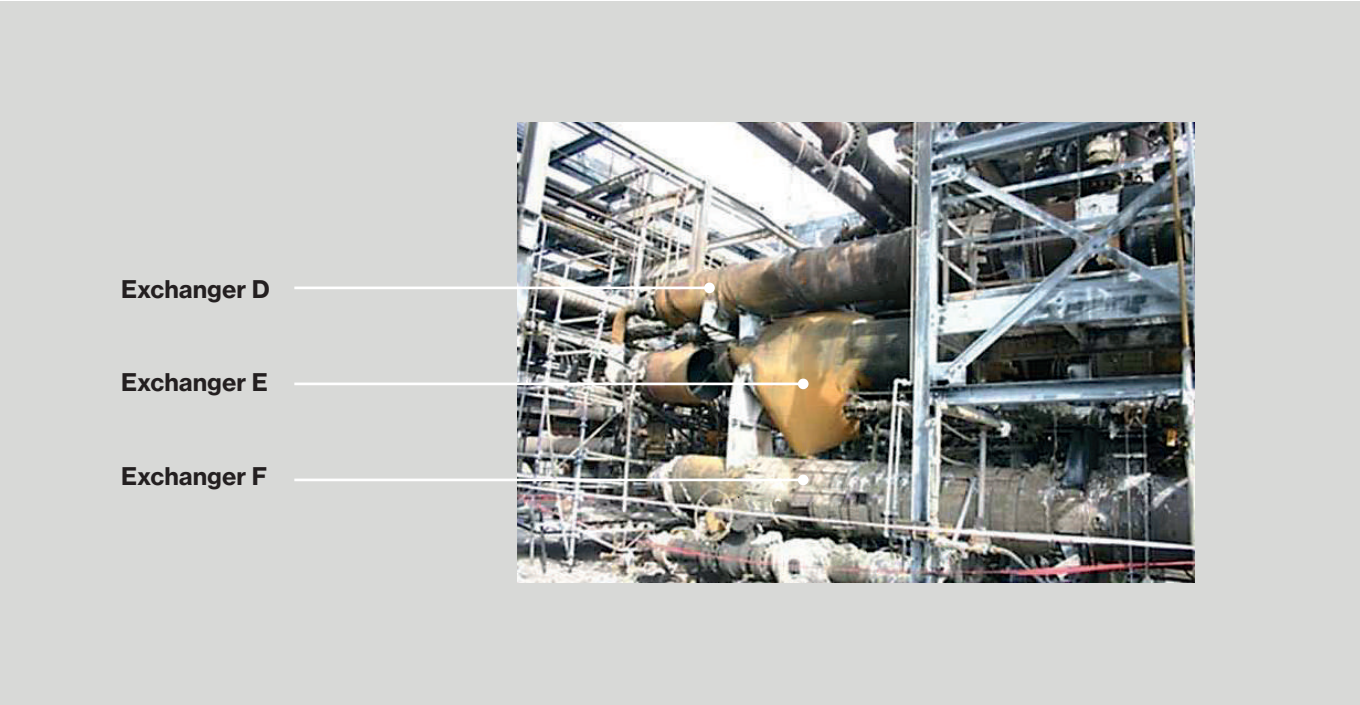
The failure of Exchanger E occurred during work to bring it and the other exchangers in that bank, D and F, back into service after cleaning. The heating-up and re-pressurising of these exchangers produces a period of higher than normal stresses on the equipment, which probably initiated the failure. The equivalent exchanger B, in the other bank of three exchangers, was afterwards found to have suffered HTHA but to a lesser degree.

Figure 2 – Schematic of the Tesoro Anacortes Refinery NHT unit heat exchangers



Source: US Chemicals Safety and Hazard Investigation Board

Figure 3 – Post incident view of D/E/F NHT heat exchange bank



Source: US Chemicals Safety and Hazard Investigation Board

Other contributory factors

Of course multiple other causes and contributory factors were identified in the CSB report that either led to the tragedy of April 02, 2010 or made its consequences worse:

- The B and E heat exchanger shells were constructed from carbon steel that was not post-weld heat treated, and just the hottest ~quarter of the lengths were internally clad with one-eighth inch (3 mm) thick stainless steel to improve resistance to HTHA. Each damage mechanism review that took place over the years incorrectly documented that B and E exchangers had protective stainless steel cladding over the entire shell length. Therefore the refinery inspection team would not have been expecting HTHA to be occurring, and it would be reasonable that they did not attempt to perform the difficult inspections necessary to identify it.
- Furthermore, Shell Oil performed a process hazard analysis (PHA) on the NHT unit in 1996 [1] – this cited ineffective, non-specific, judgment-based, qualitative safeguards to prevent equipment failure from HTHA. The Tesoro PHA revalidations in 2001 and 2006 "did not address or modify the analysis" and "the Tesoro 2010 NHT unit PHA failed to identify HTHA as a hazard".
- The tragic consequences of the incident were made far worse because several operators were required to be in the immediate vicinity of the feed-effluent exchangers during start-up to simultaneously and gradually open several large manual isolation valves arranged on several levels in the exchanger structure. During the warm-up of the equipment, flanges were also known to leak hydrocarbons, and it had become 'normal' [2] for some of the operators to deploy steam hoses to snuff out the small fires from these leaks until bolts could be re-tightened. A risk review may have recommended installing actuators on the valves and fixed steam snuffing rings on flanges to minimise personnel exposure.

The heating-up and re-pressurising of these exchangers produces a period of higher than normal stresses on the equipment, which probably initiated the failure.

[1] The 1996 PHA team significantly underestimated the risk of NHT heat exchanger failure: - the frequency was appropriately estimated as being less than three percent - "Low" - however, the consequence of the scenario was determined to be "Low to Medium".

[2] This appears to be an instance of "Normalization of Deviance", a term invented by Dr Diane Vaughan following the Space Shuttle Challenger disaster of January 28, 1986. She published a book in 1996 about the accident, and was called as an expert witness during the enquiry into the subsequent Columbia disaster of February 1, 2003. "Normalization of Deviance" is an organisation's incremental descent into poor judgement.

Key takeaways

1 – Gradual manifestation can have catastrophic impact

One feature of HTHA which makes it so hazardous is that it typically progresses over a number of years and begins by causing fissures along metal grain boundaries internally within the metal. Only when it has progressed substantially does it result in cracks to the metal surface.

These cracks might be easier to detect were it not for the fact that these surfaces are normally hidden on the internal (process) side of the equipment. Furthermore, if the metal is carbon steel and has not been post-weld heat treated, the heat-affected zones either side of the weld are particularly susceptible to HTHA because residual stresses remaining in the metal after welding are high.

The HTHA fissuring progresses over time and eventually can result in a number of cracks running parallel to and immediately next to the weld, severely weakening the metal. As a result, if the failure process begins, rather than a relatively low-consequence leak the whole cracked weld can 'unzip' in an instant. This is what almost certainly happened to the Anacortes Exchanger E; eventually, without detection, it would also likely have happened to Exchanger B.

2 – HTHA is difficult to detect

Another feature of HTHA which makes it highly hazardous is that it is difficult to detect via non-destructive testing (NDT). The American Petroleum Institute (API) recommended practice (RP) 941 "Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants" Eighth Edition has guidance on this, which includes the following important observations:

- "Most users do not inspect equipment for HTHA damage unless it has been operated near or above its [Nelson] curve. An HTHA inspection program should also consider equipment that operates infrequently above its curve."
- "HTHA is a difficult inspection challenge. The early stages of attack with fissures, or even small cracks, can be difficult to detect. The advanced stage of attack, with significant cracking, is much easier to detect, but at that point there is already a higher likelihood of equipment failure. In addition to attack of the base metal, HTHA has been known to occur as a very narrow band of intense attack and cracking, running alongside and parallel to welds."

- "Of all the inspection methods for base metal examination, UT [ultrasonic testing] methods have the best chance of detecting HTHA damage while it's still in the fissuring stage, prior to the onset of significant cracking. Most effective is the use of a frequency dependent backscatter method in combination with the velocity ratio and spectral analysis techniques."
- "Other methods are capable of detecting HTHA only after discrete cracks have formed and there is significant degradation of mechanical properties."
- "For weldment examination where attack can be highly localized, as mentioned above, only two UT methods of examination are considered effective. High frequency shear wave and angle-beam spectrum analysis techniques should be used to detect HTHA damage in the fissuring stage. Conventional shear wave UT and time of flight diffraction (TOFD) techniques can be used to try to detect HTHA in the advanced stages, when there is significant cracking."

3 – The need for inspection below the Nelson curve

So, we have a hidden deterioration mechanism which can lead to sudden catastrophic failure of pressurised equipment in high temperature, pressurised hydrocarbon + hydrogen service; and this form of deterioration is difficult to detect.

This is the reason for the first statement in the API 941 quotes reproduced above: most users do not inspect equipment for HTHA damage unless it has been operated near or above its Nelson curve. In the case of the Tesoro Anacortes disaster, the CSB investigation discovered that despite the 64% increase in feed rate to the HDT over the years, and despite variations in temperature profiles due to catalyst condition, the zone of Exchanger E that failed had not operated above the carbon steel Nelson curve as published in API 941.

Therefore the CSB recommended that the Nelson curve for carbon steel be re-drawn to move it to the 'safe side' of the Anacortes operating region as shown in Figure 4 overleaf.

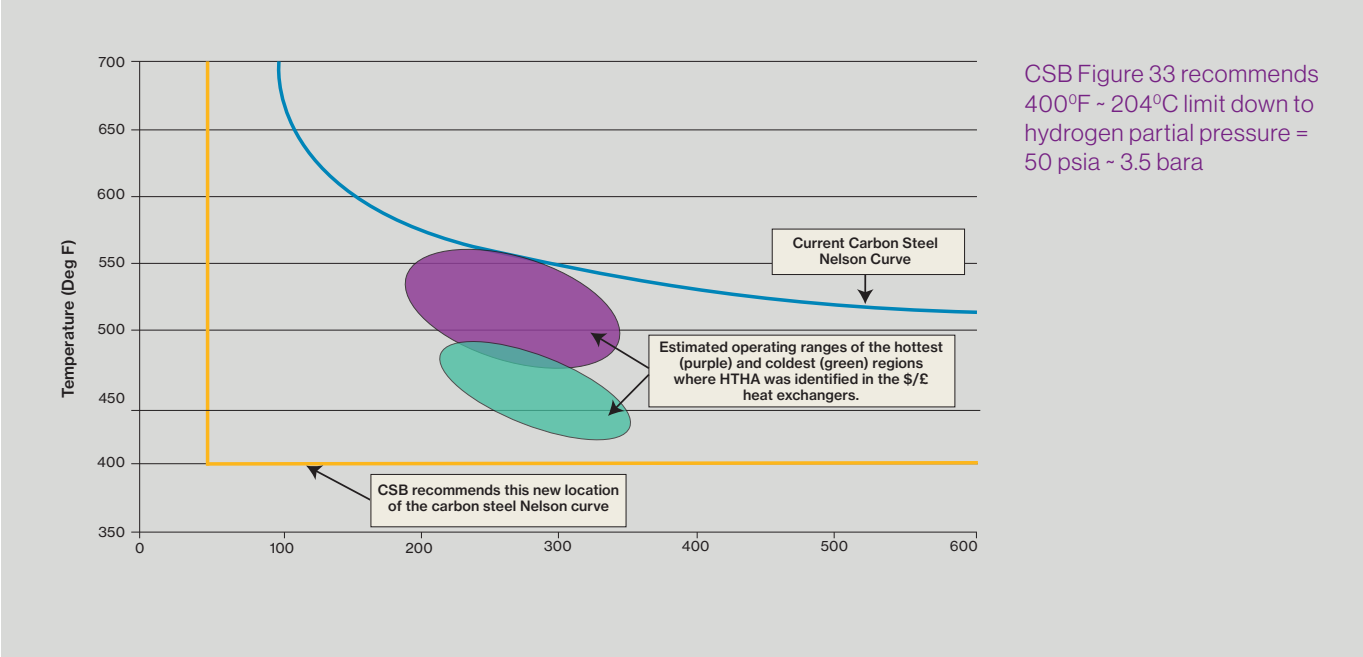
4 – Lines of Nelson curves not to be taken as absolute

API RP 941 is one of the main industry consensus guidance documents available to refiners. Its guidance is the result of decades of experience accumulated by a multitude of refinery operators. Although the API is an American institute, it draws on the experience of the global majors as well as US-only refiners, and consequently represents an extraordinarily wide experience base. All that being said, it has to be recognised that the guidance it contains is based on observed data which has scatter. The lines of the Nelson curves (there are many presented on Figure 1 in that document, for carbon steel and for various alloys containing chromium Cr and molybdenum Mo which give greatly increased resistance to HTHA) are not to be treated as absolute yes/no boundaries. API RP 941 itself includes various warnings for equipment designers, including (in the current Eighth Edition):

- Temperatures for data plotted in the figures represent a range in operating conditions that in previous editions was stated to be about ±20 °F (±11 °C).
- Because of the uncertainty of the actual operating conditions over many decades of operation for data points contained in the curves, users need to understand that Figure 1 is based largely upon empirical experience.
- Therefore, an operating company should add a safety margin, below the relevant curve, when selecting steels.

We have a hidden deterioration mechanism which can lead to sudden catastrophic failure of pressurised equipment in high temperature, pressurised hydrocarbon + hydrogen service.

Figure 4 – CSB modeling results of HTHA and the nelson curve a the Tesoro Anacortes Refinery



Source: US Chemicals Safety and Hazard Investigation Board

Outcomes

1 – CSB Anacortes Report recommendation

The CSB report recommended that the Nelson curve for carbon steel be re-drawn as per Figure 4 above.

2 – CSB August 2016 Safety Alert recommendations

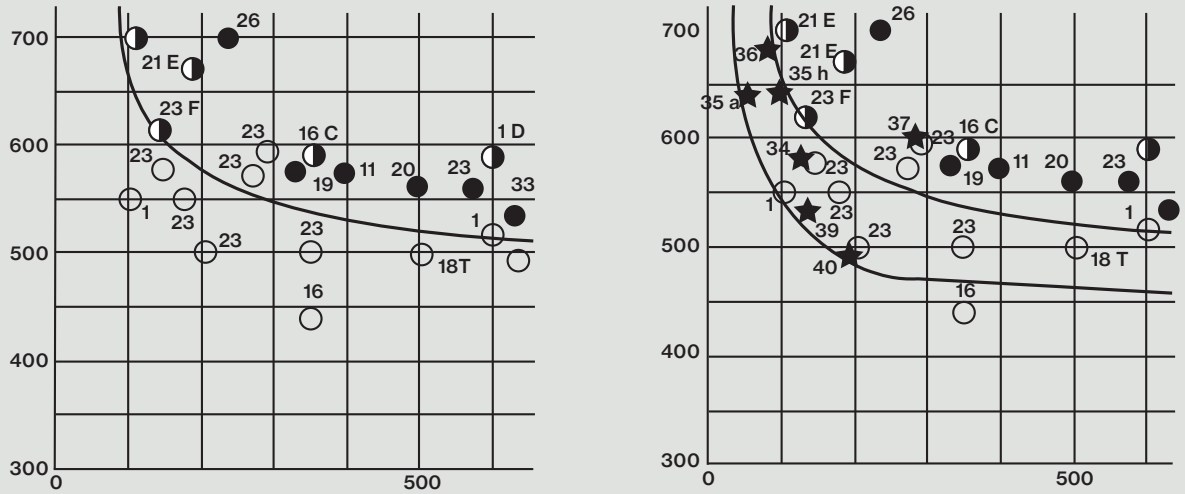
The CSB safety alert referred to earlier, included the following safety guidance to prevent HTHA equipment failure:

- Identify all carbon steel equipment in hydrogen service that has the potential to harm workers or communities due to catastrophic failure;
- Verify actual operating conditions (hydrogen partial pressure and temperature) for the identified carbon steel equipment;
- Replace carbon steel process equipment that operates above 400 °F [204 °C] and greater than 50 psia [3.45 bara] hydrogen partial pressure; and
- Use inherently safer materials [3], such as steels with higher chromium and molybdenum content.

These cracks might be easier to detect, were it not for the fact that these surfaces are normally hidden on the internal (process) side of the equipment. Furthermore, if the metal is carbon steel and has not been post-weld heat treated, the heat-affected zones either side of the weld are particularly susceptible to HTHA because residual stresses remaining in the metal after welding are high.

[3] The CSB report refers to "inherently safer" materials seemingly to mean higher-alloy materials. I think "inherently safer" in Europe is better understood in relation to reductions in intensity of the process conditions: lower temperature and/or pressure, lower inventory of hydrocarbons, less corrosive conditions, etc. An example of "higher-alloy" being the opposite of "inherently safer" is with hydrofluoric acid (HF).

Figure 5 – New carbon steel line



API RP 941 eg 6th Edition (2004)
Figure 1 (part): Carbon steel line

API RP 941 eg 8th Edition (2016)
Figure 1 (part): Lower line is for
Carbon steel (welded with no PWHT)

Source: US Chemicals Safety and Hazard Investigation Board

3 – New carbon steel line in API RP 941

API RP 941 Eighth Edition (2016) has responded by adding a new line labelled "Carbon steel (welded with no PWHT)" for HTHA of carbon steel not subjected to post-weld heat treatment (PWHT), which is below the carbon steel curve appearing in all previous editions and now labelled as "Carbon steel (non-welded or welded with PWHT)".

Figure 5 above are extracts of Figure 1 from the Sixth Edition and from the Eighth Edition showing this new (lower) line. These extracts are for the same region of the chart as included by the CSB: the vertical axis is for temperatures in degrees Fahrenheit (°F) and the horizontal axis is for hydrogen partial pressure in psia.

This guidance has wide ramifications across refining. The CSB report concludes that some design information followed for decades is not sufficiently conservative, and API RP 941 has made a considered adjustment to the main design guidance used widely across the industry. In particular, the Nelson Curve for carbon steel (the most common material used for equipment in refineries) has been found to be unsafe in regions of hydrogen service operation previously thought to be safe. The Tesoro Anacortes incident also shows that the consequences of an equipment failure through HTHA can be both sudden and catastrophic. Therefore it is important to share this issue with as wide an audience as possible across the refining world.

Hydrotreater units such as the one that blew up at Anacortes are ubiquitous in modern refineries; they are the most common higher-pressure process units out there, and so all refineries need to look at this issue. As we have shown, HTHA of the type described is a form of damage that appears over a number of years; the unit was about 40 years old when it happened, so the older the refinery is, the higher the risk.

Conclusion – forewarned is forearmed!

Hydrotreater units such as the one that blew up at Anacortes are ubiquitous in modern refineries; they are the most common higher-pressure process units out there, and so all refineries need to look at this issue. As we have shown, HTHA of the type described is a form of damage that appears over a number of years; the unit was about 40 years old when it happened, so the older the refinery is, the higher the risk.

Even when the results of investigations into HTHA losses are made public, as in the case of Tesoro Anacortes, the documentation produced is often too long and complex for many busy refinery risk managers and process safety professionals to have time to read. We in the Risk Engineering community therefore see it as an important part of our role to make ourselves familiar with losses and talk about the key learnings with our clients in a condensed form. In this way, they are alerted to the issue and can assign their subject matter experts to assess it in depth.

For example we presented the CSB findings of the Tesoro, Anacortes incident to one of Willis Towers Watson's clients on 11-12th February 2015 during a 'consultative' visit to their facilities. Since then, our client has investigated the issue in depth and has identified several heat exchangers across their two refineries where the metallurgy may be susceptible to HTHA, and they are therefore performing more inspections and are replacing some items.

We do hope that other refiners take on board the results of this case study and apply the findings to their own facilities as they deem appropriate.

Our client has investigated the issue in depth and has identified several heat exchangers across their two refineries where the metallurgy may be susceptible to HTHA, and they are therefore performing more inspections and are replacing some items.

Chris Bond joined Willis at the end of 2006 as a member of the Engineering & Risk Management team, and is now Senior Risk Engineering Director in Natural Resources, Willis Towers Watson. Prior to joining Willis, Chris worked for Swiss Re for over 3½ years. While at Willis he has advised clients including MOL, Petroplus, ADNOC, Preem, ENGEN, Sasol, FREP, Atlantic LNG, Escravos GTL and NCOC.

Captives – are they still relevant to the energy industry?

Introduction

In an age where increasing technological advancements and sophisticated work practices are leading to a host of new and complex risks, it does not seem unreasonable to question whether the traditional captive concept has become diminished over time. Captive insurance has now been around for some time and was originally used primarily for more "standard" property/casualty risks. As the risk registers of corporates diversify into new and sometimes unexplored areas, the ongoing need for captives has come under renewed scrutiny.

Interestingly, however, the evolution of captives has kept pace with the continuous changes to the environments in which they operate and captives not only continue to remain relevant, but the market is actually thriving.

