



Meeting the challenges of the new risk landscape

Power Market Review

September 2022

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Market capacity figures

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

WTW Energy Loss Database

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

Style

Our Review uses a mixture of American and English spelling, depending on the nationality of the author concerned. We have used capital letters to describe various classes of insurance products, and insurance markets, but otherwise we have used lower case to describe various parts of the power industry itself.

Abbreviations

The following abbreviations are used throughout this Review:

BI	Business Interruption
CCGT	Combined Cycle Gas Turbine
CCUS	Carbon, Capture, Utilisation and Storage
ESG	Environmental Social Governance
MWh	Megawatt hour
O&M	Operations and Maintenance
OEM	Original Equipment Manufacturer
PD	Physical Damage
PPA	Power Purchase Agreement



Introduction

Welcome to this year's WTW Power Market Review. The impact of COVID-19 may have finally begun to recede, but I trust readers would agree that we are now living in a more uncertain world than ever, given the current geopolitical atmosphere, energy prices, supply chain disruptions and, of course, climate change. As the power industry faces up to these uncertainties, there are really no easy ways to navigate the transformed risk landscape confronting the industry. But one thing seems very clear to us at WTW - the role of the risk manager in today's turbulent economic and political climate has never been more critical. Not all the risks facing the industry can be fully mitigated, absorbed or transferred, but it will be those companies who do so to the optimum extent that will be best positioned to survive the challenges ahead.

So our theme this year is "meeting the challenges of the new risk landscape". Our leading article this year comes from our GB Head of Power & Utilities, Carlos Wilkinson. Carlos has identified the Russia-Ukraine conflict, global inflation, the energy transition and climate change as the four biggest challenges that the power industry faces today. Carlos then goes on to describe the impact of these challenges on the Power insurance market and what risk managers can do to enhance their risk management strategies by taking these challenges into account.

However, there is of course much more to risk management than the risk transfer solutions provided by the insurance market. So in Part One of our Review we also include articles which highlight other ways in which risk managers can assist in helping their companies manage these challenges. These include articles on climate risk modelling (with particular reference to physical and transition risk), managing geopolitical risks and potential new exposures for directors and investors.

But perhaps there is one issue above all that is of immediate concern to our clients and that is the issue of determining correct asset and Business Interruption values. In the Review we highlight this issue in the article written by Alan McShane, our Global Head of Risk Engineering, in the interview with CV Starr's James Johnson and in our review of the International Property market. Our message to the power industry on this topic is really quite simple: it is vital that a more transparent understanding of how insured values are calculated is communicated from buyer to broker to insurer. When this is achieved, buyers will see greater price stability, which will in turn reduce the likelihood of large swings experienced between hard and soft market conditions, as we have seen so often in the past. Furthermore, insurers will increase their confidence level in received insured values and the premiums they are requesting. So

do please get in touch with your primary point of contact within WTW so we can discuss how best to address the issue of your valuations together.

In the meantime, the Power insurance markets continue to harden still further – despite the significant increases in rating levels and tightening of terms and conditions that we have seen during the last three years or so. We think there are two fundamental reasons for the continuation of this hardening dynamic. Firstly, the sector continues to suffer from a disappointing loss record, with 12 losses over US\$20 million reported already this year. It appears from our conversations in the market that because of the losses sustained over the last two years or so most insurers are still running their Power portfolios at an underwriting loss, which of course provides little incentive for them to compete more vigorously for business. Secondly, the pool of leading insurers that brokers can access to provide terms remains relatively limited compared to previous underwriting eras; although there are signs that the following market is generally more willing to follow these leaders' terms than last year, this in itself provides insufficient momentum to reverse the overall upwards market trend. However, what this increased following market appetite has at least done is to flatten the upward curve in rating levels; we are at least pleased to report that percentages rating increases are well down on what we were reporting last year, even if an actual softening of conditions is still some way off. Our colleagues around the world also report from regional markets in Beijing, Dubai, North and Latin America and Singapore, where market conditions also continue to be generally challenging.

Having read the Review, I hope you will agree with me that there are a myriad of challenges and complexities for power sector risk managers to negotiate during the course of the next few years. As ever, communication is of the essence and we do encourage you to meet with us as soon as possible so together we can determine the right strategy to absorb, mitigate and transfer your risk in a way that minimises the threats to your organisation.



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Part One: meeting the challenges of the new risk landscape





Four global challenges: risk implications for the power sector

Introduction

When we prepared the 2021 Power Market Review, our focus was firmly on the energy transition and there seemed little that could derail it, not even COVID-19; in fact, the pandemic had reminded us of the need to protect ourselves and our planet against humanity's impact on the world. Over a year later, while the energy transition remains our most significant challenge, we are facing a very different, much more immediate catastrophe in terms of the Ukraine-Russia conflict and its impact on overall global stability.

While the energy transition and the achievement of Net Zero targets by 2050 remains the most substantial challenge that we face, we now need to achieve this in a very different and more complex environment to the one we envisaged 12 months ago. The circumstances now also apply for the global community as a whole and to all sectors of the global economy. However, there are issues that arise from the recent events, that very specifically impact not only the power sector globally but also the Power insurance market on which our sector depends.

New technologies

It is becoming increasingly clear, both in terms of energy security for Europe and clean energy globally, that new technologies such as CCUS and hydrogen that have been talked about for a number of years (and that may have had some false dawns in the past) are now becoming key pillars in global energy and power strategies. However, this new world order for power will require a huge investment in infrastructure to enable it to happen, including smarter, more interconnected grids.

Effect on the insurance market

All of these risks require the support of the insurance market to enable them. However, the market does face an unprecedented range of new risks to consider and insurers will have to invest both time and resources to ensure that they are able to manage these new risks, not only in terms of understanding of risk and innovation of coverage, but also in terms of the volume of projects to be considered.

These risks are wide ranging in terms of significance and our ability to understand and control them - at global community, government, corporate and individual levels. It is therefore essential at this time to take a step back and consider these factors so the sector can fully appreciate them, consider what options are available to better understand them and what measures are available to mitigate their impact on power companies' businesses. In this article we focus on four key challenges:

- The Russian-Ukraine conflict
- Global inflation
- The energy transition
- Climate change

Challenge one: the Russian-Ukraine conflict

Geopolitics has never been such a major factor for the power sector and the insurance market. Of course we have felt its impact in the past, typically in more localised forms, but we are currently in the midst of a truly global energy crisis, the likes of which we have not experienced before.

10 months ago, global leaders were gathered in Glasgow for COP26, deciding the way forward through a challenging route to Net Zero by 2050. The energy crisis was already imminent but it was hardly referred to at all at the conference, as leaders tried to avoid any challenges that could distract the world from the commitment to the energy transition needed to achieve emissions targets. The energy crisis at that time was primarily driven by a combination of the economic bounce back from COVID-19 stimulating demand, a downturn in energy investment and production during the preceding years, together with a shift from coal to gas. Fast forward a year, and what was already a tight energy market is under significantly more pressure following the Russia-Ukraine conflict and the application of sanctions at a time when the energy transition continues to gather momentum.

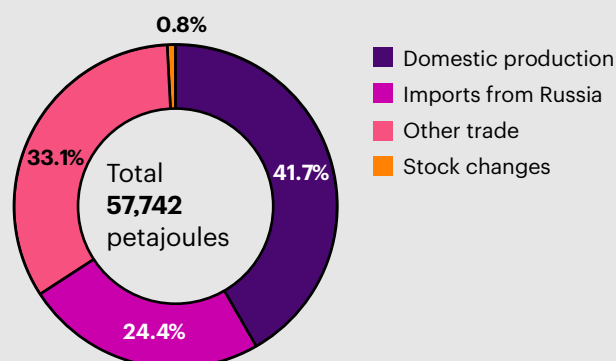
The current situation is considered the first true global energy crisis. There have been previous crises but they have typically been limited to oil, such as the crisis of the mid-1970s. However this event is not only truly global but affects all energy sources, including oil, gas and coal, as well as electricity. The other differentiator is that this is likely to last some years, rather than just being a temporary blip that can be remedied through the implementation of short-term strategies.

Will the impact be temporary?¹

In short, no. In a recent statement Markus Krebber, CEO of Germany's largest power producer RWE (RWE.GE), stated that power prices could take three to five years to fall back to lower levels and there are many that would consider this to be optimistic.² However, it is widely accepted that the situation is going to get worse before it gets better, due to Russia's strength in the global and European energy markets. Furthermore, it is not expected that Russia will stand down from its position on Ukraine anytime soon and the lead times required to put alternative arrangements in place that will neutralise the impact of lost Russian energy are considerable. The depth of the challenge lies in the extent of the reliance on Russian energy and the infrastructure around which the movement of large volumes of gas is based.

The EU depends on Russia for 24.4% of all its energy needs. The energy dependency on a specific country is dictated by the weight of the fuels in the energy mix and the extent of the reliance on imports of those fuels from a specific origin.

Figure 1: **Gross available energy in the EU and its sources (% , 2020)**



Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_energy_mix_and_import_dependency#Energy_mix_and_import_dependency

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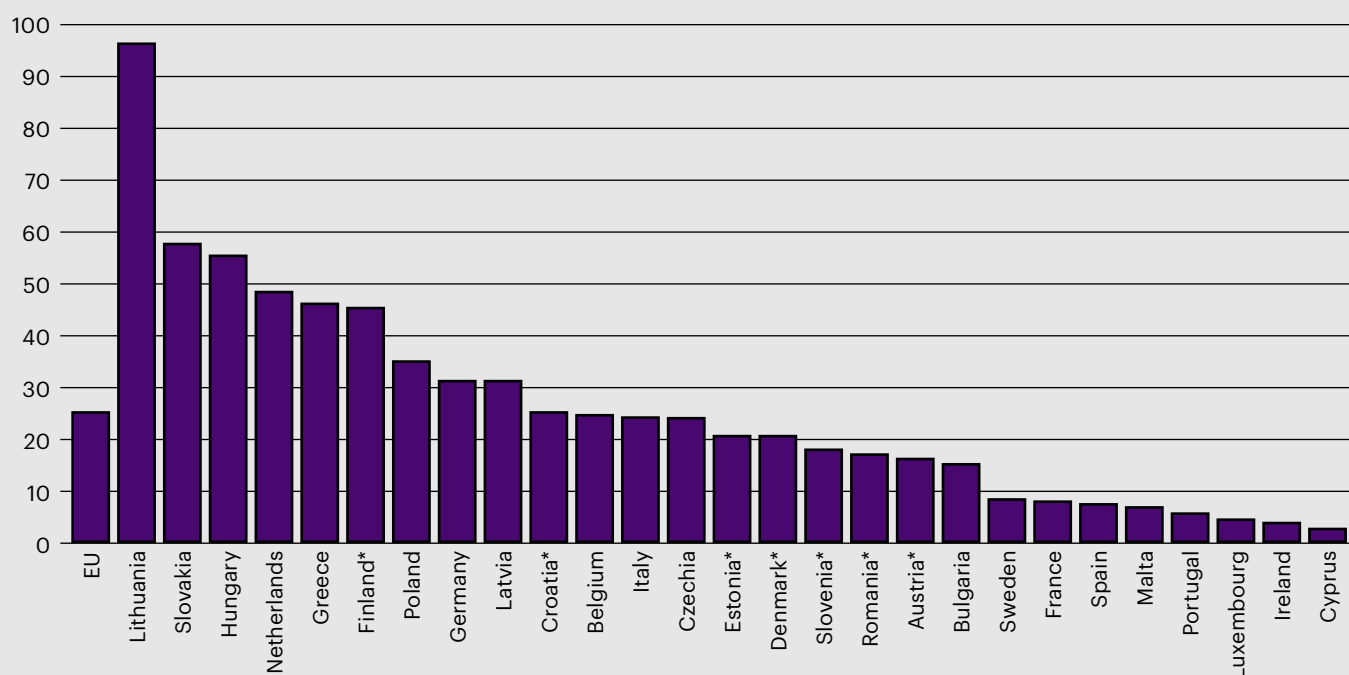
Geopolitics has never been such a major factor for the power sector and the insurance market. We are currently in the midst of a truly global energy crisis, the likes of which we have not experienced before.

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¹ All diagrams and statistics in this section are taken from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_energy_mix_and_import_dependency#Energy_mix_and_import_dependency

² <https://www.reuters.com/world/europe/europe-may-shift-back-coal-russia-turns-down-gas-flows-2022-06-20/>

Figure 2: Imports from Russia in gross available energy, EU, 2020



*Estimates for none reported data

Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_energy_mix_and_import_dependency#Energy_mix_and_import_dependency

The main origins of EU energy imports have changed in recent years, yet Russia has maintained its position as the leading supplier to the EU of all the main primary energy commodities: natural gas, crude oil and hard coal.

EU countries' different energy mixes and import dependencies create vastly different country-specific energy dependencies on Russia.

Natural gas, a major fuel for electricity production and heating in the EU, represented 23.7% of the EU's gross available energy and had an import dependency rate of 83.6% in 2020, with imports of 400.6 billion cubic meters (bcm). The reliance of the European Union on Russian natural gas has increased over the last decade, reaching 41.1% of gross available energy derived from natural gas in 2020, making it the fuel with the highest exposure to Russian imports.

Natural gas consumption in the EU has remained broadly flat over the last ten years, reaching 399.6 bcm in 2020, but EU production fell to almost a third and the gap has been filled by increased imports. The EU received 46.1% of its natural gas imports from Russia, with other important providers including Norway, Algeria, Qatar, the USA, the United Kingdom, Nigeria and Libya, countries that make up collectively with Russia 90% of the EU's

total natural gas imports. These nations will become the replacement providers of gas when the infrastructure is in place.

What are the alternatives?³

The European Commission has issued its REPowerEU plan, which provides details on how it plans to end Europe's dependence on Russian fossil fuels. This includes a longer term strategic plan that considers the various different elements that will need to be implemented to enable Europe to fully wean itself off Russian energy by 2030. However, it does contemplate being able to reduce Russian gas imports by as much as two thirds during 2022, although the landscape is constantly changing. At the end of July, as Nord Stream 1 continued to experience substantial supply restrictions due to an extended outage period of its compressors, EU states committed to restricting use of gas to 15% of the usual volumes, to give the EU the opportunity to build up its stored gas ahead of the higher-demand winter months.

Successfully managing such seismic shifts in supply and usage will be major achievements, considering Russia supplies 40% of the EU's natural gas and 27% of its imported oil and has the largest gas reserves in the world; together, they earn it roughly €400 billion

³ All sources in this section are from https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131 and <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN&qid=1653033742483>

a year. To assist, the EU plans to speed up its shift to green energy and to bring energy supplies in from other countries, but it will of course need the infrastructure to deliver on this. As we know from major inter-country electrical interconnectors and pipeline projects such as Baltic Pipe (as well as LNG and renewable new-builds) these are projects that take many years to plan and construct. There is a strong focus on easing the legal and planning regimes that typically contribute to these delays, but this is work in progress and so regardless, there is no “quick fix”.

But speed is of the essence, with rising energy costs as Europe draws on gas from other sources around the world. This puts major financial pressure on economies - not only in Europe but globally - as they already begin to struggle with rising energy prices.

The REPowerEU strategy focuses on three key topic areas: improving energy efficiency, expanding the use of renewable energy and securing non-Russian suppliers of oil and gas.

- **Energy saving:** The Commission report highlights energy saving as the “cheapest, safest and cleanest” way to reduce dependence on Russian fuel. The aim is to further reduce energy consumption in the EU from the original plan of a 9% cut to a 13% cut by 2030.
- **More green energy:** The EU has earmarked €113 billion for a “massive scale up in renewables” and new hydrogen infrastructure, together with plans for new EU legislation to make it easier to build solar and wind farms. The EU target for renewable energy has also been raised; the goal is for green energy to provide 45% of energy needs by 2030, up from 40%.
- **More gas and oil infrastructure⁴:** To quickly diversify from Russian fossil fuels, the EU is investing up to €12 billion in pipelines and Liquefied Natural Gas (LNG) terminals to improve access to gas and oil from other countries including Egypt, Israel and Nigeria.

Is turning to coal the answer?⁵

European leaders clearly believe they have little choice but to turn to coal. Europe’s biggest Russian gas buyers have raced to find alternative fuel supplies and burning more coal is clearly an option that is being planned for, particularly when the alternatives are considered, such as heating and lighting cuts in winter. Germany, Italy, Austria and the Netherlands have all signalled that coal-fired power plants could help see the continent through a crisis that has sent gas prices surging and added to the challenge facing policymakers battling inflation.

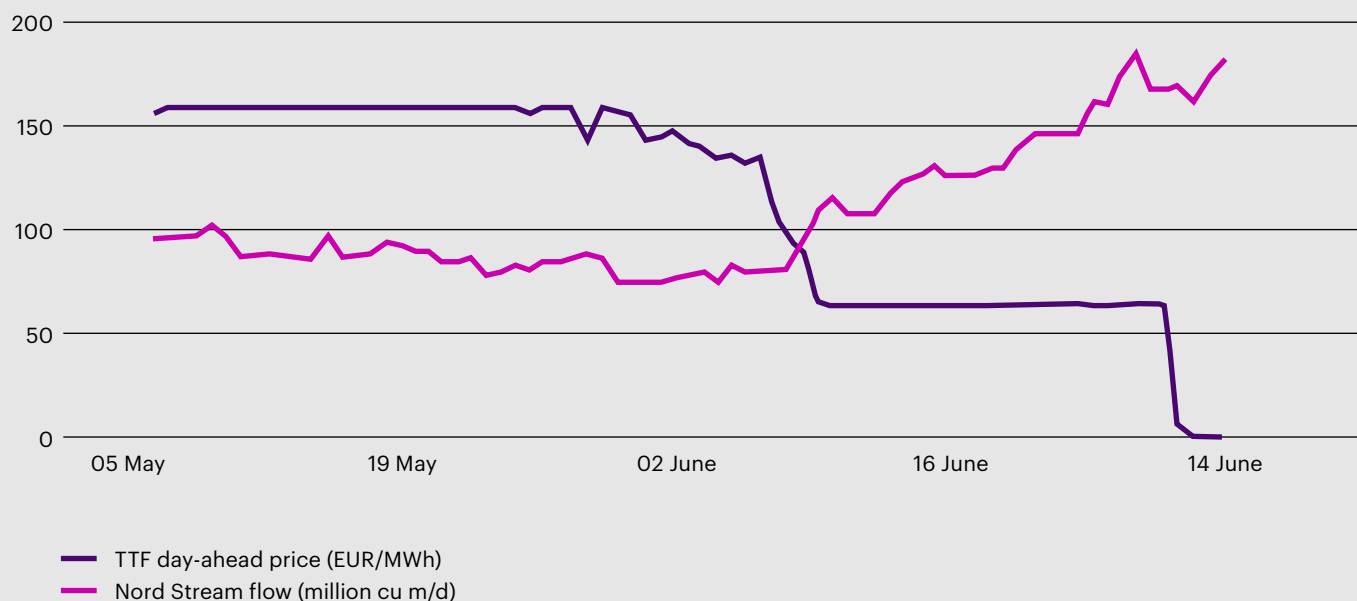
- **Netherlands:** The Dutch government has activated the “early warning” phase of a three-part energy crisis plan that seeks to preserve gas stocks by removing caps on production levels at coal-fired energy plants.
- **Austria:** In the event of emergency, the government has reached an agreement with Verbund for it to convert one of its gas-fired power plants to enable it to burn coal.
- **Germany:** The German government has plans to reduce pressure on its gas storage levels and to boost power generation levels by up to 10 GW by keeping coal-fired power plants scheduled for closure on-line.
- **Italy:** The Italian government has said it could declare a heightened state of alert on gas if Russia continues to curb supplies. Italy has stated that reductions in Russian gas levels could result in a package of responses, including a request for increased imports from current suppliers, the rationing of gas for industrial users and the need for increased output at coal power plants.



⁴ <https://headtopics.com/uk/eu-reveals-its-plans-to-stop-using-russian-gas-26551720>

⁵ All statistics for this section taken from <https://www.reuters.com/world/europe/europe-may-shift-back-coal-russia-turns-down-gas-flows-2022-06-20/>

Figure 3: European gas prices and Nord Stream flow correlations, 2022



Source: <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/080422-russias-gazprom-says-other-nord-stream-gas-turbines-also-face-sanctions-block>

Increasing energy costs

So what impact is all of this having on electricity costs?

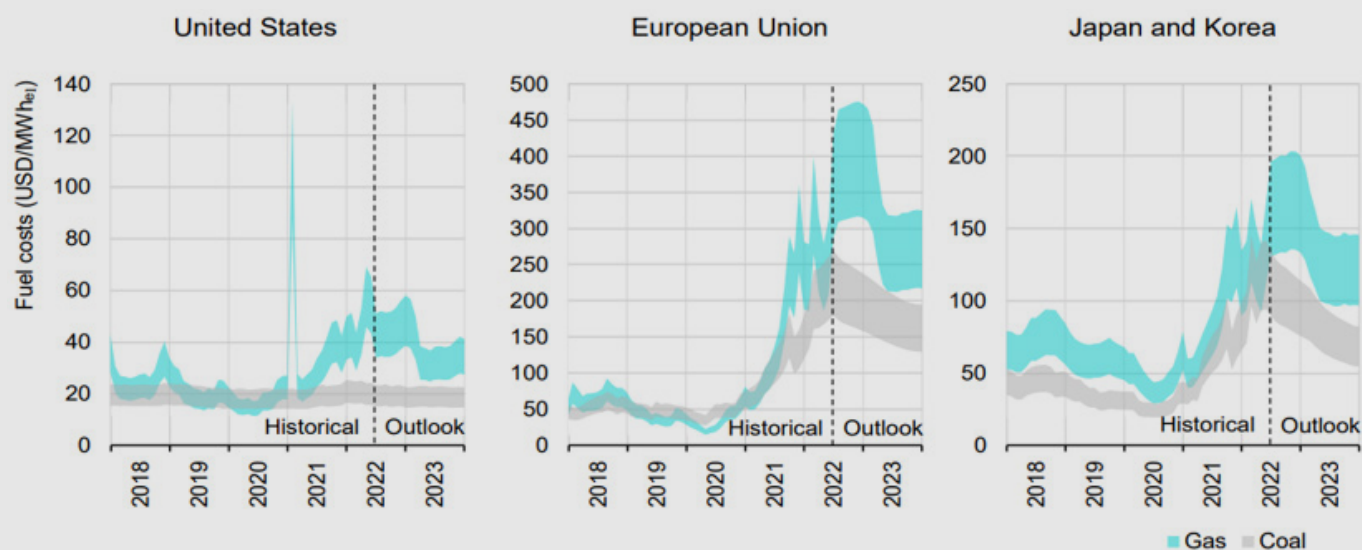
Pricing increases and volatility have, unavoidably and unsurprisingly, been increasing in evidence during this period, creating huge pressure on electricity retailers, governments and, ultimately, households. The rapid increase in gas costs has driven electricity price rises across Europe as the impact on thermal power generation costs is felt. Increased grid interconnection between countries has also driven costs higher, even in countries with significant renewables resources. For example, Norway has recently benefitted from the ability to export excess clean energy but in turn their domestic power market (that has historically been sheltered from the impacts of the energy market fluctuations) has found itself under pressure from its output being available on the wider European market.

Despite increased reliance on renewables, thermal power generators still provide an essential role in plugging gaps that arise during days of low Renewables output or following unplanned outages around networks. The opportunity cost of these rapid response and grid-support services is high - the plants in questions have historically been the more efficient gas-fired CCGTs. They will have higher costs arising from cost of gas, but the higher efficiency will work to even greater effect for them at this time. As we have seen though for those countries that are being forced to burn less gas in their power stations, coal can be the only viable alternative in the short term.

Figure 4: Fuel costs of coal and gas-fired power plants including emissions costs, 2018-2023

High Thermal generation costs expected to linger well into 2023

Fuel costs of coal- and gas-fired power plants including emission costs, 2018-2023



Notes: Coal range reflects 33-45% efficiency; gas range reflects 43-55% efficiency. Due to large geographic areas covered in each region, costs can differ between and even within countries and should therefore be interpreted as general trends. In the United States, natural gas prices increased significantly (exceeding USD 15/MBtu) in February 2021 due to supply constraints.

Source: United States: based on EIA (2022), STEO July 2022. European Union: natural gas prices TTF; coal prices CIF ARA; emission costs EU ETS. Japan and Korea: natural gas prices are oil-indexed LNG prices; coal prices are Japan market prices. Latest update: 12 July 2022⁶ <https://iea.blob.core.windows.net/assets/660c2410-218c-4145-9348-c782e185dcdf/ElectricityMarketReport-July2022.pdf>

If these pressures are combined with other factors such as climate change, fuel logistical challenges and unscheduled outages, it is not surprising that in Europe we are seeing price spikes, with German peak power prices for 2023 trading at over EUR500/ MW/h during August and French Q4 peak power prices trading at over EUR1,000/ MW/h.⁷

However, for those countries that are heavily dependent on gas fired power this will still form a major part of the electricity mix while there is gas to burn, despite high prices. But this cost pressure, which is expected to remain for the next year at least, will inevitably serve to increase the focus on, and accelerate the shift towards, renewable power.