The overall number of captives has risen steadily over the last few years, with the total captive market now reported to be in excess of 7,250, an increase of approximately 42% in the last ten years. It is estimated that more than 19% of captives are owned by corporates from the natural resources sector.[1]

Considering the soft market cycle currently in evidence, which may encourage transfer as opposed to retention of risk, and the numerous regulatory changes impacting captives such as Solvency II and more recently Base Erosion and Profit Shifting (BEPS), this growth looks impressive.

However, the really interesting story that that lies behind the statistics is that the sophistication of captive programmes within the population referenced is also fast-changing. An increasing number of corporates are not only using captives to reduce their premium spend, but as a central engine driving an enterprise wide risk financing strategy.

The speed of evolution of captives has increased in direct relation to the increasing environmental changes to which they have been exposed. It is this inherent flexibility and resilience which is, in itself, proof that the concept of captives works and is the reason why captives are arguably more relevant today than ever before.

[1] The Business Insurance Survey 2014/15, Willis Natural Resources Market Review 2015

How are captives evolving?

In general, the two most notable evolutionary traits that captives have displayed in recent times have been;

1. the utilisation of data to optimize risk financing arrangements
2. the way in which they mirror the evolving risk profile of owners, accommodating a far broader range of risks

Data and captives

Data has become valuable currency in all facets of life in recent years and the capacity of captives to act as a repository for risk management data has grown exponentially as a result.

The data collected by a captive can be used in a variety of ways. The developments in advanced analytics in recent years have become more prevalent in captive strategies and this data can now be used to optimize retention strategies, create innovative programme structures, employ parametric insurance techniques and generally bring a more scientific approach to retention and risk financing strategies. Unlocking the value of the data collected through a captive has allowed captive owners to approach insurance purchasing decisions with a similar toolkit to commercial insurers. This development has resulted in a marked shift in the renewal negotiation strategy with conversations now more akin to insurer to insurer conversations as opposed to a purchaser to vendor conversation.

Captive owners, through the correct usage of their own data, now have a wealth of insight to inform what and how they retain risk and this has led to an emergence of captive owners who speak in terms of "optimal retention structures", "portfolio benefit maximization" and "maximization of return on equity" – a genuine insurance mindset. This has led to the pursuit of more sophisticated structures such as multi-year, multi-line programmes, to refine and optimize how corporates finance their risk.

Harnessing the power of the captive's data in this way has ensured that, even in a soft market cycle, captives can continue to reduce a corporation's Total Cost of Risk, building longer-term resilience.

Broader risk profiles

It is not a coincidence that the major trends and innovations of the captive industry in recent years have been in areas such as Human Capital Benefits, Political Risk and Cyber Liability, to name but a few – these represent the fastest growing risks of most major corporates.

Captives are rapidly adjusting to the new reality of a more interconnected global economy, where human capital is now, more than ever, seen as the greatest asset a company can have.

The emergence of captives as viable insurers of employee benefit risk is one of the most noteworthy developments in recent years and exemplifies the evolution of captives from vehicles for 'traditional P&C' risk to enterprise wide risk solution vehicles. Increasing numbers of captive owners are including employee benefits in their captive because the arguments to support this approach are strong and numerous. Statistics suggest that up to 25% of employee benefits costs can be saved through pooling employee benefit risk in a captive [2]. Mixing life and 'P&C' risk in a captive increases diversification benefits and capital efficiency. This approach also provides HR departments with greater flexibility and control of benefit programme design.

This broadening of captive's risk profiles has improved the efficiency of captives through increasing diversification benefits but also ensured that they remain relevant to the key risks corporates face today.

Increasing globalization of captives

Another trend which has become more evident in recent years is the increasing global spread of captive hubs or domiciles. Historically, captives congregated in a handful of captive strongholds such as Bermuda, Luxembourg and Guernsey. However there are now over 60 recognized captive domiciles with insurance legislation specific to captives [3]. The spread is also truly global. The captive concept has now gained considerable momentum in the Far-East with locations such as Singapore, Hong Kong and China exhibiting growth, Mauritius has recently renovated its captive legislation to cater for the growing interest in Africa and there have been a series of mainland US states passing or improving their captive legislation.

This development underlines the growing demand for captive solutions outside Europe and the US, and is a reflection of the globalization of modern business environments.

Current challenges to the industry – Base Erosion and Profit Shifting ('BEPS')

One of the most significant challenges facing the captive industry is BEPS, which is an Organisation for Economic Co-Operation and Development (OECD) led taxation initiative, expected to become a global taxation standard. This initiative aims to renovate global taxation frameworks and 'close the loop' in tax legislation which allows multinational corporates to artificially shift profit to lower tax jurisdictions and reduce their overall tax bill. Although the measures introduced by BEPS are not specifically aimed at captives, as subsidiaries of large multinational companies they fall within its remit. It is likely that many companies in the natural resources industries will own captives in locations where the corporate tax rate is lower than that of the headquarter jurisdiction, and if this characteristic applies, BEPS may also.

However, it is important to stress that having a captive in a location where corporate tax rates are lower, relative to the organization average, does not imply wrong doing, nor should captive owners be unduly concerned.

Moreover, what is important is positive preparation. Although the ultimate guise of BEPS in all jurisdictions is still to emerge, there is enough in the principles covered in the OECD guidance for captive owners to be preparing for. A sensible first step on the preparation project journey, and something we are recommending to captive owners through our proprietary proposition, RADAR, will be to review the captive's position in relation to the principle expectations of the BEPS package. Measuring the captive against key metrics, as well as documenting where positive compliance can be demonstrated and where remedial action is required, will allow captive owners to begin thinking about BEPS in specific terms that are actionable. This can lead to a BEPS preparation plan which ultimately puts the captive owner in control of the challenge and removes much of the uncertainty that currently exists for many captive owners.

Ultimately, the core of the BEPS challenge is whether profits made in a captive can be aligned with genuine value creation by the captive. Given some of the developments referenced previously and the continuing prominence that captives play in the overall insurance landscape, this should be a considered a healthy challenge and one that the vast majority of captives will be able to meet, albeit with some preparation and assistance.

[2] IPNJ Employee Benefits and People Risk Digital Newsletter, 2016
[3] Willis Towers Watson Multinational Pooling and Benefit Captive Research Report 2016/17

Implications for captive owners

So what conclusions can captive owners – and future captive owners – draw from these developments?

A common theme ties the various developments observable in the captive industry of today – captives have continued to keep pace with economic and risk management developments. Big data, cyber risk, changing work places and practices, and challenges related to the governing of an interconnected global economy are all terms that will be encountered when reading any commentary of today's economy. Utilization of data to achieve a more analytical approach, accommodating risks such as employee benefits and cyber, and aligning to regulations designed for interconnected global economies through BEPS suggest that captives have more than kept pace and are displaying the ability to 'future proof' themselves.

However, none of these benefits will happen automatically. Captive owners who derive the best value, and maintain the greatest relevance from the captive strategy employ an approach of periodic review and realignment of their captive deployment. The rate of change in the risk profile of natural resources companies – changing work practices, regulations and commodity price volatility, together with the numerous external forces impacting a captive approach - results in the "shelf life" of a given captive strategy becoming potentially shorter.

However, this should not be viewed as a negative development as the greatest benefit of a captive is its ability to adapt and transform to meet the demands of the group as and when they change. If reviewed regularly, the enhancements to strategy will take the form of incremental improvements as opposed to any fundamental change in the strategic direction of the captive.

To conclude, a captive can be considered one of the few truly dynamic tools that a risk manager has at his or her disposal and in most cases will only reduce in relevance if not appropriately maintained. Indications suggest that captives will continue to have a major role to play in the risk financing arrangements of multinational corporates for the foreseeable future.

The really interesting story that that lies behind the statistics is that the sophistication of captive programmes within the population referenced is also fast-changing. An increasing number of corporates are not only using captives to reduce their premium spend, but as a central engine driving an enterprise wide risk financing strategy.

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Global political outlook: the effect on the energy industry

Introduction

The geo-political landscape remains fraught with uncertainty for energy companies. Let's look back at some of the key energy flashpoints of the last 12 months and address the potential issues that could affect the global political risk horizon.

Saudi Arabia

At the time of going to print, the oil price has pushed up towards its highest level for 12 months due to Saudi Arabia and other OPEC countries meeting in Algiers in September 2016 and agreeing to cut production by roughly half a million barrels a day. Saudi Arabia's role in the Yemen civil war comes at a price that is eased by high levels of oil production so an OPEC output reduction is not a decision the Kingdom arrived at easily. Some observers may have felt that the reduction in oil prices would impact global supply by driving shale gas and higher cost producers from the market, yet the sustainable ramifications from this for worldwide oil dependant economies such as Angola, Ghana and Nigeria are now to be seen.

Angola

Angola recently overtook Nigeria as the continent's dominant oil producer, but its economy is based on an oil price of US$80 per barrel, a deficit which has left the country struggling to pay for imports due to a lack of dollar revenue. Its foreign exchange reserves are well buffered at around US$25bn, mainly due to the government capitalising when the oil price was high, but there is currently little chance of replenishment.

Sonangol, which normally accounts for 75% of state revenues, is recognising the need for spending as they are working with oil majors to improve sector efficiency. The new owners are also employing greater flexibility in their governance and spinning off non-core assets in the hope of servicing a debt burden that has grown 40% since 2015.

Nigeria

Nigeria's reserves are the lowest for a decade, at a level of US$25.7bn and President Bhuari's ambitious budgetary spending plans have raised questions about the debt burden he is prepared to assume. Low oil prices have exacerbated the shortfalls in the country's infrastructure and plans for revival are heavily debt dependant.

The government is active in clamping down on corruption as the Economic and Financial Crimes Commission (EFCC) continues to chase hundreds of firms and individuals accused of embezzlement through overpriced contracts. Coupled with the ongoing security issues in the Niger Delta region where insurgents are continually disrupting output, one could assume that the conditions were too challenging to continue. However, the oil majors' commitment to the region is relatively secure and in October 2016 the government announced a US$10bn infrastructure programme aimed at stemming the damage to the output caused by the longstanding insurgency.

Ghana

Ghana's foreign exchange reserves are the equivalent to three months' import cover, being around US$5bn, and these are certain to feel the strain if the oil price continues at its current level. The government has however taken steps to combat dollar liquidity issues by requiring companies to repatriate all export proceeds to licensed banks within 60 days of shipping, thereby deepening the foreign exchange markets.

Meanwhile Jubilee Field outputs were down and have been attributed to technical problems that may require additional investment. Whilst this would represent good opportunity for foreign direct investment, as Ghana has just established itself as one of Africa's leading democracies through a peaceful election win for the opposition leader Nana Kufo-Addo and has an independent judiciary with a good record, there is a risk of corporate tax disputes due to the government's attempted widening of the country's tax base.

Azerbaijan and Egypt

In Azerbaijan and Egypt too, the depressed oil prices have had significant effects on their respective economies, leading to currency devaluation, subsidy reduction and increased taxes. What it has highlighted is the need for efficiency and greatest investment, be it local or foreign. Opaque government systems, corruption and excessive bureaucracy may make this difficult in Azerbaijan, whilst Egypt's erratic policy making doesn't encourage foreign direct investment. The government has also been known to circumvent trade agreements and limit exports, adding further to the difficult operating conditions.

Mynamar

Myanmar also sees the benefit of international help and following the lifting of US sanctions in 2016, the country has been trying to attract investment capital and technical expertise to take advantage of its rich natural resources. Whilst expropriation risk can be classed as low due to the need to attract investment, the regulatory framework surrounding business remains very weak and concerns that Aung San Suu Kyi's leadership is struggling to cope now the doors to international markets have opened are substantiated.

Iran

The softening of US Sanctions also applies to Iran, and the government in Tehran would be wary of imposing restrictions that could discourage foreign direct investment. Iran's cabinet has approved the new Iran Petroleum Contract, which should spell the end of the unpopular buy-back model for international oil companies. In future, international oil companies will be able to book reserves or form joint ventures with Iranian companies and share in the profits from field outputs. In light of this one could argue that expropriation risk is low, but fundamentally the remaining US financials sanctions prevent any transaction involving Iran from using the US$ financial system. Further more, powerful hardliner discontent is threatening to upset Supreme Leader Ali Khamenei's commercial views and delays have already manifested themselves in respect of new oil & gas contracts.

Phillipines

Another interesting case from an international investor standpoint is the Philippines, as President Duterte continues to defy international relation codes and aggressively rids society of crime. However, local polls show his popularity to be high and it is possible that foreign investment will be boosted given reform and a simplified tax structure. That being said, caution should be exercised as the case of the two largest telecom companies is showing. The Philippine Competition Commission stepped in when the two companies acquired the mobile spectrum of the third largest but the appeals court ruled in favour of the companies. Additionally, President Duterte has appointed well known environmentalist Gina Lopez as secretary of Environment and Natural Resources thus potentially increasing the regulatory barriers to investment in the sector.

Colombia

In contrast in Colombia, President Santos' attempts to give strategic hydrocarbon projects exemption from regulatory requirements through his flagship initiative, The Projects of National Strategic, has run into difficulties. Wider afield, the environment for foreign direct investment has been soured by the expropriation by the government of Electricaribe, the Colombian subsidiary of Spanish Power Company Gas Natural, for amassing multi-million EUR bad debts through supplying electricity to consumers unable to pay their bills. The dispute is ongoing and the Colombian government have ordered liquidation of Electricaribe as they attempt to maintain stability in the country's jeopardised power sector.

Venezuela

Latin America is also suffering from the low oil prices as the Venezuelan economy, whose oil industry, which accounts for some 95% of the export earnings, is effectively in meltdown.

China

Another factor to consider when looking at the energy sector is demand from the Asia Pacific region, in particular the impact of reduced demand from China could have on commodity prices and the health of the global economy for the foreseeable future. China's total debt has grown 20% per year since 2009 and now exceeds 250% of GDP. Whilst the government appears to have the ability to withstand the pressure and recapitalise the banking market should the need arise, the growth sustained has been mainly credit backed. If this were to sharply slow down due to a reduction in credit availability, it would cause a large fall in world commodity prices. US policy is as yet unknown, so it is unclear whether this could be fractious to US-China relations but no flare-up in the near term or disruption to energy industry operations in the area is expected.

Europe

In Europe, 2017 could be even more of a landmark year than 2016, the year the UK voted to leave the European Union. Uncertainty remains around the deal that the UK will obtain in the two years following the trigger of Article 50, and the key general elections upcoming for France (May) and Germany (September) will go some way to deciding the fate of the Eurozone. If populist parties prevail, the already ailing Eurozone's recovery from the previous banking crisis will continue to slow with differentials between the stronger and weaker states growing, making the breakup of the Union a distinct possibility. This is an outcome that will likely cause a significant fall in world oil and other commodity prices.

Political risk management challenges

Just as Political Risk Insurance stands apart from other insurance classes from a Solvency II perspective, so political risk also differs from other business risks in that it is inherently difficult to estimate and model exposure when making overseas investment decisions.

Political risk can be defined as the threat posed to businesses by actions or inactions of governments, both foreign and domestic, political upheavals or social change. Common examples include expropriation or political violence or sanctions. These events are significantly more difficult to manage than other business risks, such as exchange rate volatility, for two key reasons:

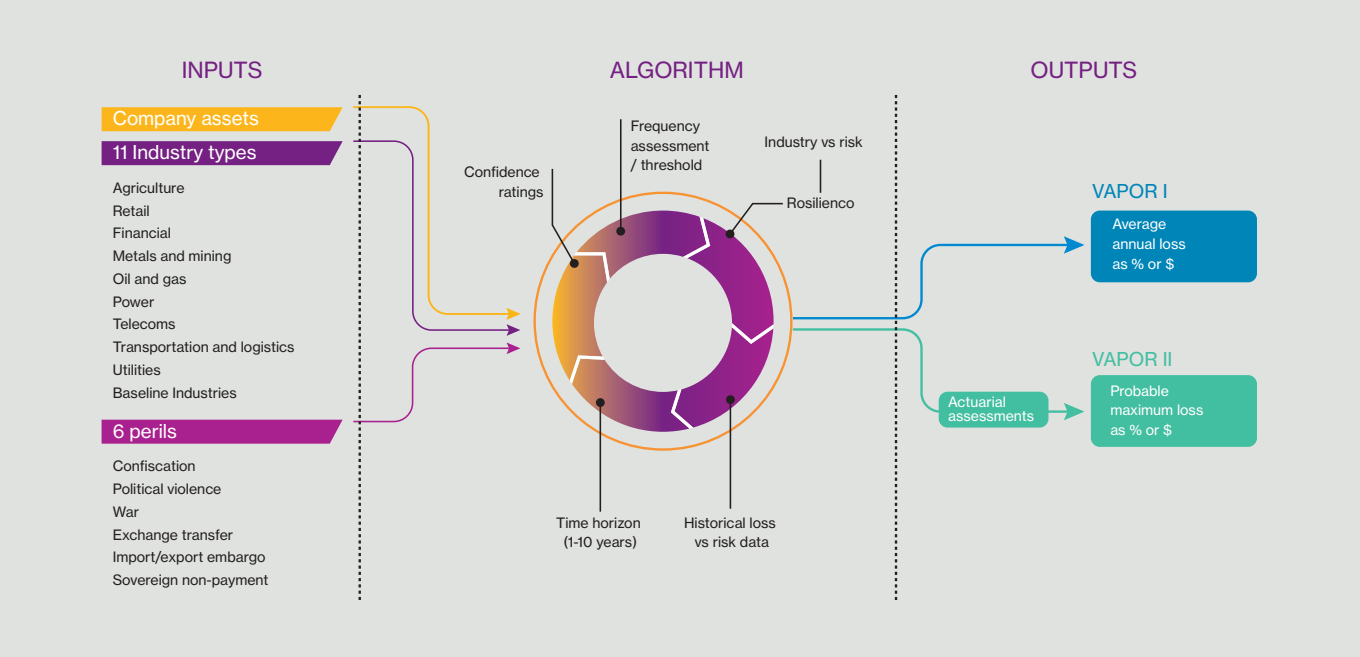
- they are inherently unpredictable – arising from complex, dynamic human societies
- they often have catastrophic consequences – as we have seen, for example in certain Latin American countries, where assets owned by multinational energy companies have been expropriated by national government.

Given this uncertainty over frequency and severity, it is very difficult to put a monetary value on the expected losses arising from international investments over time.

Applying the analytical approach – VAPOR

Willis Towers Watson has attempted to overcome these issues by applying a leading edge analytical approach. In partnership with the global qualitative risks analysis of Oxford Analytica, and employing the leading global catastrophe risk modelling capabilities of Willis Towers Watson Analytics, we have developed a web-based political risk modelling platform known as VAPOR (Value at Political Risk).

Figure 1 – The VAPOR system combines the user's exposure input with political risk ratings to put a price on policital risk



Source: Willis Towers Watson

Although there are a number of risk mapping tools in the market which score risk on a traffic light system, or one-to-ten basis, these tools are largely generic, are based on third party information much of which is in the public domain, and are not forward looking. In contrast, VAPOR is a unique platform which, for the first time, allows companies to put a real dollar value on their capital at risk when investing, or seeking to invest, in emerging markets.

It enables businesses in a specific sector such as the energy arena to:

- Estimate dollar-value expected losses and probable maximum losses for political risk events over time
- Monitor political risk exposures on an ongoing basis in light of changing world conditions
- Assess the severity of particular political risk contingencies under alternate investment scenarios

Therefore VAPOR now makes it possible for companies to assess their exposures against a suite of political risks, globally, regionally, by sector and over time, allowing companies to make informed investment decisions and better plan their current and future investment strategy.

If you would like a demonstration, or further information on VAPOR, please speak to your Willis Towers Watson account team.

Guy George is a Divisional Director, Financial Solutions at Willis Towers Watson London.

Part two

Today's energy industry risk transfer markets

Introduction – the new normal?

So on it goes. The relentless softening in the global Energy insurance markets, which this publication has been describing now for a number of years, continues apace into 2017. Meanwhile oil prices remain at approximately 50% of where they were only two years ago and, although the situation stabilised during the course of the last 12 months, "Things ain't what they used to be" as the old 1940s jazz standard would have it.

What did we say in last year's Review? Essentially, that the Energy insurance markets were in the middle of a "Perfect Storm", in which a steep increase in supply was coinciding with a steep reduction in demand, threatening existing business models and premium income streams.

Five key questions

So in analysing conditions in today's Energy insurance markets in more detail, we must address five key questions that apply to virtually all lines of business:

1. Are the Energy insurance markets still enveloped in this perfect storm?
2. If so, is this now likely to reflect the new normal for these markets?
3. Can insurers trade profitably in these new normal conditions in the long term?
4. What factors could possibly change these underlying market dynamics?
5. How should buyers respond?

1. Are the Energy insurance markets still enveloped in this perfect storm?

Continued over-supply of capital

The short answer is yes. As we show in the individual market commentaries for each line of business within this section of the Review, all the key Energy insurance markets remain over-supplied. Capacity levels in every line of business have either remained flat or have increased during the last 12 months, and while for many years we have feared that softening market dynamics would lead to possible capacity withdrawals, with a few very minor exceptions this simply hasn't materialized. Furthermore, the number of insurers ready to step up to the plate and lead business has increased significantly in recent years.