Challenge two: global inflation

Consumer price indexes⁸

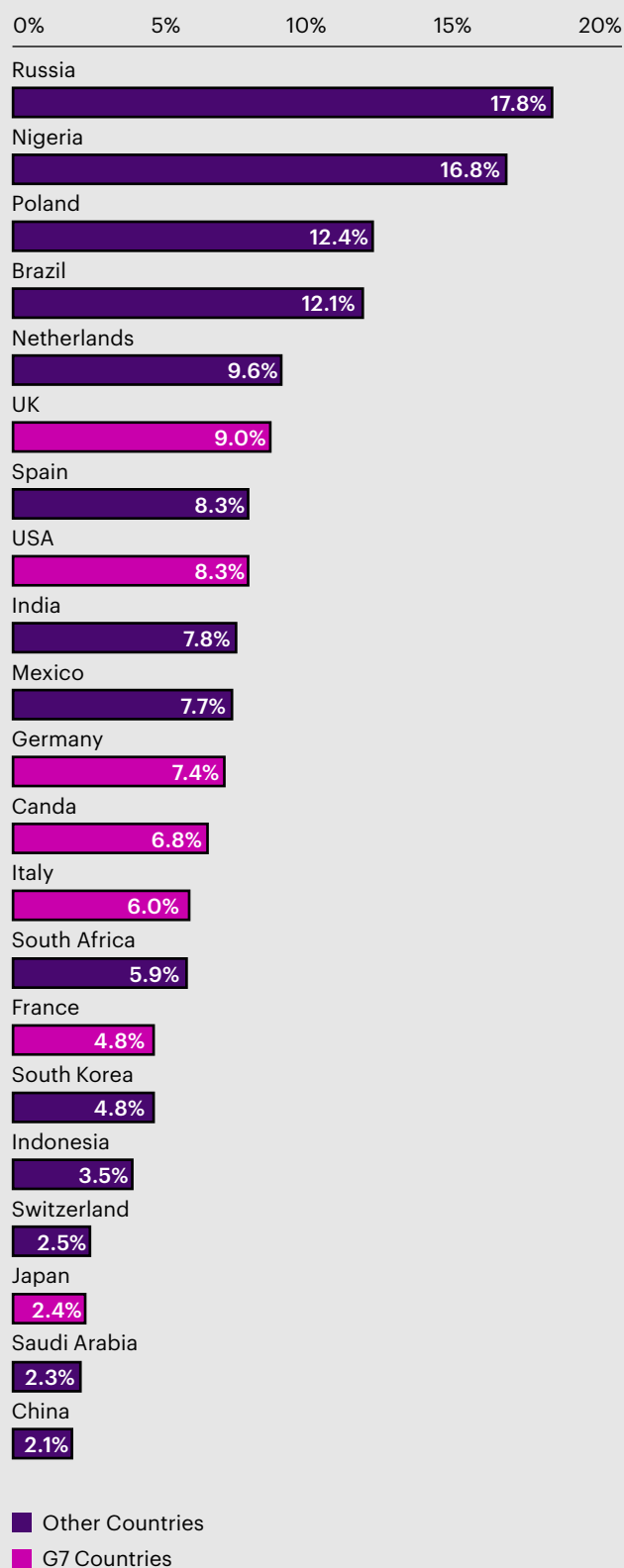
Increased inflation is a factor across the globe, with rates increasing rapidly over the year since COVID-19 related lockdowns began to ease. The recovery in demand that followed, combined with supply chain and logistical constraints, has put significant upward pressure on pricing, with numerous and varied factors at play. These include the effects of lockdowns in China (the world's largest supplier of goods), the devastation caused by the Russian-Ukraine conflict (Ukraine being a major food exporter to Europe, the Middle East and Africa) and the economic sanctions imposed on Russia (one of the world's largest suppliers of oil and gas).

⁶ <https://iea.blob.core.windows.net/assets/660c2410-218c-4145-9348-c782e185dcdf/ElectricityMarketReport-July2022.pdf>

⁷ <https://www.reuters.com/business/energy/europe-power-spot-prices-up-less-solar-rising-french-demand-2022-08-17/>

⁸ Comments and chart taken from <https://www.icaew.com/insights/viewpoints-on-the-news/2022/may-2022/chart-of-the-week-inflation-around-the-world>

Figure 5: Inflation around the world, May 2022



26 May 2022. Chart by Martin Wheatcroft FCA.

As can be seen from Figure 5 to the left, the rates of inflation can vary widely between various countries. However, for most countries the rate of inflation is now substantially higher than it has been for many years, reflecting the significance of the change in a global economy that has come to expect relatively stable prices. This is not the case for every country; for example three hyperinflationary countries, which had major problems with inflation even before the pandemic, have been omitted, including Venezuela at 222.3% in April, Turkey at 70%, and Argentina at 58%.

Commodity price inflation⁹

National inflation rates and specialist commodity rates that heavily impact the power sector are actually different things, with the latter being more exposed to global demand and markets.

If we take steel as a benchmark for the power sector, in June 2022 the World Steel Association (WSA) released its short range outlook for 2022 and 2023. WSA forecasts that demand will grow by 0.4 percent in 2022 to reach 1,840.2 Mt after increasing by 2.7 percent in 2021. In 2023, steel demand is expected to see further growth of 2.2 percent to reach 1,881.4 Mt.

Ongoing supply chain issues and COVID-19 waves aside, the economic recovery from the pandemic has come faster and stronger than anticipated. However, the outlook for the remainder of 2022 and 2023 remains uncertain against the backdrop of the Russia-Ukraine conflict.

For 2022, inflationary pressures will vary from region to region, depending on trade and financial exposure to Russia and Ukraine. However, it is clear that energy and commodity prices, including those related to steel production, are rising around the globe. Inflationary pressures will also continue to be impacted by reduced investment resulting from financial market volatility, rising interest rates and the wider economic uncertainty.

The forecast is based on the conflict being resolved during 2022 but with sanctions remaining in place during 2023 and beyond, which will continue to impact global trade flows and supply chains.

Source: <https://www.icaew.com/insights/viewpoints-on-the-news/2022/may-2022/chart-of-the-week-inflation-around-the-world>

⁹ <https://americanrecycler.com/8568759/index.php/news/metal-recycling/5275-world-steel-short-range-outlook-released-for-2022-23>

Insurance values and claims cost inflation ¹⁰

Inflation doesn't only hit the business or its clients; it also has the potential to significantly impact the insurance market. It is for this reason that insurers have been so focussed on ensuring that inflationary provisions are adequately reflected at each renewal. It is difficult to fully assess the impact of higher inflation on claims at this stage, as the higher inflation environment has not been present for a sufficient amount of time to accurately measure this. However, this will inevitably feed through to higher claims costs.

In his company's Global Claims Review 2022 issued on the 19th July 2022, AGCS Chief Claims Officer and Board Member Thomas Sepp summarised the position as follows:

"Insurance claims from companies have become more severe over the past five years due to factors such as higher property and asset values, more complex supply chains and the growing concentration of exposures in one location, such as in natural catastrophe-prone areas.

"The future does not look brighter anytime soon. Companies and their insurers have shown resilience to weather the loss impact of the pandemic, but the ongoing war in Ukraine, a spike in the cost and frequency of business interruption losses and the sustained elevated level of cyber claims are creating new challenges. At the same time, the top two causes of claims, fires and natural hazards, remain significant loss drivers for companies. Last but not least, the impact of soaring inflation around the world will bring further pressure on claims costs."

This concern is being felt by many insurers who are also looking more closely at property declared values. This includes business interruption, the impact of more volatile power markets and whether the positive impact of this on generators' profits is being fully reflected in values.



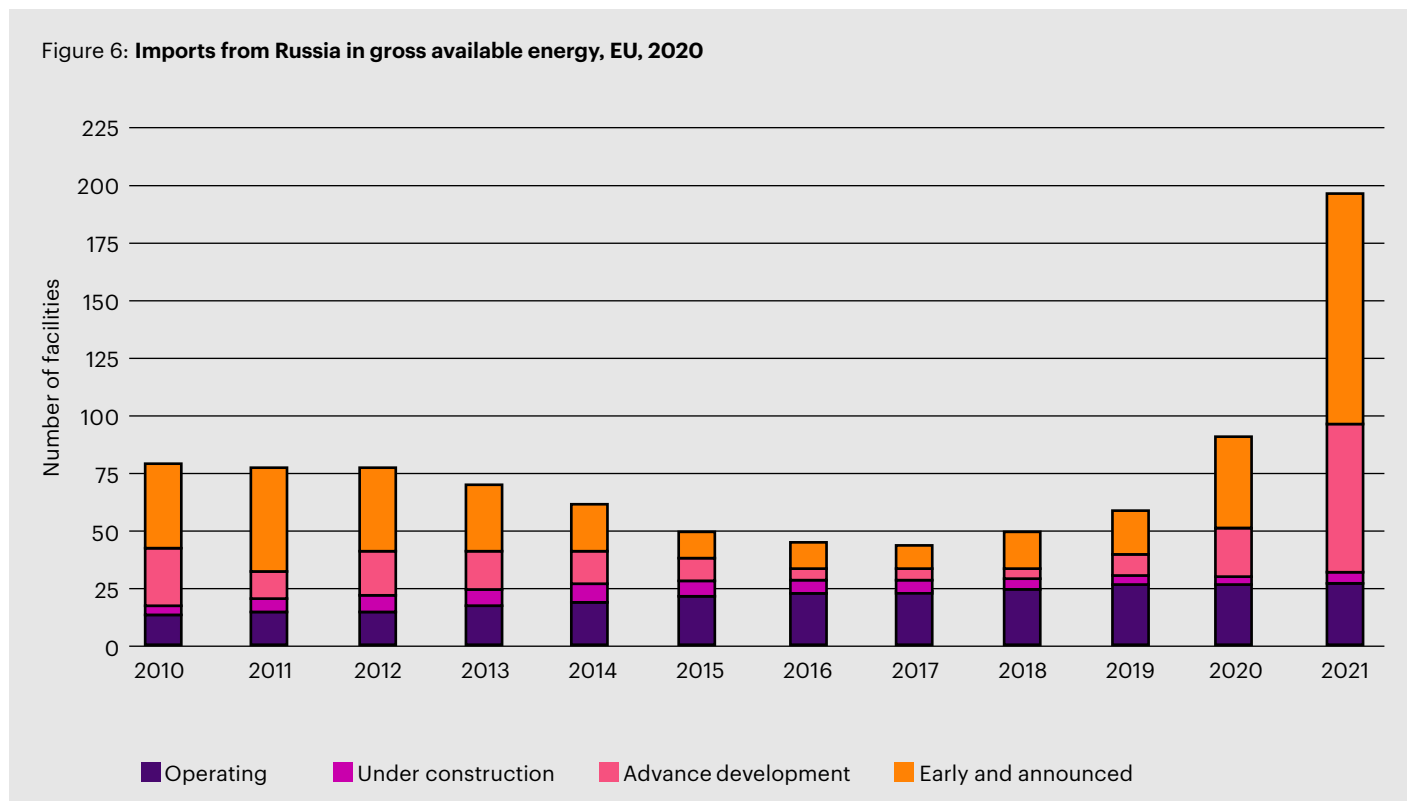
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Inflation doesn't only hit the business or its clients; it also has the potential to significantly impact the insurance market.

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¹⁰ All quotes from this section are taken from the AGCS Claims Review 2022: <https://www.agcs.allianz.com/news-and-insights/news/claims-review-2022.html>

Figure 6: Imports from Russia in gross available energy, EU, 2020



Source: <https://www.iea.org/commentaries/carbon-capture-in-2021-off-and-running-or-another-false-start>

Challenge three: the energy transition

The energy transition is seeing a major shift in focus and investment, not only towards renewables and battery storage but also additional new technologies that will support ongoing thermal power generation. Key elements of this shift will be the development of CCUS and hydrogen.

This year has seen unprecedented advances for carbon capture, utilisation and storage (CCUS) technologies. In 2021, more than 100 new CCUS facilities were announced and the global project pipeline for CO₂ capture capacity is on track to quadruple, a target that is essential to support the pathway to Net Zero by 2050¹¹. This is supported by CCUS being a key part of the IEA's strategy for the achievement of Net Zero in view of its unique ability to deliver carbon emissions abatement for heavy industry and existing energy sector activity, as well as commercial viability for the development of low-carbon hydrogen. However, CCUS has suffered from previous false dawns as a result of unreliable government funding plans, such as the UK's high-profile CCUS competition, that the UK government unexpectedly withdrew support for in 2015¹². So why can we be so sure, with its previous track record, that this time the pipeline will actually be delivered?

While CCUS certainly still faces challenges, the combination of strengthened climate goals, an improved investment environment and new business models have set the stage for greater success in coming years. Indeed, 2021 generated unprecedented momentum behind CCUS; the growth in the project pipeline in 2021 represented a major departure from the years 2010 to 2017, when plans for CCUS facilities were being cancelled and the pipeline of potential projects shrank. This trend only started to reverse in 2018, which saw a net increase of six planned projects. The Russian-Ukraine conflict and the focus this has brought on the need for a diversified energy base and options has continued to energise the CCUS sector.

Hydrogen: an abundant fuel, with disruptive potential

Low-carbon hydrogen is poised to play a key role in industries that feature heavy emissions which are hard to abate, such as aluminium and steel. But for global hydrogen markets to emerge, massive scale-up is needed across production pathways using both renewable and fossil-based feedstocks, and transport costs need to come down.

That being said, the viability of hydrogen production varies between types and regions. Electrolysis-based hydrogen costs are at least double those for

¹¹ <https://www.iea.org/commentaries/carbon-capture-in-2021-off-and-running-or-another-false-start>

¹² <https://www.bbc.co.uk/news/uk-scotland-scotland-business-34357804>

conventional hydrogen in most regions, while gas-based hydrogen with CCS costs are closer to viability. But as renewable energy costs drop, electrolysis-based hydrogen has the potential over time to become the cheapest and dominant source. Indeed, it is already cheaper than gas-based hydrogen with CCS in the Middle East and Western Australia.

Production predominates around ports in Europe, the US Gulf Coast and East Asia, where Japan, South Korea and China have aggressive hydrogen strategies aimed at long-term decarbonization and energy security. China recently published its first ever national hydrogen strategy, with its state-backed think tank expecting hydrogen to contribute to 20% of final energy consumption by 2060. Its plan is focused on boosting the supply of renewables-based hydrogen and making it an economically viable option in the nation's energy transition¹³.

Clean hydrogen project proposals have proliferated since 2020. European nations with strong gas industries and offshore carbon storage potential (e.g. Norway, the UK) are backing CCS technologies for production of natural gas-based hydrogen, while those with lower carbon power systems (e.g. Germany, Spain, France)

tend to favour electrolysis for renewable hydrogen. Electrolysis projects are also planned where renewables are abundant and export potential is enticing, such as in the Middle East, Australia and Chile.

Over a third of funds under the EU's EUR750 billion *NextGenerationEU* recovery plan are to finance goals set out in the European Green Deal, including those for clean hydrogen. Low and zero-carbon hydrogen projects across Europe have submitted requests for this EU-level funding. Meanwhile, UK projects await details of how a 5GW national target by 2030 will be subsidized.

Challenge four: climate change

As stated earlier, climate change remains the world's greatest challenge; the effects are already being felt in numerous ways that are having profound impacts on the power sector as well as society globally. This is not only in terms of operational impact and damage to assets but also in terms of output, particularly in respect of hydro power. The lack of reliability in terms of hydro is only serving to exacerbate power market pricing tension created by the global energy crisis.

Current examples also include high temperatures in Europe, causing stress with European power generators. In France, EDF have had concerns over the need to reduce output at four nuclear plants due to cooling water restrictions due to low water levels impacting cooling water usage. In Germany, generators of coal-fired plants have been struggling to get coal barges down the Rhine, due to low water levels at critical points in the river. Against this, as mentioned previously in the report, we are seeing significant price spikes, with French Q4 2022 and German 2023 wholesale prices trading at over EUR1,000/ MWh and EUR500/ MWh respectively. Q4 peak power prices have more than doubled to over EUR500/MWh between mid-June and mid-July 2022 and French Q4 peak power prices are now trading at over EUR1,500/MWh.¹⁴ Such pricing has been exacerbated by weather-impacted low hydro reserves around Europe that have led to a reduction in hydro plant output. Similar hydrology factors are also being felt elsewhere around the world.



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As renewable energy costs drop, electrolysis-based hydrogen has the potential over time to become the cheapest and dominant source.

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¹³ <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/060722-infographic-china-hydrogen-decarbonization-arsenal>

¹⁴ <https://www.reuters.com/business/energy/europe-power-spot-prices-up-less-solar-rising-french-demand-2022-08-17/>

Impact of hotter temperatures on operations¹⁵

Changing weather patterns are creating challenges for power companies and have the potential to impact not only the businesses themselves but also the power markets in which they trade.

- **PV panels:** For PV, light, not heat, is the source of power and PV panels are at their most efficient when the ambient temperature is low. Equally, efficiency improves on the nameplate rating as the temperature drops below 25°C.
- **Wind farms:** Like hydro and water, a network that is highly dependent on wind power is exposed to climate risk. Wind speeds were milder than usual in Europe this year, so windmills across the bloc generated less electricity which worsened a crunch that sent power prices to record highs as utilities had to buy more coal and scarce, costly, natural gas.
- **Gas turbines:** Gas turbine efficiency is also impacted by ambient temperature. Gas turbines rely on a temperature differential between the inlet and the exhaust, so the cooler the inlet temperature the more power a gas turbine can generate. Temperatures above 15%, such as have been experienced around Europe recently, will therefore reduce plant output with hot days in excess of mid 30°C having the potential to reduce output to approximately 73%.
- **Thermal plant:** We have touched on this in the introduction to the section but all thermal plant has to be cooled, generally with abstracted river or seawater that is discharged back into the river or sea after use. River conditions can create major problems for generators, as dry conditions can mean the river is too low to abstract the necessary water. It may be because water temperature limits are breached at the discharge point, or because river water has already been warmed by the sun – especially when river levels are low – and the water is too warm to allow it to be abstracted for use in the power plant.
- **Hydropower:** Healthy water levels are essential for hydro stations so that enough water is available to drive its turbines and maintain river conditions. In the summer, rivers can run much lower. Hydro plants may operate under restrictions that stop them from using water to generate at times when river water levels are low.
- **Network capacity:** The actual amount of power that can be carried on transmission and distribution lines can vary according to the ambient temperature. It can also cause network cables to expand so transmission cables ‘sag’ further between transmission towers. Limits are set for all of these physical parameters, and they determine how much power can be transmitted.

Nat Cat exposures

There is no part of the globe that is not experiencing greater severity and frequency of natural catastrophe (Nat Cat) events. Other than the transmission and distribution sectors, which have long had exclusions against damage to overhead lines and cables for this reason, the hydro power sector is also coming under particular pressure due to the exposure to both earthquakes and floods affecting its major structures. This sector is also one where a number of assets in operation are 50 to 100 years old and potentially designed with different environmental pressures in mind.

Flood & drought¹⁶

In February 2022 the Journal Water issued findings of a study that showed the extent to which the environment and risks to which hydro assets globally are being exposed will change between now and 2050. The study used the WWF Water Risk Filter (WRF) and geospatial analysis to screen hydropower projects, both existing (2488 dams) and projected (3700 dams), for a variety of risks at a global scale and with a key focus on biodiversity risks, hydrological risks (water scarcity and flooding), and how those hydrological risks may shift with climate change, based on three scenarios.

In terms of water scarcity risk, the study found that approximately 26% of existing hydropower dams and 23% of projected dams are located within river basins that currently have medium to very high risk. However, those numbers are projected to increase by 32% and 20% respectively by 2050 due to climate change. This is expected to be especially applicable for projects located in eastern China, the Middle East, Morocco, the southwestern USA and India.

For flood risk, the study found that 75% of existing dams and 83% of projected dams are within river basins with medium to very high risk. However, the proportion of hydropower dams in basins with the highest levels of flood risk is projected to increase by nearly twenty times (i.e. from 2% to 36% of dams). In addition, a large proportion of existing (76%) and projected hydropower dams (93%) are located in river basins with high or very high freshwater biodiversity importance. This was a high-level overview, intended to raise awareness of broad patterns of risk, highlight trends, and guide more detailed studies.

¹⁵ <https://www.newpower.info/2022/07/from-the-new-power-archive-long-hot-summer-how-power-assets-are-affected-as-ambient-temperatures-rise/>

¹⁶ All statistics relating to this section can be found at https://wwf.panda.org/wwf_news/?5168466/Hydropower-projects-threatened-by-increasing-floods-and-droughts-due-to-climate-change-warns-WWF-study



The study also highlights the serious threat posed by planned hydropower to freshwater biodiversity. Fragmentation of rivers by dams is one of the leading causes of the 84% collapse in freshwater species populations on average since 1970. Yet the analysis found that up to 80% of all planned dams are in areas with high or very high risk to freshwater biodiversity, such as the Amazon, Irrawaddy, Mekong and river basins across the Balkans.

Windstorm¹⁷

In 2019, the east coast of Africa was hit by tropical cyclone Idai, one of the strongest southern tropical cyclones on record. Mozambique, Madagascar, Malawi and Zimbabwe experienced windstorm, heavy flooding and the loss of over 900 lives – the heaviest loss of life from such an event in 100 years.

The conditions that led to and intensified the impact of Idai are considered by many climate experts to have been climate change-related. The dynamics of several

factors coming together to increase the impact and losses (including secondary losses) arising from storms, are now well understood by experts, including those of the insurance sector. For Idai this included:

- increased energy and rainfall from warmer air sea-surface temperatures
- greater impact of storm-surge on coastal communities and lower-lying cities due to rising sea-levels
- greater risk of flash-floods, arising from drought-related hard ground conditions

The frequency of higher intensity tropical cyclones is expected to increase (2019 saw the record for South Indian Ocean basin cyclones reaching hurricane intensity equalled, with 13 out of 18 reaching hurricane levels) which will put mounting pressure on African countries to be prepared for future climate impacts on their electricity systems.

¹⁷ <https://www.iea.org/reports/climate-impacts-on-african-hydropower/climate-impacts-on-african-hydropower>

Implications for the Power insurance market

We have seen that the world has become more complex, not only for the global community but also for the insurance sector and especially the Power insurance market.

The challenges it has to face not only relate to those that have historically always been present, such as operational risk, an aging generation fleet, new technology variants and natural catastrophes. There is now a whole new wave of challenges arising from the four key challenges outlined in this article.

This impact is being felt in many ways but ultimately it will place new pressures on the insurance market to not only understand and develop solutions for the new or developing risks but also to ensure that it understands those risks enough to create a sustainable market for these emerging or growing sectors. Below we have outlined how each of our four challenges will impact the Power insurance market.

Russian-Ukraine conflict

- **The impact on supply chains from an industrial downturn that may arise following reductions in gas flows from Russia.** A reduction in gas flows to 15% of the usual levels will inevitably impact Europe's ability to generate from gas; this will be exacerbated on days of low renewables output. When demand exceeds available power, users will have to be cut off to ensure the grid remains balanced. Residential customers and essential services will be prioritised, meaning industrial users will be cut off in line with an order of importance. Supply chains will be affected and the impact of this on the Power sector remains to be seen. It will be important for this to be monitored so that contingency plans can be put in place for key parts/supplies.
- **The increased investment in new assets and infrastructure that will facilitate reduced dependency on Russia.** The increase in demand for an already resource-challenged contractor base has the potential to impact timescales, quality and cost. Similar upscaling of demand and production has often resulted in pre- and post-handover losses to the market from poor workmanship and project management failures during the construction phase. Attention to contract risk management, contractor management and quality assurance, will be needed to ensure risk is minimised.

- **The need to ensure that power wholesale market volatility and the impact of this on Business Interruption values is understood.** Wholesale electricity prices are multiples of prior year values. While higher gas and carbon credit costs (typically "variable costs" for insurance purposes) account for a significant part of this rise, higher demand following the COVID-19 bounce-back, combined with lower Renewables output at times, is also enabling power generators to benefit from notably higher margins. This has been problematic for insurers, who have had losses that are unexpectedly high compared to declared Gross Margin values. This is leading to insurers trying to apply \$/MWh price caps, which can only be avoided by greater clarity of how the declared values have been arrived at. The changing electricity market conditions need to be reviewed regularly with the company's broker to ensure the basis of cover remains accurate.
- **The increase in coal use to the market and how insurer ESG principles will adjust to reflect and provide for this.** The ESG-based withdrawal from coal by insurers and financiers and its impact on available insurance coverage terms has been well documented. The current conditions in Europe, however, have created pressure on generators to bring back or increase coal-fired output in line with governments' emergency energy strategies. This is unlikely to be short-lived and buyers and their brokers should be engaging with Insurers who have ceased to write new Coal business, to acknowledge that for a number of countries of Europe, the "Social" element of ESG currently outweighs the "Environmental" considerations.

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We have seen that the world has become more complex, not only for the global community but also for the insurance sector and especially the Power insurance market.

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Global inflation

- **The impact on property values.** In much the same way as the difficulties faced by insurers with BI values, the market is becoming increasingly aware of the impact of inflation on its exposures. Values need to be reviewed and benchmarked with the company's broker to ensure that they are adequate. For those risks where insurers have under-valuation concerns, Average Clauses are increasingly being applied.
- **Monitoring of inflation relevant to the applicable sector.** As suggested earlier, there are various measures of inflation - over-estimating results in unnecessary costs, while under-estimating potentially results in inadequate limits and application of coverage restrictions such as Average. To avoid this, it is important for power companies to have a good understanding of the rate most applicable to their sector and location, and to be able to explain this to insurers, so they have greater confidence in the values declared.
- **Ensuring EMLs (Estimated Maximum Loss) maintain pace with the changing world.** For "First Loss Limit" based programmes, limits should be based on accurate EML studies. Those EMLs need to be regularly reviewed against expected loss levels, which will be impacted by inflation and supply chain issues. It is essential that buyers work with their brokers to ensure EMLs keep pace with the dynamics of the sector.