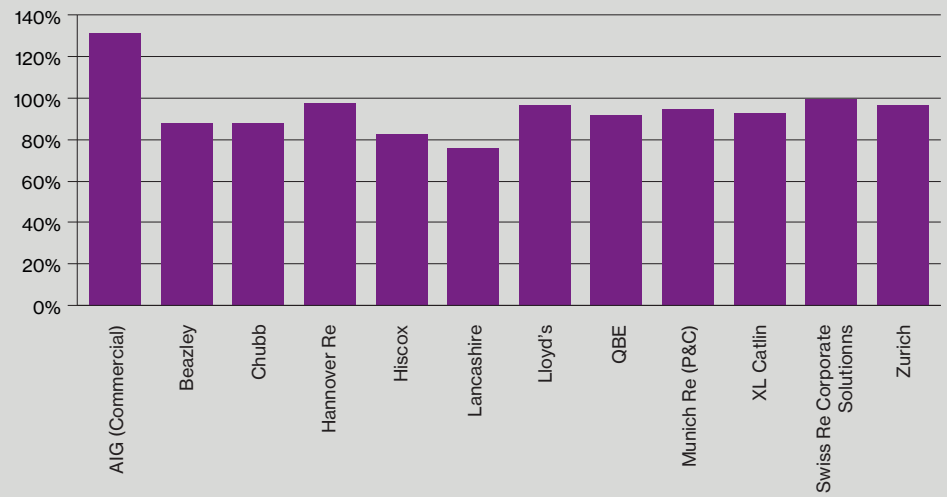
Most (re)insurers still reporting favourable results

Why have (re)insurers continued to stay in the game? There are both macro and micro reasons for this. On a macro level, since the 2007-2008 financial crisis the insurance industry has been seen to be a safe haven for capital, and very little has happened over the last ten years or so to suggest that investors will generate a superior return elsewhere. Despite many 2016 results being less impressive than 2015 [1], a quick review of the overall Combined Ratios (CRs) reported by the major insurers for 2016 (see Figure 1 overleaf) indicates that most continue to report CRs below 100%. So although there have been some noticeable exceptions to this trend in 2016, most major insurers (including most Lloyd's syndicates) have continued to trade profitably during the soft market cycle. As a result, despite some London operation results being less impressive than the global ones, the glut of excess capital continues to be deployed – and the softening pressures therefore continue to be maintained.

Lack of catastrophe losses

From a micro perspective, the Energy portfolio continues to benefit from a gradual improvement in the overall loss record. This chart is from our Willis Towers Watson Energy Loss Database (WELD) and shows that the loss record in recent years has reduced to between 6-8 billion dollars during the last three years. If the increased rate of risk retention by energy companies is also factored into consideration (reducing the amount of these losses being absorbed by Energy insurers), it can be seen that the Energy insurance markets have been able, at least until now, to trade relatively profitably at these reduced premium levels.

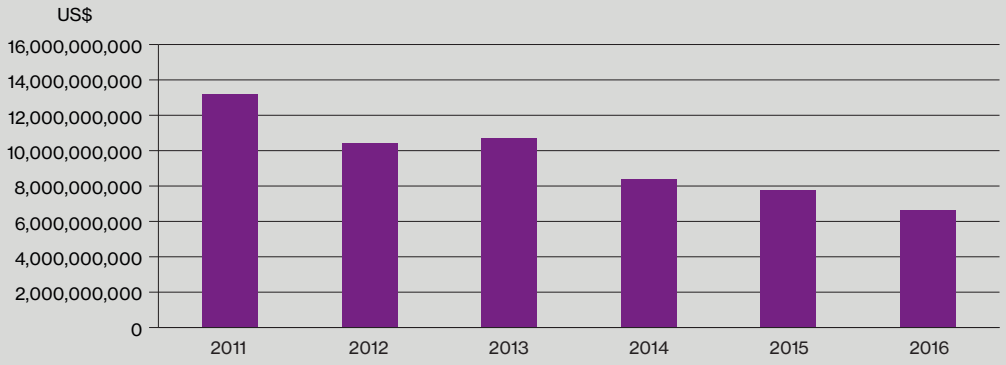
Figure 1 – Selected (Re)insurer overall Combined Ratios, 2016



With very few exceptions, major (re)insurers still generated overall profits for their shareholders in 2016.

Source: company websites

Figure 2 – Losses reported to WELD, 2011-16 (to date)

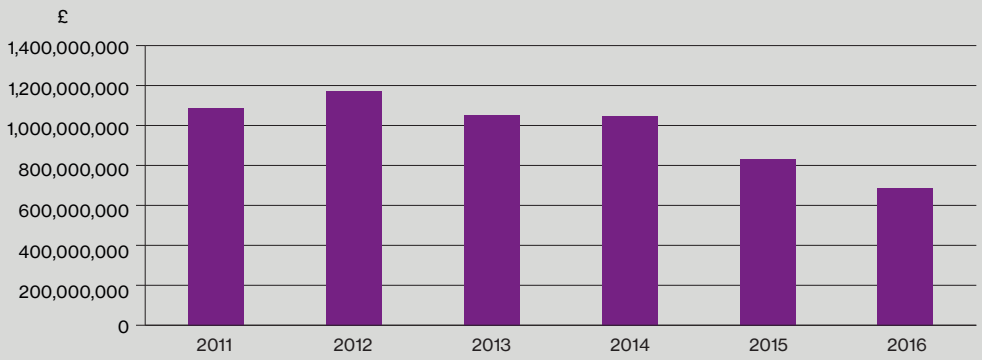


Our Willis Towers Watson Energy Loss database (WELD) continues to show an overall improvement in the recent energy industry loss record.

Source: Willis Towers Watson Energy Loss Database as of March 1 2017 (figures include both insured and uninsured losses)

[1] For example, the US property/casualty industry closed 2016 with an underwriting loss of US$5.2bn, its first loss since 2012 and the third consecutive year of deteriorating underwriting results (source: AM Best)

Figure 3 – Lloyd's Energy premium income as at Q4, 2011-2016



While not quite as dramatic as some market figures would have us believe, Lloyd's has indeed faced a significant slump in premium income during the last two years.

Source: Llyod's (Audit Codes EC, EF, EM, EN, EY and EZ)

Dwindling premium income levels

So the plentiful supply of Energy insurance capacity continues. What of the demand side? To determine how much insurance is being bought by the energy industry, perhaps the most accurate method available to us is to examine the Energy premium income streams to Lloyd's of London in recent years.

From this chart it can be seen that overall Energy premium income into Lloyd's for the period 2014 – 2016 decreased by approximately 35% – a considerable reduction at a time when insurer operating costs continue to increase. While a significant part of this reduction can simply be put down to competitive market conditions, there can be little doubt that some of the reason for this dramatic reduction is down to energy companies simply buying less cover [2]. Indeed, from our own experience it seems that buyers, under pressure to reduce overall risk management budgets, may if anything be scaling back still further on their insurance purchase rather than returning to the market to purchase additional cover. Of course, there are always exceptions to this general trend but in summary we see no measurable upturn in demand.

No way out!

So with supply still plentiful and demand still stagnant, Energy insurance markets find themselves still firmly entrenched in the "Perfect Storm". Indeed, in very general terms it could be reasonably argued that the only reason why insurers have not reported more negative trading figures in recent years has been the virtual absence of catastrophic losses.

While it remains true that there have been softer markets in the past – for example in the late 1990s pressure was brought to bear on coverage and retention levels as well as rates, so the product on offer, particularly for Downstream, was broader in those days – the glut of (re)insurance capital in the global markets is preventing insurers, for now, from generating any kind of market upturn.

[2] Given that Lloyd's Energy Facultative Reinsurance (Fac R/I) premiums are included in these figures, the actual deterioration in direct revenue from the energy industry itself may be even more pronounced.

Figure 4 – Brent crude oil prices, 2014-17

Oil prices seem to have steadied during the first part of 2017 – but where they might head in the future remains anybody's guess.

Source: MoneyAm.com

2. Is this now likely to reflect the new normal for these markets?

This question will depend on a number of factors, including the price of oil, developments in risk management strategies and whether or not insurers continue to invest capacity in this sector. Let's start with the oil price.

Oil prices

The latest oil price data available to us at the time of writing (above) shows that prices have recovered a little from the time of our last Review and so far this year have moved little from an average of around US$55 per barrel. This has allowed some oil companies to re-examine their capex budgets and we have seen a small number of major projects, such as the Mad Dog 2 project in the Gulf of Mexico, get the green light in circumstances where this would have been much more unlikely only 12 months ago.

However, one swallow does not make a summer and the overall consensus within the energy industry continues to suggest that the levels of E&P activity that were commonplace only three years ago are very unlikely to be reached again in the next few years if oil prices remain the same. Moreover, with risk managers having to work within the reduced budgets imposed on them over the last two years, no one in the insurance markets is realistically expecting demand for traditional risk transfer products to increase dramatically in the short term.

One swallow does not make a summer and the overall consensus within the energy industry continues to suggest that the levels of E&P activity that were commonplace only three years ago are very unlikely to be reached again in the next few years if oil prices remain the same.

Figure 5 – The insurance paradox

	SUPPLY	PRICING	DEMAND
THEORY	Low Returns High Volatility	Higher Prices	Increased Exposures Under-Insurance
REALITY	Share Focus New Capital	Lower Prices	Higher Retentions Cost Management

Consolidation

Sophistication

Insurance buyers are becoming more sophisticated. They now see the value in retaining more risk – even when supply is cheap.

Source: Willis Towers Watosn

Trend towards self-insurance continues

In terms of risk management philosophies, the trend for many years continues to be one of increased self-insurance, whether that be by use of a captive insurance company, an internal company fund or simply electing to retain the risk.

In general terms, the insurance industry is moving ahead in a way that seems to be something of a paradox. In theory, insurance for risks which are characterised by low frequency, high severity losses such as the energy industry should produce low returns on average over a given timeframe. Prices should therefore increase, as capital should be put off by the low returns on offer. So as the overall industry loss exposure continues to increase, demand for insurance from those industries should also increase, as the greater the level of under insurance, the more the need to protect the asset base.

However, this is not what has actually occurred. Instead, capital has been more concerned with achieving market share rather than maximising existing returns, and of course the one way to increase market share has been to consolidate – i.e. merge with other competitors. This may have theoretically reduced capacity in the short term but in the long term this has given individual "mega" insurers the muscle to increase their overall capacity, leading actually to lower prices.

At the same time as this increase in overall capacity is happening, the demand for insurance has actually fallen, because buyers have worked out that it is more efficient in the long run to retain more risk and develop captive insurance company portfolios than simply to transfer risk where possible.

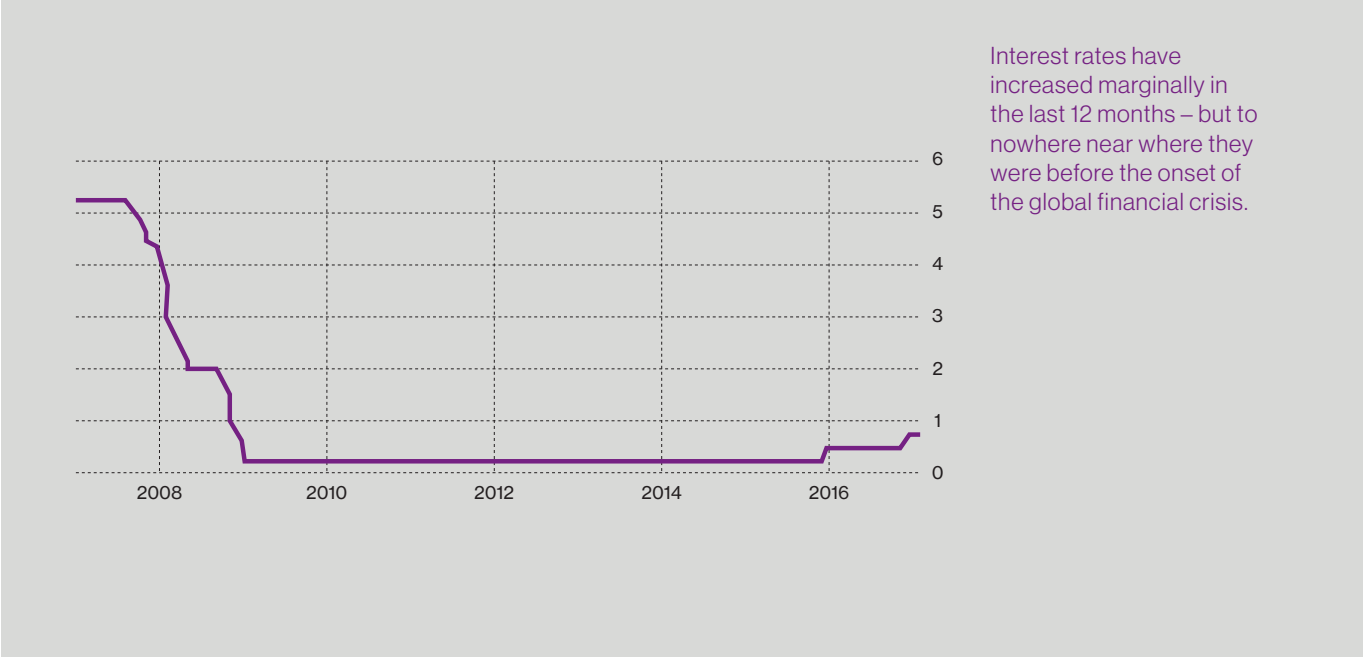
In summary, while supply has consolidated, actual capacity has increased. But at the same time demand has become more sophisticated – energy companies won't buy insurance unless this can be proven to be the most rational cost-effective solution.

Alternative capital havens thin on the ground

So to our third issue – will insurers continue to invest in the (re)insurance industry? It's true that global interest rates have indeed risen recently but, as Figure 6 on the opposite page shows, to nowhere near the levels that were considered the norm before the onset of the global financial crisis of 2007-08.

As a result, alternative havens for capital remain thin on the ground, and there is absolutely no sign of any capital flight away from the insurance industry as we head further in to 2017. Instead, we are experiencing a "deceleration" of the overall softening process, with notes of caution being sounded by major (re)insurers that the current situation is "untenable" and that they may begin to "walk away" from some unprofitable business.

Figure 6 – US Federal interest rates, 2006-2017



Source: www.tradingeconomics.com | Federal Reserve

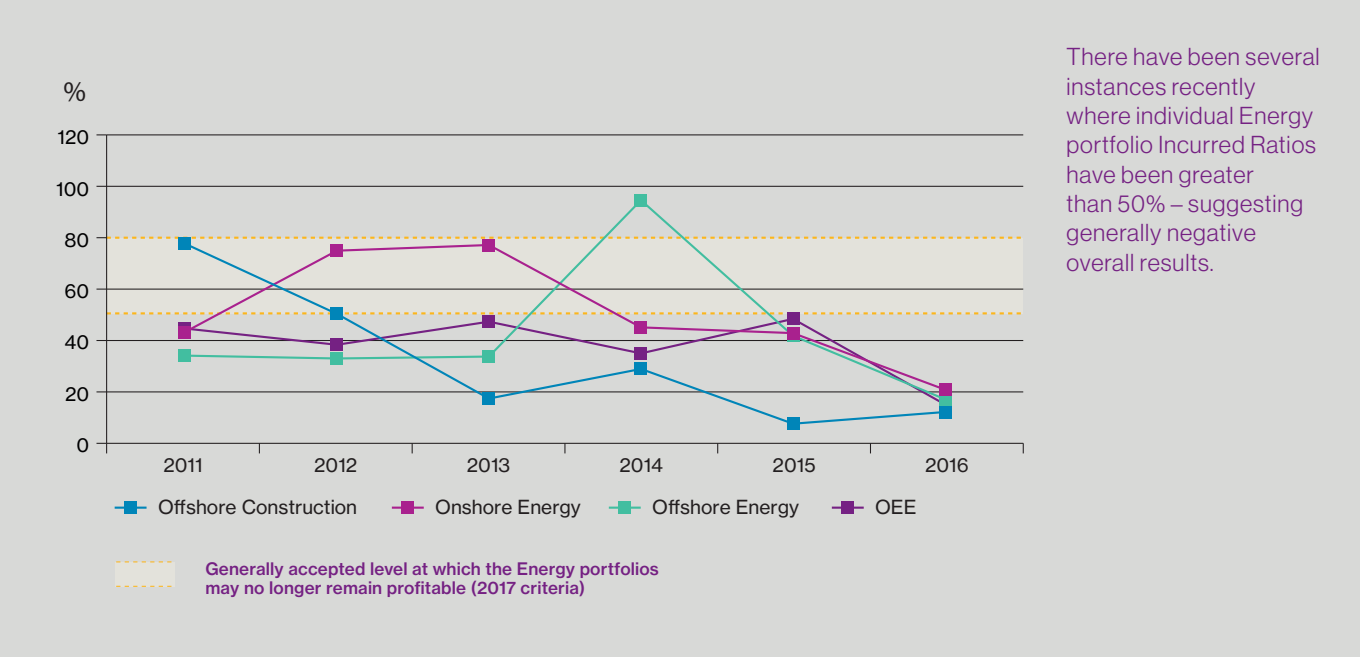
That, of course, is their prerogative. However, such is the abundance of capacity waiting to be utilised in the global marketplace that, for the moment, finding replacement capacity for virtually any specific programme withdrawals has generally not presented much of a challenge. The rate of softening shows signs deceleration, but prices are still heading in only one direction as replacement capacity fills in any gaps left by the more apprehensive insurers.

So is today's scenario the "new normal" for the foreseeable future? In general terms, while predicting the future is often fraught with difficulty, we can see no reason at present to suggest anything else as this Review went to press.

Such is the abundance of capacity waiting to be utilised in the global marketplace that, for the moment, finding replacement capacity for virtually any specific programme withdrawals has generally not presented much of a challenge.

[2] By "Facultative Reinsurance" we mean specific reinsurance policies taken out by original insurers for individual original insurance placements, as opposed to automatic cessions into annual reinsurance treaties

Figure 7 – Lloyd's Energy audit code incurred ratios, 2011-16 (excludes Gulf of Mexico)



Source: Lloyd's

3. Can insurers trade profitably in these "new normal" conditions in the long term?

Incurred Ratios near to break-even

It is possible to argue, as some market observers have done in the past, that rating levels have been artificially high in the past and are only being pushed down to a more realistic level by today's competitive pressures. A glance at this chart, however, suggests that this may not be the case.

In the past, it was generally agreed that an Incurred Ratio (i.e. written premiums versus paid and outstanding claims) of 80% or below was sufficient to deliver an overall underwriting profit. However, it seems likely, given the declining premium income levels, that this ratio in some cases may now need to be at 50% or below to ensure that all operating costs (and indeed future Incurred Ratio deterioration) will be accounted for in producing an overall portfolio profit.

Bearing this in mind, the chart shows that on several occasions during the last six years or so some parts of the overall Energy portfolio in Lloyd's have reported Incurred Ratios at or in excess of 50%. In 2015 in particular, all the featured lines of business except for Offshore Construction came in at just under 50%, while 2016's figures are still too immature to be germane.

If we take into account the relatively benign catastrophe loss record of recent years compared to past eras, it can be seen that it would take very little additional loss activity to push the majority of the Energy portfolio into the red.

Increased losses only a matter of time?

But if, as we have just seen, demand for Energy insurance products is a least flat, if not actively decreasing, and if the current over-supply of capital to the general (re)insurance market shows no sign of abating, then it seems reasonable to suggest that the Energy insurance markets are inevitably going to slide into unprofitability at some stage – as we have said on many earlier occasions in the last three editions of this Review, it is just that we do not know when.

If we take into account the relatively benign catastrophe loss record of recent years compared to past eras, it can be seen that it would take very little additional loss activity to push the majority of the energy portfolio into the red.

4. What factors could possibly change these underlying market dynamics?

Is it all doom and gloom for Energy insurers? What could change their current predicament?

New products?

One obvious solution to the dwindling revenue stream would be for new, innovative products to emerge from the market that would address buyer's needs while at the same time providing new sources of premium income to the market. The two most obvious examples of where new products are keenly sought by the energy industry are:

- **Cyber:** depending on the actual coverage purchased, there has been some progress in the market since we reported in depth on this issue in our 2014 Review, and resultant damage to energy infrastructure following a cyber-attack has been provided by the Downstream market for some time now. Although demand for Upstream cyber products developed by the market is increasing, buyers would dearly love the insurance community to provide a single cyber product, for example including Business Interruption losses following a cyber-attack where there has been no physical damage to the insured asset itself. Furthermore, despite the high profile that this exposure has attracted in recent years a product offering this comprehensive, seamless protection at a catastrophe (US$2-3 billion) limit still seems a long way off. [3]
- **Environmental Liability:** major incidents involving natural resources industries in the Gulf of Mexico and Brazil during the last decade have graphically demonstrated the potential environmental liability that energy companies may be exposed to in the future. Today's risk transfer solutions offer only makeshift cover, with no energy company ready to buy more than a maximum of US$1-1.5 billion in pollution cover, despite the risk potentially running into many billions of dollars. Gradual pollution is indeed available from the specialist Environmental Liability market, but the limits available today remain only a fraction of the potential overall exposure.
- **A broad "All Risks" Property form:** for many years we have argued that clients would prefer Downstream insurers in particular to revert back to the product they used to offer before 9/11, which included Terrorism, Testing & Commissioning, Cyber and other related covers.