The energy transition

- **Understanding new risks arising from new technologies.** Hydrogen, CCUS and Battery Storage will proliferate over the coming years, and yet at this stage the market has little true understanding of these risks. As much as they may want to support the energy transition, the market will not bear risks it is not able to fully assess. This education process will not be straightforward; buyers that require bespoke, comprehensive cover, in good time to ensure projects are bankable, will need to start work now with their brokers and their engineers. This will enable them to provide valuable advice through the project design/decision making process, assess the risk and worst case scenarios, commence programme design and facilitate the early engagement of potential markets.
- **Developing a deep understanding of business models**

relating to new risks. With the energy transition comes not only new physical risks but also different business models - these will include varying revenue streams and regulatory regimes, which will depend on the technology and country in which the risk is located. The legal and regulatory structure that sits around some of these risks can provide protections and risk limitations, including the potential for government indemnities, which will have a material impact on cover requirements and cost. The assessment of certain risks in different parts of the world (e.g. CCUS) will require the broker to have in-depth knowledge of the above, in each territory, to ensure that the risk is presented accurately and clearly to the market, delivering optimum cover and pricing.

Climate change

- **The monitoring of the climate change related exposures and understanding implications for the business and future investment in the business.** It is becoming increasingly apparent that climate change is having a profound effect on companies' risks, both short and long term. This can range from losses arising from physical damage, to reductions in asset yields or even the stranding of assets following regulatory and legal changes, for example emissions limitations. Some of the above will relate more to strategic decisions and some, such as the physical loss, to insurable risk programmes - both are important. Later in the report we discuss the ways in which buyers can work with their brokers to identify, model and monitor climate risk.
- **The identification of Nat Cat exposure.** As mentioned above, some of the risks are more business strategy related, but Nat Cat-related physical loss is a class of cover for which capacity is being increasingly restricted as the market performance continues to deteriorate. The reinsurance market, on which many insurers rely to cover their own Nat Cat exposures, is not one that tends to fully reflect positive risk management features. If the cost becomes difficult to accept, a thorough understanding of the true, reduced exposure that could help support reduction in limits becomes an essential part of a buyer's armoury. Later in this Review, we discuss the tools available to support buyers through this challenge.

Conclusion: next steps

It is clear that the market's ability to respond positively to this complex and fast changing world will depend heavily on how strongly it engages with buyers and brokers.

Understand the scale of the challenge

We address the issue of wider market conditions later in this Review, but strong underwriting governance remains a feature of this market and this can only be expected to increase rather than to soften in the future. Therefore, the reality is that buyers and their brokers have an obligation to understand the scale of this challenge and to put in place robust risk management strategies that will enable buyers to understand how all of these factors will play out for their respective organisations.

A broader range of ESG strategies

However, although it is important to note that the Russia-Ukraine conflict has had a profound effect on the Power sector and is demanding new strategies to manage its fallout, it is only one factor that has served to refocus the attention on the need for self-sufficient, diversified, cleaner, more flexible and more resilient energy strategies. ESG and the energy transition continues to be at the heart of this and WTW regularly reports that this now requires a broader range of strategies than historically we have worked with.

Engineering and analytics will be key

Engineering risk management will always remain core to our business, as the new technology will demand greater understanding of the impact on risk of modifications (including retro-fitting of hydrogen to gas fired plans), upgrades and prototypical designs and specifications. Analytics will also be key - indeed, the insight that well-designed risk models provide in a world

of changing climates, higher frequency and severity natural catastrophe events, globalised distribution of higher value assets and more complex supply chains and revenue streams, will become increasingly essential.

Effective long term investment strategies

However, ESG demands more. The focus on ESG highlights the risk of ineffective long-term investment strategies that fail to keep pace with the energy transition and the increasing demands of consumers, employees and investors. The impact of this will be catastrophic for those that underestimate its pace and impact - loss of market share, stranded assets, a lack of investment, an inability to secure support for insurance programmes, a miscommunication of progress to Net-Zero, reputational damage - all these factors ultimately lead to failure.

There has therefore never been a more important time for buyers to engage fully with their risk intermediary across all of their organisation's activities and levels, to fully understand the range of services, support and insights available to help buyers navigate the challenges of the coming years.



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Risk modelling: how to embrace these disorderly transitions

Global commodity markets are facing volatility not seen in a generation, perhaps even since the energy crisis of the 1970s. What does this mean for transition risk for power and power-intensive companies and related service industries – and how can we navigate the disorderly transition that we are already living through?

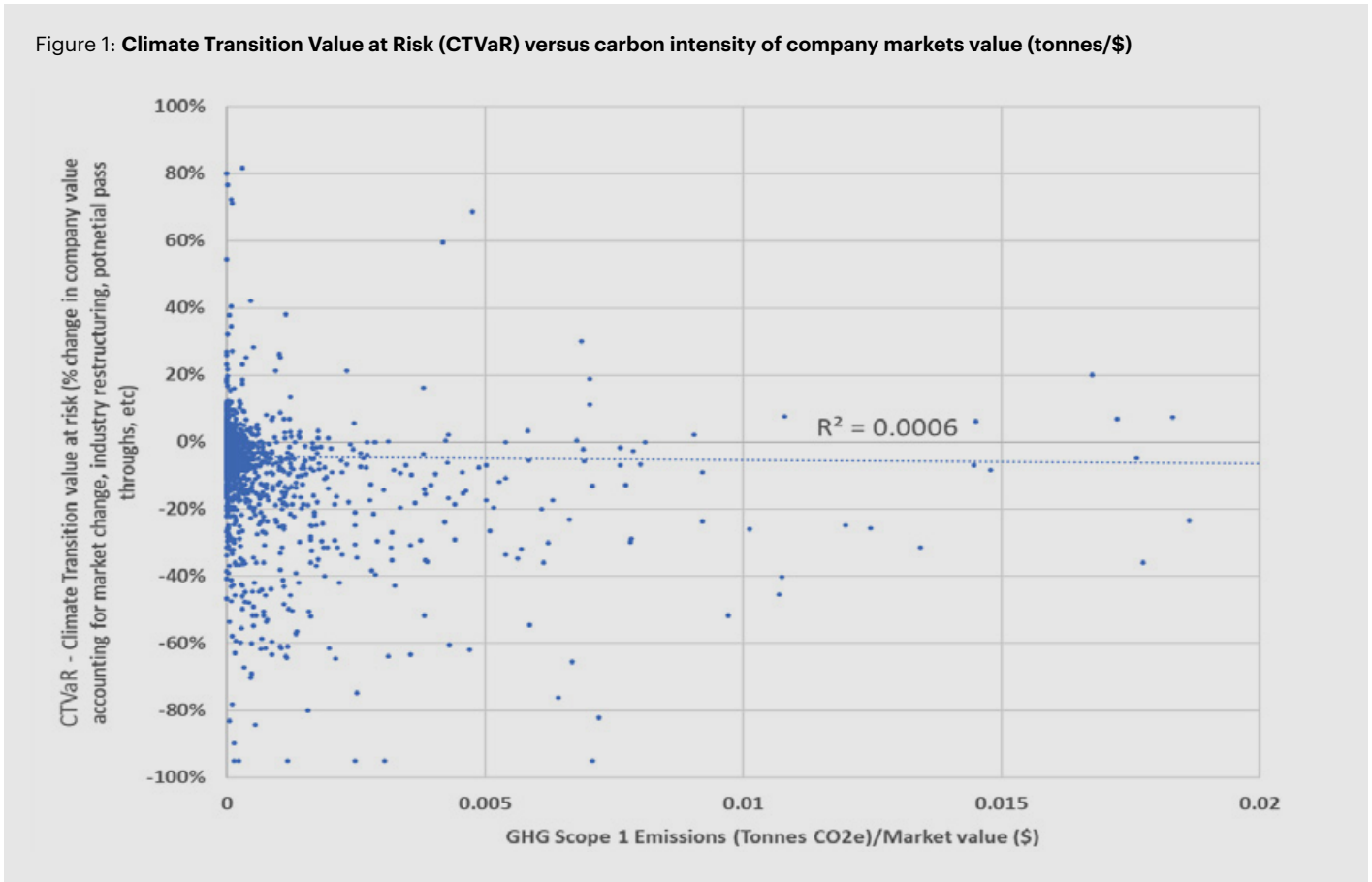
Introduction

Long before the Russia-Ukraine conflict, global markets had already started to change the power industry landscape over the past 12 months – Europe’s “energy crunch” and creeping inflation were beginning to eat into household budgets and company balance sheets, while oil prices were already edging upwards. These impacts are now manifesting across commodity markets, including food. But even as they work out into the wider global economy, our own modelling capacity at WTW already helps us understand at least aspects of the current situation – this type of volatility is exactly what our methodology has been designed to account for.

The Climate Transition Analytics (CTA) team, part of the Climate & Resilience Hub at WTW, has been developing models to show the impact to businesses, investors and countries of market changes, policy and shifts in behaviour in response to action to mitigate climate change - also known as transition risk.

In Matthew Foote’s article later in this Review, we explore in more detail the financial impacts of the acute (shock events) and chronic (long term shifts) of the physical risks of climate change on power companies. And in this article, we explore how our transition risk modelling addresses volatility by design to account for “disorderly transitions”, and why counting molecules in “carbon footprint” methodologies fall short of capturing the level of complexity required to understand the problem.

Figure 1: **Climate Transition Value at Risk (CTVaR) versus carbon intensity of company markets value (tonnes/\$)**



Source: MSCI World Index companies/WTW analysis

Carbon price vs climate risk

Most other “transition risk” modelling focuses on carbon footprints; however, there are two main problems with this approach. First, carbon footprint valuation methods are based on historical emissions data (often multiple years out of date) and apply a price on carbon or assumed reduction in emissions (and therefore demand) to meet carbon budgets.

Second, our analysis indicates an extremely low correlation between carbon emissions intensity and transition risk, using our Climate Transition Value at Risk (CTVaR) methodology which more accurately captures financial risk. Historical emissions data are not the ideal indicators of future risk and can introduce some perverse findings, such as manufacturers of spark plugs and software suppliers to the oil and gas industry, both of which would see declining markets in a climate change shift to electric vehicles, showing low transition risk.

By contrast, WTW’s bottom-up methodology, which is based on future free cashflows of operating assets or the expectation of future cashflows from capital investments, provides an enriched view of transition risk as a forward-looking financial metric. When allocating capital to align with Net Zero targets, these forward-looking metrics are much more useful to investors and much more helpful in the Net Zero challenge, as those

// **Our analysis indicates an extremely low correlation between carbon emissions intensity and transition risk.** //

companies with high transition risk in many cases can make a more significant contribution to the transition than companies with low transition risk.

As our methodology assesses value at the level of the individual asset, such as a thermal power station, we can also help alignment with global Net Zero targets, rather than simply aligning portfolios with Net Zero, for example by divesting assets that just shift the costs of carbon to another balance sheet.

Our CTVaR methodology is also more responsive to market changes and can capture the effect of changes on cashflows that we see in today’s volatility, while also addressing the wide variety of possible pathways for the climate transition in the years ahead.

Figure 2: Network for Greening the Financial System's six scenarios

Net Zero 2050

Net zero 2050 is an ambitious scenario that limits global warming to 1.5°C through stringent climate policies and innovation, reaching net zero CO₂ emissions around 2050. Some jurisdictions such as US, EU and Japan reach net zero for all greenhouse gases by this point.

Below 2°C

Below 2°C gradually increases the stringency of climate policies, giving a 67% change of limiting global warming to below 2°C.

Divergent Net Zero

Divergent Net Zero reaches Net Zero by 2050 but with higher costs due to divergent policies introduced across sectors and a quicker phase out of fossil fuels.

Delayed Transition

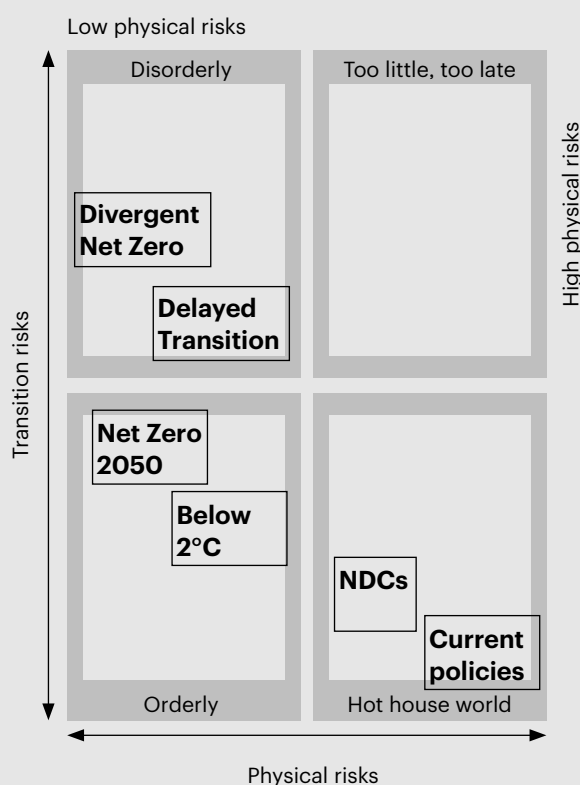
Delayed Transition assumes global annual emissions do not decrease until 2030. Strong policies are then needed to limit warming to below 2°C, Negative emissions are limited.

Nationally Determined Contributions

Nationally Determined Contributions (NDCs) includes all pledged policies even if not yet implemented.

Current Policies

Current Policies assumes that only current implemented policies are preserved, leading to high physical risks.



Source: Network for Greening the Financial System <https://www.ngfs.net/ngfs-scenarios-portal/>

Risk management tools

Commitments to achieve Net Zero by 2050 might give the impression that there is one “climate transition” on a linear pathway to reduce emissions. But our theory of change has always understood that there will be many different transitions across sectors and geographies at the very least – with the speed, depth and timing of decarbonisation adding further variations.

Over the past few years, central banks have started framing some of these variations in climate scenarios, i.e. modelled outcomes that vary depending on the speed and depth of action to mitigate climate change. The Network for Greening the Financial System (NGFS), a global group of central banks, has published six scenarios aimed at providing a common reference for understanding how climate change (physical risk) and climate policy and technology trends (transition risk) could evolve in different futures.

The NGFS also provides macroeconomic scenarios – including scenario variables such as interest rates, economic growth and commodity prices – that financial institutions can use for stress tests and for evaluating financial risk.

These scenarios reflect the transition path that is most likely given current conditions, absent some sort of organizing force. Even though these scenarios appear more likely, and thus more reflective of the real world, we do not yet have scenarios that adequately address the potential sources and magnitudes of risks that could affect financial systems.

With respect to scenarios of disorganized transitions, we currently see at least four major issues that need to be addressed to evaluate adequately the potential for financial risk:

1. Transition timing
2. Mismatch between changes in demand (policy, technology, behaviour) and supply (investment)
3. Uneven transitions – either geographically or sectoral
4. Expected risk versus extreme/outlier risk

Smoothing out the disorderly transition

However, the Climate Transition Analytics (CTA) team believes that there are not just six scenarios, or even a hundred – there are actually thousands of different transitions, depending on geography, sector and macro changes such as interest rates, or indeed sanctions.

Furthermore, the current macroeconomic variables incorporated in the NGFS scenarios can, at times, produce counterintuitive and counterproductive results. For example, the higher oil and commodity prices included in the disorganized scenarios can make high emission sectors like oil, gas and coal look more attractive to investors, while higher interest rates discount future declines in value due to the climate transition, making all companies with future transition risks comparatively more attractive than they really are – sometimes even under the business-as-usual case.

Delayed transitions or aggressive 1.5°C scenarios (for instance the IEA 1.5°C scenario) often appear unfeasible, or at least prohibitively expensive. Often these scenarios do not address capacity issues that are caused by accelerated or unaligned sectoral inputs.

A transition that happens in five years, instead of twenty, is significantly more than four times as expensive because the facilities such as mines, factories and logistics chains themselves will need to be four times as large, meaning that the capital costs will be increased accordingly.

Furthermore, if the entire world were to convert to electric vehicles in five years rather than twenty, the large investment in these mines, factories and logistics chains would then be stranded after five years, as demand would fall to replacement levels, leaving these investments stranded.

Our results suggest that organized sectoral transitions taken in aggregate, could balance each other out in ways that would pose very modest macroeconomic risk to the global economy. However, the only certainty we have is that the transition will be disorganized in several directions. Some sectors will have relatively clear transitions, while others will delay and then be disrupted by technological innovation. Some regions may phase in or out individual sectors with well thought out and executed plans, but those plans are unlikely to be coordinated with all countries and regions in the world; there will be a mismatch in timing, with phasing in and phase in out industries and technologies. Finally, it is extremely unlikely that every sector in every country will be coordinated in ways that balance capital requirements, labour and consumer demand.

Crucially, our analysis to date suggests that the portfolio effects, driven by which sectors and geographies move how far and when, may be more impactful and realistic than moving from basic transition scenarios in each sector to extreme transition scenarios in each sector.

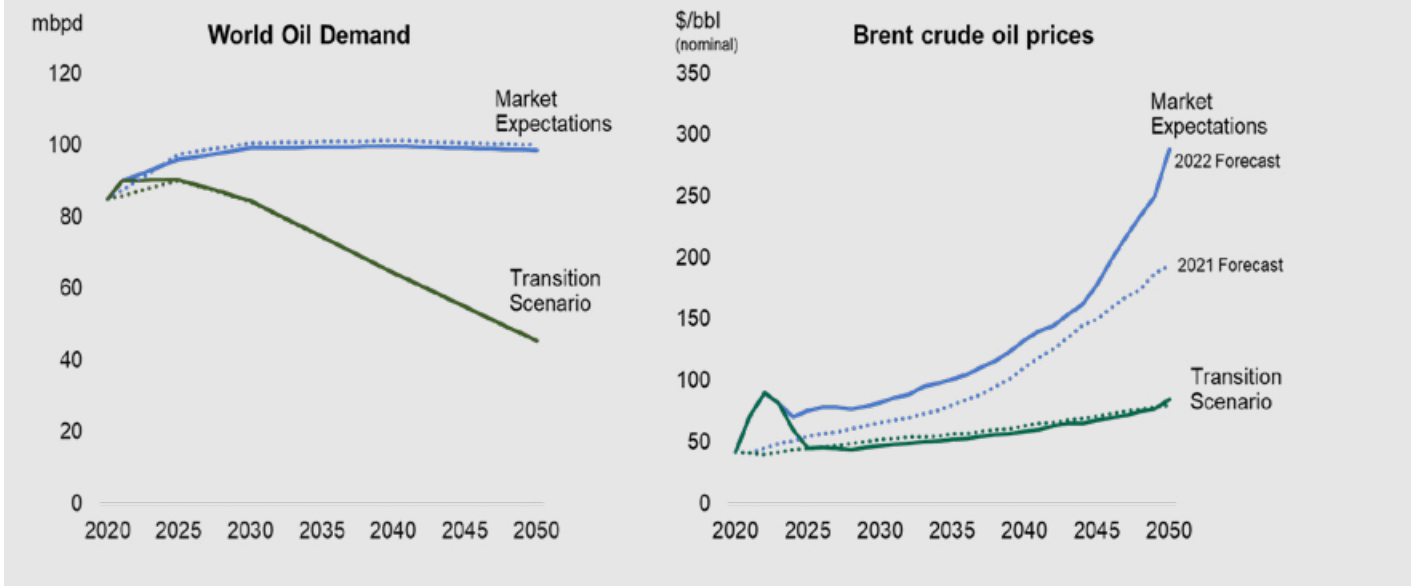
Therefore while basic and extreme versions of each sector/geography transition element will help quantify risk, the ability to mix and match different sector/geography combinations will be essential to identify and manage risks for both financial institutions and sovereign balance sheets.

What do scenarios mean for businesses and investors?

Scenarios can be effective in the policymaker advocacy arena, as they point out the feasibility of the transition and the sizable economic benefits of pursuing a well-organized transition. They also force the conversations about climate transition strategies at the corporate level, in great part due to the reporting requirements set upon institutional investors and asset managers that demand companies think about and develop transition plans.



Figure 3: The decline in oil demand due to a global climate transition would lead to significantly lower prices for crude oil in the long term



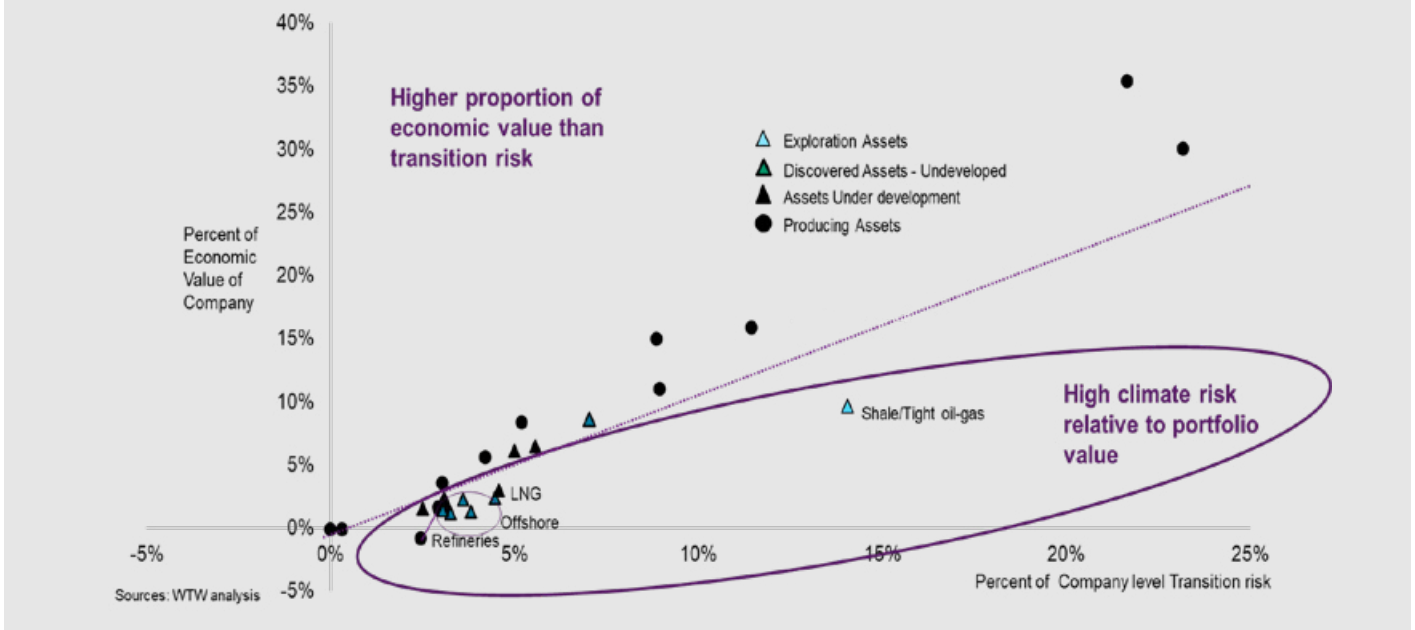
2022 forecast in solid 2021 in dashes Source: IEA, WTW modelling

Figure 3 above shows how different demand scenarios change the price of commodities such as crude oil, which then feed into the value of oil production assets and related businesses such as power generation. These valuation inputs are critical components for developing corporate and investment strategies to manage the transition and address the transition risk. With lower oil price expectations, for example, power companies should reduce new investment and devise investment and financial strategies to reflect the new reality.

Using those scenarios can help a company think about their portfolio of assets and investment strategy. For

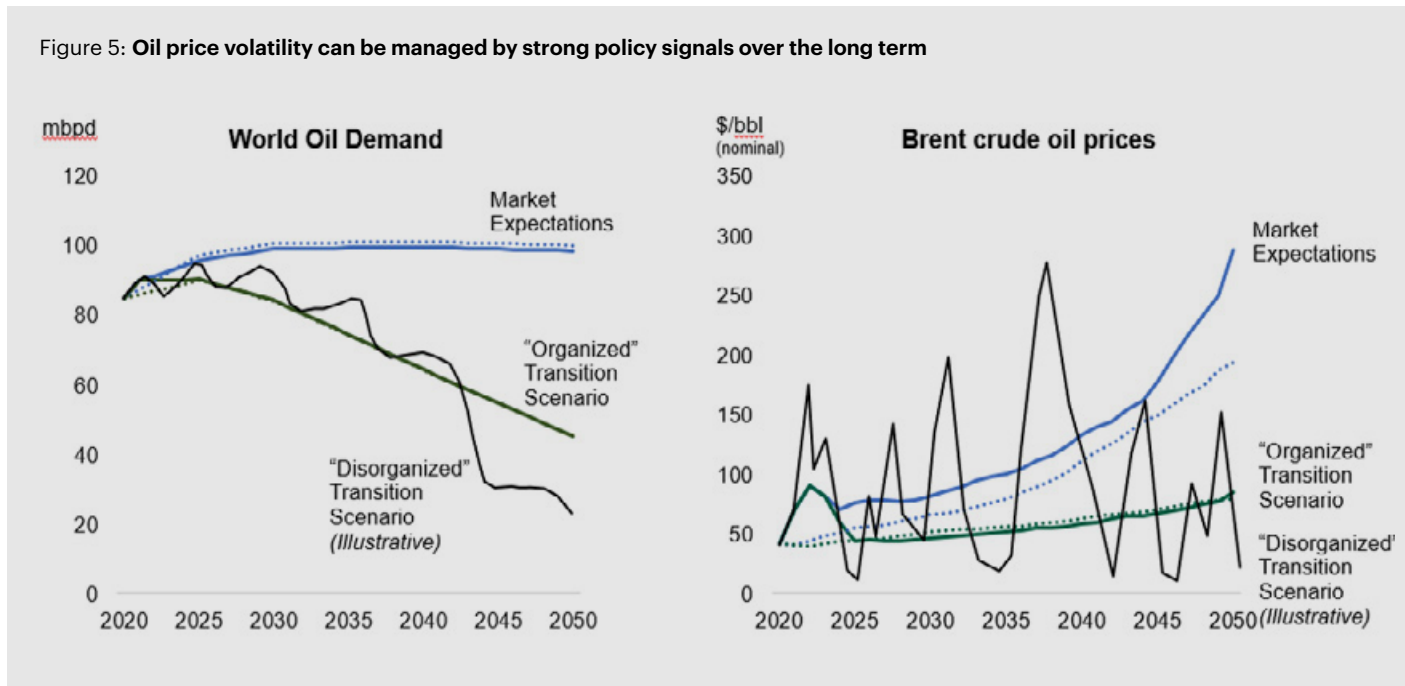
example, in Figure 4 below the value of a portfolio of energy company assets – based on the free cash flows that these assets would generate after capital investments, operating costs and taxes – is compared against the contribution of that asset to transition risk; that is, the proportion of a company’s decline in value due to the transition scenario that that asset would be responsible for. Simply put, the higher up an asset is, the more it is worth to the company, and the further to the right, the greater the asset’s exposure to transition risk. In this example, any asset below the dotted line generates more risk than value and should be cause for concern for the company’s investment portfolio.

Figure 4: Value of a company’s assets versus the impact of a transition on the value of those assets



Source: WTW analysis

Figure 5: Oil price volatility can be managed by strong policy signals over the long term



2022 forecast in solid 2021 in dashes Source: IEA, WTW modelling

Altogether, these types of tools help manage the transition through:

1. **Corporate strategy.** Encouraging companies and businesses – particularly those that receive investment from financial institutions in the global financial system - to develop strategies that are aligned with a global, climate-related, economic transition, while managing physical risks associated with climate change. Implementation of these strategies would thereby reduce the financial risk associated with investment in these companies.
2. **Asset re-pricing and investment de-risking.** Incorporating physical and transition risk into asset pricing and therefore investment decisions and the relative cost of capital of risky versus less risky assets. Repricing would reallocate capital to companies and industries that required capital to make the transition happen and increase the cost of businesses with high transition or physical risk. The result would align investment and valuations with the transition and reduce global systemic financial risk.

Stranded assets, policy and the graceful decline to Net Zero

Implicitly, there is a third objective. When the climate transition scenario concept first became an important tool of risk management, markets and financial regulators were mainly concerned about the impact that “stranded assets” might have on global financial markets. By this thinking, stranded assets would occur when companies invested perhaps trillions of dollars in infrastructure and fossil fuel production assets that would cease to be economic when fossil fuel demand collapsed as a result of energy conservation and

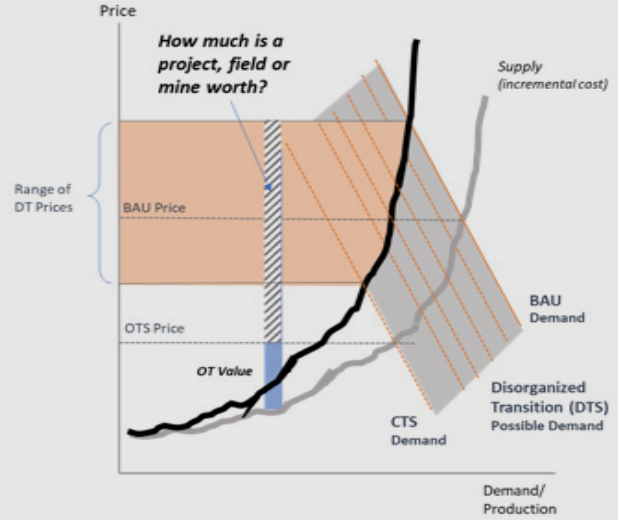
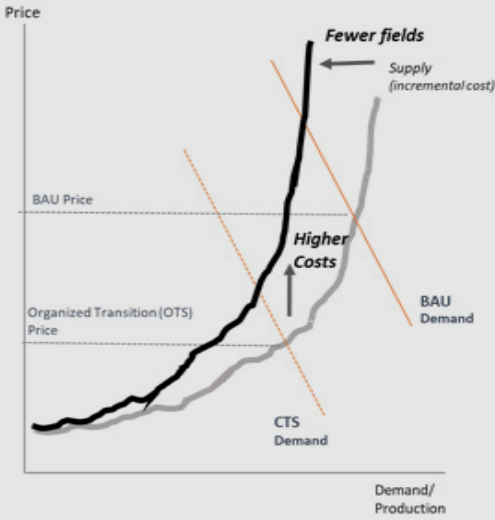
alternative energy supplies. The ensuing losses and write downs of these assets would reverberate through the financial system, causing higher interest rates, slower economic growth, job losses and significant financial instability. The goal of scenarios has been to encourage companies to avoid overinvestment and thereby reduce the risk of financial instability.

However, recent shifts in the investment landscape and the Net Zero investment trends could unintentionally have the opposite impact. What happens if investment falls, but the alternative energy sources and energy efficiency fail to materialize? The result could be energy shortages, leading to soaring energy prices. The response to high energy prices could be a recession and slower economic growth, combined with increased investment in alternative energy and energy efficiency, and even emergency (but inefficient) increases to fossil fuel investment to increase short term supply. A couple of years later, when the recession-driven fall in demand was met with a wall of new supply, oil prices could plummet, triggering the very stranded assets and financial instability the world was seeking to avoid. Potentially this cycle could repeat itself, as in Figure 5 above.

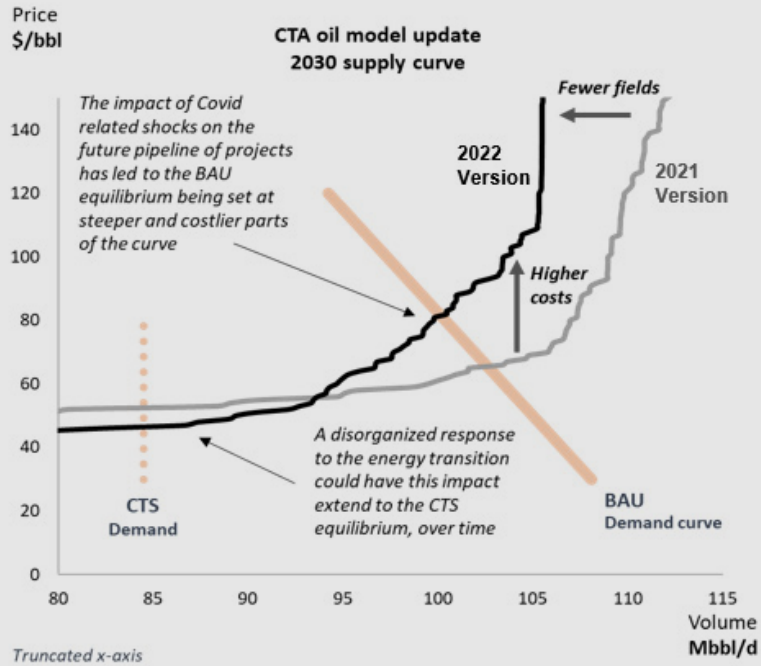
Figure 6: Cost of capital has increased as projects were withdrawn during the pandemic

Uncertainty about the transition and investor pressure raises the cost of capital and leads to project cancellations

Demand reductions are unpredictable and partially fail to materialize



The supply curve has shifted substantially in one year, with little forecast change in demand



Source: IEA, WTW modelling

Conclusion: a self-reinforcing trend?

For power markets and the economy, the trend could become self-reinforcing. The more that falls in supply are not balanced by increases in alternative supplies, the greater the risk of oil price volatility and the greater the imperative for conventional power companies to produce shorter term, more expensive, solutions to provide energy. Combined, these effects steepen the curve further and add even more volatility.

Only clear-cut policies to reduce fossil fuel demand can break this cycle and allow power markets to decline gracefully. In the meantime, power companies will need better data, more flexible strategies, and careful monitoring of trends to manage the volatile market. For its part, the world will need to hope for both alternative supplies and independence from supply side shocks like that driven by the Russia-Ukraine conflict.



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Power companies will need better data, more flexible strategies, and careful monitoring of trends to manage the volatile market.

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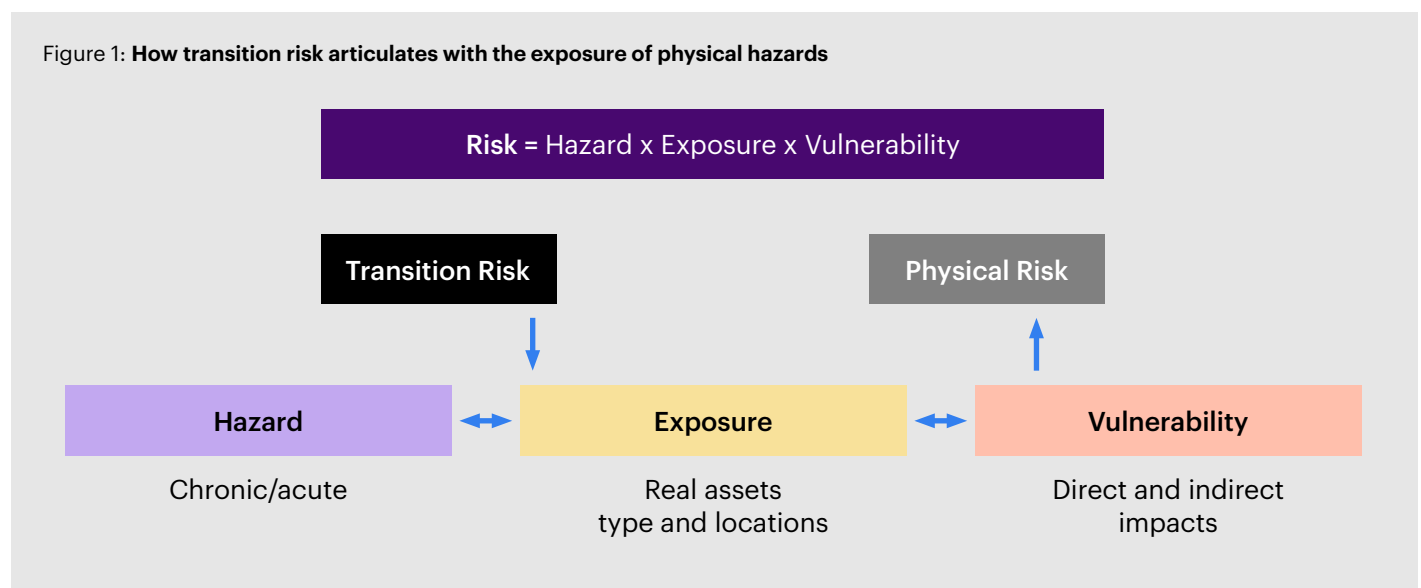


Physical and transition risk: the holy grail of investing in the future

Physical risks of climate change can have a dramatic impact on the balance sheet of companies at high risk of exposure to the loss events triggered by acute events such as storms and floods. Last year, global insured losses rose to an estimated US\$112 billion – the fourth highest on record¹. It was also a pivotal year as climate changes came knocking on the door of Europe’s biggest

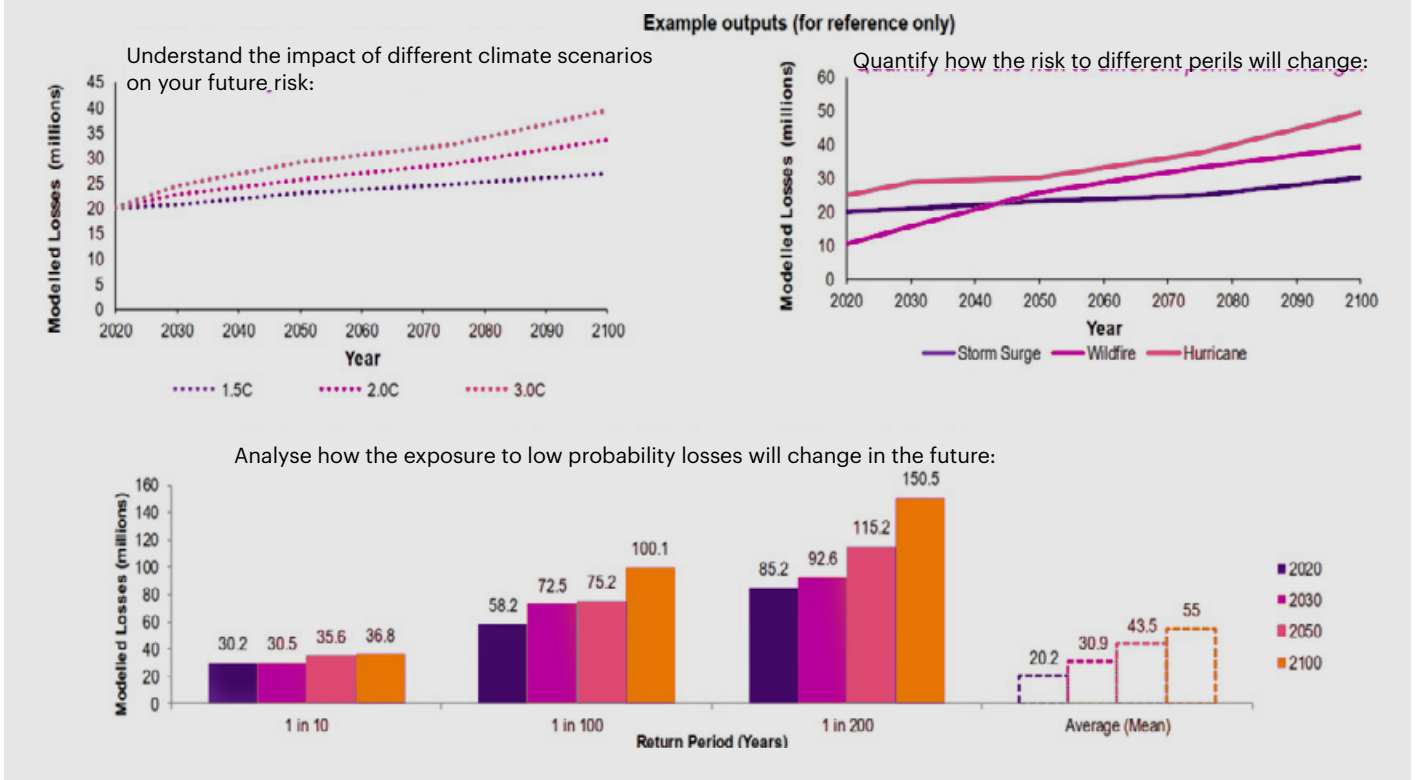
economy, with floods in Germany that triggered the largest losses on record for its insurance industry, with the government on the hook for uninsured damages. Meanwhile, hurricane Ida exposed a dramatic lack of resilience in the world’s largest economy. Such examples are likely to increase as we are already seeing the effects of carbon from fossil fuels that was burned decades ago.

Figure 1: How transition risk articulates with the exposure of physical hazards



¹ <https://insurtechdigital.com/digital-strategy/global-insured-catastrophe-losses-rise-usdollar112bn-2021>

Figure 2: Quantifying future climate risk over the lifetime of assets is WTW's natural domain



Source: WTW

The management of physical climate risk has never been so urgent; fortunately, WTW's heritage and leadership in natural catastrophe modelling and actuarial science give us a head start in understanding the impact of both acute events and longer-term chronic changes.

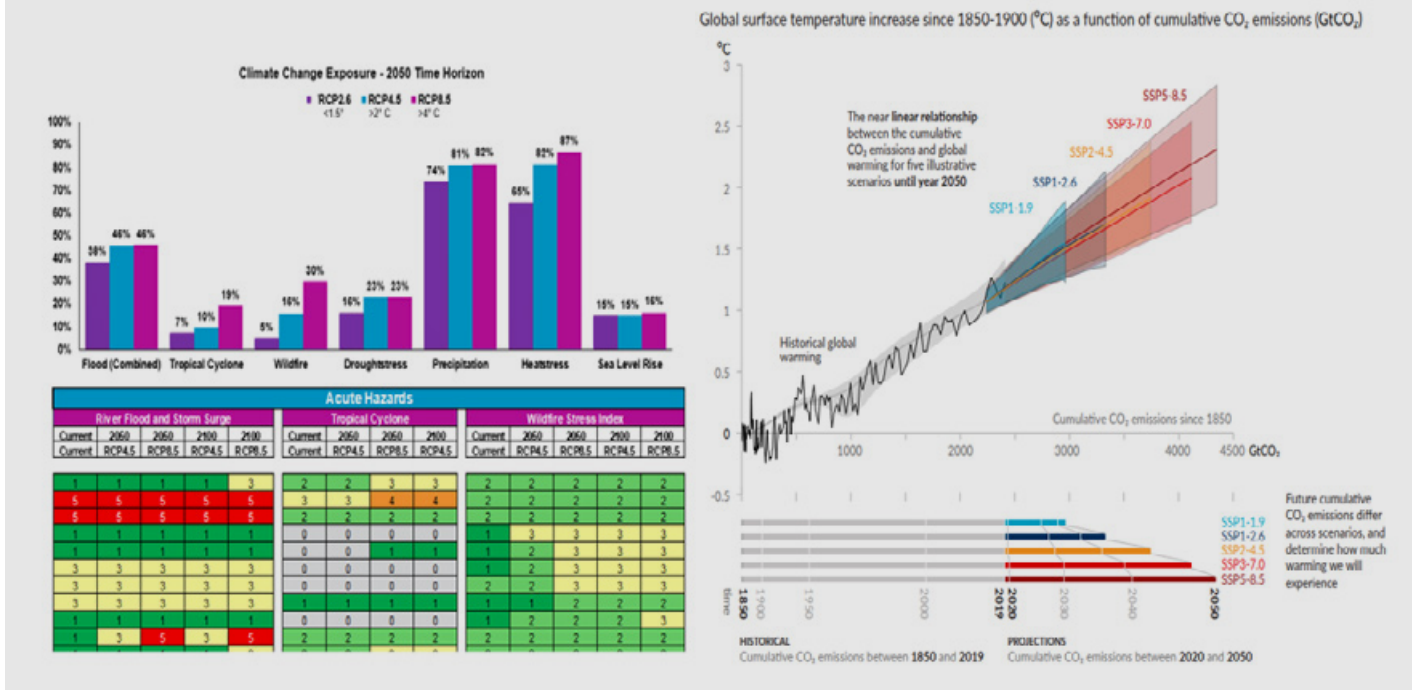
Natural catastrophe modelling developed within insurance indicates the value of the asset today, but we need new tools to understand overall climate risk over the long term. Within the Climate & Resilience Hub, we are building a platform that draws on this rich analytical expertise across WTW and integrates transition and physical risk analytics.

Factors that determine transition and physical risks follow a similar pattern, but with significant differences. Transition risks are largely influenced by global markets, such as commodities with variable impacts, depending on domestic policy, royalties or taxes.

On the other hand, physical risks, such as acute flood or storm events, are determined by the climate as it is today and longer-term, chronic changes such as rainfall or rises in sea level or temperatures. Forecasts of how the climate will change are by nature uncertain and can be further influenced by human interventions such as mitigation efforts, for example the decarbonisation of the energy system. The degree of exposure to these risks can also vary depending on human interventions such as adaptation, e.g. flood defences erected near critical infrastructure.

"Climate conditioned" models, drawing from the Intergovernmental Panel on Climate Change scenarios that project what may happen if the world warms by 1.5C or 4C by 2100, help us to understand how to allocate capital to align with the Net Zero targets.

Figure 3: Exposure to climate change can be modelled according to different warming scenario

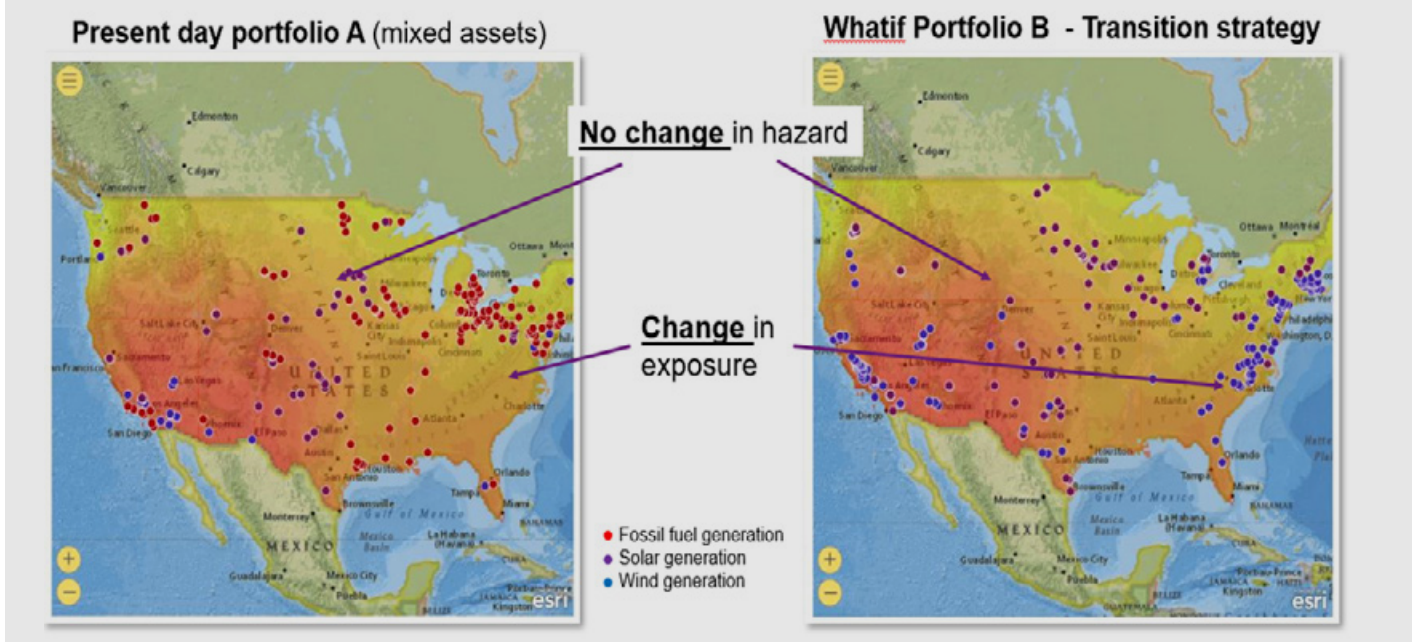


Source: WTW and Intergovernmental Panel on Climate Change, AR6 paper: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf

Although climate change is a global phenomenon, its impacts are always felt at the local, often very granular, level, i.e. a sea level rise might not affect inland agricultural activity but could hinder operations at an oil refinery, causing disruption to domestic fuel supply. Resilience measures are not just related to climate, of course, as we have seen in Taiwan where global semiconductor supply was disrupted by an earthquake in 2021 – not just because of the seismic shock but because of the dust that settled in the processing rooms.

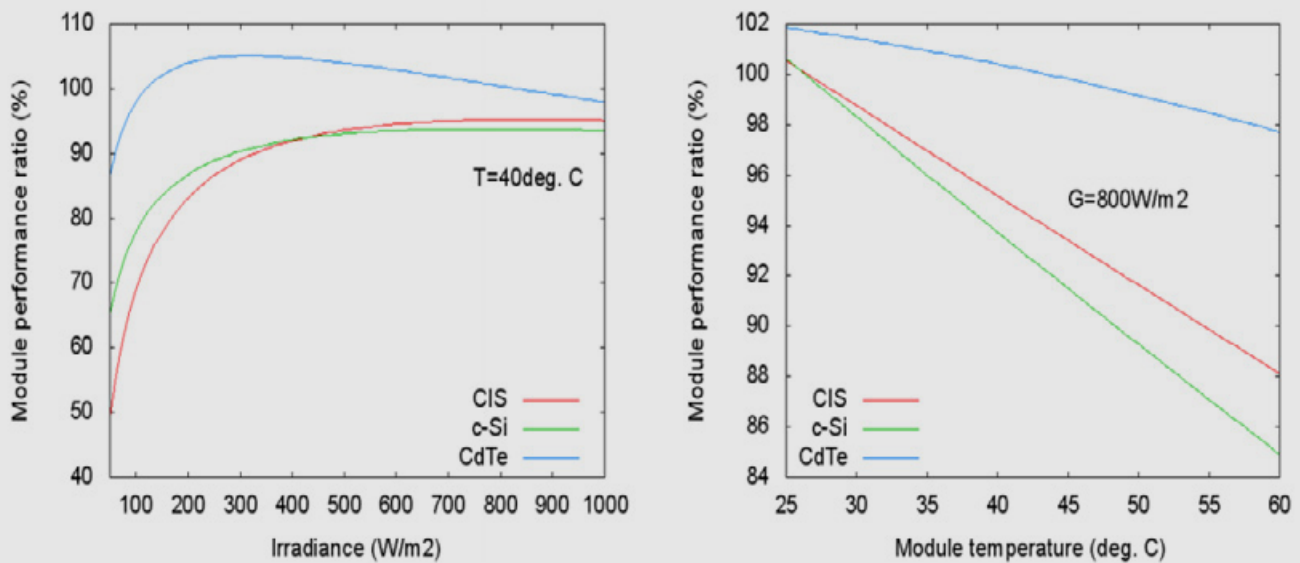
When it comes to identifying the potential for future risks, and the impact a transition might have on an energy company’s portfolio, we see a change in exposure to assets (even if the hazards are the same) when investments in clean energy technologies increase. Understanding these risks enables investors to price the risk more accurately.