However, the real issue in attempting to square the circle by offering new cover to generate new income is very simple: the energy industry is still feeling the pinch from lower oil prices and all our feedback from our client base suggests, apart from a handful of instances, that risk management budgets remain tight and that consequently the buyer appetite for increased additional insurance purchase, no matter how attractive or compelling, remains extremely muted.

[3] Meanwhile we understand that one major insurer is looking at paying a significant resultant damage BI claim from a recent aviation industry loss which was proximately caused by a cyber-attack.

Reduced transactional costs?

A final alternative might be to make renewed efforts to reduce the transactional costs associated with today's insurance markets. Even today's most conservative market practitioners would admit that the insurance market, particularly in London, needs to revise its cost base if it is to maintain its competitive edge and transact business efficiently and profitably. Here there are some glimmers of hope of the horizon:

- **Placing Platform Limited (PPL):** a new electronic placement platform designed to move risk through the London market more effectively by avoiding duplication and rekeying. PPL is introducing more radical changes to its insurance exchange software than originally planned, after a group of Marine underwriters suggested some major amendments following its roll out for classes such as terrorism earlier last year. The Property portfolio is next in line for PPL, and it is anticipated that in the fullness of time that more sophisticated lines such as Energy will also be able to be incorporated, thereby removing a significant amount of operating cost from the placement process. It's perhaps no surprise that there has been some resistance to PPL from some, but its future development and deployment is surely going to be unstoppable in the long run.
- **Insurtech:** Prime examples of the insurtech innovation in the international insurance markets have ranged from the launch of peer-to-peer insurer Lemonade in New York for home insurance to the sale of drone insurance via a mobile app by Verifly. In the UK, mobile app Trov allows users to protect domestic electrical items in conjunction with Axa. However, there is still plenty of work to do. More work clearly needs to be done to build bridges between risk carriers and the tech community, particularly for more sophisticated lines of business such as Energy.
- **Blockchains:** This is potentially a truly exciting development. Facilitating secure online transactions, a blockchain is a distributed database that maintains a continuously growing list of ordered records, called blocks. Each block contains a timestamp and a link to a previous block. By design, blockchains are inherently resistant to modification of the data – once recorded, the data in a block cannot be altered retroactively. Blockchains are an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. If this new technology could be applied effectively to the insurance transaction, this could streamline the entire process in a way that would eliminate a significant degree of frictional cost, while at the same time speeding up the process, reducing fraud and improving transparency and visibility.

However, implementing new technology, developing more streamlined ways of doing business and reaping the benefits of the cost savings made are all bound to take time. The question is therefore this: for how long can Energy insurers continue to trade, given today's reduced premium pool and with operational costs, if anything on the rise in advance of cheaper ways in which to onduct business?

Most capital providers tend to take at least a five year view of a given portfolio. As we have shown, the market has generally still made money from their Energy portfolios – up until now. When an increasing number of insurers report overall underwriting losses from their Energy books, it will in our view still take some time before any decisions to withdraw actually materialise.

However, our fear is that once such decisions are actually made, the withdrawal process could then snowball, with increasing numbers of capital providers electing either to take their money elsewhere away from the insurance arena or deploying it away from the Energy portfolio in such lines as Employers' Liability or Cyber.

5. How should buyers respond?

Within this article, we have shown how today's conditions are likely to represent the new normal in the Energy insurance markets. So buyers may well take the view that all that remains for them to do is to take advantage of the continuing competitive nature of the market, and to continue to press for the increasingly advantageous terms and conditions that can be negotiated on their behalf by their broker.

Stick to the tried and trusted?

It all sounds very simple. However, we have also shown that although the market remains over-supplied, it would take very little in the way of increased claims, particularly catastrophic claims, to drag more portfolios in to the red. In previous editions of this Review we have warned that it is in nobody's interest – buyers and brokers, as well as insurers – for prices to drop to such a level that a widespread withdrawal is suddenly, for the first time since 9/11, a fact of life. There is perhaps one thing worse than an expensive insurance market, and that is no market at all.

We have previously encouraged buyers to continue to build long lasting and trusting relationships with their key leaders, on the basis that their understanding of the risk will enable them to continue to provide the right cover at a competitive cost, as well as being in the strongest possible position to pay valid claims promptly and efficiently should they arise.

Consider long-term policies?

We would now also suggest, given that in our opinion rate reductions are slowing in some areas, that buyers consider the possibility of taking out long term, non-cancellable policies with their strategic risk partners in the market. By doing so, buyers would be able to accurately budget for their insurance spending over a much longer period while still taking advantage of today's rock bottom insurance rates. Moreover, in the event of any future upturn in market rates as a result of future insurer unprofitability, these buyers would be protected from the corresponding increase in prices.

Of course it is possible that the softening will just continue, as it has done for the past six years or so. But eventually, something will have to give. Buyers will need to make sure they are in the right position to be as protected as possible when it eventually happens.

For how long can Energy insurers continue to trade, given today's reduced premium pool and with operational costs, if anything on the rise in advance of cheaper ways in which to conduct business?

Robin Somerville is Global Communications Director for Willis Towers Watson's Natural Resources Industry Group and editor of the Willis Towers Watson Energy Market Review.

A global carrier perspective on the Energy insurance market: AIG's Alessandro Cerase in conversation

How do you find the current state of the market?

Energy prices have slightly recovered since the end of 2015. However, continuously depressed oil prices and a steady over supply of Energy insurance capacity have continued to impact the Energy insurance market. Clients are finding benefit in a softer insurance market as they focus more intensely on managing costs.

Is it sustainable? What did AIG do in response?

These dynamics have driven some insurance markets to broaden terms and conditions and increase their lines to maintain market share. These markets tend to be extensive purchasers of reinsurance and in order to make their business models work, they need to maintain premium.

While some maintain that the Energy insurance business has been profitable, that profitability has relied on unusually low levels of catastrophe losses. Once more historical CAT activities are factored in, the challenges with the Energy market become immediately apparent. Considering the softer market, the attritional loss activity that we continue to experience has resulted in a larger impact on the overall profitability of the business.

So, the key questions are whether the market is receiving adequate rate and premium, and whether low CAT activity means the natural catastrophe premium is subsidizing the fire premium.

In response to the market environment in Energy, AIG went back to the drawing board to redesign its operating model and the way it evaluates risk. We reduced market share across all Energy lines of business to maintain profitability and control the risk exposure. Historically, AIG wrote a broad-based book of business, with rates strongly differentiated by engineering risk quality. However, as the market has declined these rates have tended to converge, requiring a different approach.

In AIG's view, there can be no compromise on natural catastrophe premium under current market conditions if all markets are factoring in the cost of capital allocated to their property book, as they should. Picking the better engineered risks is only logical for AIG, since the differentiation in rate is becoming narrower and narrower. Also, we are definitely of the view that Property and Business Interruption rates need to increase considerably to be sustainable in the long term. Equally as important, operating expenses need to be closely monitored and addressed to support profitability.

How have the clients responded? How did AIG react internally?

From July 2016 to January 2017, AIG's Energy and Engineered Risk (EER) division executed its plan to centralize business under its Energy Center of Expertise (CoEx). The CoEx integration by geographical location and product line ensures key locations with scale are better integrated with engineering, underwriting and claims expertise.

AIG, with the support of both clients and producers, has relocated resources in locations such as Chicago, Houston, New York, London, Paris, Dubai, Singapore and Melbourne.

We believe this new operating model positions AIG to better serve all business partners and clients, by providing better access to key business leaders backed by AIG's scale and expertise.

Have you seen an improvement in loss record? What other benefits have you seen?

We have avoided losses on business that we had participated on in the past, but did not renew since mid-2016. This underscores the benefit we are realizing from the expertise that resides in our major Energy CoEx hubs, serving global business.

We believe that our CoEx approach allows AIG to create a more scaled resource for the EER division and provides benefits for both clients and AIG employees, including access to a deeper expertise and broader knowledge of EER risks, a simplified process with enhanced customer service, and faster, more consistent decision-making and consistency in the EER strategy's execution and uniformity of action.

We believe AIG benefits from improved risk selection, increased retention of more profitable business and ultimately improved loss ratio, a better operating model for talent development and career opportunities, an enhanced alignment with both engineering and claims taking advantage of their expertise. There is also avoidance of replication of work with consequent process efficiencies and standardization as well as delivery of improved operating costs.

Do you expect the market to follow what you did or react differently?

Some markets have started to follow a similar strategy of consolidating expertise or focusing more sharply on reducing operating expenses. We note that we have passed on renewing a considerable amount of premium due to a lack of engineering information about the risk, and have improved risk quality, rates and terms and conditions. The business we did not renew was placed elsewhere with little trouble, confirming the overabundance of capacity available in the market today.

We don't know if all markets are monitoring the cost of capital necessary to write this business.

Alessandro Cerase was appointed AIG's Global Head of Energy and Engineered Risk in March 2016, maintaining the role of Global Product Line Executive for the Oil and Petrochemicals (O&P) Product Line. Based in New York, Alessandro is responsible for developing strategy, creating underwriting and rating guidelines, and management and profitability of the O&P Product Line and for all other Energy and Construction Product Lines in conjunction with the relevant Global Product Line Executive.

Upstream

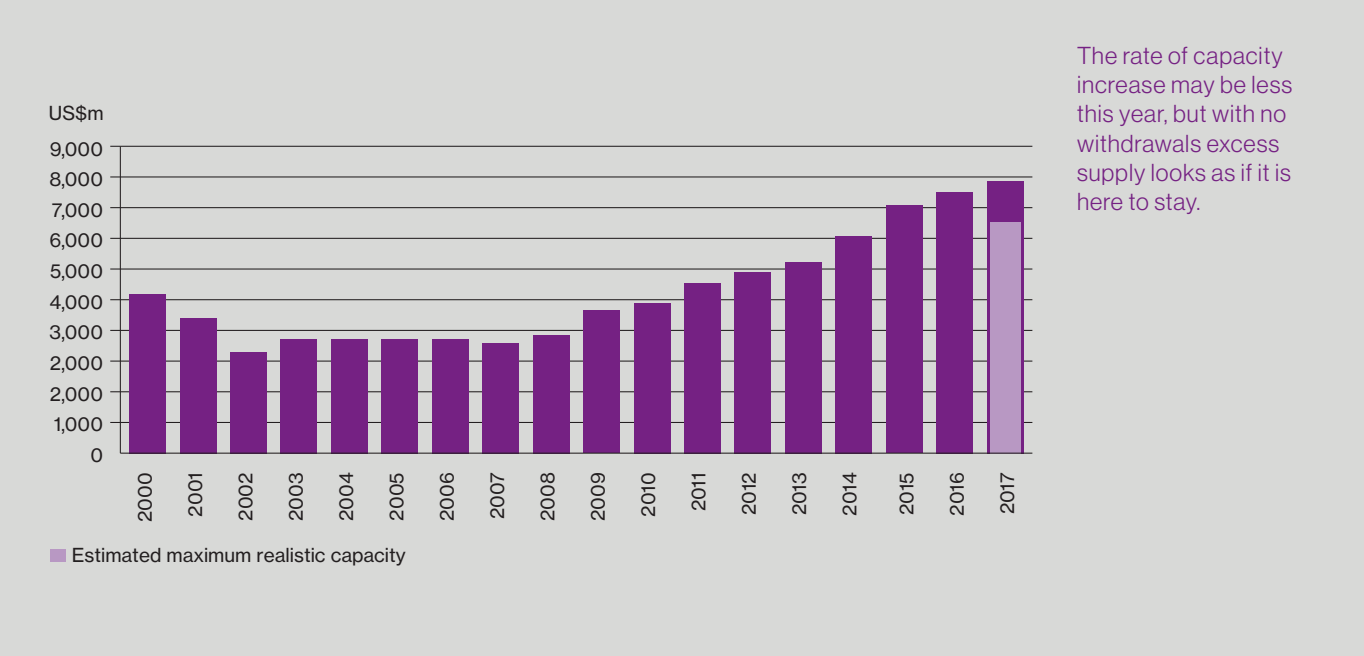
Introduction – the same story, but with a darkening loss backdrop

Conditions in the Upstream market have been so competitive for so long that it becomes increasingly difficult with every passing year to reflect on any significant new developments. Once more the story of the last 12 months remains resoundingly familiar; increased capacity, more competition, falling rates, dwindling premium income streams. This year however, the story is set against a backdrop of a deteriorating loss record and an indication that some underwriting reserve funds are beginning to reach exhaustion levels. In particular, the loss figures for the 2014 year of account, which in previous editions of this Review we showed as being a profitable one for the market, have deteriorated sharply as 2015 losses written into the 2014 year of account have been finalised and settled during last year.

With underwriting losses almost certainly going to be reported for this class by some insurers in 2016, are we any nearer the "end game" in this market, where lack of profits and insufficient premium income finally persuade some insurers to withdraw from this class? Or is it a case of "more of the same" over the next 12 months as all the key market players stay in the game and continue to compete for business?

As ever, we begin our review of the market by focusing on the core issues of capacity, losses and profitability.

Figure 1 – Upstream Energy operating insurer capacities 2000-2017 (excluding Gulf of Mexico Windstorm)



Source: Willis Towers Watson

Figure 2 – Upstream Energy losses excess of US$50 million, 2015-16

Type	Cause	Region	Land/Offshore	PD US$	OEE US$	BI US$	Total US$
2015							
Platform	Fire + explosion/VCE	Latin America	Offshore	780,000,000			780,000,000
Platform	Misc	North America	Offshore	650,000,000			650,000,000
MOPU	Explosion no fire	Latin America	Offshore	382,000,000		112,500,000	494,500,000
Plant	Terrorism	Africa	Land	455,000,000			455,000,000
Rig	Leg punch through	Latin America	Offshore	240,000,000			240,000,000
Platform	Collision	Middle East	Offshore	200,000,000			200,000,000
Pipeline	Ruptured pipeline	Middle East	Land	190,000,000			190,000,000
MOPU	Faulty work/op error	Latin America	Offshore	116,000,000			116,000,000
MOPU	Corrosion	Latin America	Offshore	100,000,000			100,000,000
Well	Blowout	North America	Land	11,000,000	85,000,000		96,000,000
Well	Blowout	Middle East	Offshore		80,000,000		80,000,000
Oil sands	Ruptured pipeline	North America	Land	77,700,000			77,700,000
MOPU	Unknown	Africa	Offshore	60,000,000			60,000,000
Rig	Leg punch through	Middle East	Offshore	60,000,000			60,000,000
Pipeline	Corrosion	Middle East	Offshore	60,000,000			60,000,000
MOPU	Unknown	Africa	Offshore	50,000,000		6,540,000	56,540,000
2016							
MOPU	Mechanical failure	Africa	Offshore	350,000,000		950,000,000	1,300,000,000
Rig	Mechanical failure	North America	Offshore	83,500,000		95.000,000	178,500,000
Platform	Fire + explosion/VCE	Latin America	Offshore	150,000,000			150,000,000
Pipeline	Anchor/jacking/trawl	Africa	Offshore	100,000,000			100,000,000
Platform	Piling operations	Asia	Offshore	51,000,000			51,000,000

Source: Willis Towers Watson Energy Loss Database as of March 1 2017 (figures include both insured and uninsured losses)

Capacity, Losses and Profitability

Capacity – up again, but flattening out

It will come as no surprise to regular readers of our Review that underwriting capacity has once again increased, now for the eleventh successive year. Moreover, the gap between the official stated capacities provided by insurers (in grey) and the maximum realistic capacity that we estimate is achievable (in blue) continues to narrow – we now think that US$6.5 billion would be available for an attractive programme featuring no clash exposures.

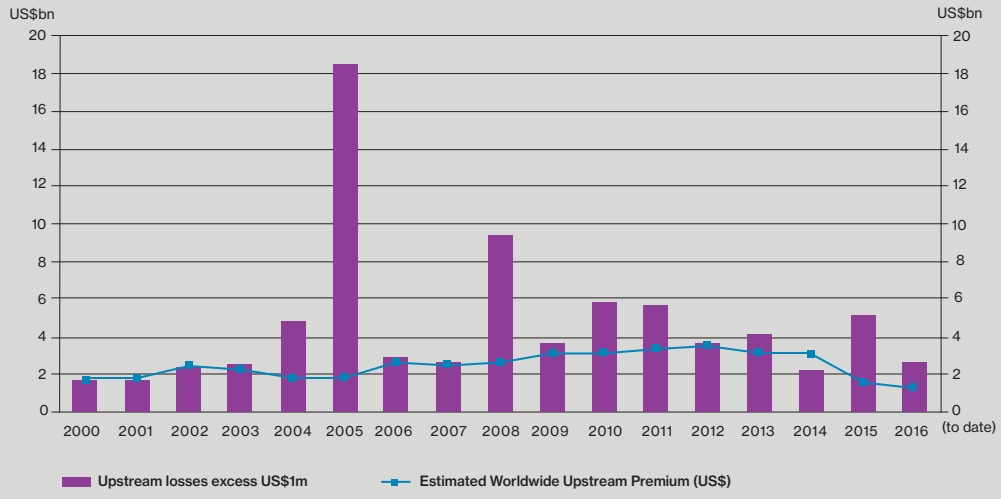
However, it can also be seen that the rate of capacity increase has now begun to slow, with only a small increase for 2017. With the market having been at saturation point for several years now, this is perhaps not surprising and we understand that Lloyd's in particular has been quick to discourage individual syndicates from developing business plans involving significant growth for this class. But with no withdrawals from this market during the past 12 months, capacity levels remain at a record high and seem likely to stay that way for several years to come if the current status quo is maintained. We explain the macro reasons for this in the Introduction to this part of the Review and so the question for us to discuss here is simply whether insurers will continue to deploy capacity in this class or transfer it to others.

Given the track record of the class to date, all the signs are that, for the moment, the over-supply in this market will remain. But even if some insurers were to withdraw from the market during 2017, there would still be over US$6 billion of capacity available – enough to continue to generate significant competition for all but the most highly-valued Upstream assets.

Losses – a significant deterioration for 2015, a big loss in 2016

In previous editions of the Review we have noted that the Upstream industry loss record has been relatively benign in recent years compared to the overall 20 year record. However, our Database now shows that the 2015 loss record has deteriorated significantly since this time last year, with no less than 9 losses in excess of US$100 million now recorded and no less than 16 losses in excess of US$50 million. In addition our Database shows that for 2016 the market has sustained one of the largest Upstream losses ever recorded, involving a major incident offshore West Africa where there was a very substantial Loss of Production Income loss.

Figure 3 – WELD Upstream Energy losses 2000-2016 (excess of US$1m) versus estimated Upstream premium income



Following a benign 2014, the market was hit by the worst losses for several years in 2015 – most of which impacted insurers' 2014 year of account. Meanwhile, premium income levels have slumped to an all-time low.

Source: Willis Towers Watson Energy Loss Database as of March 1 2017 (figures include both insured and uninsured losses)

It could be argued that some of these losses are to be expected and that insurers should be neither surprised nor particularly disappointed – losses are, after all, the reason that they are in business. But back years can sometimes deteriorate significantly and cause consternation in a market that is continuing to face the twin challenges of excess supply and dwindling premium income. The difficulty for several insurers is that, apparently, underwriting reserves designed to cater for such a scenario have already been exhausted by these insurers in an attempt to shore up their reduction in premium income.

So for some underwriters, the day where they have to report overall underwriting losses to their management for this portfolio has already arrived. Already a senior Lloyd's Upstream underwriter has privately admitted to us that he has had to report a loss for 2016, and we do not think that he is the only underwriter in this predicament.