Figure 4: A portfolio adjusted for an energy transition can have a dramatic impact on risk even when the physical hazard remains constant



Source: WTW

Figure 5: Temperature rises can reduce the efficiency of different types of solar technologies at different rates



Source: WTW

The application of new technologies, investment in renewable energy and power distribution, or carbon capture and storage, can all result in changes to a company risk profile, and in particular due to changes in type and magnitude of the physical risks that can be experienced.

When we drill down to specific clean technologies, we can model what the longer-term changes to solar radiation and air temperatures will have on solar PV. Understanding the difference in yield for better or worse can help manage risk and inform investment decisions, helping the selection of the correct subtype of technology. We can run similar models for wind power.

In particular, it is essential that the most appropriate sources of physical hazard data are used to represent the range of long and short term hazards which can affect a company's performance over defined timescales. Alongside this, the key vulnerabilities of assets, as well as supply chains, must be properly defined, or changes in customer demand due to long or short term physical impacts.

Multiple 'shock' events, whether from global geopolitical events, global pandemics or natural disasters, when added to expected changes to the frequency and severity of natural hazards, can have the effect of compounding the impact on organisations, resulting in losses and impacts greater than those expected due to a single cause.

Clearly some risks will be easier to identify than others, especially when there is no experience or the risks are rapidly evolving, and there is no 'crystal ball' that will identify future risks accurately. As part of a well-developed enterprise risk management process, the use of analytical tools and data can provide a means to work through a range of potential scenarios and help determine the most appropriate set of management actions that can be put in place to mitigate the most plausible risks identified.



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Investing policies and sustainability success: the role of investors in the energy transition these disorderly transitions

Introduction: three drivers of change

With the world transitioning to a low-carbon economy there is a society-wide change taking place, while simultaneously adapting to other societal and environmental pressures. In this article, we consider what part institutional investors are playing, could be playing, and should be playing in this transition. In particular:

1. **Fiduciary duty:** the ownership responsibility (and opportunity) that is carried by asset owners and asset managers involves a fiduciary duty of loyalty both in the financial and ESG context and in a member/ stakeholder context. We consider how the changing interpretation of fiduciary duty is affecting and will affect institutional investors.
2. **Asset ownership:** this involves the exercise of rights and responsibilities in voting, engagement, and shareholder resolutions. We consider how effectively these functions are performed and ways for these functions to be improved.
3. **Modern investment models:** we explore the mandates that asset owners and asset managers might design and manage to produce positive impacts on the economy, the environment and society within the constraints of fiduciary duty and of maximising risk adjusted return.

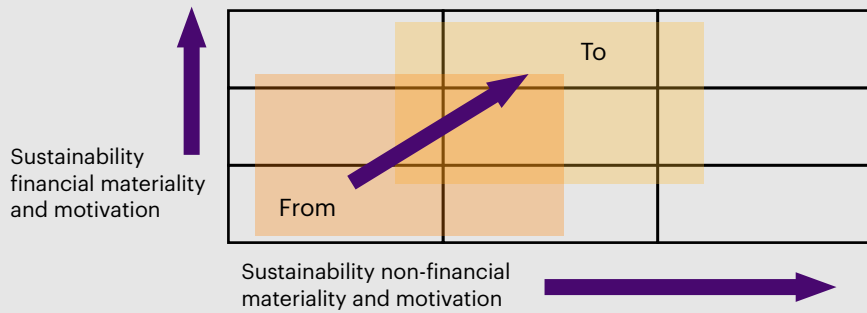
Figure 1: Investor high level principles and beliefs

High-level principles and beliefs	
<p>1</p> <p>Fiduciary model</p>	<ol style="list-style-type: none"> 1. The 'fiduciary window' is shifting in the direction of sustainable long-term value creation and wider stakeholder interest as a result of a combination of systemic forces - social, cultural, institutional, regulatory. 2. In developing sustainability principles there is a need to work within a beliefs framework in which systems-thinking, double materiality and the potential gaming of data are central. 3. Paris-aligned transition pathway strategies need to be designed and validated to 'work' within the fiduciary window.
<p>2</p> <p>Active ownership model</p>	<ol style="list-style-type: none"> 4. The active ownership function is critical to sustainable investment practice and is both under-resourced and under-delivering, requiring major improvements in the people model and investment model. 5. A number of practical considerations mostly related to incentives hold back active ownership from obtaining traction, in particular in passive and macro investing mandates. 6. System stewardship - engagement and advocacy that work on reducing system risks, particularly financial stability, climate change and social stability - is a critical activity to support sustainable investment practice.
<p>3</p> <p>Asset owner (AO) investment model and 3D (three-dimensional) framework</p>	<ol style="list-style-type: none"> 7. Sustainability factors (ESG) are material to financial factors (company performance and investment returns). 8. Financial factors (those generated by company and investor actions) are material to sustainability factors (real-world impacts). 9. There is a dynamic link over time between sustainability factors (real-world impacts) and financial factors (investment outcomes). 10. 3D AO investment framework can be created that balance the risk, return and impacts of strategies. These frameworks include 3D goals, longer time horizons, total portfolio thinking, dynamic asset allocation, significant active ownership, and scorecard reporting. 11. Long-horizon investing is critical to effective sustainable practice. It requires skill and mindset changes, and mandate clarity involving commitment of time, mutuality of trust and exchange of value. 12. Framing and reporting the materiality and validity of the data employed in decisions and reporting are critical to limit the hazards of gaming and greenwashing.
<p>4</p> <p>Asset manager (AM) 3D mandate</p>	<ol style="list-style-type: none"> 13. The 3D AM mandate - calling out 3D goals, longer-term orientation, and scorecard reporting - has a significant future in both active and rules-based strategies. 14. Paris-aligned Net Zero transition pathway frameworks and strategies involve integrating asset allocation and active ownership investment elements in a multi-stakeholder context with appropriate accountability, culture and reporting. 15. Transition pathway frameworks and strategies are laden with complex data issues and may require new standards to work within and third-party reporting assurance.
<p>5</p> <p>Challenges: reporting, data and the ecosystem gaps</p>	<ol style="list-style-type: none"> 16. There are gaps in our eco system that are compromising the effectiveness of sustainable investment practice. These gaps comprise enablers like critical infrastructure and incentives. They are most evident in skills; reporting, data and technology; collaboration and culture. 17. Scorecards are needed for AO and AM 3D mandates and should be designed to meet multiple stakeholder requirements. 18. Elements of organisational culture, notably purpose, inclusion and diversity, innovation, collaboration, openness and respect, are critical factors in the coherence of sustainability principles and the success of sustainability practice. 19. Legislation, regulation, and public-private engagement are also a 'gap' in the ecosystem, in that they could be shaped into a more effective enabler through increased industry engagement. 20. To address the limitation in the ecosystem, particularly skills, data and technology, collaboration, innovation and culture, we suggest will require the commitment of investment organisations to transformational change processes.

Source: Roger Urwin, "With great power comes great responsibility" Thinking Ahead Institute.

<https://www.thinkingaheadinstitute.org/research-papers/with-great-power-comes-great-responsibility/>

Figure 2: **Factors in the movement of the fiduciary window**



- The key test of the fiduciary window is whether the trustee board can visualise that in future intermediate and end state results - given a plausible range of scenarios for performance and changing factors and circumstances - the board will be able to support the policies adopted.
- This will depend on following sound process and documentation.

Actor	Factor	Weighting in the past	Weighting in the future
Investment industry	Industry theory and practice	1 st	+
	Empirical evidence	2 nd	o
State	Legislation and regulation	3 rd	+
Corperation	Corporate reporting and alignment	4 th	+
People	Member views	5 th	++
	Activism	6 th	++

- The multiple factors and circumstances arise from each stakeholder.
- The dynamic state of influences is demonstrated by increasing weights from several sources.

Source: Roger Urwin, “With great power comes great responsibility” Thinking Ahead Institute.

<https://www.thinkingaheadinstitute.org/research-papers/with-great-power-comes-great-responsibility/>

Driver one: fiduciary duty

The ‘fiduciary window’ denotes the set of investment policies acceptable from a fiduciary duty perspective, given current interpretations. The fiduciary window is described by one spectrum, stretching from short-term finance to sustainable long-term value creation, and by another from pure member financial interest to wider stakeholder interest.

The window is shifting in the direction of sustainable long-term value creation and wider stakeholder interest because of a combination of systemic forces – social, cultural, institutional, legal and regulatory. The fiduciary window concept is illustrated in Figure 2 above.

The core issues of fiduciary duty are that those who manage investments on behalf of others are bound by a number of fiduciary obligations, notably:

- Loyalty - putting the interests of beneficiaries first when determining the investment strategy
- Prudence and care - investing to the standard of care of a prudent expert

The importance of loyalty makes financial factors dominant, but not to the exclusion of other non-financial factors. The exact interpretation of these factors will not be black and white.

Fiduciary duty naturally evolves as circumstances evolve. But while the window has been stretched by the influences of sustainability, there remains a preciousness to fiduciary practice to retain financial primacy. This means that funds in most jurisdictions and circumstances must adopt policies that maximise risk-adjusted return, and not allow concessions from other motives that may diminish risk-adjusted returns.

This becomes important when policies depart from previous norms, as is possible with climate risk management strategies and climate alignment strategies. In a later section, we explore how such ESG considerations can work within the fiduciary window. The Paris-aligned or Net Zero strategies must reconcile several constraints, as well as the fiduciary standard which will mostly apply a high bar of needing to achieve at least the level of risk-adjusted returns that would have been achieved with strategies that omitted those impact elements.

The fiduciary test is interpreted differently in different jurisdictions. The US is widely referenced as a country in which fiduciary interpretation has been conservative on finance-first principles, although in practice this has followed the political cycle and so may well change with the recent changes to the administration in power.

The changes occurring in other parts of the world are substantially in the direction of more progressive practice, stretching the window in the direction of

wider stakeholders. It appears that the legal framework could support clearer practice to support non-financial goals by reference to the wider economy, communities and the environment as informed by the views of the beneficiaries themselves.

ShareAction's 'Responsible Investment Bill'¹ is framed in this way. Legal interpretation could also potentially benefit from guardrails or safe harbour provisions that call out appropriate limits. One possible area to identify is prescribing asset owners to work within 'do no significant harm' principles; one example of this is specified under the EU Sustainable Finance Disclosure Regulation (SFDR).

Driver two: active ownership

Active ownership is a combination of voting, engagement and shareholder resolutions - it uses rights and position of ownership to influence issuers' or companies' activities or behaviours related to ESG matters and other business practices. Ownership rights are exercised differently, depending on the asset class.

Most investors believe the benefits of successful active ownership exceed the costs, although this cannot be proved with existing hard data. But the activities suffer from being tricky to measure; they are difficult for asset managers to monetise; and some investors may not participate but may still benefit from the active ownership of others.

Both active and passive investors typically treat active ownership as a lower priority and manage it as a low-cost activity; this reflects the limited appreciation of the ability of this activity to deliver both private value and a 'public good' that all investors can benefit from. This results in the limited resources applied to active ownership - estimated by WTW to be less than 1% of total front-line investment expenses.

The benefits of collaboration represent one source of opportunity where partners are, ideally, seen as extensions of the organisation. Collaboration partnerships with high levels of trust and mutual dependence give the opportunity for each partner to focus on what it does best.

The accountability of industry participants for their active ownership is weak, reflecting the inconsistencies and lack of focus in reporting, together with relatively high degrees of opacity.

The delegation to asset managers, the use of engagement overlay approaches and proxy advisors, and improvements in the strength of these collaborative activities all represent methods that may help the effectiveness of the active ownership activity.

Driver three: modern investor models

Double materiality

The development of the 'double materiality' principle is a central consideration. First, ESG and other sustainability factors can be demonstrated to be material to financial outcomes. The materiality will vary by sector, but any fund considering long-term sustainable value should be interested in ESG as a financial factor with relevance to future outcomes (we can describe this as 'pre-financial' or simply 'financial').

Second, investors' actions and those of the companies they invest in can produce material real-world impacts (impacts on environmental or social factors). It therefore follows that reporting of ESG factors should reveal as much as possible about what these impacts are for the scrutiny of wider stakeholders.

The third aspect of double materiality is that it can be dynamic; real-world impacts ripple through the economy to the financial outcome of the investor. Put in other words, issues that are material from a societal perspective (such as climate change) can become material from an enterprise perspective, either slowly or rapidly. This is often denoted as 'triple materiality.'

The aim is to allow the company's shareholders and other stakeholders to make informed investment and engagement decisions. In recognising these issues, accounting standards must tread a pathway to balance what is material for different audiences with "interoperability" - structural connectivity between standards that companies use to report to different audiences.

These issues are actively being progressed within accounting bodies. The TCFD reporting framework is being increasingly adopted and, in some jurisdictions, being made mandatory.









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Any fund considering long-term sustainable value should be interested in ESG as a financial factor with relevance to future outcomes.

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¹ <https://shareaction.org/policies/responsible-investment-bill-the-change-we-need>

Figure 3: 3D framework – a straw model

			Lite	Full	
1	3D goals		• The portfolio and strategy seeks to integrate risk, return and impact (=positive and measurable social and environmental impact)	✓	✓
2	Total portfolio long-term thinking		• Strategy is focused on producing long-term absolute returns contributing to the total portfolio risk and return consistent with goals	✓	✓
3	Strategic partnership		• Adding IP to the AO outside the mandate; providing strategic input - investment strategy ideas, and reverse enquiry new mandate ideas	✓	✓
4	Core sustainability strategies		• Integrated ESG and active ownership adding insight and engagement to support value creation, short-term and long-term	✓	✓
5	Impact strategies		• Targeting and achieving real-world impact using UI strategies - portfolio and stewardship positions - including carbon management		✓
6	System-level agreement		• Addressing the systematic risk elements in their portfolios - climate change, financial stability, social stability		✓
7	Scorecard monitoring		• Has a long-term orientation; fulfils the impact information needed; is 'integrated reporting'; includes TCFD compliance; narrative and data	✓	✓
8	Other mandate details		• External managers governance and culture • Also termination terms, could involve closed-ended structures	✓	✓

Source: Roger Urwin, “With great power comes great responsibility” Thinking Ahead Institute.

<https://www.thinkingaheadinstitute.org/research-papers/with-great-power-comes-great-responsibility/>

3D investing

Asset owner policies are a parallel development here. The choices over managing ESG factors cover a spectrum from improving performance to, in some cases, creating impacts.

For impact strategies, we call these three-dimensional approaches ('3D' for short) where the dimension of impact is put alongside risk and return. Investors can in practice choose from one of two 3D approaches:

- Core sustainability strategies that exploit ESG issues through integrated ESG portfolio construction and active ownership; here the impact is 'lite' in that it arises from collateral influences and is generally second order
- Universal investor (UI) strategies that utilise additional strategies in systematic engagement and more significant ESG allocation strategies on top of ESG core strategies; here the sustainability impact is more 'full', being directly targeted and accounted for. It is important to emphasise that a universal investor seeks better long-term financial outcomes and real-world impacts by undertaking actions that produce impacts and improve performance.

The summary of the 3D framework is outlined in Figure 3 above, drawing out the features of the lite and full versions.

Currently, most strategies that asset owners have committed to have fallen into the 'lite' area as they have focused on allocations to companies that have in the past performed well on metrics of ESG performance. This is an approach focused on secondary market exposures which can produce only modest investor real-world impact.

By contrast, the universal investor strategy gives emphasis to achieving much more significant and intentional impacts, tapping substantially more into active ownership actions to manage sustainability change.

The challenges: reporting, data and other ecosystem gaps

Data and information sit alongside people and process as the key resources used by investment organisations. They are enabled by culture and governance as reflected by values and incentives.

We can characterise the technology and data challenge generally for investment firms as creating a technology system (data and knowledge management platform and infrastructure) that aims to process and channel relevant high-quality information adaptably, cheaply and efficiently into the investment process, with security and resilience.

But data and information challenges are more than just technology problems; there is widespread industry pressure for improvement of ESG data reporting standards and metrics. Investors and corporations have been subject to evolving regulatory requirements and proliferation of data sources/standards that have added an extra burden to the area. And it's not only a technical problem – there are culture, talent and governance problems mixed in.

Success will certainly favour those organisations that manage to evolve the highly imperfect ESG data sources into decision-useful forms via effective data governance and culture. The “secret sauce” here is a lot about governance and culture rising to the challenge of over-abundance.

There are mixed signs when it comes to progress on data standardisation and streamlining. We believe some aspects of the data challenges will always remain; attributing cause and effect ‘correctly’ in a complex system with multiple causes and multiple effects and two-way feedback will be difficult and inaccurate at best, and standardisation of data methods can progress only so far. A more realistic and effective strategy is to move away from the hunt for more and better data and towards the codifying of the existing data by reference to its inferential quality.

Conclusion: achieving sustainability success

The power of asset owners and asset managers is clear from the size of the assets they manage, variously assessed as a figure close to US\$100 trillion. We suggest that with great power comes great responsibility to make the changes necessary. We believe the future will favour organisations that are:

- collaborative, with research relationships across wider fields (like climate change)
- at home with 3D investing, coherently able to balance risk, return and impact
- innovative in research, thought leadership and effective engagement on ESG and impact
- deeply endowed with talent, to connect and engage key stakeholders
- effective culturally, with emphasis on purpose and people as central pillars

These hurdles are high, but over time we believe that a number of asset owners and asset managers will achieve some or all of this list.



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Climate change: potential liabilities for directors

Introduction: Directors' Liability Survey 2021-22

The last couple of years have seen a real change in the amount of legislation and regulation imposing obligations on directors in connection with climate change. Before looking at some of those changes in more detail, it is worth considering whether these risks are ones being recognised by directors.

Earlier this year, WTW published the results from our 9th Directors' Liability Survey (in partnership with law firm Clyde & Co LLP), having canvassed directors and risk managers in more than 40 countries around the world. Amongst other questions, we asked respondents to indicate the significance of 22 different risks for directors.

Climate change is ranked as the number 5 risk for GB, Asia and Australasia. By contrast, it doesn't even make it into the top 7 for Europe, North America or Latin America.

When we consider the responses broken down by industry groups, we can see that climate change is ranked in the top 5 for Energy & Utilities as well as Finance and Insurance. This is perhaps not surprising, given that Energy & Utilities have been aware of climate change as a risk for many years, while Finance and Insurance have been the subject of PRA stress tests looking at the financial risks from climate change¹.

Figure 1: WTW 9th Directors' Liability Survey results: top 7 risks by industry

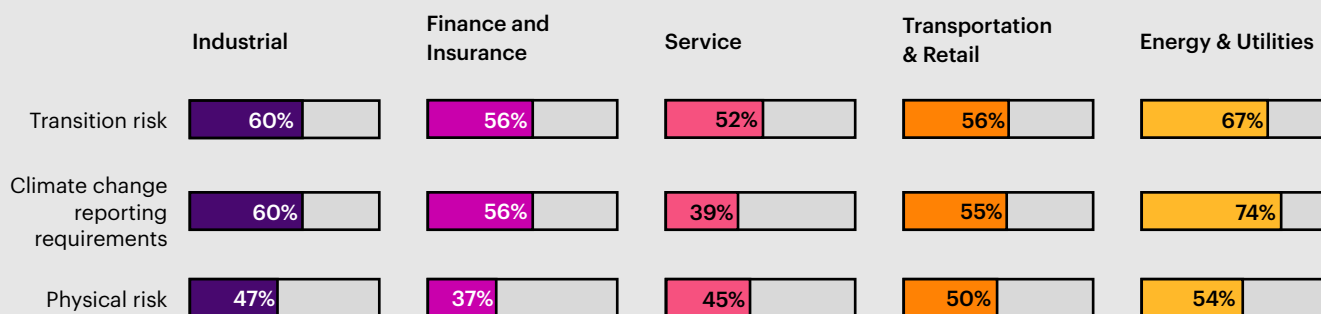
	Industrial	Finance and Insurance	Service	Transportation & Retail	Energy & Utilities
#1	Cyber-attack 65%	Data loss 65%	Data loss 74%	Cyber-attack 73%	Cyber-attack 76%
#2	Data loss 62%	Cyber-attack 62%	Cyber-attack 72%	Data loss 73%	Data loss 70%
#3	Cyber extortion 51%	Cyber extortion 60%	Cyber extortion 65%	Cyber extortion 61%	Cyber extortion 64%
#4	Regulatory risk 49%	Regulatory risk 55%	Regulatory risk 43%	Regulatory risk 59%	Health and safety 58%
#5	Health and safety 46%	Climate change 48%	Economic crime 43%	Health and safety 56%	Climate change 55%
#6	Economic crime 43%	Economic crime 45%	Criminal penalties from breach of sanctions 39%	Supplier business practices 49%	Regulatory risk 48%
#7	Supplier business practices 43%	Focus of a social media campaign 45%	Social engineering crime 39%	Criminal penalties from breach of sanctions 46%	Bribery and corruption 48%

Source: <https://www.wtwco.com/en-GB/Insights/2022/04/d-and-o-liability-survey-2022>

¹ <https://www.bankofengland.co.uk/stress-testing/2021/key-elements-2021-biennial-exploratory-scenario-financial-risks-climate-change>

Figure 2: **WTW 9th Directors' Liability Survey results: climate change risks by industry**

How significant are the following climate change risks for the directors and officers of your organisation?



(% of 'Very significant' or 'Extremely significant')

Note: Only those who answered that climate change is at least a significant risk for the directors and officers of their organisation

Source: <https://www.wtwco.com/en-GB/Insights/2022/04/d-and-o-liability-survey-2022>

For respondents who indicated that climate change was at least a significant risk, we also asked them to comment on how they rank transition risk, climate change reporting requirements and physical risk. The interesting result here is how much more significant the respondents from the energy and utilities industries considered all of these risks to be and, in particular, that they ranked climate change reporting requirements as by far the highest risk for their directors.

Existing laws in the UK

There are already duties imposed on directors in the UK relevant to climate change. In particular, section 172 of the Companies Act 2006² contains the following obligations:

(1) A director of a company must act in the way he considers, in good faith, would be most likely to promote the success of the company for the benefit of its members as a whole, and in doing so have regard (amongst other matters) to –

(a) the likely consequences of any decision in the long term,

...

(d) the impact of the company's operations on the community and the environment, ...

However, notwithstanding these existing laws, there have been several statutory and regulatory developments in the UK which have the potential to considerably increase the level of director risk in connection with climate change.

In December 2020, the Financial Conduct Authority (FCA) introduced a rule requiring premium listed companies to include a statement in their annual report as to whether they had made disclosures consistent with the recommendations of the Taskforce for Climate-related Financial Disclosures (TCFD) or, if they had not done so, an explanation of why they had not done so (a "comply or explain" obligation)³. This was then followed in December 2021 with an equivalent rule expanding this obligation to most standard listed companies in the UK⁴.

At the same time (i.e. December 2021), the FCA also introduced climate-related financial disclosure rules and guidance for asset managers, life insurers and FCA regulated pension providers, who will have to disclose how they take climate-related risks and opportunities into account in managing investments. They will also have to make disclosures about the climate-related attributes of their products.

Then on top of (and in addition to) the FCA rules for listed companies, the UK Government has brought into effect mandatory climate-related reporting for all large companies (whether listed or not) for accounting periods starting on 6 April 2022, under the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022⁵.

The Department of Business, Energy and Industrial Strategy (BEIS) has issued non-binding guidance on compliance with this new mandatory reporting

² <https://www.legislation.gov.uk/ukpga/2006/46/section/172>

³ <https://www.fca.org.uk/news/news-stories/fca-introduces-rule-enhance-climate-related-disclosures>

⁴ <https://www.fca.org.uk/publications/policy-statements/ps-21-23-enhancing-climate-related-disclosures-standard-listed-companies>

⁵ <https://www.legislation.gov.uk/uksi/2022/31/made>

obligation⁶. This guidance makes it clear that those companies which are both subject to the FCA rules and subject to the new Regulations will need to comply with both requirements. The guidance states that as both the FCA rules and the new Regulations are based on the TCFD recommendations, compliance with the TCFD recommendations for the purposes of the FCA rules will normally be likely to satisfy the requirements of the Regulations as well.

As well as the new reporting obligations, the UK has also imposed new obligations on Trustees of large pension schemes in connection with Climate Change, in the Pension Schemes Act 2021⁷.

The international position

Australia

In Australia, banks and insurers seeing similar climate-related stress tests⁸. In addition, in 2021 the Australian Securities & Investments Commission identified disclosing and managing climate-related risk as a key director responsibility and released a tranche of material which reiterates the need for listed companies to specifically report in respect of climate related matters in order to comply with their disclosure obligations and to also disclose relevant and useful climate related information to investors⁹.

It appears that the position in Australia may also be similar to that of the UK insofar as there are existing laws under which claims could be brought against directors in connection with climate change risks. In April last year, Noel Hutley SC released a further update to his earlier opinions on climate risk disclosure¹⁰. His updated opinion provides that companies and directors can be sued for “greenwashing” commitments to achieve their Net Zero carbon pledges or emission reduction targets without having any credible plans to achieve them. He also warned that there may also be liability under Australian laws for misleading or deceptive conduct.

European Union

The EU introduced obligations to make climate-related disclosures in the Non-Financial Reporting Directive in 2014. The Commission then supplemented this with non-binding guidance on reporting climate-related information in 2019 and in 2021 has proposed a Corporate Sustainability Reporting Directive which

proposes to expand the obligations in the Non-Financial Reporting Directive to all large companies and listed companies as well as expanding the obligations imposed¹¹. However, the Corporate Sustainability Reporting Directive has not yet been passed¹².

In the meantime, the EU has passed a specific rule in relation to financial products which promote environmental or social characteristics and financial products which pursue sustainability objectives¹³.

United States

While there is considerable discussion regarding climate change reporting obligations in the US, they have yet to impose equivalent legal requirements. The Securities and Exchange Commission has made it clear that it considers that climate-related risk is a matter which companies should be reporting on and has proposed imposing mandatory reporting requirements¹⁴. However, that rule is reported to be the subject of controversy as some of its proposals further than TCFD in requiring companies to make disclosures of emissions generated up and down the company value chain, including by suppliers and customers¹⁵.

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There is a whole sector of the plaintiff bar that makes it their business to find companies that have had a stock drop

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So, what's the exposure for directors?

Public statements

Why, then, do these developments have the potential to give rise to director exposure? Well, one of the main sources of claims against directors is in relation to public statements made by them. Particularly in the US, there is a whole sector of the plaintiff bar that makes it their business to find companies that have had a stock drop and to pick over the statements made by directors to see if there is anything they can find to tie the statements in with the drop in the value of the stock.

⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1056085/mandatory-climate-related-financial-disclosures-publicly-quoted-private-cos-11ps.pdf

⁷ <https://www.legislation.gov.uk/ukpga/2021/1/part/5/crossheading/climate-change-risk/enacted>

⁸ <https://asic.gov.au/about-asic/news-centre/speeches/corporate-governance-update-climate-change-risk-and-disclosure/>

⁹ <https://asic.gov.au/about-asic/news-centre/speeches/corporate-governance-update-climate-change-risk-and-disclosure/>

¹⁰ <https://www.minterellison.com/articles/summary-updated-hutley-opinion-greenwashing-climate-risk-directors-duties-april-2021>

¹¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0095>

¹² https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

¹³ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019R2088>

¹⁴ <https://www.sec.gov/news/press-release/2022-46>

¹⁵ <https://www.reuters.com/legal/legalindustry/will-secs-proposed-climate-risk-disclosure-rules-survive-supreme-court-scrutiny-2022-08-05/>

The very fact that directors are going to have to sign off on statements being made in connection with climate change means that other people can examine and, if they are so inclined, seek to challenge those statements. Many companies, particularly in the energy sector, will have been making statements in connection with climate change on a voluntary basis for many years. Now that they have to make statements in compliance with TCFD (and/or in compliance with the mandatory disclosure rules once they come into force), that will offer potential claimants the opportunity to compare what is being said now with what has been said previously. Even without reliance upon these rules, 2022 has seen a number of “greenwashing” claims and the introduction of these rules seems likely to increase companies’ exposure to these types of claim.

Regulatory action

Directors may also face regulatory action; for example, in the UK non-compliance by listed companies to the FCA’s “comply or explain” rule could lead to this. Moreover, the BEIS guidance on the pending mandatory climate change disclosure obligations in the UK specifically notes that failure to make the relevant disclosures could lead to the Financial Reporting Council (or presumably the Audit, Reporting and Governance Authority, when it comes in next year) seeking a declaration that the Annual Report, the Strategic Report, or the Directors’ Report do not comply with the requirements of the Companies Act 2006.

Again, we can see this in practice, with a number of regulatory investigations into alleged greenwashing in 2022, in the US as well as in Europe.

Derivative actions

Directors will also be exposed to potential derivative actions. Derivative actions often follow securities claims, but in addition to the potential for claims in relation to failures in connection with disclosures, directors could also be exposed to claims for breach of their duties in managing the business’s response to the risks associated with climate change. As noted at the start of this article, the UK Companies Act 2006 already imposes duties on directors which could be the subject of claims, for example alleging failures to consider the impact of the company’s business on the environment or the likely consequence of any decision in the long term.

Conclusion: a new world of duties

Despite all of these new and existing laws, the prospect of climate change-related claims being brought against directors in the UK remains an open question. The litigation regime in England & Wales remains challenging for potential class actions, while the prospect of adverse costs orders for failed cases continues to discourage potential claimants in a way that is simply not found in the US. However, a climate-related claim has recently been brought in the UK against the directors of a large energy company, demonstrating that there is a willingness amongst activist groups to potentially test

the waters. Were someone to successfully bring a claim and establish a precedent that may open the floodgates as that could get litigation funders interested.

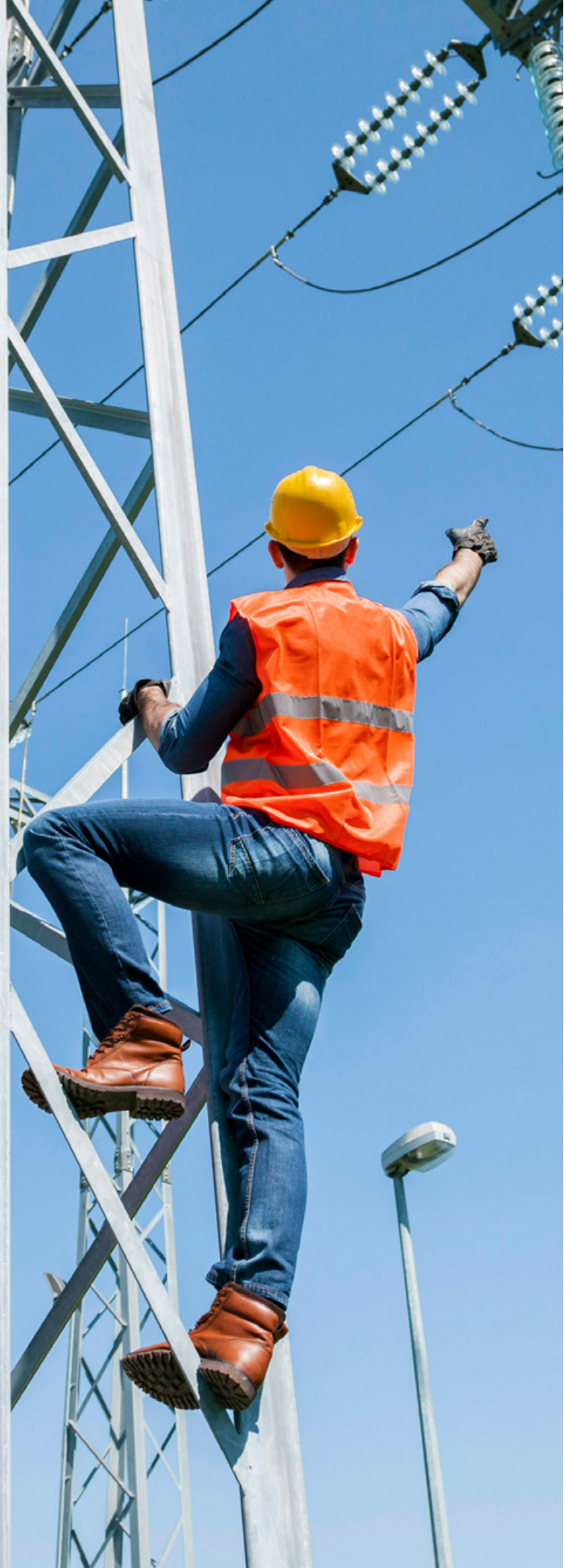
In other jurisdictions, the position is also developing. The US is probably the place most likely for claims to arise, simply because of its class action regime. While the US has not yet brought in mandatory disclosure requirements, greenwashing claims are already being brought and the SEC has been active in commencing “greenwashing”-related investigations and proceedings. Similar claims and investigations are also being brought in continental Europe.

So, we are in a new world of duties for directors and increased focus on this area and we are only just starting to see the impact.



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Geopolitical crises: their impact and management

Introduction: a new geopolitical map for the power industry

This article is written as the power industry negotiates the effects of COVID-19, responds to the increasing demands of ESG standards and begins to face the extraordinary impacts of the geopolitical crisis which has driven the war in the Ukraine - to name but one eruption along the ever-grinding tectonic plates of international power-play.

Companies are now caught up in economic politics as a non-kinetic response to war. ESG is shaped by geopolitics and vice-versa; environmental and societal changes will always drive human conflict, for example in the competition for water. Conversely, the scramble for raw materials, decarbonisation disparities and the ability of states and blocs to cooperate in a fractious and multipolar world will be the determining factors in the survival of the planet.

The risk quantification challenge

Many boards and risk committees struggle to find the meaning and quantify the potential business impacts of geopolitical developments, amidst the proliferation of corporate literature and 'chatter' on the subject. As with natural catastrophes, the drivers of geopolitical risks (as opposed to the political or 'country' risks which characterized the 'frontier and emerging' economies of the 90s and 2000s) are notoriously difficult to control, influence or offset with insurance. This creates an urgent need for guidance, methods and coaching to identify and reduce impacts where possible.

In the following paragraphs, the continued importance of managing geopolitical risks beyond the token dot on the risk matrix is highlighted, together with a short checklist based on the ways in which risk intermediaries can help power companies foresee and navigate geopolitical changes, prepare for unavoidable crises and increase their resilience to geopolitical shocks.

¹ Mead, Walter Russell. "The Return of Geopolitics: The Revenge of the Revisionist Powers." *Foreign Affairs*, vol. 93, no. 3, Council on Foreign Relations, 2014, pp. 69-79, <http://www.jstor.org/stable/24483407>



Defining geopolitics

There are many definitions to this term, but geopolitics is fundamentally about power relations between nations – at a political, economic, military, and cultural/ideological level.

Geopolitical risks conventionally occur at points of friction when status quos (and thereby stakeholders) are or are felt to be threatened. Ultimately, risks are probably reduced by all parties feeling that they have adequate control over real or potential threats from other states or blocs.

Impacts and nature of geopolitical risks

The impacts of a resurgence in Great Power politics since around 2008 are numerous, and now include the erosion of international institutions such as the UN, the IMF and the World Bank, together with the final nails in the coffin of a rules-based ‘new world order’. This in turn brings:

- credit, market and capital liquidity risks
- trade tariffs and investment restrictions (resulting in geo-economic degradation)
- supply chain frictions (leading to near and onshoring)
- turns toward regionalism
- vaccine and resource nationalism
- populism and autocracy

These are further amplified by geopolitical cyberaggression and misinformation campaigns.

It seems that de-globalization has set in. Consequently, there is greater awareness and ranking of geopolitical risk on registers, as well as regulatory obligations to consider - and not just quantify - risk scenarios since the 2008 financial crash. In the Financial Services sector, insurers and investment banks have a dual exposure to geopolitical shocks and chronic deterioration through their clients’ and their own exposures.

Geopolitical risks are becoming more complex and intertwined with other emerging risks in this age of transformation. Complex risks require complex adaptive responses; understanding and managing geopolitical risk therefore requires a holistic, cross disciplinary and synthetic approach. Increased uncertainty is now demanding more resources for sense-making and strategic adjustments.

Strategic ownership and oversight

Geopolitical risks management needs to be adopted at a strategic level of understanding and response. This is primarily because various functions in an energy company may be considering geopolitics in different ways, so alignment across various functions such as business expansion, treasury, security, legal and enterprise risk is required if coherence is to be achieved.

Ownership and management of this risk needs to be assigned at group or company level in order to identify and understand plausible scenarios, foresee the risks (where possible) and identify the dependencies and business impacts. This promotes strategic preparedness for any crises that may occur, as it is only an accountable leadership that can nurture the structures, culture and competencies that constitute a strategic crisis management framework.

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Geopolitical risks are becoming more complex and intertwined with other emerging risks in this age of transformation. Complex risks require complex adaptive responses

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Figure 1: **Activities – towards strategic ability through diversity**

Board	Risk Functions	Regional and Country
<p>Geopolitical Risk Ownership</p> <ul style="list-style-type: none"> • Terms of Reference for strategic geopolitical risk • Periodic Scenario Reviews • Challenge assumptions • Consider and Measure Business Impacts • Define and direct business response to impacts • External Relations: Direct the tone of corporate narratives • Allocate resources to risk mitigation strategies • Exploit strategic opportunities • Set questions for the Risk Committee • NEDs 	<p>Risk Committee, security markets risk etc.</p> <ul style="list-style-type: none"> • Development and monitoring of plausible scenarios and indicators. • Alignment of models across functions • Identify dependencies • Challenge assumptions • Business Impact analysis • 2nd and 3rd order risks • Challenge and develop mitigation strategies • Identify strategic opportunities <p>Requires</p> <ul style="list-style-type: none"> • Structure, discipline people resources to acquire the granularity for geopolitical analysis • Corporate strategy and risk framework • Cultural change 	<ul style="list-style-type: none"> • Identify geopolitical effects and business impacts • Anticipate likely effects and plan accordingly • Feed back into the risk analysis function • Amplify corporate narratives • Lobbying, where appropriate • Resilience through the building of trust • Spot local and regional opportunities and feedback for replication elsewhere • Identification and liaison with stakeholders e.g. governments

Source: Special Contingency Risks/WTW

Board buy-in critical

Board buy-in is critical to ensure integrated planning for and reactions to geopolitical scenarios and to capitalize on opportunities thrown up by changes in the current and future operating environment. Those responsible at board level should be assisted to challenge every assumption they have about their business model and their key functions in terms of exposure to geopolitical change.

Approaches to implementation

All businesses are exposed to and are affected by geopolitical risks in different ways; it is therefore important that situational awareness is built, sense is made of it and that specific business impacts are identified. There is no syllabus and no ISO; however, the analytical approaches found in the Risk Management, Business Continuity, Crisis Management, Market Risk

and Intelligence & Security functions are all relevant and can contribute to a pragmatic approach to geopolitics. In the United Kingdom, the work of the Risk Coalition has pioneered a principles-based guidance and a self-assessment tool to evaluate where organisations stand in their ability to manage the challenges presented by geopolitics - an excellent starting point².

The first challenge is that the nuances of geopolitics do not lend easily to quantification. In the minds of some risk managers, the trite phrase ‘if it can’t be measured it can’t be managed’ prevails and excludes the subject from the overall risk calculation - at the company’s peril. Indeed, attempts to apply figures in the guise of prediction of probability can cause more problems than they solve. Any quant models that exist should be supplemented and be subordinate to well thought out and regularly reviewed scenarios and selected indicators that those scenarios are playing out (or not).

² <https://www.riskcoalition.org.uk/geopolitical> accessed 10 Mar2022

Boardroom apprehension

Boards and risk functions are understandably reluctant to adopt 'yet another' risk function or lens. Many of them may be prone to what diplomats call 'dinner party darling' syndrome, where a well-connected and polished individual dispenses 'inside' information and scenarios to senior management which is then uncontested by the risk functions. Others may point to geopolitical risk on the ERM "matrix" as proof that it is being considered. It is sensible to adapt or augment successful risk management frameworks that are already in place, such as enterprise or security risk. Here it is possible to blister geopolitical risk on to the Three Lines of Defence (3LoD) risk model, although audit is probably best conducted by an external body with the required skill set. A more comprehensive lists of suggested activities at board, risk and function level are shown in Figure 1 above.

Importance of regional and country teams

Some of the most geopolitically risk aware and agile businesses in the energy sector have achieved their awareness through the endeavours of their regional and country teams. Although country politics are not necessarily geopolitical in nature, there are few countries that are not influenced by geopolitics. This obviously increases at regional level as blocs and opposing alliances form and rub up against each other as in, for example, the South China Sea or in the Shia Arc of the Middle East. This is where corporate narratives can mitigate risk, trust may be built with local stakeholders and the local business impact of geopolitics can be assessed and reported into the risk functions and committee.

Conclusion: five ways for the insurance industry to engage

Finally, the insurance industry must engage with geopolitics and change, as it surely will, to deal with the demands of ESG risk. So, what can be done by the insurance industry to foster and promote geopolitical risk and opportunity management? We would suggest the following five ways to engage with this issue:

1. Build internal geopolitical analysis capacity, in tandem with ESG and other emerging risk offerings, to help clients identify geopolitical risk scenarios. Do not rely on AI feeds to gauge future plausible scenarios – instead, invest in bespoke client-specific qualitative analysis as well as quant.
2. Build links with and act upon interactions with academics, diplomats and thought leaders on the subject.
3. Offer geopolitical risk management implementation advisory. This should assist client leadership to adjust policies, structures and processes in order to fulfil statutory scenario-building (and any future) obligations, conduct business impact analysis and drive proactive strategic planning (see Figure 1 above).
4. For geopolitical events beyond a client's control (the majority of them), offer Crisis Management preparatory training and advisory to complement insurance and to minimise damage to people and assets whilst protecting reputations.
5. Socialize and grow practical geopolitical analytical and implementation expertise within and across relevant (for example, ERM, ESG and Political Risk) insurance offerings.

The power sector is front and centre in this age of transformation. To adapt in order to survive, its understanding of and strategic responses to risks presented by geopolitics, the environment, societies and other phenomena that drive them, is now critical to the resilience that will be severely tested in the decades to come.



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Property valuations: time for a reset?

As the power sector embraces the energy transition, charting a path to Net Zero, is it time to re-think how the insurance sector handles property valuations, given the recent increases in inflation, geopolitical changes and the future promise of major investment activity?

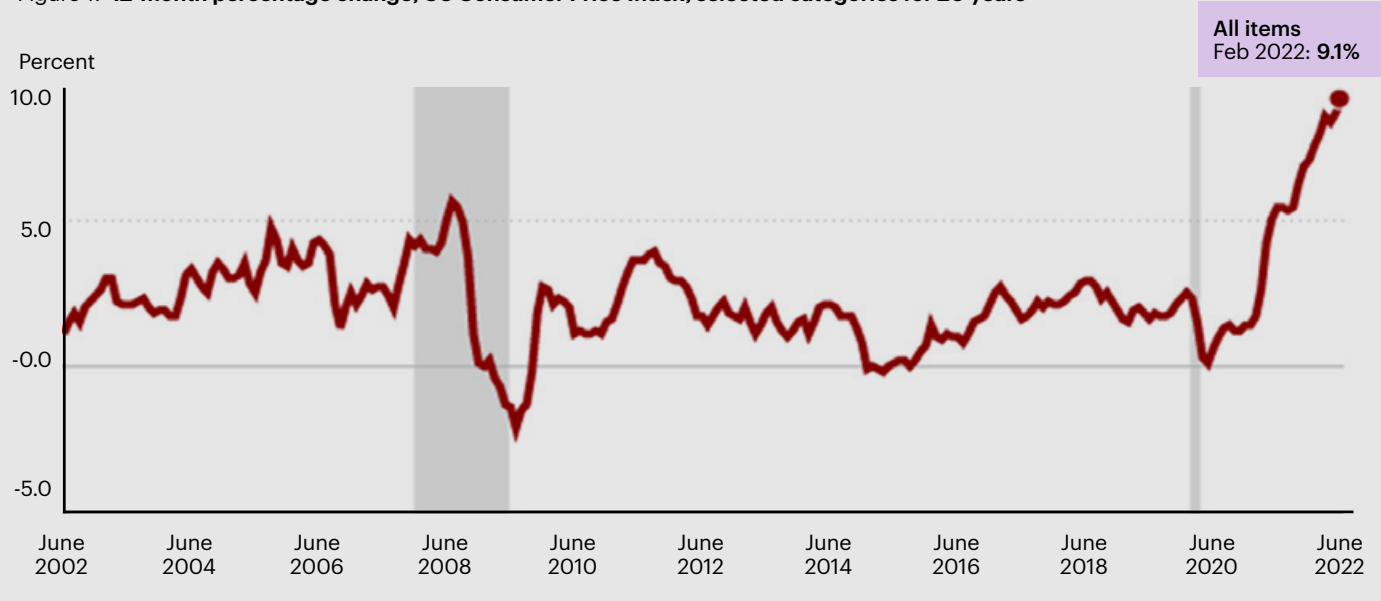
In this article we will explore the current background to property values, the factors that influence their development and what we can do in the insurance sector to address many concerns that stakeholders have with this important aspect of insurance purchase.

A new economic environment

As countries began to shake off the remnants of the pandemic earlier this year, the global economy was looking highly uncertain and volatile. We've observed many commodity prices surge to unprecedented levels arising from high demand, as economies emerged from lockdowns; moreover, inflation reached levels not experienced for over 40 years.

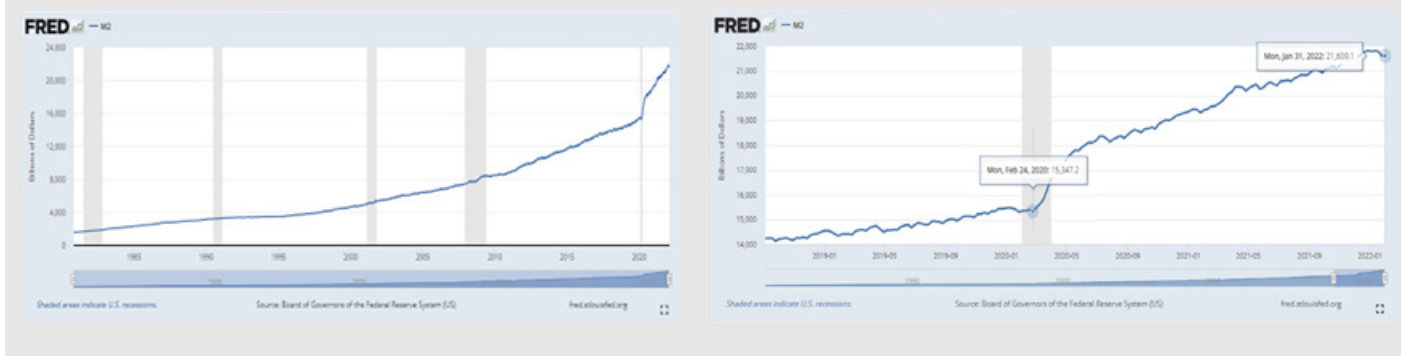
Many central banks hoped that this spike in inflation would be transitory and short-lived, reducing as supply chains return to near pre-COVID levels. That illusion has been shattered with the start of the Ukraine-Russia war.

Figure 1: 12-month percentage change, US Consumer Price Index, selected categories for 20 years



Source: U.S. Bureau of Labor Statistics <https://www.bls.gov/charts/consumer-price-index/consumer-price-index-by-category-line-chart.htm>

Figure 2: US Money supply (M2)



Source: Board of Governors of the Federal Reserve System (US) <https://fred.stlouisfed.org/series/WM2NS>

The introduction and expansion of sanctions from western governments across much of the Russian financial sector and “influential people” has quashed any thoughts of inflation being transitory. In fact, inflation has exploded over the early part of this year – we have seen that the world’s ninth largest economy, a significant supplier of commodities, can’t be shut off without having a major impact on the world economy.

Added to this is the extensive quantitative easing that following the post-2009 crash and the massive COVID-19 stimulus packages undertaken by many western countries, which has left their respective central banks with very little room to increase interest rates. As an example, the US increased money supply by US\$6.3 trillion in the last two years, as outlined in Figure 2 above.

Increasing interest rates to the required levels of around 7-10% would have the potential to crash the world economy which no one wants to happen. Consequently, lower interest rate rises are expected by central banks; as such, high inflation is here to stay for the foreseeable future.

In recent months some commodity prices have started to drop, while talks of country and even global recessions have picked up. This has made the mapping of inflation even more challenging as it will not be uniform across all areas of the economy.

The challenge of declaring property values

As we now enter a radically new age of significantly higher inflation, this is going to present a major challenge to insurers and insureds alike when it comes to the declaration of property insured values. Values will increase more rapidly than in previous years on a like-for-like basis; as such, we anticipate a greater desire by insurers to see new valuations. This is directionally going to increase total declared values, meaning premium increases for insureds; this will be a less than desirable outcome, coming on top of the significant rate and premium hikes over the past few years.

How can this seemingly impossible situation be resolved? The declaration of appropriate property

insured values is important to support an efficient insurance market that is ready and able to provide cover and pay claims in a timely manner from loss events as they occur. This is easier said than done, as each party may seek to exploit this situation for their short-term gains. However, if one-sided practices prevail, they will damage the integrity of the market to meet its stated intent, both in the short and longer term.

A more collaborative framework therefore needs to be established whereby all stakeholders feel fairly treated. The first step in this process is a transparent understanding of how property values are constructed.