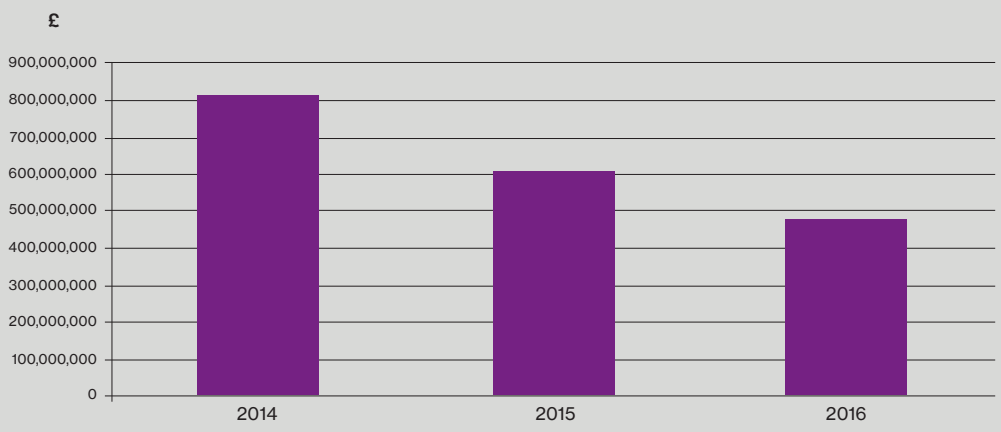
However, as we have already intimated this does not mean that this insurer is considering an immediate withdrawal as a result. Investors are well aware that a portfolio has to be viewed within the context of a much larger timeframe, and as we have seen, capacity levels in this sector are being maintained.

So far then, all the current players seem content to stay in the game. But can today's softening dynamic really be sustained for much longer? Let's take a more detailed look at some of the dynamics underpinning this sector.

Profitability – underwriting losses are certainty at this level of premium income

Figure 3 above plots the recent loss deterioration against historical losses and premiums for Upstream over the course of the last 16 years. It can be seen that, aside from the hurricane-affected years of 2005 and 2008, 2015 is now the third worst loss year in recent memory. Even if we accept that the conventional insurers are probably only likely to absorb some 50-60% of each year's overall loss total due self-insurance and captive insurance retentions, given the recent decline in premium revenues annual losses of this magnitude are bound to cause underwriting losses, at least for some insurers (and reinsurers).

Figure 4 – Total Lloyd's Upstream premium income as at Q4 each year, 2014-16



Lloyd's has lost nearly 50% of its Upstream premium income over the course of the last two years. Any further market softening will of course erode this income still furthre, so how much more of this can the market absorb before insurers start to withdraw?

Source: Lloyd's (Audit Codes EC, EN, EY and EZ)

So perhaps it is not so surprising that underwriters are now expressing a significant degree of concern about the future of the portfolio, insisting that something needs to be done to halt the softening process if this class is to remain viable. The difficulty, of course, is that everyone still wants to remain in the game, hoping that any withdrawals can be left to someone else.

To illustrate the point still further Figures 4 and 5 are taken directly from the most recent Lloyd's Market Association Quarterly Loss Report. Figure 4 points to the alarming decline in premium income for this class over the last two years – a near 50% drop from 2014.

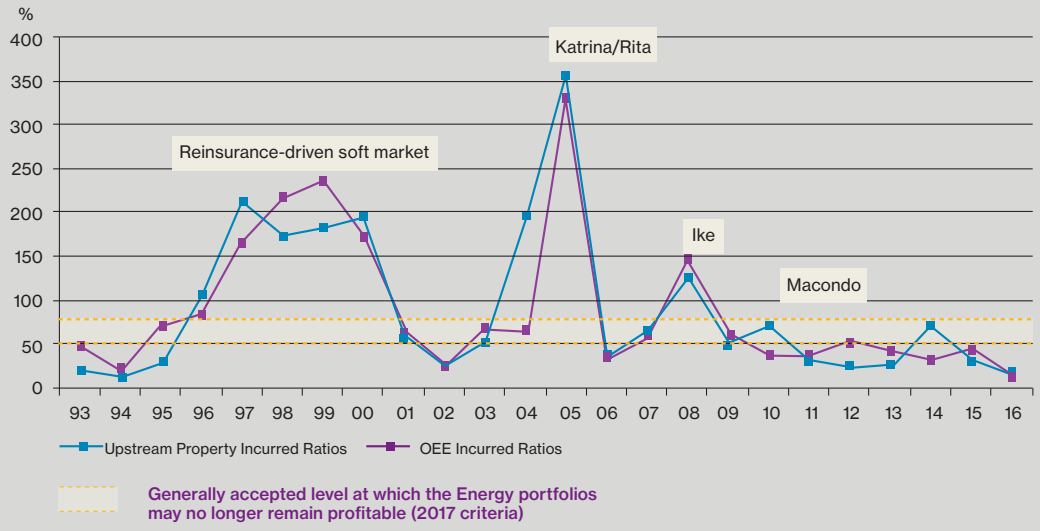
Further evidence of the long term challenges involved writing this class of business come from a study of the Incurred Ratios (written premiums against paid and outstanding claims) of Lloyd's Upstream portfolios over the course of the last 23 years. This is reflected in the Figure 5 overleaf.

As we explained in the previous article of this Review, Willis Towers Watson now estimates that, due to increased operating costs and the collapse in premium income levels, that an Incurred Ratio of 50% or below may now be needed if positive underwriting results are going to be secured (previously we have estimated this at 80%). This is not an easy chart to interpret given the huge skewing brought about by the hurricanes of the 2000s but looking towards the right hand side of the chart it is still possible to discern that:

- There have been several instances in recent years where the 50% barrier has been breached, both from a Property and an OEE perspective.
- In several other years, the overall Incurred Ratios come in at very close to this figure.
- Only in 2012 and 2013 has the market really made a decent profit from this portfolio.

What does this mean for the market? Simply this: should the Upstream loss record in the next year or so eventually deteriorate to the same extent as it did in 2015, underwriting profits are going to be virtually unsustainable, regardless of market position or underwriting muscle. Investors would then have to make the difficult choice as to whether to continue trading through the losses or accept defeat and withdraw from this sector.

Figure 5 – Lloyd's Upstream Incurred Ratios 1993-2016 (as at Q3 2016)



Lloyd's has sometimes found it difficult to achieve Incurred Ratios below 50% in recent years for Upstream business. With reduced premium income levels, this should get even harder in the future.

Source: Lloyd's. "Upstream Property" – combination of ET/EC/EM/EN Audit Codes; "OEE" – combination of EW, EY and EZ Audit Codes

Warranty & Indemnity ("W&I") Insurance

Use of W&I insurance (known in the US as Representation and Warranty insurance) has increased dramatically in recent years with sectors (including the energy sector) and jurisdictions that were previously outside the appetite of the insurers now very much in scope.

W&I insurance is a specialist insurance product designed to cover breaches of representations, warranties or certain indemnities (including the tax covenant) given in the sale and purchase agreement ("SPA") on the sale of a business. The insurance protection covers loss arising from unknown or undisclosed matters which result in a breach of a warranty in the SPA or the tax covenant. It is used in mergers and acquisitions in a number of ways, often enabling transactions by bridging the gap between a seller's liability position in the SPA and the requirements of the buyer on the other side.

The insurance can be placed either for the buyer or the seller. A buyer-side policy covers the buyer against the seller's misrepresentations (both innocent and fraudulent) and is typically used to reduce (or remove entirely) the seller's liability under the SPA with the buyer (the insured party) going directly against the insurance policy in place of the seller. Over 95% of the W&I policies placed by Willis Towers Watson in 2016 were buyer-side policies. A buyer-side policy is often instigated by a seller who insists that the buyer enters into a W&I buyer-side policy to enable the seller to have a "clean exit" from the transaction.

Where a buyer will not accept reduced seller liability under the SPA (with a buyer-side policy as its recourse for a breach of a warranty), a seller-side policy can be put in place and offers liability protection to the seller. The seller-side policy is designed to respond in the event that the buyer brings a claim for breach of warranty or a claim under the tax covenant against the seller. This enables a seller to ring-fence the risks associated with the disposal.

Current market dynamics

Reinsurance market still stable –so no major cost increases for Upstream insurers

At the beginning of the last quarter of 2016, following the major Reinsurance market meetings in Monte Carlo and Baden-Baden, it seemed from market rumours and whispered conversations in London that the direct market might be facing a Reinsurance-led backlash during the January 1 renewal season. Perhaps everyone should have known better; given the continued glut of capital in the global Reinsurance market we understand that no such backlash actually materialised, with most programmes renewing either at the same rates as last year or within ten percentage points either way. As a result, the direct market has in the main been able to continue to offer increased overall capacity and to trade aggressively for business.

Decelerated softening for most of the portfolio

However, given the sobering figures that we have just analysed, it is perhaps not surprising that the actual rate of softening in the market, at least compared to the free-for-all of last year, appears to have decelerated. With individual underwriters nervous about being seen to be "chasing the market down" given the current loss and premium income data, the market as a whole is now becoming a little more hesitant to compete as vigorously as last year. As usual, the actual rate reductions achievable continue to depend to a large extent on individual risk profiles, premium volume levels and loss records and it will be interesting to see how the situation develops further during the next two quarters of 2017.

Leadership choices continue to broaden

Of course in a portfolio as sophisticated as Upstream it's true that there are exceptions to this general trend. In particular, the leadership aspirations of several Upstream underwriters continue to ensure that significant competitive pressures can continue to be brought to bear on the most sought after programmes. Last year we showed that there were essentially four types of insurer in this market; existing recognised leaders, those with leadership aspirations, those who were followers and those who simply provided Facultative Reinsurance (Fac R/I) support.

We have not provided a similar illustration this year because the market has essentially divided into two simple camps – those who can and do lead business, and those who do not. There are now about 15 different Upstream insurers who can now be considered leaders; in historical terms, this is a very high number and reflects an understanding by an increasing number of insurers that they have to step up to the plate and lead if they want to maximise their premium income opportunities. Not all of these new leaders have had their placements supported by the more experienced market practitioners, but this has not prevented these placements from being completed without their participation.

Customer loyalty for experienced leaders

However, despite the broadening of the leadership options available to buyers and their brokers, there is still a significant degree of customer loyalty being shown to the most experienced and respected market leaders. This is particularly the case among those buyers that have taken a strategic decision to partner with these leaders for the long term, not only with a view to improving their risk and their insurers' understanding of it but also to ensure that their programmes pricing can remain stable during any period of volatility in the market. It is also true to say that these leaders tend to represent the very best in terms of claims expertise; some of the buyers who have taken this approach have sustained complicated losses in the past which have been paid without any undue difficulty.

Meanwhile other leaders, particularly the larger players from the composite company market, are adopting a selective strategy. For their target programmes, these leaders are providing highly competitive terms, while at the same time they are also showing signs of withdrawing from a large part of their non-core business.

The loss figures for the 2014 year of account, which in previous editions of this Review we showed as being a profitable one for the market, have deteriorated sharply as 2015 losses written into the 2014 year of account have been finalised and settled during last year.

Figure 6 – Offshore Construction loss record deterioration, 2010-16 (losses occurring basis)

Source: Willis Tower Watson Energy Loss Database as of March 9 2017 (figures include both insured and uninsured losses)

Offshore Construction: market enthusiasm weakens

Offshore Construction has never been the most popular area of the Upstream portfolio, mainly because of the long term nature of the product and the potential for attritional losses arising out of pipe laying and other subsea installations. It is interesting to report that nearly 30% of 2015's Upstream losses were from this subsector and this is reflected in the chart above. Indeed, 2015's Offshore Construction losses were by some 40% the largest recorded in our Database for a single year, a statistic which is a startling one for a market whose ongoing premium income for this class is receding rapidly, due to the cancellation of major projects brought on by the recent collapse in oil prices.

Indeed, we were surprised recently by the apathy of the market to a recent major project that we placed only a few weeks ago; we did encounter a degree of resistance in the market that we had not anticipated, given the large project value and sizeable premium income on offer. Perhaps these statistics explain why. Furthermore, one should also factor into the equation the long term nature of most Offshore Construction projects; insurers are generally reluctant to commit their capacity for longer than 12 months for all but the choicest business.

Meanwhile, the abandonment of several projects over the last 18 months or so has caused a major existence headache for some insurers. Not only are these half built assets being abandoned by their owners, they are also often being housed in yards with other similar abandoned infrastructure, thereby increasing Upstream insurers' aggregate exposures. While oil prices have of course recovered a little from this time last year, it seems that they will need to increase further in the next year or so before any of these half built assets attract the renewed interest of their owners – or other potential buyers.

So maybe those looking for signs of any future market upturn might look first to this part of the portfolio, as it is entirely possible that it will be here that we first see any signs of a market turn. For the moment, however, that still seems some way off.

Norwegian market update

General Activity

Company budgets for all non-core/essential drilling in Norway have been cut back substantially. The few projects which were/are being sanctioned and those already in progress have reduced CAPEX values. The generally held view is that 2017 will follow a similar story to 2016, but that activity will begin to build again in 2018. The Barents Sea and Northern Norway are the places where most new exploration is taking place.

Mergers & Acquisitions

There are plenty of assets which are for currently for sale. Many of the 'the Majors' and larger companies are selling assets; some are looking to exit Norway completely, others want to rationalize their portfolio to focus on what they consider to be their core assets. During May 2016 Point Resources was formed when Pure E&P, Core Energy and Spike Exploration were merged together as one company. The former Det Norske and BP Norge businesses were combined and renamed Aker BP ASA. Explora Petroleum was bought by North Energy. Tellus Petroleum's E&P activities in Norway will cease. Elsewhere Atlantic Petroleum exited Norway and sold its licences to new start-up M Vest Energy. There are a handful of new start-up small cap companies looking to become qualified as license holders on the Norwegian Continental Shelf and some of the existing mid-size players are looking for capital to make investments.

Insurance Market Developments

Energy underwriters in the Nordic region, as elsewhere, are faced with the "double whammy" of historically low activity and premium rate reductions in this market are now averaging 10-15% each year. The established leaders in the region Gard, XL Catlin and AIG, remain the 'go-to' quoting markets. Recent entrants Riskpoint and Standard Hydor have added to the significant capacity which is already available. In general the Norwegian market rate reduction levels are not quite on a par with those witnessed in the London market. Scandins, a coverholder on behalf of various Lloyds syndicates and other London market companies, was acquired by Riskpoint.

First signs of resistance from the Fac R/I market?

No review of the Upstream market would be complete without an examination of the Facultative Reinsurance (Fac R/I) market; indeed, it could be argued that the entire Upstream market dynamics are held in place by this critical market segment. Last year we commented that this market consisted largely of smaller players who did not have the size of capacity to attract the attention of brokers whose major programmes were already subject to significant "signing down" due to aggressive written lines from the larger Upstream insurers.

This year, we have witnessed a subtle change in approach from this section of the market; while their appetite for attractive Excess of Loss Fac R/I is as robust as ever, brokers are now finding it more challenging to place primary reinsurance programmes. We are aware of one insurer who has withdrawn from writing this line of business due to a poor claims record, and perhaps the only surprise is that it has taken this long for the Fac R/I market to push back on writing truly primary business. Instead, the Fac R/I market is looking to write say the first US$100 million of major placements that truly offer generous premium income and a decent rate on line; however, this development is of course encouraging the major leaders to compete still more aggressively for the choicest business.

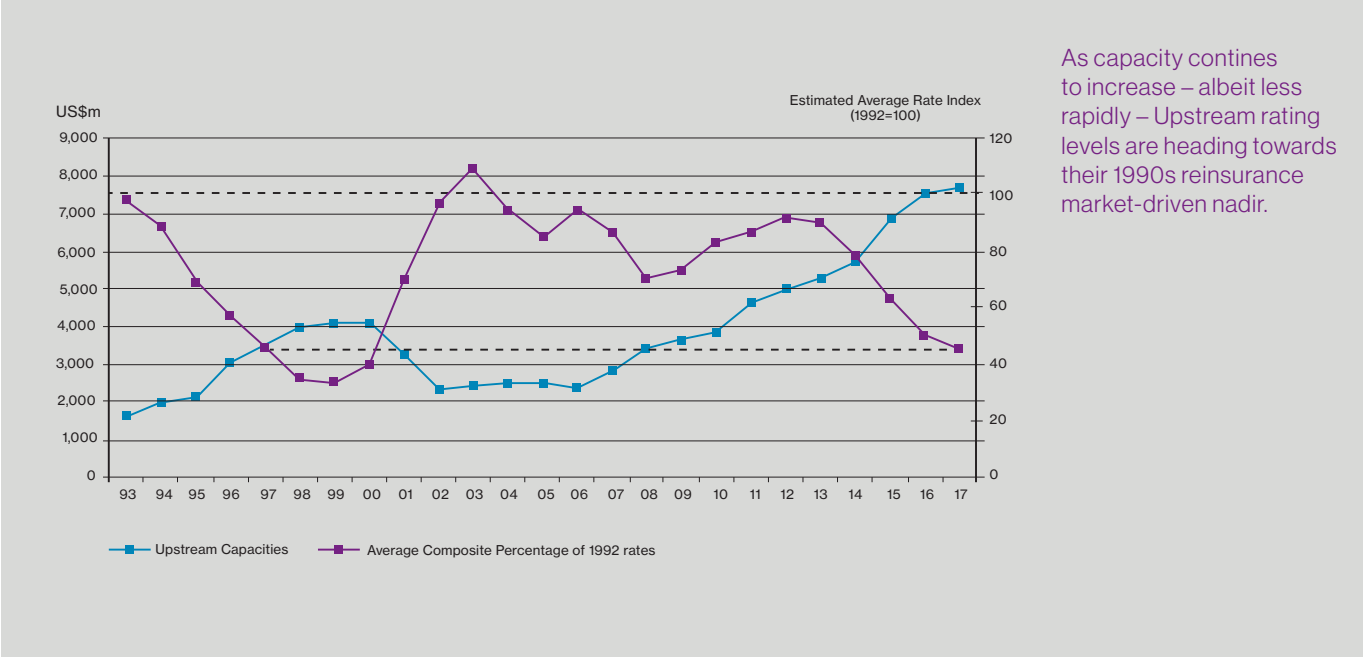
One thing is still working in the Fac R/I market's favour – because they have generally only been writing business on this basis for the last two years, they have generally missed out on the majority of the 2015 losses as so much of them have been attributable to the 2014 year of account.

Conclusion – is the day of reckoning any nearer?

As ever, we conclude our analysis of the Upstream market with a look at our historical chart (Figure 7 overleaf) which shows capacity and average rating levels plotted over the last 23 years. Three things are immediately apparent:

- The last truly hard market was following the tragic events of September 11, 2001. Since then, despite several blips following the hurricane losses of the 2000s and the Gryphon A loss in 2011, the market has been essentially in softening mode.
- Capacity has been relentlessly increasing since 2006; given the macro-economic picture, we do not forecast any significant withdrawals in 2017-18, even if the loss record continues to deteriorate.
- However, rating levels have now reached the point where they are now approaching the all-time market lows of 1998-2000. But this was a market where you did not need to be seen to be writing for an underwriting profit; the market has changed a great deal during this time and simply arbitraging your portfolio by buying it out with cheap reinsurance will no longer hold water with senior management (and in the case of Lloyd's, the Performance Management Directorate).

Figure 7 – The outlook for 2017: Upstream Energy capacity versus rating levels, 1993 – 2017 (Excluding Gulf of Mexico Windstorm)



Source: Willis Towers Watson

Do buyers have the appetite for increased risk transfer spend?

There is no doubt that the market is now more apprehensive following the deterioration of the 2015 loss record. Insurers might look to new cyber products to help them augment their premium income, but to date, although we now have several cyber products in the Upstream arena, we understand that only a handful of programmes have achieved a 100% subscription. However, despite the current risk management budget constraints we anticipate that cyber will be a major area of focus for Upstream risk managers in the next few years.

Are insurers ready to lower retention levels?

So how else can insurers augment their income? For those buyers who are most in favour with the market, there is always the possibility of insurers offering to reduce retention levels in lieu of a further premium reduction. Indeed, we are aware that some major leaders have already offered to reduce waiting periods on LOPI policies for their most trusted and long standing clients. However, this in itself is hardly likely to be enough to change overall market dynamics.

Cashflow is key

In the end, of course, it's all about cashflow. To date, despite the dwindling premium income stream and the deterioration of the loss record, Upstream insurers have managed to generate sufficient cashflow over the last few years of market softening to allow them to continue to trade and maintain their underwriting operations. So what will come first – a refusal to follow the market further down the softening pricing spiral or a summons to senior management to be told that their operation is no longer viable?

Buyers continue to enjoy the luxury of knowing they continue to have a choice – either to continue to maximise the economic benefits or increasingly cheap risk transfer products by electing to go with the most competitive leader, or instead adopt a long term strategy by sticking to the more established leaders to achieve stability in the event of any market upturn.

It remains a buyer's market –and the choice is theirs!

Meanwhile, buyers continue to enjoy the luxury of knowing they continue to have a choice - either to continue to maximise the economic benefits or increasingly cheap risk transfer products by electing to go with the most competitive leader, or instead adopt a long term strategy by sticking to the more established leaders to achieve stability in the event of any market upturn. As always, there are good arguments for both sides, but buyers will need their brokers to be at their most vigilant in the event of any sudden change in market dynamics during the next 12 months.

Upstream underwriter movements Q1 2017 (London unless stated)

Underwriter	From	To
Simon Williams	Hiscox	Unknown
Matt Holmes	Beazley	Elseco
Melanie Markwick-Day	Ascot	Neon
Chris White	Barbican	Unkown
Michael Green	Allianz	Beazley
Jaqueline Wiffen	XL Catlin	Barbican
Richard Dare	Munich Re Syndicate Singapore	Munich Re Syndicate London

Please also note that Alexandra Barnes has been promoted to Head of Energy at Beazley London

Paul Braddock is global head of Upstream Energy at Willis Towers Watson.