The key factors in a complex puzzle

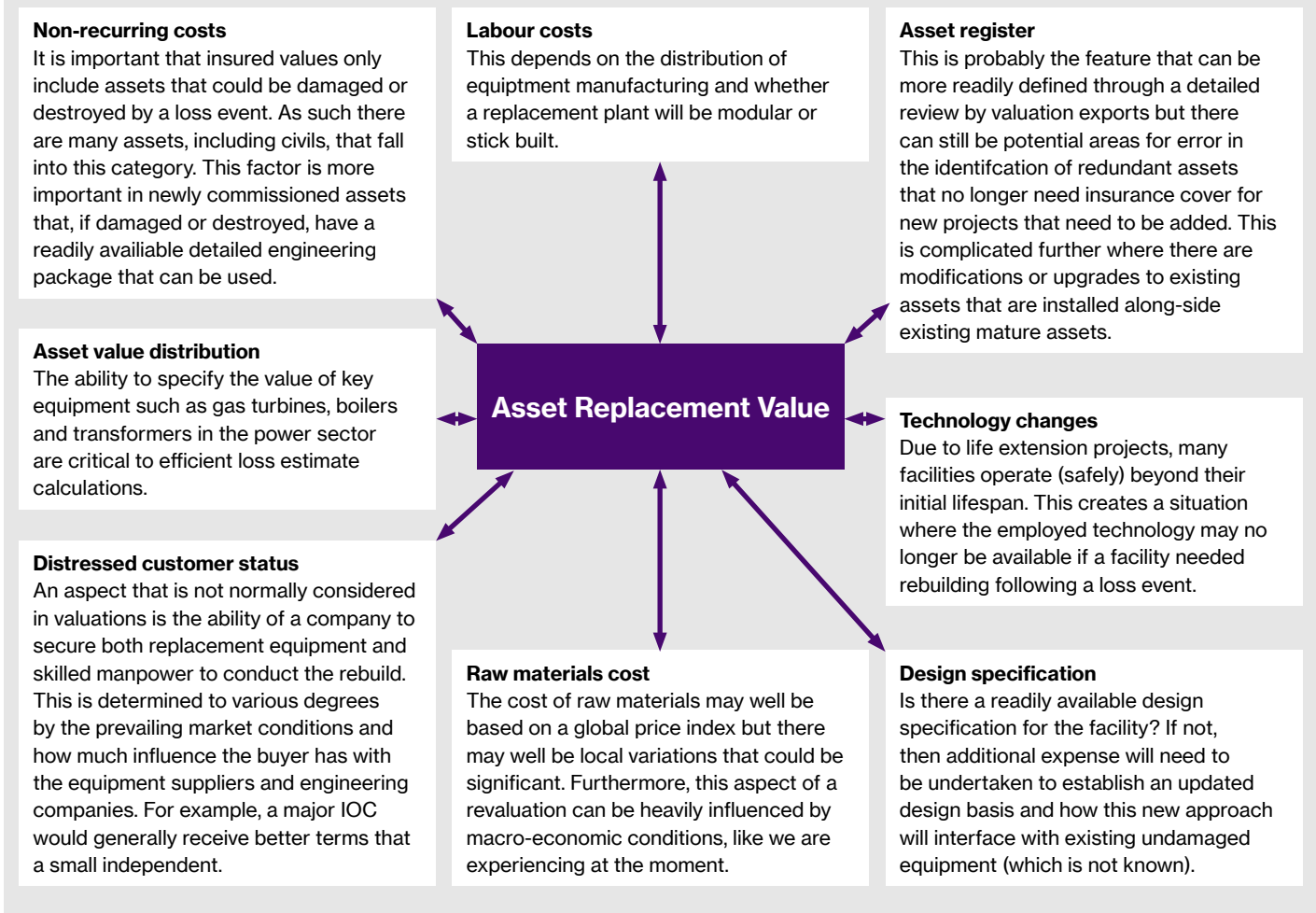
We shouldn’t underestimate the task of determining insured values as there are many complex factors that can influence them, many of which are difficult to estimate and some of which are subjective in nature. Therefore in some ways it’s not surprising that there are such concerns and differing of options over the actual values. So it’s important that greater understanding and agreement is achieved on this topic across all stakeholders.

It may be helpful to briefly explore the factors that significantly influence the setting of appropriate insured values. For the most part, they are provided on a replacement value basis; although book or actual cash value can also be used to determine insured values, for the rest of this article we will focus on a replacement value basis.

Some of the key factors are:

- Asset register
- Asset value distribution
- Raw materials costs
- Labour costs
- Design specification
- Distressed customer status
- Technology changes

Figure 3: Elements that make up asset replacement values



Source: WTW

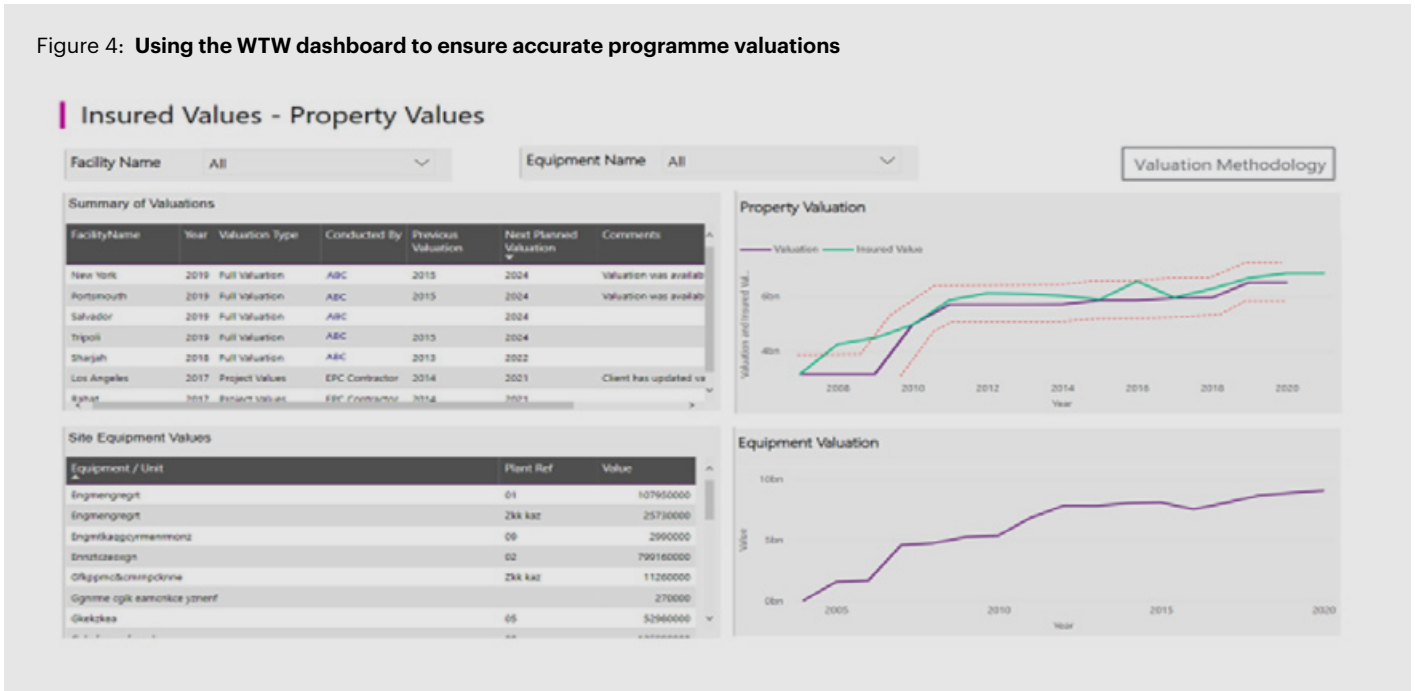
Each of the above factors are complex topics in their own right and have a broad range of influences or interpretations that can affect both the magnitude and weighted importance in insured values calculations. Furthermore, there is the change in these factors over time which must also be considered, so it is not surprising that we observe significantly differing views on declared values between stakeholders.

These differing views lead to significant price and premium flow volatility that is amplified during extreme market conditions in both hard and soft market environments. It could well be argued that values volatility could well cause these market cycles to some degree.

So is there a way to improve transparency and develop an agreement structure for values calculations? If so, this would surely work to dampen market volatility, increasing price and premium flow certainty.

Having a market that exhibited both these characteristics would be beneficial to both the insured and insurers as it would increase market stability, allowing all parties greater clarity and confidence in setting premium budgets. This would not only make for a more efficient market in terms of pricing but arguably claims would be settled quicker, as one of the key areas of claims dispute would have been removed.

Figure 4: Using the WTW dashboard to ensure accurate programme valuations



Source: WTW

A more efficient market?

An essential initial step towards a more effective insured values framework would be to improve transparency on the calculations methodology and the factors employed. This would provide a basis for an open dialogue between stakeholders to start building a better understanding of each party's points of view.

This is not to suggest a standard valuation framework across all programmes but more a protocol for agreeing the valuation framework that best suits each individual programme. This would allow for flexibility in the approach to consider specific company/sector nuances.

A possible first step could be to develop an initial view of the key metrics on each of the factors influencing insured values and a means of monitoring their evolution over the coming years. In many cases, indices are normally selected as they offer a quick and time-efficient way to achieve this objective; however, this approach is not a panacea as many have built-in biases that can distort values estimation (e.g. geographical bias).

WTW is keen to promote this engagement with all stakeholders; we are using our Natural Resources risk engineering dashboard as a platform to support and build stakeholder engagement in these early stages. The dashboard seeks to provide a clear values history, with details of the key underlying factors to create this deeper understanding that has been discussed in this article.

Conclusion: towards a more transparent understanding of value calculation

Overall, a more transparent understanding of how insured values are calculated will benefit all market participants. Buyers will see greater price stability, reducing the likelihood of large swings experienced between hard and soft market conditions. Insurers will increase their confidence level on received insured values and the premiums they are requesting.

The key factor for success is collaboration and by working together, we can develop a more efficient market that benefits all stakeholder both in the short and longer term.

These initial steps, albeit simple, are vital as we move into a higher inflationary environment, as the dynamic nature of the factors influencing insured values will be moving more than in previous years, when inflation was much lower.



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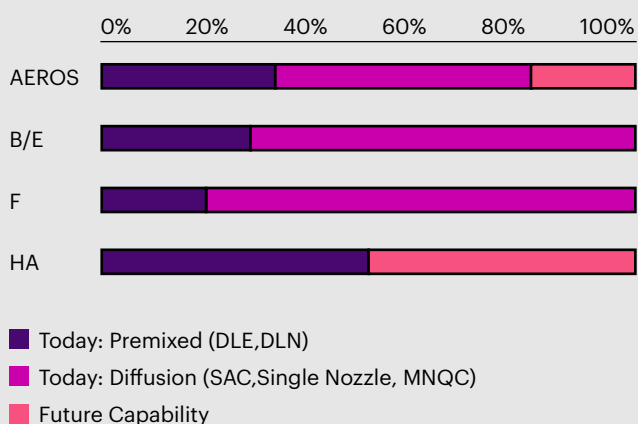
Gas turbine power plants: are they hydrogen ready?

Introduction

The transition to using hydrogen rather than natural gas as a fuel for gas turbines is becoming an increasing reality as the global power industry looks to invest in hydrogen-ready technology. The attraction of the fuel is that it is carbon free, so when combusted in a gas turbine the main product of combustion is steam, with no carbon dioxide emitted.

There has been a steady interest in hydrogen for over thirty years, and particularly in the last decade as gas turbine manufacturers have focussed a part of their R&D activity towards the development of hydrogen ready gas turbines and hydrogen ready power plants. Presently new gas turbine technology can burn up to 100% hydrogen and new power plants built adjacent to hydrogen hubs can in theory burn up to 100% pure hydrogen. The graph below from GE demonstrates the technical ability to burn hydrogen today across their gas turbine portfolio.

Figure 1: **Burning hydrogen today across the GE gas turbine portfolio**



Source: GE Hydrogen Overview
https://www.ge.com/content/dam/gepower-new/global/en_US/downloads/gas-new-site/future-of-energy/hydrogen-overview.pdf

Hydrogen concerns

During the last few decades, the large frame gas turbine manufacturers have experimented with mixing hydrogen into gas turbine methane. One of the key problems faced by the combustion designers is controlling the Nitrous Oxide emissions (NOx). Reducing the NOx emissions using more air, steam, or water to cool the flame reduces the efficiency of the gas turbine; this is undesirable as manufacturers have invested heavily in increasing gas turbine efficiency.

The other main issues with hydrogen as a fuel are:

- The potential for a higher flashback risk, due to higher flame speed (approximately ten times faster than methane) and a higher autoignition risk, due to the lower ignition delay time
- Changes in flame frequencies and intensities, used for combustion flame monitoring to avoid mechanical damage to the burners
- Hydrogen has a lower Wobbe Index, due to lower volumetric heating value MJ/m³ (as its less dense) - natural gas is 47 while hydrogen is 40. This means the output will vary with the blend of the fuels
- Hydrogen rises and disperses faster than methane when released into the air, so it is more difficult to identify a leak
- Hydrogen molecules are the smallest of all molecules; it is therefore more prone than methane to leaking through joints, cracks, and seals on valves
- Hydrogen atoms can diffuse into the lattice structure of metals, causing hydrogen embrittlement
- Hydrogen's flammability range in air is between 4% and 75%, which is a much wider range than that of methane which is 5% to 15%; hydrogen therefore needs much less air to burn.

Despite the issues with burning hydrogen, it is still an attractive fuel as it has the highest calorific value of a fuel gas at 120-142MJ/kg with methane at 50-55 MJ/kg. The products of hydrogen combustion are steam, and this steam will more readily transfer heat to the combustion liners and combustion hardware. The lifetime of these components may reduce if burning higher blends and volumes of hydrogen.

Gas turbine burner evolution

The dry low Nox burner method currently used in operators' gas turbines will accommodate a blend of hydrogen, typically up to 20% for F type technology. The Alstom GT26, with sequential combustion – and therefore with improved flame temperature control – can accommodate up to 30% without modifying the hardware.

To burn hydrogen blends over the 20% to 25% range, the original equipment manufacturers (OEMs) have had to test new design burners to avoid NOx emissions. The 3rd and 4th generation burners adopted for use with hydrogen are an evolution of the DLN (dry low NOx) technology. Each manufacturer has developed its own system based upon premix swirling of gas, vortex in the burner, pilot air, micro-mixing, and high velocities to avoid flashbacks at lower outputs of the machine.

The major OEMs (including Siemens, GE, MHP, Ansaldo,) have developed new DLN burners so that owners are able to retrofit a burner from the OEM. The Dry Low Emission (DLE) technology is designed to leverage the capabilities of 3D printing technology to manufacturer complex burner configurations to improve air and fuel mixing. The DLN burner technology now has the potential to enable fuel flexible operation at zero to 50% blends of hydrogen and methane, with low emissions.



Advantages for remote power stations

For gas fired power stations that are not constructed near a hydrogen hub or dedicated hydrogen gas pipeline; indeed, in the USA alone there are 1,600 miles of dedicated hydrogen pipelines. The option of burning a blend of hydrogen and methane maybe therefore an attractive way to improve CO₂ emissions at these plants.

For example, an open cycle gas turbine operating at 300MW with methane gas blended with a 15% by volume of hydrogen will, in one hour, consume 1,500 kg of hydrogen and save the burning of 3,600kg of methane gas. Most importantly, there will be a reduction of approximately 10 tonnes of CO₂ emissions for that one hour. Clearly as the percentage hydrogen increases, the CO₂ decreases, so why not transition sooner with higher percentages of hydrogen? The restriction is due to the National Gas Pipeline systems which were installed for natural gas (methane) transportation.

Natural gas transmission & distribution networks

Natural gas pipelines are generally manufactured from a low carbon steel, typically 0.3% carbon to API standard 5L grade B. This steel pipe is perfect for methane gas as the molecules are “large” and do not penetrate the steel. The opposite is true for hydrogen at typical NTS pressure of 100bar.

Generally, hydrogen contained in the pipelines is molecular hydrogen (H₂). However, atomic hydrogen (H) can develop in pipelines, dissociating at the surface of the pipelines wall, according to Sieverts’ Law. This law demonstrates that as pressure increases, the quantity of atomic hydrogen dissolved in the material lattice increases; consequently, hydrogen embrittlement becomes more severe. The embrittlement can then lead to stress cracking in the pipeline wall, with a reduced service life and potential for failure.

To overcome the problem of hydrogen embrittlement, gas pipelines need to be laid using an alloy steel in the manufacturing process. The recognised standard for this steel is ASME B31.12-2019 (hydrogen piping and pipelines) which recommends the use of X42 and X52 grade steel pipes. This standard stipulates that hydrogen embrittlement at low temperature performance must be considered. Should the environmental conditions be extreme, then X56, X60, X65, X70, X80 alloy steels should be considered.

These alloy steel pipelines are at least two to three times the cost of a standard gas pipeline and become prohibitive for an in-service gas fired power station to justify replacement of its feeder gas pipeline from the NTS. To feed purpose-built new gas turbine plants designed and operating on 100% hydrogen, new or replaced piping infrastructure would be required for 100% hydrogen transport.

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Clearly as the percentage hydrogen increases, the CO₂ decreases, so why not transition sooner with higher percentages of hydrogen?

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Hydrogen blends

For in-service power stations connected to existing gas NTS infrastructure, the possibility of burning low percentage hydrogen gas can be realised. A blend of hydrogen - between 0 to 10% mixed with natural gas - is considered to be a low level that does not require any changes to materials or designs, with only minor or zero modifications to control and protect at the power station.

The blend of hydrogen in methane has currently no defined safe limits in standards documentation or in legislation, but a 10-20% hydrogen blend is generally considered a safe range. Analyst studies suggest that 20% hydrogen concentrations by volume may be the maximum blend before pipeline material upgrades are required. If less than 20% hydrogen is introduced into distribution system, the overall risk is not considered significant; however, if the hydrogen level in natural gas increases beyond 20%, the overall risk in pipelines can significantly increase¹.

Hawaii Gas Company provides gas on the island, distributing synthetic gas with a significant hydrogen concentration. The “syngas” in its Oahu pipeline system, which is derived from naphtha, contains approximately 15% hydrogen and there have been no reported issues².

If we categorise medium levels of hydrogen mixed with natural gas as a range of 10% to 30% hydrogen, this still does not require significant changes to materials, designs, control, and protection at the power station. For example, seals may have to be changed on gas control valves; however, the existing burner technology can still be used. The acoustic and pressure monitoring systems on the burner cans may have to be recalibrated for higher frequencies, and on load combustion tuning may have to be fitted as a standard. A review and improvement of gas detection systems on site is considered necessary. This would be prudent from an environmental perspective as it would avoid greenhouse gasses being released and would minimise the potential explosion risk.

If we categorise high levels of hydrogen as over 30%, then the gas turbines would have to have major retrofits. This work would be completed as part of a major outage or hot gas path replacement of components outage.

¹ <https://csrreports.congress.gov/product/pdf/R/R46700>

² <https://www.hawaiigas.com/clean-energy/decarbonization>



The work would include:

- The replacement of the burner cans with revised DLN burners from the OEM, with new replacement stainless steel fuel lines
- A review of the gas preheating system and technology to ensure that the gas preheaters can accommodate hydrogen under pressure and temperature (at 200oC, H2 migration starts to become an issue for alloy steels requiring 316L stainless steel or better alloys)
- A review of the hazardous area demarcation and hazardous area enclosures to country standards and National Fire Protection Association standard (NFPA 50A Gaseous Hydrogen Systems and zone classification)
- The modification of the instrumentation and fuel control system, with new valves to overcome high levels of hydrogen
- Ventilation upgrades, ensuring that the ceiling area of the GT enclosure is well ventilated - hydrogen is 93% lighter than air and 88% lighter than methane, so it rises and disperses faster
- Gas turbine fuel delivery system modification, including modified purge lines, metering, gas composition measurement fitting of fast acting fuel gas analysers to measure hydrogen composition and provide feed forward information to combustion controller
- Gas monitoring, safety systems (including package sensing)
- On site gas fuel line replacement and replacement of gas reception facility equipment, such as gas filters metering streams and gas isolation valves
- Retrofit to reuse where possible existing hot gas path components, with regular borescope review to monitor component life

Conclusion: the transition to high hydrogen blends will continue

The hydrogen industry is in its infancy and the volume of hydrogen production is a barrier to mass use. However, we believe that as hydrogen production increases, that low percentage blends (less than 10% of hydrogen) will be consumed by the existing gas fired power station fleet as part of countries' national aim to reduce CO2 reductions. These low levels should not present a significant problem for the existing gas turbine fleet. As hydrogen production increases in traditional heavy industry areas, new gas turbine plant will be constructed near hydrogen hubs to minimise the cost of new pipeline construction. The transition to high hydrogen blends consumed by gas turbines will materialise as a natural evolution of a country's hydrogen hubs.



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Part Two: the Power insurance markets in 2022





James Johnson: underwriting a balanced Power portfolio

As the loss record for Power risks continues to deteriorate, we asked Starr Insurance Companies' James Johnson (JJ) to speak to us about some of the key drivers that he is seeing in the Power market in the second half of 2022. James is Head of Power & Process Industries at Starr UK and is one of the most experienced Power underwriters currently operating in the London market. Asking the questions were Declan Cleary, Broker, Power and Utilities, Natural Resources, WTW London (DC) and Carlos Wilkinson, GB Head of Power & Utilities, Natural Resources, WTW London (CW). The following is an edited transcript of their conversation.

DC James, in general terms, how profitable do you think the Power portfolio now is across the global insurance markets? Have the premium increases imposed over the last few years enabled insurers to attain technical rating adequacy?

JJ That largely depends on the insurer's book of business. From a Starr UK perspective, over the last couple of years we have been very profitable, but that's almost certainly because we don't write US business or Australian business, which is where the majority of

this year's high profile losses are coming from. That being said, we have had incurred other large losses, in Africa and elsewhere. In terms of rating adequacy, we are getting to the point where rates are adequate for our specific book of business, although other insurers' portfolios might be in a different position. So now it's important for underwriters to show a degree of discipline and ensure that this rating environment holds together rather than us becoming complacent or hyper-competitive, thereby resulting in a market softening.



DC So you would accept that some of the more severe rating increases that we have seen over the last few years might now begin to ease?

JJ We have already seen that - a year ago we were easily seeing double digit rating increases, which have now tapered down into single digit territory.

CW How far are you from seeing actual rating reductions? Presumably you have seen some flat renewals in recent weeks?

JJ We may have seen that in one or two other lines of business, but not for Power risks, where a flat renewal would still be the exception to the rule. Generally speaking, it's still a hard market; it's just not hardening to the extent that it was a year ago.

DC But with more capacity coming into the market, might we not expect some reductions at some stage?

JJ It's hard to say - the premium of all pays for the losses of the few, so while we do want to distinguish between our clients' risk profiles and price them appropriately, we have to pay for our losses somehow. In terms of new entrants, I don't see a new flood of capacity coming through, say in a year's time, that would result in an overall market softening. That might happen with the Renewables book, but our involvement in that portfolio is relatively new.

DC Noting that Starr's own portfolio remains profitable, has there been any particular type of losses that have impacted your company recently?

JJ We have been fortunate to avoid some of the big high profile losses. But we have had some major losses, particularly relating to generators, so together with steam turbines this is an area where we are taking a closer look. Generally speaking, Power losses tend to be about Machinery Breakdown and this remains the case; there is a particular focus on new gas turbines. We have specialist Power engineers that get involved with the engineering of specific risks, and so we make sure that all of the underwriting and engineering criteria is in place for us to have a successful renewal.

CW When considering the renewal of loss-impacted programmes, what tends to be the balance that you strike between declining the business, imposing rating increases and amending the existing coverage?

JJ To a large extent it depends about the way we feel about the risk. There are some accounts where we feel that the trajectory is not moving in the right direction, and it may be time for us to part ways. Or there may be accounts where there is a loss and it's just one of those things - the loss doesn't necessarily reflect poorly on the client's risk management. In those situations we would try to renew the account if it's good business - we would just try to get some of that money

back, as well as understanding from an engineering perspective whether there were any systems or processes that need to be put in place to ensure that a similar loss doesn't happen again.

CW Are you still seeing the larger losses having more of an impact on your portfolio than the attritional ones?

JJ It's difficult to comment because the large losses have generally not been from accounts that we have written. Clients and their brokers should generally put in place a programme that is primarily only impacted by catastrophic losses, but on the Power side, we all know that this is a little bit different because the loss scenarios are different. So as a result there is an element of frequency impacting the Power book, which theoretically gets rid of the severity element. But at the moment that's not really the case - we are seeing both frequency and severity of losses in our market right now. That's not necessarily a new thing - the past year or so has probably been worse than others, but that has basically been the case for a number of years now, and the Power market as a whole has been trying to figure out how to write the business in a profitable way. There are a couple of losses in the market right now of over 100 million dollars each - I know of one account that has had a 50 million dollar loss where the lead terms are paying only three million dollars. Now you don't have to be an underwriting genius to know that this doesn't add up - how are you going to get your money back with such low pricing? No one is expecting a two year payback, but surely we would be entitled to a ten year one? I would hope that you would agree that having paid out a 50 million dollar loss, a five million dollar annual premium would be reasonable.

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The premium of all pays for the losses of the few, so while we do want to distinguish between our clients' risk profiles and price them appropriately, we have to pay for our losses somehow.

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CW Turning now to prototype technology, how critical is this issue to Power insurers? For those programmes that do feature prototype technology, what are you looking for in the underwriting submission to persuade you to participate?

JJ We don't have a lot of accounts that feature prototype technology – but where we do, it is simply a case of ensuring that adequate underwriting restrictions, deductibles and wordings have been applied. From an engineering perspective, we would want to ensure that the appropriate warranties and LTSAs are in place – if it was prototypical, we would want to see LEG clauses being applied. We would generally only look at insuring a prototypical unit if it was part of a much larger account; even then, we would want to highlight that specific unit and ensure that the coverage provided would be more restrictive.