Downstream

In the Downstream Energy market, we must first of all begin by saying that, on the face of it, very little has changed since we last reported in 2016. Capacity remains buoyant, rates continue to soften, competition remains robust and buyers continue to reap advantages from a market that has now been in a softening mode for the last seven years.

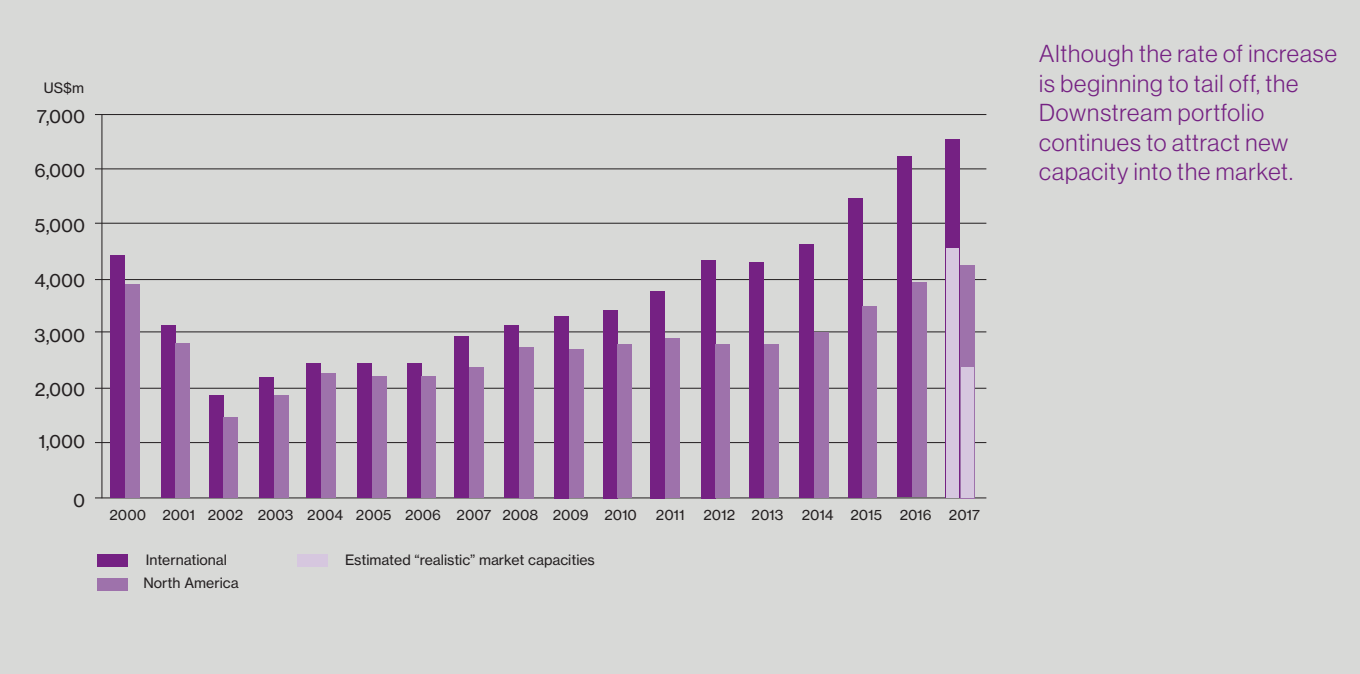
However, it seems that we may now be experiencing a slight reduction in the actual rate of softening, which we will examine in more detail later in this chapter. Could the fundamental dynamics of this market be about to change? Or will the relentless supply of excess capacity push the market further towards unprofitability?

Once again it is time to examine the key issues in this market – capacity, losses rates and other market developments.

Capacity increases – for the 15th year in a row...

It should come as little surprise to the regular readers of this Review that we report an increase in capacity levels for the 15th year in succession. Elsewhere in this Review we comment on the macro situation in the global economy, so suffice to say here that we have had no significant withdrawals from this class in 2016, and in the meantime have seen the introduction of insurers such as Barbican and Axa. Meanwhile some existing insurers are becoming more aggressive, and armed with increased capacity levels are now in a position to compete more fiercely for market share. For example, the appointment of Rob Kuchinsky at Zurich is expected to bring this insurer firmly back into the Downstream market spotlight, while major regional insurers such as Qatar Re now have the underwriting muscle, especially within the Middle East region, to go head to head with the more established market leaders.

Figure 1 – Downstream Energy insurer capacities 2000-2017 (excluding Gulf of Mexico Windstorm)



Source: Willis Towers Watson

Figure 2 – Downstream Energy losses in excess of US$50 million, 2015

Downstream losses in excess of US$50 million, 2015					
Type	Cause	Region	PD US$	BI US$	Total US$
Petrochemical	Fire + explosion/VCE	Europe	160,000,000	380,000,000	540,000,000
Refinery	Fire + explosion/VCE	North America	100,000,000	320,000,000	420,000,000
Chemical	Fire no explosion	Europe	26,000,000	150,000,000	176,000,000
Oil sands	Fire + explosion/VCE	North America	71,596,000		71,596,000
Petrochemical	Fire + explosion/VCE	Latin America	10,000,000	55,000,000	65,000,000
Petrochemical	Fire no explosion	Europe	15,000,000	44,600,000	59,600,000

Only six major Downstream losses were recorded for the whole of 2015 – making the year one of the most benign on record.

Source: Willis Towers Watson Energy Loss Database as of March 7 2017 (figures include both insured and uninsured losses)

Furthermore, some of the smaller insurers, particularly in London, have also increased their capacity for 2017 in an attempt to keep up with their more muscular global competitors.

Lloyd's insurers losing out?

As the number of competitors in this market increases, and as the size of the capacity offered by each major insurer becomes even more impressive, this does leave some of the smaller players who have not increased their capacity, particularly from Lloyd's, potentially being left to one side by clients who, understandably, are looking to their brokers to implement the most straightforward insurance programme designs possible. It may be the case that some Lloyd's operations may be being restricted as to how much capacity they can offer by internal management controls; as a result, we have seen an increased willingness by some Lloyd's underwriters to utilise their company stamps (where possible) to ensure that they maximise the changes of obtaining the largest possible share of an attractive placement. Lloyd's insurers are also disadvantaged in that they are not allowed to bolster their gross written line by means of Facultative Reinsurance (Fac R/I) in the same way as their company counterparts.

So it remains firmly a buyer's market. With over US$4.5 billion in working (i.e. realistic) capacity available (US$2.3 billion for North American risks), buyers can attract sufficient cover to protect themselves from even the largest losses – the largest Downstream loss ever recorded by our Database was no more than US$2 billion in total.

Losses – a sharp increase from 2015

While capacity continues to climb, the Downstream loss record has now begun to deteriorate. Figures 2 and 3 show the losses excess of US$50 million that have been reported to our Database for 2015 and 2016 and the picture is a contrasting one. Whereas 2015 produced only six Downstream losses of any note at all – an almost hitherto unknown phenomenon – 2016 has very much been a years in which the loss record has reverted to form [1]. Furthermore, already in 2017 there has been a major loss in the Middle East, which is likely to exceed any of the losses reported for 2016 to date and which, to several insurers' consternation, may have a significant Contingent Business Interruption element.

[1] Please note that the pipeline loss referred to in Figure 3 overleaf is classified as Downstream as this particular pipeline was carrying a blended oil product.

Figure 3 – Downstream losses in excess of US$50 million (to date), 2016

Downstream losses in excess of US$50 million (to date), 2016					
Type	Cause	Region	PD US$	BI US$	Total US$
Petrochemical	Fire + explosion/VCE	Europe	55,000,000	440,000,000	495,000,000
Petrochemical	Fire + explosion/VCE	Latin America	340,000,000	140,000,000	480,000,000
Refinery	Fire + explosion/VCE	Europe	150,000,000		150,000,000
Pipeline	Ruptured pipeline	North America	148,000,000		148,000,000
Oil sands	Fire + explosion/VCE	North America	71,000,000	68,032,000	139,032,000
Gas plant	Fire + explosion/VCE	North America	98,000,000		98,000,000
Petrochemical	Unknown	Asia Pacific	20,000,000	75,000,000	95,000,000
Refinery	Fire + explosion/VCE	Middle East	4,000,000	84,500,000	88,500,000
Refinery	Fire + explosion/VCE	Eurasia	7,800,000	74,000,000	81,800,000
Refinery	Fire + explosion/VCE	Europe	15,000,000	60,000,000	75,000,000
Gas plant	Flood	North America	34,000,000	30,000,000	64,000,000
Chemical	Supply interruption	Asia Pacific	37,700,000	17,600,000	53,300,000
Gas plant	Fire + explosion/VCE	Eurasia	50,400,000		50,400,000
Refinery	Fire + explosion/VCE	North America	50,000,000		50,000,000
Petrochemical	Fire no explosion	Europe		50,000,000	50,000,000

In constrast to 2015, 2016 has produced 15 major losses to date – in combination with reduced premium income levels, this year's underwriting results are bound to be challenging for some insurers.

Source: Willis Towers Watson Energy Loss Database as of March 7 2017 (figures include both insured and uninsured losses)

Lack of attritional losses

However, the actual number of losses reported to our Database has continued to decrease in recent years. Back in 2011, we had 107 losses reported; by 2014 this had been reduced to 77 while to date the same figure for 2016 has been further reduced to 59. This does suggest that the usual "attirional" element of the loss figures has declined in recent years, with insurers thereby being able to recover more of their losses from their reinsurance treaties.

A declining premium income pool – but no freefall

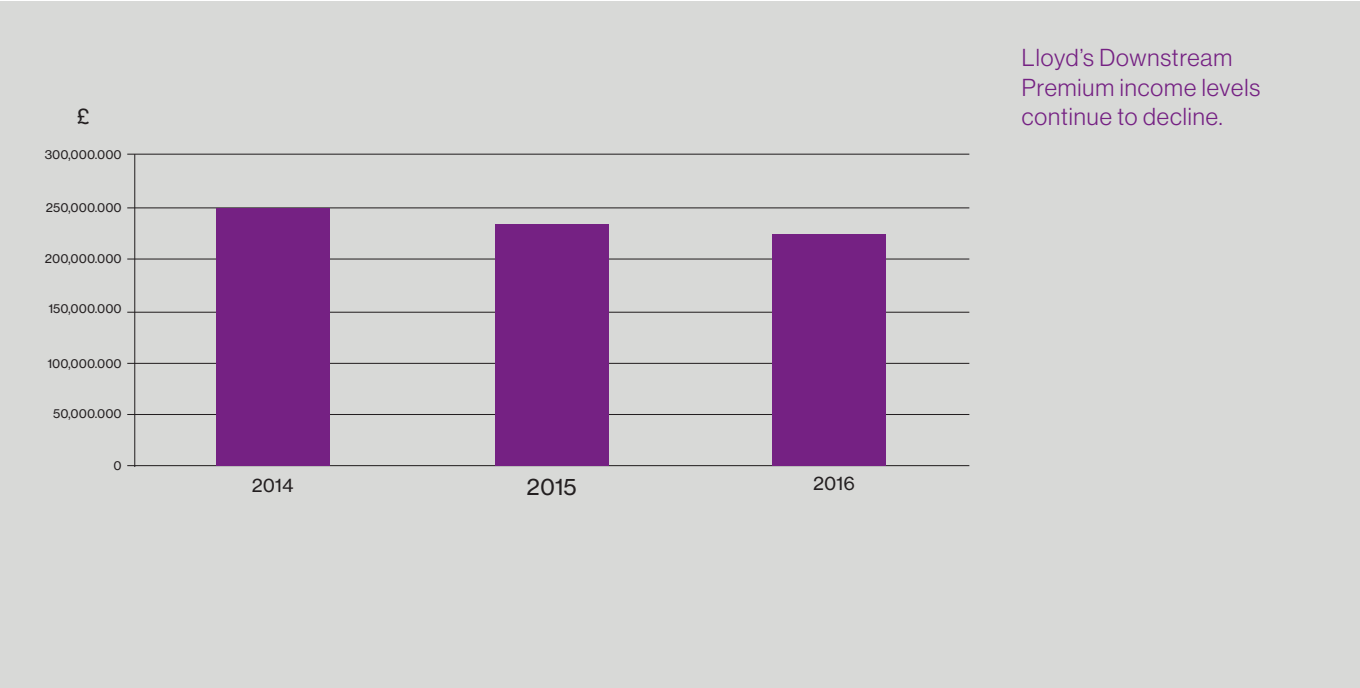
This deteriorating loss record is materialising at a time when, as we have reported last year, premium income levels continue to decline. However, we believe that reports of a "freefall" in Downstream market premium income are possibly wide of the mark. Figure 4 overleaf, the data from which we have sourced from Lloyd's, shows a decline in premium income levels that seems to be much more gradual than most market observers would have us believe.

Of course, the percentage of the overall global Downstream portfolio written by Lloyd's is considerably less than its Upstream counterpart. That being said, these figures do show that Lloyd's has, up until now, continued to maintain the vast majority of its Downstream revenue.[2]

Whether or not that continues to be the case as new competition in the market continues to assert itself remains uncertain.

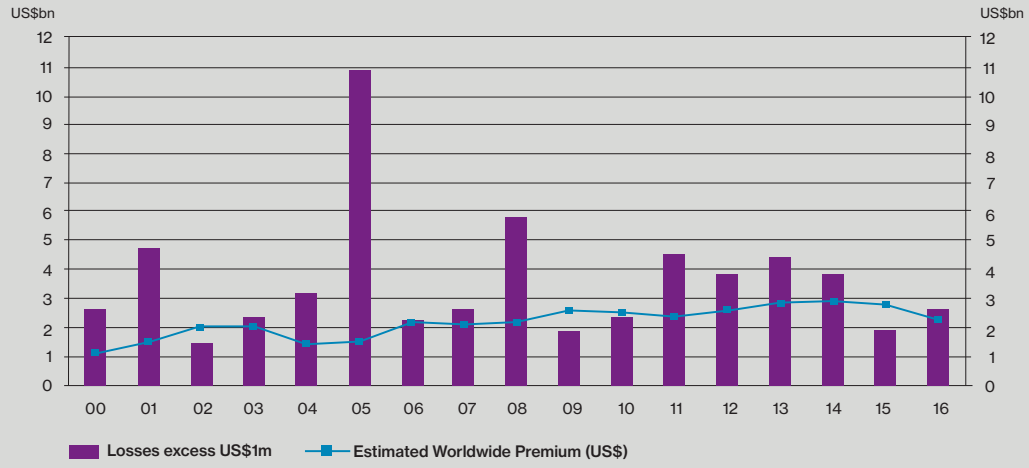
[2] The recent decline in the value of the Pound Sterling against the US Dollar is also helping to keep London market premium incomes from any steeper declines.

Figure 4 – Total Lloyd's Downstream Energy premium income as at Q4 each year, 2014-16



Source: Lloyd's

Figure 5 – WELD Downstream Energy losses 2000-2016 (excess of US$1m) versus estimated global downstram premium income



The 2016 loss record is nearing recent average levels – unlike 2015, which was exceptionally benign.

Source: Willis Towers Watson Energy Loss Database as of March 1 2017 (figures include both insured and uninsured losses)

Is the current softening sustainable?

However, if we take both the increased loss record and combine it with the premium income deterioration, then the picture looks a lot bleaker for the market. Figure 5 above shows overall Downstream Energy losses excess of US$1 million shown against our global Downstream premium income estimates, year on year.

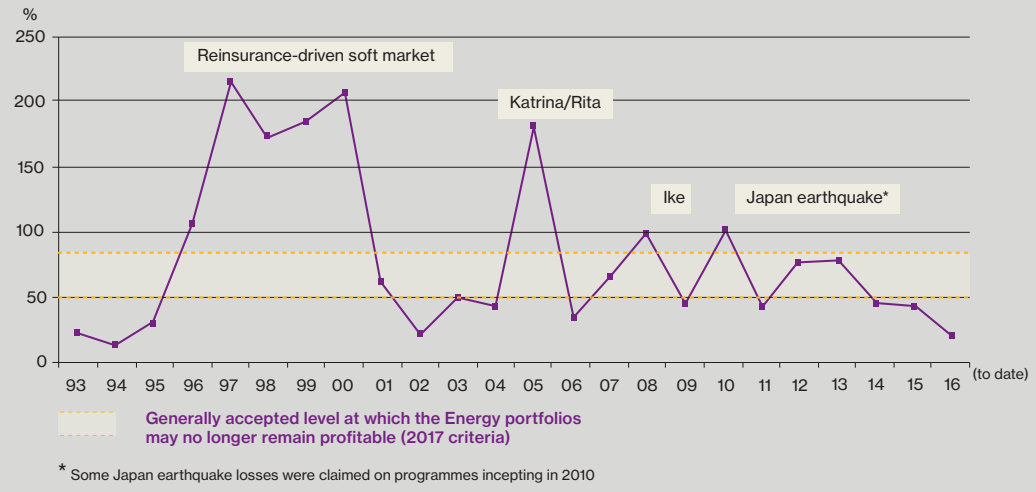
If we take the period 2007-16, an era which has been remarkably free of catastrophic losses, it can be seen that for most years the loss figures still outstrip the estimated global premium income for this class. Of course, not all losses reported to our Database are insured in the commercial insurance market, but with a mean annual loss of US$3.11 billion for this period, any global premium income estimate below US$3 billion seems to suggest that underwriting profits may not be achievable in the long run. And as the chart shows, our global estimate is now significantly below that figure and declining all the time.

Profitability – insurers on a knife edge...

Are there any other indicators that might point to the overall profitability or otherwise of the Downstream Energy market? Again, in the absence of available data across the portfolio we must rely on Lloyd's figures for guidance. Figure 6 overleaf shows Lloyd's Incurred Ratios (written premiums versus paid and outstanding losses) for the Downstream Energy portfolio for the last 23 years.

We have often produced this chart in previous editions of our Review, but regular readers will notice an important distinction that we have made this year. As we noted in the preceding two articles of this Review, due to increased operating costs, and after some deep discussions with a variety of underwriters, it is now considered that in order to make an overall profit on a given portfolio, even taking the availability of reinsurance into account, an underwriter may have to achieve an overall Incurred Ratio of less

Figure 6 – Lloyd's Downstream Energy incurred ratios, 1993-2016 (as at Q4 2016)



Lloyd's incurred Ratios for 2016 are still too immature to be germane. Bearing this in mind, you have to go back to 2006 to identify a year where the Lloyd's Downstream portfolio genuinely made a profit at today's high operating costs.

Source: Lloyd's

than 50% (in pervious Reviews we indicated this figure at 80%). As a result, we can see that the Lloyd's sector of the Downstream market has:

- Failed to secure a significant profit from this class since 2006
- Recorded significant underwriting losses in five of the past ten years
- Been right on the cusp of underwriting losses for the other five years (2016's figures are too immature at this stage to be germane)

It's important to note that these figures should be treated only a guide rather than as a detailed assessment of the overall profitability of the portfolio. However, they do perhaps show that if premium income levels deteriorate still further – as seems very likely, given the continued increases in capacity – then individual insurers are going to be hard pressed to secure underwriting profits in the long term.

Current market dynamics

Rating levels continue to decline

Given what we have just reported, it is therefore no surprise that rating levels, on average have continued to decline still further during the first quarter of 2017. Again, the improvement in the attritional loss record is one reason why insurers feel confident in offering reductions even to the smaller programmes. As can be imagined, with the introduction of more competition during 2016 pressure on underwriter signings has if anything intensified.

Upstream market competition now more significant for Midstream

One of the main reasons for this is the introduction of still more competition for a large part of the Onshore Energy portfolio from the Upstream market. Any programmes that do not feature refining operations as defined by Upstream insurers' reinsurance programmes – such as gas plants, compressor stations, LNG plants, pipelines and other Midstream infrastructure – are now considered fair game by Upstream insurers whose predicament is even more critical that their Downstream counterparts (see the Upstream chapter of this Review). Downstream brokers have therefore found themselves in the unusual position of approaching Upstream underwriters to quote on this part of the portfolio. In the vast majority of instances, these insurers are providing much more competitive terms, especially as these programmes are considered as new business to them so they do not have to justify writing them at such competitive terms, unlike their Downstream counterparts who would have to justify a significant reduction to their own management.

Differing underwriting philosophies

While the market may be softening, this does not mean that the placing process has got any easier for brokers. Unlike the Upstream market, there is now virtually no trace of any subscription element to the Downstream market, with each insurer participating on their own terms rather than following any established leader. This means that brokers still have to show ingenuity in coming up with programme designs that match the requirements of their clients to what is on offer from the market, while all the time optimizing market pressures to generate the most competitive possible terms.

Caution matched by aggression

Perhaps it is no surprise that, given the relentless softening of the market, some insurers are now attempting to scale back their involvement in this portfolio, presumably in the hope that they can escape the worst effects of the downturn and position themselves to take advantage of any market upturn. Some of these insurers continue to take an engineering-led approach to writing business, looking to maintain a profitable portfolio by selective underwriting. However, it would seem that this approach might have its drawbacks in today's market; in several instances towards the end of 2016 we witnessed these insurers "coming back to the table" when they realised the placement was going to be completed easily, having originally declined to participate.

Moreover, caution by some is being matched by aggression from others. Apart from the new entrants we are also witnessing some markets adopting a straightforward approach to today's market conditions by simply writing for premium income and market share.

Regional competition intensifies

Meanwhile, the London market continues to come under pressure from regional competitors. It is certainly true that several major insurers have recently begun the process of centralising their Downstream underwriting operations by appointing global heads who can exercise much more authority over regional underwriters than in the recent past. Indeed, these insurers are now offering more consistent terms and conditions than before and as a result there are now fewer instances of regional undercutting of the London market by these insurers. However, this is by no means the end of the story. Just as some insurers are beginning to centralise, others are moving in the opposite direction in order to generate additional premium income by competing for smaller regional business that would not normally find its way into the London market. The picture is also complicated by the degree of underwriting autonomy granted to individual class underwriters around the world; some have full underwriting authority, while at the other end of the scale others act purely as a conduit to centrally managed capacity.

As a result, we have a mixture of underwriting strategies among the global insurers, while we also have seen more underwriting muscle on display from various regional insurers. In particular several insurers operating out of Dubai and Singapore now have sufficient underwriting capacity to challenge even the largest global insurers – at least in the region where they originate from.

The upshot of all this is an intensifying of the global competition for the most sought after business where regional and global insurers are both in a position to compete. During the rest of 2017 it will be interesting to see which of the centralising or regional expansion underwriting philosophies will win out, given the current market dynamics.

Where does this leave the smaller insurers?

Given the scale of the competitive pressures that we have just described, we should perhaps now return to the plight of the smaller insurers that we identified earlier in this chapter. Given the increase in capacity of several global (and some regional) carriers, although programme designs can remain complicated there is no doubt that there is now considerably more capacity available to buyers on a quota share basis. This has had the effect of reducing both the number of layered programmes that have been placed recently as well as the amount of premium available to those insurers who have traditionally participated in this class on an Excess of Loss basis. These have generally consisted of the smaller Lloyd's and other London operations that we discussed earlier whose size prevents them from competing effectively with the major carriers for participation on major quota share placements.

At the same time, despite the continuing softening of the market, we continue to report that deductible levels, waiting periods and most sub-limits remain virtually static. Competitive pressures are preventing insurers from increasing deductibles in line with inflation, but at the same time the market has not come under pressure to reduce deductibles, if only because buyers have generally been happy to absorb risk above the dollar swapping level and in any case have not had the leeway in their budgets to absorb any additional premium that would invariably be charged for lowering retention levels.

Deductible buy-down reinsurance – will the trend take off?

However, now that the excess layer opportunities for smaller insurers are beginning to dry up, we have found that some excess players are being persuaded to write "deductible buy-down" reinsurance policies as these require only small programme limits and offer attractive rates on line – as well as premium income to make up for the lack of opportunities on excess programmes. This is a relatively new development and has by no means yet become the norm in the market but we do think that this might provide an opportunity for buyers to improve their insurance programmes for minimal additional cost. Clearly, those buyers who have experienced significant losses in the past might see the value of such a development more than those who have not.

Of course, should this new trend of primary facultative reinsurance on major programmes take off, this would undoubtedly serve to perpetuate the softening process in this market still further.

Relaxation of sub-limits

Meanwhile we can report that we have seen a small relaxation in some minor sub-limits such as Course of Construction, Expediting Expenses, Sue & Labour costs etc. The degree of increase may not amount to very much but this in itself may be an indication of a further softening of the market.

Letter from Africa

Last year we highlighted various complexities facing clients with operations in the region. Reflecting on that now, the situation sadly seems to be equally if not more complex. Whilst slightly improved commodity prices may have improved the situation, exploration activities are still massively down, affecting pioneering territories in particular. As always there are cash rich companies taking advantage of the situation.

From a risk management perspective we would highlight two main issues:

- **Lack of access to Forex/ declining rates of exchange – this issue goes well beyond insurance spends but it is very testing on reinsurance premium payment warranties. With the ever rising presence of local content this further complicates the issue of keeping coverage in place.**
- **Further ramping up of Local Content i.e. CIMA legislation changes 1st June 2016 – The changes are not designed around the oil and gas industry but it falls subject to them. This alone causes a huge amount of extra work and is having to be conducted at a time where reduced premium spends and associated commissions are down, making the seamless placement strategies required by clients extremely difficult to orchestrate.**

Generally insurance companies and brokers group strategies and centralisation seem to demonstrate the testing times in this region.

Figure 7 – Downstream Energy capacity versus estimated average rating levels, 1993-2017 (Excluding Gulf of Mexico Windstorm)

With capacity levels continuing to increase, the Downstream market looks set to remain soft – notwithstanding any deterioration in underwriting results in 2016.

Source: Willis Towers Watson

The outlook for 2017/18

So in summary, where is the market heading as we move further into 2017? Our historical chart in Figure 7 above shows capacities set against average rating levels and, in general terms, indicates the correlation between supply and demand in this industry. It can be seen that average rating levels, after a brief rally following a dramatic collapse in 2010, have been declining for the last five years, while in the meantime capacity continues its relentless journey upwards.

The effect of future catastrophic losses

Where will it all end? In the Introduction to this section of the Review we show how even a series of catastrophic losses – eradicating existing premium income streams and presenting significant losses to virtually every insurer engaged in this market – may not in itself result in a withdrawal of capacity. However, at some stage premium income levels will drop to a point whereby this class of business is no longer sustainable, and insurers may begin to focus on other parts of the Property portfolio to sustain their market share and revenue streams.

Furthermore, should a series of catastrophic losses hit the majority of players in this market – as it has done so often in the past – even if there was no actual withdrawals, insurers would have an excuse to call a halt to the softening process and, at least until the shock wore off, would probably be able to engineer a hardening dynamic, even if it proved not to last particularly long. We have seen this dynamic work in the past following major losses (the last time was 2011) and there is no reason to suggest that such a scenario can't play out again.

Time for long term policies?

It is for this reason that we suggested in the Introduction that now might be a good time to consider a long term policy in partnership with buyers' current leaders. Although the softening pressures remain relentless on the surface, we understand that a significant amount of underwriting reserves, which have served to keep any market withdrawals to a minimum up to this point, have now become exhausted.

With insurers keen to secure existing premium income streams to maintain their current position, 2017 might be a sensible time for buyers to consider protecting their programmes at today's rock bottom prices and at the same time hedge against the increasing possibility of any future market upturn.

Underwriter movements, Q1 2017 (all London unless stated)

Underwriter	From	To
Robert Kuchinski	AWAC	Zurich
Sean Mannion	AIG	Zurich
Marc Sullivan	CV Starr	Barbican Syndicate
Oliver Williams	Allianz	CV Starr
Mark Mackay	Allianz-Singapore	Axa

Justin Blackmore is Chief Broking Officer, Property and Casualty at Willis Towers Watson.

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

Oil Insurance Limited

Offshore Gulf of Mexico Designated Named Windstorm Coverage

Introduction

Earlier this year Oil Insurance Limited (OIL) announced that effective January 1, 2018, it would no longer cover Offshore Designated Named Windstorm risk in the Gulf of Mexico. In a statement issued to its members on February 7th, OIL explained that as a result of diminishing demand for the coverage and growing issues with the way losses are mutualized in the Offshore Pool system it was not in the best interests of the membership to continue offering this coverage.

Why this statement?

Several dynamics were at play. When the current Windstorm Premium mechanism was put in place in 2010, there were 12 active participants purchasing Offshore Designated Windstorm coverage. By 2016, there were only 4. With each successive departure from the pool, each member's pool percentage increased. Despite OIL demonstrating that the chances of losses making it into the pool were declining as members elected not to purchase coverage using EQECAT/CoreLogic modeling results, member after member continued to drop coverage. A number of members came to the conclusion that they were large enough to retain the risk, given the infrequency of losses and the growing robustness of their assets. Others elected to insure selected assets in the commercial market as opposed to their entire portfolio with OIL. Several others exited as a result of selling their offshore assets and thus no longer had a need for the coverage.

Unsuitable for a mutual system?

During 2016, OIL surveyed its members on the subject to understand whether there was latent demand for the product if modifications were made to it. Several alternatives were explored, including using commercial reinsurance, moving back to a fully mutualized model and annually capping the amount of losses in the system. None of those measures appealed to the membership. When one considers the fact that close to 80% of OIL's membership have windstorm exposed assets in and around the Atlantic Basin, it would lead one to believe that a solution was possible. That may be the case; however, mutualizing infrequent losses under a system that doesn't contemplate risk differentiation within a business sector (a basic OIL premise) across factors such as shallow versus deep water, highly engineered structures versus older ones that are more simplistic, mobile ones versus fixed ones, etc. eventually convinced the members that this risk did not work well in a mutual system.

OIL is built to service its members and in the end its members elected not to use an offered product. Under that framework, the Board made a decision that was in the best interests of its overall membership with the unfortunate outcome that a few of its members will not have OIL windstorm coverage in 2018.

Strategic Plan

The announcement regarding the discontinuance of Offshore GOM Windstorm coverage came on the heels of OIL completing its 2016 Strategic Review and approval of its Strategic Plan at the company's December 2016 Board meeting. After over a decade of changes to its policy wording, Rating & Premium Plan, capital management philosophy, Shareholders Agreement and the way it operates, the company is embarking upon a forward focused strategic plan that emphasizes:

- the development and evolution of its product offering;
- adding member services as a core value added; and
- further expanding the way it markets itself and distributes its product.

Flexible Product Limits

At the core of its strategy to expand its attractiveness to its members and prospects is OIL's creation of an Advisory Panel that is comprised of members, brokers, adjusters and consultants; it is also looking to offer more flexibility with how it offers limits. Presently, OIL members are required to purchase the same amount of limit irrespective of a company's needs. Once the review is complete, it is possible that members will be able to purchase a limit that falls within a designated range instead of a one size fits all approach.

Broader eligibility rules?

Additionally, it is considering broadening its eligibility rules in an effort to increase the breadth of companies who are eligible to become members, as well as possibly adding a Renewables Sector. And lastly, consideration is also being given to finding ways to work with commercial insurers to expand the overall value proposition associated with being a member of the mutual.

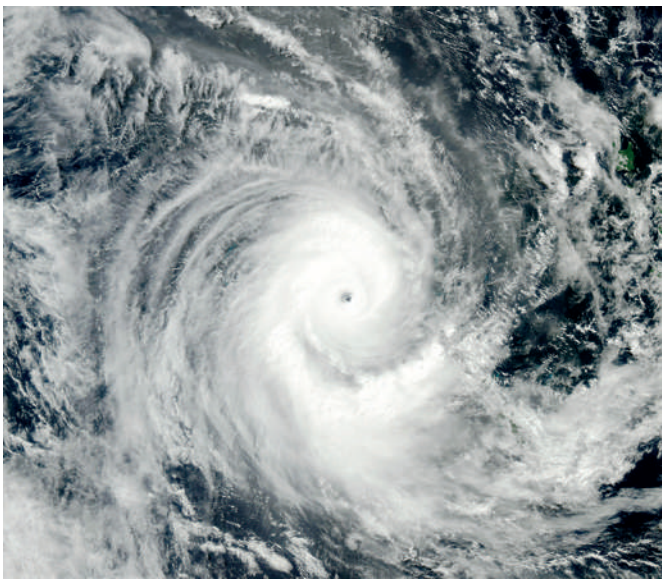
Member Services – advanced analytics

OIL has been in operation for 44 years and in the process has paid over US$13 billion in claims. The mutual has plans to leverage the use of that data and feed it back to its members in the form of advanced analytics in an effort to help them with their risk management efforts. The project has been under way for a year and Willis Towers Watson's Energy Loss Database is set to play a pivotal role in its formation. Other initiatives include OIL personnel visiting each of its shareholders every three or four years as well as improving the member experience at its Annual General Meeting.

Marketing & Distribution – developing broker relationships

OIL's business model is very cost effective, as demonstrated by its sub 5% expense ratio. As a result of that efficiency, the mutual relies heavily on the brokerage system to market and distribute its product instead of setting up costly regional hubs in the countries where its clients are present. The new strategic plan intends to gear up its relationships with its key broker partners, including Willis Towers Watson, in an effort to maximize its presence in important energy insurance markets where its clients and prospective clients do business. The company is also targeting the Power & Utility Sector.

Should your company have an interest in learning more about OIL, please contact your local Willis Towers Watson representative or Joe Seeger, Head of the Calgary office, at Joe.Seeger@WillisTowersWatson.com.



George Hutchings holds the position of Senior Vice President & Chief Operating Officer of Oil Insurance Limited for The OIL Group of Companies in Bermuda. George has overall responsibility for the insurance and claims operations of the company. In addition, he is responsible for leading the strategic planning process and championing shareholder initiatives to effect positive change to the business model.

Onshore Construction

2017 – more of the same!

The Onshore Construction insurance market continues to experience extremely competitive conditions, fuelled by increasing capacity year on year. Over US$1 billion of additional capacity has emerged from new and existing markets during the last 12 months, with very few features mitigating the global trend of soft insurance buying. Over US$5 billion of PML capacity now exists, and once again rates have reduced over the last 12 months. However, projects requiring capacity from major insurers and reinsurers maintain more acceptable terms and conditions (certainly from an insurer's point of view).

New capacity has international flavour

Regional markets, mostly in Asia (Singapore and Hong Kong), Dubai and Miami remain strong alongside the key centres of London, Munich and Zurich. New markets continue to emerge, notably Qatar Re in Dubai, Aspen in London and significantly in China where increasing visibility and capacity is evident. Indeed, substantial capacity from insurers such as PICC, Ping An, Huatai and CIPC has created an independent market able to cover most domestic projects and those outside of China with Chinese interest. The increased membership of the Lloyd's Construction Consortium from 4 to 6 syndicates has resulted in the capacity rising to US$340 million. However, caution is always advised when considering choice of leaders; low premiums can also result in inferior coverage and stricter claims management, with the resulting uninsured losses causing financial gaps to be filled by risk retention.

Energy industry still investing in certain territories

Low oil and gas prices over the last 12 months have done little to stimulate investment in new onshore projects or any expansion of existing plants. However, selectively some countries continue to invest in the energy sector and many countries outside of North America see this investment to be a priority, examples being Egypt, Russia, Kazakhstan, Uzbekistan, Nigeria and of course Iran (although the latter clearly has its challenges). Increasing oil prices give cause for optimism that construction of new works and upgrades will once again bring fresh insurance premiums over the next 24 months. In Canada, several oil sands, gas to liquids and clean energy projects maintain a healthy pipeline for the North American insurance markets together with Lloyd's, where a majority of North American projects continue to eventually be insured.

The Construction insurance product – not enough innovation?

Whilst rates and (lately deductibles) have tumbled, the product (i.e. the policy coverage) has seen less innovation as energy companies seek to secure lower premiums rather than wider cover. However, it is becoming more common for wider defects (LEG 3) to be expected to be included rather than offered as an option. Natural catastrophe risks, Testing and Commissioning activities and risks emanating from greater output from larger pressure vessels remain the focus of underwriters insuring energy industry projects. As always, the insurance risk for plants being upgraded, re-vamped or scaled up focuses attention to unproven or prototypical equipment being installed. In such projects consideration is given to Testing and Commissioning (particularly of used items) and to phased completion and partial handover, especially where tie-ins are being carried out.

Lack of major funding of new oil and gas plants has reduced the need for Delay in Start Up (DSU) insurance compared to previous years; however when required, the amount of capacity needed to cover the Physical Damage and DSU pushes the capacity requirement to increased levels.

Market outlook – good news for buyers!

Over-capacity in London and in the regional underwriting centres remains as a single dominant factor for Onshore Construction in the next 12 to 18 months. This and the significant appetite from local insurers desperate not to lose market share (protected knowingly by treaties from reinsurers who deny a part in reduced rating) will continue to dominate. In some territories, rates have "bottomed out" and pressure is now on deductible levels that are beginning to reduce. All of this is excellent news for the insurance buyer and, when represented by a broker who concentrates on obtaining the best cover, buyers should certainly enjoy a favourable short and medium term future.

David Warman is leader of the Willis Towers Watson Construction Global Centre of Excellence to ensure the specialists in London provide technical and placement support to all Willis offices globally and ensure that marketing and servicing standards are delivered to the highest levels.

Terrorism and Political Violence

Introduction – the over-capitalisation continues...

Despite the increased frequency of political violence events worldwide, the over-capitalisation of the global insurance market means that rates for Terrorism and Political Violence insurance continue to soften. Rather than just pocketing the premium savings on offer, many insured companies are acting prudently by reinvesting the savings in broader and more comprehensive insurance coverage, helping them to avoid the potential pitfalls of unforeseen and unpredictable risk.

Terrorism and police violence activity

The last three years have recorded steady increments in the number of terror events globally, particularly with the emergence of Islamic State. In reality the majority of the incidents go unnoticed by people who are not immediately impacted or are not otherwise purposefully monitoring their frequency. Numerically, the predominant regions for terror incidents are the Middle East, Africa and Central Asia, where the legacies of ongoing conflict perpetuate themselves, but 2015 and 2016 have seen an increase in attacks in Europe and North America. Fatalities in the West during the last twelve months are the highest in a single year since the Madrid bombings in 2004, and large-scale attacks such as those in London in March 2017, Paris in November 2015 and July 2016 and Brussels in March 2016 keep the threat of terrorism firmly in the public consciousness.

Middle East conflict escalation highlights predictability challenges

The escalation of the conflicts in Syria, Iraq and Yemen are furthermore a reminder that political violence and the spectrum of risks covered under a conventional Terrorism insurance policy are extremely difficult to predict. Unlike other risks with the potential to cause catastrophic injury, loss or damage, in particular natural phenomena such as earthquakes and hurricanes which tend to be limited geographically to known “cat zones”, patterns of violence cannot be so easily predicted on an empirical basis. Of course, in the case of Yemen, where the conflict between the Saudi backed President Hadi and the Houthi rebels is ongoing, there is a well-known precedent for terrorism and the potential for the civil war that has developed, but there are other examples of increased political violence that will have caught analysts and risk managers unawares. Events in Ukraine in 2014 are a good example; underwriters’ rates for political violence cover for Ukraine had been low, reflecting the conventional view of the level of risk, until protests in early 2014 resulted in skirmishes between the military and pro-Russian rebels in the summer of 2015.

Conflict escalation may require broader risk transfer products

The Arab Spring is perhaps the perfect example of how an escalation of violence can rapidly transform perceptions of predominant risk exposures, in this case moving from terrorism to full war in relatively short timeframes. Companies operating in the region today would be well advised to seek insurance against a broader range of political violence perils, as simple terrorism coverage would not have provided adequate indemnification against the civil unrest and rioting that emanated out of the events of December 2010, and certainly the insurgencies and civil wars that erupted in Syria, Libya, and Yemen.

Significant energy industry impact

In calculating risk, the sum of probability and impact, it is clear that certain companies in the international energy sector are exposed to some of the highest levels of political violence risk. Vulnerability for such companies stems from multiple factors, not least that many are operating in hostile and less permissive environments, where remoteness and spread-out assets can render their interests almost un-securable. The probability of loss is further exacerbated in certain territories due to the economic reliance of energy production and associated critical national infrastructure, often with state interest and high values, raising the target profile during times of conflict.

For example, Islamic State in Syria and Iraq were quick to target the acquisition of energy installations in their attempted conquest of the region, identifying power generation as key to their establishment of a new state and energy resources as a key economic necessity. Incidental to this, regional instability has contributed to a recent rekindling of hostilities between Turkey and displaced Kurdish fighters, who have a history of targeting unsecured energy installations and pipelines as a method of economic harassment of the Turkish state.

Contingent Business Interruption and Interdependency

One of the key areas most frequently left unprotected by companies is third party contingent risk. The most obvious example of this risk in recent times was not terrorism-related, but occurred when the Japanese electronics industry virtually shut down as a result of floods in Thailand, from where many components were sourced. Similarly, oil storage and distribution networks are interdependent on each other, and loss or damage at one location can impact the other, ultimately resulting in a failure to supply to customers. Energy corporations may have divested interests, but rely on each other for their ongoing operations. For example, where an insured owns and operates a processing facility, the Upstream and midstream operation may be outside of their control. Indemnification against the consequences of a terror event, strikes, or riot on these third party facilities should therefore always be considered in a suite of coverage options.

Impairment of access – the risk

Another area that is often overlooked is the risk of site access being prevented or hindered, with consequent impact on the business. Under conventional Property Damage and Business Interruption policies, including those covering Terrorism and Political Violence, the occurrence of an incident of physical loss or damage is usually required in order to trigger the policy coverage. However, as many companies have experienced, even if buildings and other facilities remain unscathed after a security event, the disruption can still lead to a significant loss of earnings.

Take, for example, a scenario where roads surrounding storage installations are blocked by political protestors following national price increases, restricting access for employees and suppliers, and preventing the site from operating. The financial ramifications could be serious. Similarly, if an oil operator were to suffer a fissure on their pipeline, causing seepage and pollution, impairment of access caused by consequential protests during the attempt to repair the fissure could conceivably exacerbate the environmental impact and the financial loss.

Impairment of access – the solution?

In response, Willis Towers Watson and a leading Lloyd's Syndicate have recently collaborated to offer a new and exclusive policy wording covering Impairment of Access. This unique product provides cover for losses incurred if an incident, threat, or a hoax means a business cannot function normally due to the total or partial prevention of access to their premises. The policy is a standalone product, uniquely requiring no property damage trigger, and covers business interruption losses not only if caused by a terrorist event or threat, but also if they arise from a government cordon, civil unrest, and strike action, at either the company's own or adjacent facilities within a given radius or defined route.

Subsequently, Impairment of Access cover would mitigate any concerns over whether insurers will consider the protest to be the proximate cause of the interruption (and therefore not insured under a conventional policy). Alternatively, a neighbouring company's actions could generate strikes, riots, or peaceful protest within the proximity of the insured, or at a location vital to their interests. The impact of this could be a severe impairment of access, through no fault of their own. Yet, because of the relatively short-lived nature of the events being insured against, the time deductible is lower than under a conventional policy, helping buyers recover their gross revenue, fixed costs and additional increased costs of working.

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Third Party Liabilities

International Liability Markets

Rising tide of capacity

As any mariner, stargazer or sandcastle builder will know, nature follows certain predictable cycles. Seasons change, night follows day and tides ebb and flow.

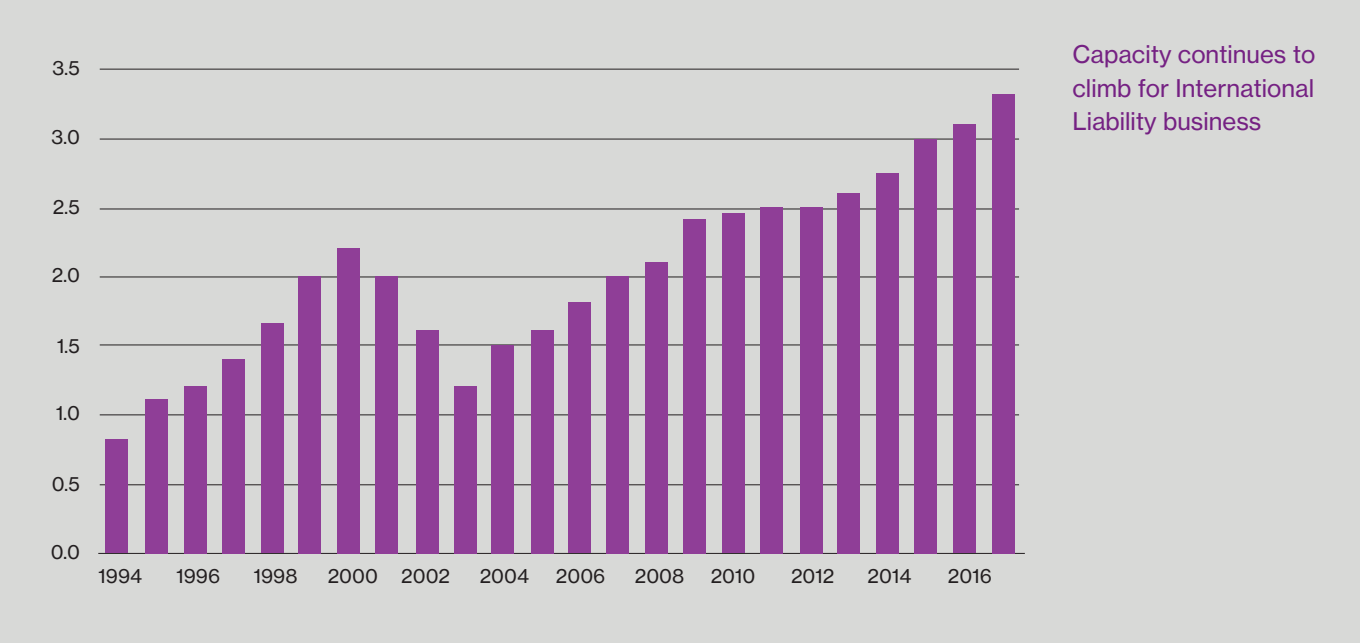
In the International Liability market however, the incoming tide of capacity seems inexorable, driven by new investment, cheap treaty capacity and increased net retentions. This has been the most prolonged period of expansion since the mid-1980s when a capacity crisis prompted the development of the Bermuda Excess Casualty market. The market has experienced 14 years of continuous and sustained capacity growth which has resulted in a new high water mark, with total global capacity reaching US$3.3bn in 2017.

While the laws of nature may seem to be temporarily suspended or at least stretched, the economic laws of supply and demand still very much apply, and this abundant capacity has prompted a continuing downward pressure on rates. Due to the long tail nature of Liability it is true that reductions have been less dramatic than for other sectors of the market; however, the sustained nature of the soft market cycle, combined with reduced activity, revenues and exposures of most Energy clients, has led to a gradual but sustained period of lower liability premiums.

This is good news for buyers, many of whom are faced with the conflicting demands of cost pressures born by the downturn in the energy industry and the desire to increase limits to acknowledge and address their increasing liability exposures.

A rising tide may be said to float all boats, but it also covers rocks and hazards. The longer sighted buyers and risk managers will therefore also be concerned with wider considerations, namely the future predictability of pricing, the availability and consistency of coverage and the stability and risk paying ability of their insurers. To understand these considerations it is worth taking a deeper look at the subtleties and dynamics of the current market conditions.

Figure 1 – Global Liability capacity (US$bn)



Source: Willis Towers Watson

Beneath the surface: headlines belie the detail

Whilst the total global capacity is US$3.3bn, realistic capacity for any given insured is significantly less:

- Many insurers write less than their published maximum capacity
- Some insurers cannot write Energy business
- Some only write Onshore Liability exclusively or Offshore exclusively
- Some are unable to cover US-domiciled exposures
- Some only write on specific forms (e.g. Occurrences Reported rather than Follow form Losses Occurring)

As a result, realistic capacity for most programmes is approximately 50% of this figure. However, this is more than adequate for most buyers.

Positive inflows

A positive feature of the more recent growth in capacity is that it is driven not just by increases in existing capacity but also by new carriers entering the market. This has resulted in genuinely new competition and a greater choice of leaders, particularly for single territory, non-global programmes.

For example, relatively recent entrants and re-entrants over the past few years such as Apollo, Aspen, Probitas, and more recently Endurance (London) have been supplemented by a new wave of capacity from the likes of China Re and Berkshire Hathaway.

Counter currents

- **Market withdrawals:** in contrast to this influx of capacity there have been some notable withdrawals. Axis London, Canopius, Marketform (Neon) and Novae have all recently withdrawn from open market Non-Marine Liability underwriting, citing unsustainability of the portfolio in the face of increasing losses and reducing premiums.
- **Tighter margins and lower reserves:** in an effort to sustain profitability, many carriers have sought to cut staff, offshore their back office operations and create cost saving synergies by merger and acquisition and reduce their liability premium reserves. While this helps to shore-up balance sheets, the release of reserves is not a sustainable strategy and makes insurers more vulnerable to future deterioration in loss results.
- **Increase in UK awards:** one recent development in the United Kingdom is the decision by the Lord Chancellor to reduce the personal injury discount rate from 2.5% to minus 0.75%. Discount rates are used to assist UK courts in deciding lump sum compensation amounts and are linked to low risk investments, typically Index Linked Gilts. The net effect of this significant reduction and realignment in the discount rate is that future UK court awards for catastrophic injury claims are expected to increase by approximately 30% and clinical negligence awards by as much as 50%. This change will come into effect on 20 March 2017 and is expected to negatively impact the results of UK domestic insurers.
- **Energy Liability Losses:** while there have been no market-turning Energy Liability catastrophe losses in the past few years, there have been some meaningful claims and incidents arising from pipelines, storage tanks and tailings dams. The Pipeline sector in particular has seen a series of losses, most notably the 21 July 2016 pipeline leak in the North Saskatchewan River in Canada resulting in a potential loss of US$90m to US$140m. Whilst many losses only hit selected insurers, an interesting feature of this loss was the range and spread of insurers involved particularly in Lloyd's, including a number of the newer Casualty syndicates. So some smaller Lloyd's syndicates, when renewing their reinsurance treaties, are encountering problems obtaining cover for Energy/ Pipeline risks.
- **More selective underwriting:** in an effort to mitigate losses and improve portfolio performance, underwriters are looking much more closely at risk selection and are pulling out of certain territories or sectors to mitigate losses. As an example one major global carrier recently announced it was set to further cut its US casualty portfolio amid reserving concerns. Furthermore in terms of industry sectors, there is marked caution in the Pipeline sector as a result of the losses outlined above. This has resulted in more stringent underwriting information requirements and certain insurers choosing to pull out of or limit their exposure to stand-alone Pipeline risks.

Change on the horizon?

The big question is could all these factors prompt a sea change in market conditions?

We do not foresee any dramatic change in the tidal flow as yet, given the current macroeconomic environment. Low interest rates and a lack of market changing catastrophe losses still make the insurance sector a relatively appealing sector and within the insurance industry, insurers are keen to expand into the Liability sector to spread their overall exposure portfolio.

It is certainly the case that current conditions continue to make it a buyer's market. It is equally true that after years of competitive market conditions, many underwriters are reaching minimum levels of income for their participation on many programmes. While price remains a major focus, enlightened risk managers are working with their brokers to ensure sustainability of their programmes, optimisation of their coverage and re-evaluation of the adequacy of their limits.

While risk selection remains key for insurers, for risk managers the correct selection of markets is key to the long term sustainability of major energy programmes. After all, castles built on sand rarely survive for long when the tide changes.

North American Excess Liability markets

From a distance, the Energy (and related) industry Liability market in North America continues in the same direction that it has for the last half decade, showing no great movement in capacity or conditions. However, certain pockets are showing signs of ingenuity and expansion. Renewals should expect a continued competitive ride; as a result, we would suggest to buyers that now is a good time to pursue policy form and condition enhancements. Furthermore, where achievable multi-year options should be also be explored.

In particular we would highlight the following as we move further in to 2017:

- The market continues to deal with attritional losses – these have had a particular impact on fresh underwriting capacity. These insurers have been seen to be underwriting to establish market share, and the timing of these losses into the market has brought havoc to some.
- Auto Liability losses in the United States have plagued retail insurers. Reinsurance solutions for this segment sometimes leave upfront carriers with greater exposure, as those carriers deal with the cost of standard reinsurance conditions.
- The revitalised oil price, so long as it continues to trade above a certain level, will bring with it increased activity for North America including:
  - LNG/gas exports via ship and pipeline
  - pipeline construction, most notably the final stages of the Dakota Access Pipeline, and the Keystone XL Pipeline
  - fracking
  - a movement into the operational phase of large construction projects in the onshore Gulf of Mexico region and the Alberta oil sands
  - increased activity offshore Eastern Canada, including Hebron, being additional participants in offshore exploration
  - the resumption of construction projects in the Gulf of Mexico and offshore Canada

Losses

As we referred to earlier in this chapter, seemingly the most talked about event in 2016 has been a North Saskatchewan River spill from a crossing pipeline, carrying heavy oil and diluent. The capacity affected is at Lloyd's, and while initial reports suggested a much higher cost, the current reserve is anywhere between C$107-190m. Unfortunately the loss topped a list of a number of events involving pipelines in western Canada over the end of 2016 and into 2017, and for several insurers these risks are now prompting senior management review of the underwriting detail for these programs.

Furthermore, pipeline operations in the USA continue to generate underwriting losses, in particular a large products pipeline loss in Georgia followed by other events nearby. No one event in 2016 grabbed all the headlines, but two losses from an earlier period continue to deteriorate in terms of underwriting reserves.

Further loss deterioration was experienced by the market from two 2015 Californian losses, a wildfire and a gas cavern escape. These losses still held the market's interest during 2016 and could well continue to do so in 2017. The gas escape is now considered to have a greater greenhouse-gas-effect in the United States than more notorious large pollution events, but the Physical Damage aspect of this loss is minimal. While these losses have hit some markets disproportionately hard, neither loss has adversely changed the transactional aspect of most renewals.

Capacity

Overall North American "domestic" capacity seems to have increased as certain underwriters are now well-staffed with Energy/Natural Resources liability experts. Lloyd's coverholders in the south east United States continue to thrive; one such established firm has shown renewed underwriting vigour having consummated a new London insurer relationship after parting with their long-time previous partner at the end of 2016.

Swiss Re and Scor have also bolstered their offering domestically in the United States and both have committed admitted underwriting capacity to Canada. Further to this, we still await signs that Everest Re wants to move strongly into this space; their innovation and desire has been notable in certain non-energy areas.

In Bermuda, Liability insurers have been maintaining capacity with the exception of Oil Casualty Insurance Limited (OCIL). In the early part of 2017 it advised that it was reducing its maximum capacity offered to US$75m, although this development is likely to be affecting only a dozen or so of its client base. In doing so, the company pointed publicly to reasons which have caused many insurers to ponder this class: declining premium levels due to strongly competitive global market forces for energy business; mergers/acquisitions within its client base; and expected loss volatility against a higher available limit (a similar position was taken by Axis Insurance in Bermuda two years ago). Several insurers, including Argo Re, XL Catlin and Iron Starr, have selectively offered increased limits, opportunistically offering those on programs where they have a good relationship with the buyer. Bermuda has lost some Energy Liability market share over the past years, sometimes by design, and some lost business has moved to domestic markets or to Lloyd's.

Finally as Sompo has closed its deal to purchase Endurance, two senior underwriters from Canopius – Sompo's initial Bermuda capacity – have left to join Hamilton. This matches the talent growth in Hamilton's Lloyd's syndicate, and the two underwriters are experienced in Excess Liability offerings for the energy industry. Furthermore Allied World, who as of late had not really supported the wider energy insureds, is to be purchased by Canadian Fairfax Financial. Under the moniker of "Watch This Space", the interaction of Endurance and Canopius, the emergence of Hamilton and the reassessment for Allied World all are noteworthy developments for buyers.

Marine Liability Market

Another year without a market changing event, additional capacity offered between existing markets and new ones – the softening which during 2016 was supposed to flatten out continues into 2017. There is more capacity available than will be used this year, and the dynamic of new leaders and capacity going after market share continues to sustain a discounted renewal cycle.

We expected some squeeze to the market in 2016, with the merger of the Britannia and UK P & I Clubs and with it the loss of reinsurance premium among marine reinsurers. However, this impact won't materialise as this union was abandoned during the summer months. The proposed merger did at least allow an insight in to the workings of P & I Clubs for those not involved in this segment of the industry.

We had expected to see the reductions in 2017 to run flat to 5%, but certain programmes just after January 1 were able to negotiate much larger discounts. These may continue, not only from new capacity (which would be understandable) but also from incumbents who can ill-afford any premium depletion.

Within last year's Review we identified the approaching opening of terminals (new or re-constituted) for the export of LNG, especially in the United States and Australia. This new business will continue to absorb underwriting capacity and will slightly increase premium income levels within the specialty insurer segment. Furthermore, increased worldwide activity is predicted in the energy sector, which will seemingly push increased marine industry usage and affect the use of capacity for the return of this business.

Environmental Insurance Liability market

Operating in a global market place, the London insurance market has been trading with our partners and clients around the world for over 200 years. Where does environmental risk sit for those clients operating across the world?

At the recent Willis Towers Watson "One Belt – One Road" conference in Shenzen, China, we heard a detailed description of the potential economic benefits of the Chinese strategy to reinstate the "Silk Road" and "Silk Maritime Shipping Route" to Scandinavia and the Mediterranean Sea respectively. This multi-billion dollar investment programme is designed to link the Chinese economy to the EU and beyond to truly link up various markets in a seamless manner.

The talk of the catalytic effects of a physical conduit for goods and services was positive and one can really see how benefits will accrue both in supply from China but equally in "return trade" or exports from the EU to the Asian continent. As an economic multiplier the potential is significant.

But don't we have a global insurance market already? The short answer is yes we do, where non local insurance is permitted and legislation/regulation and permitting of processes is developed and established. However, in many areas of the world such as China this is not the case and local insurance is often required.

The Environmental Insurance Liability (EIL) market is a specialist market which has continued to evolve in Europe significantly since the late 1990s. The market's continued growth has gathered momentum with the development of new products and applications across a wide range of industry sectors and risk scenarios.

London the centre of International EIL market but other hubs are emerging

The market for environmental risks outside North America has grown significantly in Europe over the last 10 years and is focused in London, with a number of the environmental insurers developing a European network using their local offices and in some cases able to provide country specific policies in the local language. The London market is now host to more environmental insurers than ever before with a steadily increasing range of products that can be tailored to individual client requirements.

The product line is evolving on a week by week basis with new insurers entering the sector to augment existing lines such as Property and Casualty, Contractors All Risks and Crisis Management.

The market is enlarging in terms of coverage offered, capacity available, and some carriers are also expanding coverage to include off-shore operations with no limitation.

The sector is also expanding geographically, with local centres such as Sydney and Melbourne, Singapore, Hong Kong and Shanghai becoming significant placement centres for local and international risks.

There are currently 12 environmental insurers in the London market, namely:

- AIG Europe
- Aspen
- Argo
- Beazley
- Chubb
- Liberty
- QBE
- Zurich
- XL Catlin
- Navigators
- Channel Syndicate
- Liberty

to which can be added AXA Corporate Solutions based in Paris.

Some additional insurers have recently demonstrated interest in providing additional capacity within Lloyd's (BRIT, CV Starr) or on Company's paper (Aspen Insurance).

These insurers are also the providers of other insurance liability lines i.e. general liability and in some cases leverage with the environmental counterparts of the same insurer can be obtained.

EIL in Continental Europe

In continental Europe, approaches can be different depending on the territories:

- **In France, Italy or Spain**, reinsurance pools were established in the middle of the 1980s (Assurpol, Pool RC Inquinamento and Pool Español de Riesgos Medioambientales) to provide coverage for third-party liabilities arising from gradual pollution and more generally pollution catastrophe exposures that direct insurers were not willing to provide anymore.
- **In Germany**, the environmental insurance market developed from a base wording that has been developed in the 1990s and updated since by the GDV, the German Insurance Association. Provided as an extension to the casualty wordings or on a stand-alone basis, the UHV (third-party pollution liability) and USV (statutory pollution liability according the German ELD's transposition law), is an environmental insurance model that satisfies most of the 'basic' pollution exposures in the country, but that is also limited compared to the covers provided by Environmental specialist global insurers (for example the USV do not provide cover for all the environmental public regulations applicable beyond the German Environmental Damages Act).

Global EIL Spread

Companies operating in the energy sector are often spread across the globe in multiple continents and engaging in a range of activities. Companies may only have a financial interest in a project, or they may be a principal engaged in the design and implementation of a project, or they may be decommissioning an old asset in order to introduce new technology or change the use of the resource. The operations can be complex and varied.

In short, the business activities associated with a complicated energy operation requires specialist underwriting of these complex legal, technical and commercial exposures. That being said, the resulting policy needs to be simple in terms of insuring agreements, continuity dates and interpretation of relevant standards.

Insurers recognise this and the provision of policies that cover global operations is now common place with the wordings reacting to Pollution Conditions and Environmental Law being almost all encompassing. It is true that EIL insurance is not, and cannot ever be, the panacea for all pollution conditions but the Global EIL market can provide real insulation from an often uninsured peril.

Underwriter movements, Q1 2017 (all London unless stated)

Underwriter	From	To
Giles Quarterly	CV Starr	Endurance
Charles Harcus	QBE	Apollo
Ana Blanco	Broking	QBE
Simon Green	Ironshore	Apollo
Emma Hilton	Willis Towers Watson	NOA
James Tully	Ironshore	QBE
James Cassidy	Marketform	Chaucer
Lee Clarke	Novae	Chubb
Stella Hancock	Marketform	Endurance
Jane Steward	Zurich Global Energy	Willis Towers Watson
David Cutmore	AIG	Munich Re
Darren Tasker	Zurich Global Energy	Generali
Stephen Hartwig	Sompo Canopius Bermuda	Hamilton Re Bermuda
Jeremy Wright	Sompo Canopius Bermuda	Hamilton Re Bermuda
Ed Abbott	XLCatlin	Navigators
Georgina Rothman	Chubb	Arch
Darren Jacobs	Unknown	Allied World
Raymanda Smith	OCIL Bermuda	CV Starr

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