DC Are there any pre-defined amount of hours that the unit has to run to stop being deemed to be prototypical? Or would you take more of a generalist approach?

JJ We work with our engineers on this kind of question. I know that some companies have a set number of hours that they look to, but at Starr we tend to take a holistic approach. We see how many units are out there and determine how many hours collectively that they have got going. In general terms, if there have been no incidents after a certain amount of hours maybe we might move forward with it. However, if there have been more than that amount of hours but there have also been some problems with it, then we would need to give it more time, so there are no hard and fast rules here.

CW This seems pretty reasonable - given that you spend a good deal of time with your engineers, does this signal that you are expanding your engineering capabilities?

JJ Yes – since I joined Starr nine years ago we have more than quadrupled the size of our Power book, and as a result of that we have not only had to recruit more underwriters but we have also had to increase our offering from an engineering perspective. We have a number of lead positions that require us to do the engineering, and we want to get involved with it and to understand the risk as much as possible. With that in mind, we do have a permanent Power engineer on our staff; furthermore, we use one specific third party contractor for a couple of our risks and he is effectively part of our team. We are also having discussions about hiring another engineer as well. It's a huge part of what we do; it's an integral part of our underwriting process because we engage with our engineer on every risk.

CW We do have certain technology issues out there and it's never quite clear from one underwriter to another as to how prepared they are to sit down and listen about the specifics of each case.

JJ It doesn't mean that our engineer ends up underwriting the risk; it just makes it more challenging for us to write a risk where the engineer is not so supportive. It's not for the engineer to say - yes, let's go forward with this risk or not; we are in business to write risks, and we have some very ambitious growth goals. However, we must write the business presented to us in a profitable way.

CW One of the features that has been absent from the market in recent years has been competition to lead business. If a broker approached you with a case where the lead insurer was taking a particular view of an element of cover, and the broker was suggesting that broader cover may be justifiable, would you concur, if your engineer agreed?

JJ Probably not. If we are talking about another lead market that has engineers that have been to the site, it is unlikely that we could know more about that risk and understand it better than they could. I know that we do have competitors but they are also our peers; it's a quota share market, so while we do have the capacity to lead and enjoy doing so, we are also happy to follow as well. There is no ego or pride involved in that and I'm certainly not here to undercut the market. I'm happy to follow others, especially if they understand the risk and have very specific elements about the insurance programme that are tailored to that client - it gives me confidence that they know what they are going. I'd be reluctant to go against a strong lead such as that.

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I know that we do have competitors but they are also our peers; it's a quota share market, so while we do have the capacity to lead and enjoy doing so, we are also happy to follow as well.

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CW So if you all are taking the same engineering-based approach to risks, what differentiates Starr from other leading insurers?

JJ Well, we may not take exactly the same engineering - led approach, even if we won't undercut other insurers or second guess their proposition. But it's a good question - we differentiate ourselves in a number of ways. I would reference our engineering capabilities, the amount of capacity that we have, our fronting capabilities, our claims services that specialise in Power and other industry-related losses, and indeed our specialist underwriters - we are not a generalist property or Construction team. But perhaps more importantly, I think we have an ability to write risks which others can't. Starr does have ambitious growth plans and the company does empower me and those on my team to do what we feel is best with risks, which means we can be much more flexible than some of our peers. We are not specifically a primary, quota share or excess layer insurer; we are all of those things. It all depends on what the risk is and how we want to play it. For many programmes we simply ask our broker: where do you want us to play? So long as the maths adds up, it doesn't really have a huge impact on us, unlike some of the rest of the market.

CW Turning now to the issue of inflation, with commodity prices rising across the globe, how has this affected your attitude to asset and BI valuations? What do you want to see in underwriting submissions to encourage you to participate?

JJ We have to see some movement in values; if the values declared at renewal are just the same as last year's, then we know that this is going to be problematic. Because of inflation, we would expect at least high single digit figure increases from a PD perspective, maybe more. From a BI perspective it's a similar situation; we frequently engage with our claims team as they have been highlighting to us claims inflation, including costs of labour, costs of spares, costs of repair parts and so forth; there has to be some way of addressing that. Even if a client has had a valuation carried out a year ago, that won't be applicable anymore; from a BI perspective, that's why we apply monthly indemnity caps and dollar per MW

caps while on the property side we like to use average clauses if we feel that there could be an issue with the valuation. And that is something that we also engage with our engineers on; they are aware of the price of new pieces of kit and if I have any doubts about any valuation issues, I will discuss it with them.

DC On the PD valuation piece, what would your preference be – would it always be to see a valuation report or would you be happy with an index-linked approach?

JJ We're not economists, we're underwriters; so long as the client puts something in front of us that makes sense, I'm sure that would be fine. For example, if last year the values were \$100 million, and the assets are in say the UAE, where the inflation rate is 8%, we'll accept a similar loading on the asset values.

DC On the BI side, valuations have been under the spotlight for the past 18 months or so – does the way buyers declare their BI values need to change at all? Have buyers improved their reporting recently?

JJ Some have improved, but we are still trying to persuade others to declare monthly rather than annually. That protects us, because we can then put a monthly cap on these values, especially given the spikes that we have seen recently. We want to give some flexibility to our clients, maybe as much as 10-20% or so, but we have to cap that exposure at some stage.

CW Some insurers have mentioned moving to an adjustable basis – is this something that you would ever consider?

JJ You were referring to other commodities such as steel - on one of my non-Power risks, we are having a problem with steel because the values are hard to adjust monthly because steel prices are fluctuating so much. On some of those programmes we have instigated a rolling declaration process, whereby we are notified when the values change and at the end of the year there is either an AP or RP based on those changes. We need to understand what the exposure is, bearing in mind that the buyer needs to have adequate



cover as well. We are in the process of figuring out how to do that within a global context of wildly fluctuating commodity prices.

DC To what extent do you think clients understand the need to get a grip on values? Do you think there is still some way to go before there is a general consensus to declare values accurately?

JJ It really does depend on the client. As with everything, some clients are more sophisticated than others; some can provide the required information more easily, whereas others prefer to go through the motions year-on-year and provide the same renewal values over and over again. In terms of providing adequate and updated information, I think a lot of the responsibility falls on the brokers; I would hope that you stress the importance of providing this to your clients.

CW We certainly spend a lot of time talking to our clients about this. But on the BI side, it's a constant challenge because ultimately we want to ensure that our clients are put in the same position as they were in before the loss, although in a very volatile market we also want to ensure that the issuers don't get any nasty surprises.

JJ The underwriter's job is to understand the risk and to contain it; the last thing we want is to have any surprises. We don't mind about having a loss, but we do mind if we had not realised what we were actually exposed to.

CW Has that happened to your book recently?

JJ Yes we have, indeed, there have been situations recently where the loss scenario was blown through the roof; you write a risk where you think the maximum loss is 100 million dollars and the next thing you know you are looking at a 300 million dollar claim! So the underwriter's job is just to get back to the basics, tighten up the terms, make sure there are sub-limits where there should be, review the wording and make sure all the clauses are phrased properly. That way, in the event of another loss there should be no further surprises.

DC Do you differentiate in favour of those clients whose information has turned out to be generally accurate?

JJ I would say that we do. There is inherently a bias towards clients that have risk management teams or processes in place compared to others that don't have a dedicated team and take a more lackadaisical approach - even though their programme may be more profitable to us than the former. So this goes back to the kind of underwriting that we want to do; we want to get close to our clients and understand them, to develop a meaningful partnership. I think our portfolio

is relatively balanced between the more relationship-driven accounts and the more transactional accounts where we won't have so much face to face time with the client or engagement with them from an engineering perspective.

CW In relation to property values, one concern raised by some insurers is the use of peak values to replace sums insured. Has that been in your mind at all?

JJ Not really. I take the view that our underwriters, the brokers and clients that we deal with are all mature, honest and up front people who are just trying to do business. If values go up or down, that's fine; so long as there is a legitimate story behind it that we can agree with, then that's okay with me. I don't think there's much of a risk of values coming down in the next few months based on current geopolitical tensions, but if there is a logical story about why values have come down, then I'm happy to listen to it.



DC Turning then to these geopolitical tensions, how have they affected the way in which you write business?

JJ Yes they have; indeed, the Russian situation has cost us millions of dollars as a result of the new sanctions. We also lost some accounts that had assets located in Ukraine and one where we can no longer front for the Russian assets within the programme. Then there are other locations such as Iraq, where the ability to go in and adjust a claim and the ability to get to the property and deliver replacement parts is very challenging. And even beyond Ukraine and Russia, we have SRCC issues elsewhere in the world, particularly in Latin America.

CW How concerned are you about the supply chain disruption that is arising as a result of these geopolitical issues?

JJ As well as the sanctions issue that we have just discussed, we have a Territorial Exclusion Clause on all of our risks that excludes losses from property located in Russia, Ukraine and Belarus. And of course the situation there has had a major impact on commodity prices, impacting iron ore, steel nickel as well as oil and gas.

CW How has that affected your appetite for business from the other areas of the world? Presumably you are going to have to make up the revenue that you have recently lost, so does that put you under pressure to be more competitive?

JJ I think Starr takes a more mature approach to the situation. Yes, we are ambitious in terms of our growth goals, but we insist on profitable growth to ensure our on-going ability to meet our customer obligations. Wars don't happen every day – that's simply lost premium, it's just gone. Obviously we have a budget which has been impacted by those lost accounts; when we are discussing whether we are going to hit the budget or not, those conversations will be had, but there is no pressure on me to go out and find new business to make up for that loss. Because of the underwriting approach that we take, I'm not necessarily focused on growth in the first place - we just want to remain in a position where we can offer solutions to our clients; when we do that, growth is something that naturally happens for us. That's been happening for the past nine years and I don't think that will stop any time soon.

CW Let's turn to the issue of the energy transition. What is your general attitude to companies that demonstrate a commitment to the energy transition, maybe in terms of either adopting CCS technology or divesting into the renewables sector? To what extent would these issues affect your underwriting judgement regarding such programmes?

JJ There are two things here; one is that Starr wants to facilitate the energy transition, and so we want to help our existing clients in that process. That being said, it is still a very hazardous market with large exposures, whether you are talking about the power industry moving into carbon capture and storage, or into renewable energy or such like, these developments have a large element of risk attached to them. So while we want to be supportive of our clients in this transition, we also have to be pragmatic, put our underwriting hats on and go through the same process as normal. There could be situations where we take more of a commercial approach because of the relationship and the confidence that we have in that company's risk management, but generally speaking that would be a commercial decision rather than an underwriting one.

CW Some insurers have decided to get into renewables early to obtain an understanding and a commercial advantage in this market – is that something that fits Starr's strategy, or do you need to be convinced by experience?

JJ Both really. We are getting involved with a number of energy transition elements – renewable energy, carbon capture and storage, offshore wind and battery storage are some of these, but we are also very prudent underwriters. That aspect of our portfolio is a very small, albeit growing, element, and we understand that a lot of the technology is very new - as a result, they still have losses. But instead of not writing it, we do in some cases take advantage of carving out a little bit of a market share so we can ride whatever bumps there may be in the future - but in a way that doesn't have a major impact on the rest of the portfolio if there is a loss. So in those situations we take small lines on small limits; if there is a loss, we can cut our cheque and move on, without impacting the book of business as a whole. So we are gaining more experience and profile in that segment.

DC So are these the areas of the Power portfolio that you identify as opportunities for the future?

JJ There is no doubt that we identify renewables as the area of growth in the future. We have been writing Power in London now for 15 years, so there is not a lot of new Power business out there that we haven't already seen. During this time we have opened up offices in Latin America, Asia and Europe and so a lot of that existing Power business is now being placed in our local Starr offices. So the biggest area of growth for us is in the renewables sector. We are doing so in a prudent manner; while it's a popular area to be involved with right now, it's a growing area with new technology that has losses. We are also growing in areas regarding our service to clients, such as fronting services, engineering services and the like.

CW Are you still committed to your thermal coal clients?

JJ Yes, we are continuing to renew our current coal programmes.

DC What's your attitude now to Natural Catastrophe (Nat Cat) risks? It seems that this is less of an issue in the market than it was in 2018 after the hurricanes.

JJ It's always an issue that we look at, although I wouldn't say that our appetite had changed much in recent years. We use RMS to model all of our accounts, and where there isn't a model available we go to our engineering reports. Flood is a big issue with power plants, because there are a lot of plants located near rivers, so we would need to see the defence systems in place. But on climate change, the reality is that the insurance industry as a whole should figure out what the changing climate means and address that - especially on the wind power side, where your operations necessarily have to be in windy areas. We do sometimes base our line size on the Nat Cat exposure.

DC Would you be looking to lead renewable energy business in the future, or is your strategy to offer s following line behind a recognised leader?

JJ A little bit of both. We recognise that there are other underwriters in the market with expertise, and we do follow them on some renewable energy risks. However, we do lead a couple of renewable energy programmes right now. We feel comfortable and confident leading. We engage with our engineers, and we are very thorough when it comes to reviewing wordings and the exposures associated with the risk.

CW You mentioned that your Power book is mature – how often do you now participate on accounts that you have seen before and previously rejected, and what reasons would you generally have to reconsider?

JJ It could be a variety of things. If we declined a risk last year because of poor risk quality or poor engineering, we would need to see that our concerns have been addressed. If the programme has had five losses in the previous five years, but in the four years since there have been no losses, and there has been some good engineering since then, we will take another stab at it. If there is an account where we don't want to participate because of the pricing, then as soon as those issues have been addressed we can obviously take another look. I always say to our brokers: send us the risk; let's go through the process again and don't assume that we are not going to write it. If everything has been OK for a year or two, the chances are we will be able to write it again.

DC James, thank you very much for your time.



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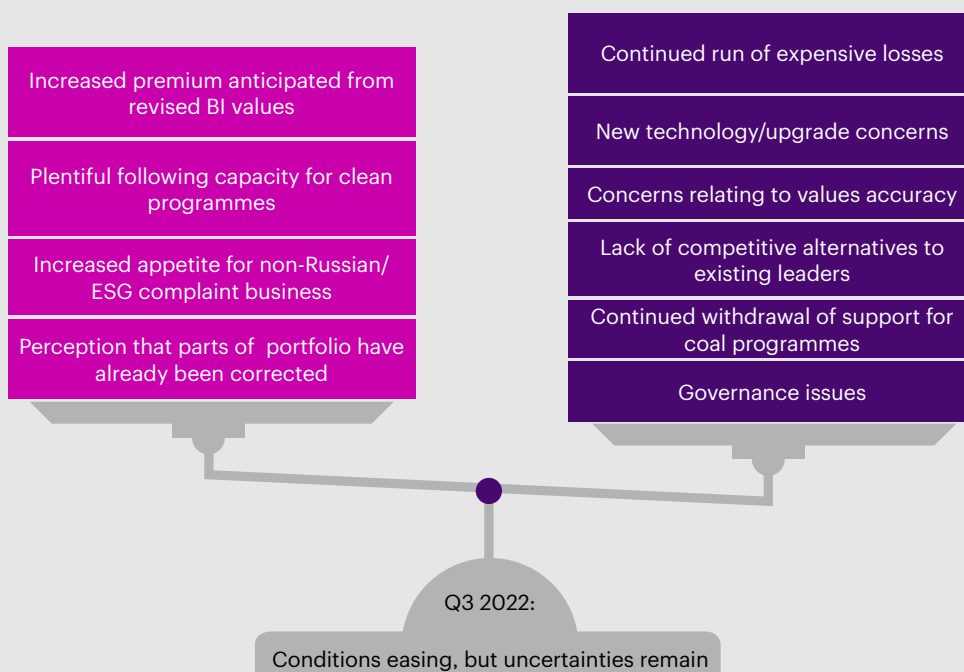


International Property: uncertainty continues as insurers hold firm on pricing

While there may be some areas of the Natural Resources portfolio that are beginning to see a gradual turning of the insurance market cycle, the same cannot yet be said of the International Power market. After several years of acute rating increases, many buyers might have hoped for a tailing off of the current hardening dynamic, given that the normal hard market phase of the underwriting

cycle usually lasts only two to three years at best. So why is it that we have to report a continuing hardening of market conditions, albeit to a lesser degree than previous years? And are there any signs that these pressures might ease further as we look towards the January 1 2023 renewal season?

Figure 1: **Hardening eases slightly - the International Power market underwriting environment, September 2022**



Continuing hard market conditions are still being driven by underlying insurer determination to achieve technical rating

Signs of encouragement

Increased premium anticipated from revised BI values

Let's look at the positive developments first from a buyer perspective. At the heart of insurers' insistence on higher rating levels over the last few years has been the requirement to ensure sufficient premium revenue to pay for the significant losses that have impacted this portfolio. However, we are now finding that increased commodity prices are fuelling Business Interruption (BI) values, thereby creating more revenue even before the imposition of higher rates. One WTW Power client has recently declared BI values for the coming winter months in the northern hemisphere which are projected to be as much as four times those declared for the same period last year.

Of course, increased BI values eventually should mean more expensive losses. But for the moment, they are helping insurers to meet existing premium income targets and thereby easing the pressure on percentage rating increases. During recent renewals we have found that some insurers who had previously held out for higher premium rating increases have accepted a lower increase because of the exponential change in premium volume offered as a result of these revised BI values.

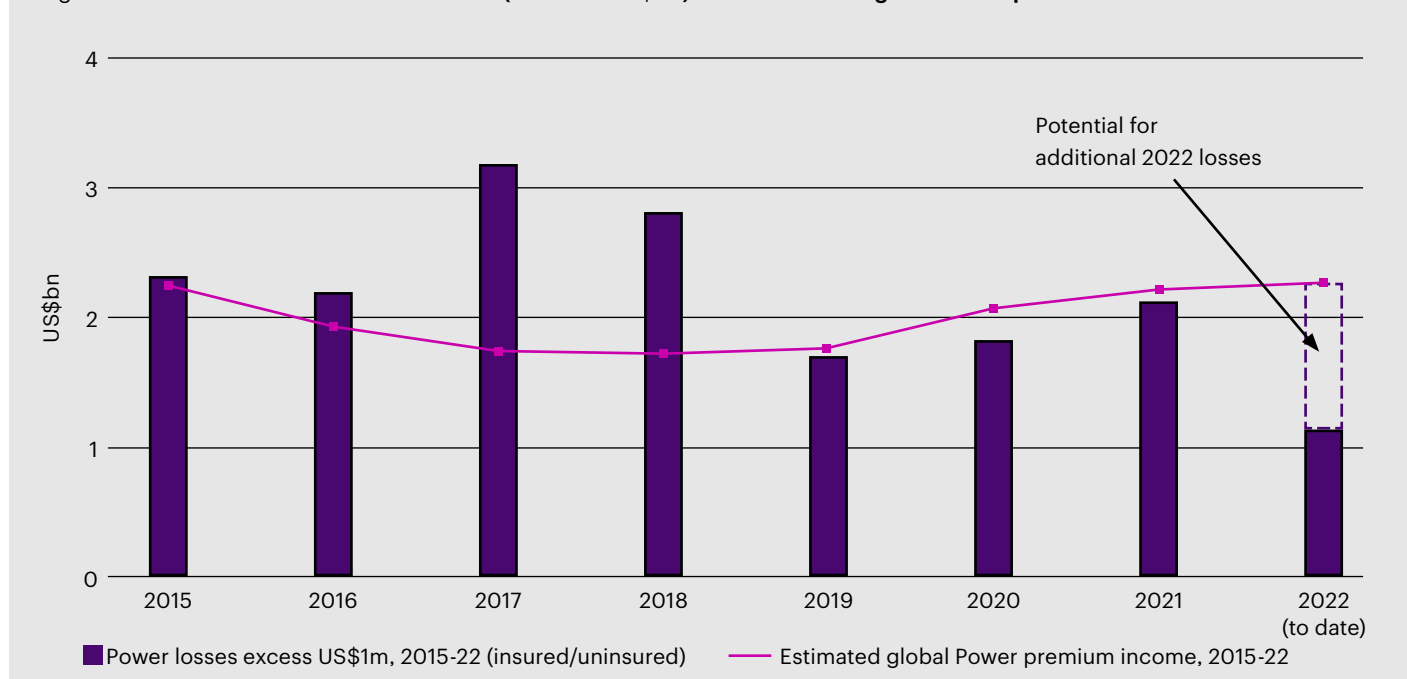
Plentiful follow capacity for clean programmes

Another sign that the market hardening is easing somewhat has been signs of an increased appetite from the following market. Our own market research suggests that theoretical total global capacity for power risks remains at approximately US\$3.5 billion, with realistically deployable capacity close to the US\$1.5 billion mark. However, in relation to coal assets this amount reduces to a much lower figure of around US\$250 million (Coal capacity for new risks entering the London/European markets is significantly lower, and it might pay buyers to differentiate between existing and new business).

For several years, one of the most besetting challenges faced by brokers, having secured lead terms, has been finding ways to complete the placement in question without a twist in the tale - the requirement to accommodate the capacity of a following insurer who insists on more stringent terms than that of the leader. We are pleased to advise that we are now seeing a reverse of that trend; indeed, there now appears to be a healthy degree of competition in the following market for the most well-regarded business.

¹ Although Europe is particularly affected by gas supply issues, the effect on global prices means that the effects are felt all over the world in terms of business interruption exposure.

Figure 2: **Estimated Power losses 2015–2022 (excess of US\$1m) versus estimated global Power premium income**



Source: WTW market intelligence/WTW Energy Loss Database as of July 19 2022 (figures include both insured and uninsured losses)

Increased appetite for non-Russian/ESG compliant programmes

One of the reasons for this increase in competition has undoubtedly been the fall-out from new positions taken by certain insurers to two of today’s most topical issues, that of the Russia-Ukraine conflict and that of ESG. At a stroke, the Russian portfolio has been removed from the vast majority of Power insurers during 2022, while several prominent global insurers have already made public their stance on coal-fired power plants and other operations deemed by them to be high carbon-emitting operations¹. This has left several Power underwriters suddenly bereft of a significant part of their existing premium income stream; as a result, they are now being less selective and are now showing an increased interest in other programmes which they have rejected in the past, mainly due to engineering concerns which they are now prepared to overlook. So for the most well-regarded business, the completion of the programme essentially following the leader’s terms has not only proved to be less challenging – the increased appetite has actually led to some placements being over-signed, which we have not seen for a number of years.

Perception that parts of the portfolio have already been corrected

Added to the withdrawal of premium income has been a growing perception among some leaders that the corrective measures imposed over the last two years or so have negated the need for year-on-year increases of the same magnitude as those imposed previously. Brokers are therefore now able to negotiate much reduced premium rating increases for the most sought after programmes, with only nominal rises for those programmes deemed to have reached technical rating adequacy.

Causes for concern

However, we must advise that this is where the good news ends for the buyer. On the other side of the scales in Figure 1 on the previous page are our “purple bricks” - the issues that are preventing market conditions in the Power sector from easing in the way in which other similar markets are doing and which continue to ensure that rating levels generally remain in an upwards direction.

A continued run of expensive losses

Figure 2 above shows overall losses in excess of US\$1 million (both insured and uninsured) compared to our best estimate of global Power premium over the course of the last seven years. It can be seen that although the loss record has improved somewhat since the dark days of 2017-18, loss levels are now heading back up again and our latest market intelligence, combined with data from our WTW Energy Loss Database, suggests that 2022 may well turn out to be the heaviest loss year since 2018. Meanwhile although premiums are moving in an upwards direction, to date the overall level has not moved rapidly enough to prevent overall loss totals from catching up. If operational costs are factored into consideration, it can be seen that in general terms the market has yet to reach the point where overall profitability has been achieved.

In a market where operational costs continue to rise (particularly this year, given recent inflationary pressures) and where little risk is mutualised, it can be seen that any gap between recorded losses and premium income reflected in Figure 1 is unlikely to be sufficient to prevent overall underwriting losses.

Figure 3: Power losses excess of US\$20 million, 2021-22

2021

Type	Cause	Region	PD US\$	BI US\$	Total US\$
Substation	Fire no explosion	Europe	235,000,000	193,000,000	428,000,000
Coal	Fire + explosion/ VCE	Australasia	150,000,000	150,000,000	300,000,000
Coal	Explosion no fire	Africa	185,000,000	0	185,000,000
Gas	Fire no explosion	Europe	8,270,000	72,500,000	80,770,000
Coal	Collapse	North America	37,150,000	37,400,000	74,550,000
Cable (elec/control)	Unknown	Europe	33,000,000	32,000,000	65,000,000
Gas	Fatigue	Middle East	24,000,000	31,000,000	55,000,000
T&D	Anchor/jacking/ trawl	Asia Pacific	45,000,000	0	45,000,000
Multifuel	Mechanical failure	Latin America	25,200,000	12,400,000	37,600,000
Gas	Impact	South Asia	6,400,000	25,000,000	31,400,000
Multifuel	Impact	Europe	10,900,000	14,000,000	24,900,000
Solar	Ice/snow/freeze	North America	20,000,000	1,000,000	21,000,000
Gas	Fire no explosion	Asia Pacific	16,890,000	4,076,000	20,966,000
Multifuel	Unknown	Middle East	8,298,300	12,400,000	20,698,300

Source: WTW market intelligence/WTW Energy Loss Database as of July 19 2022 (figures include both insured and uninsured losses)

2022 (to date)

Type	Cause	Region	PD US\$	BI US\$	Total US\$
Gas	Fire + explosion/ VCE	North America	240,000,000	46,000,000	286,000,000
Gas	Fire + explosion/ VCE	Asia Pacific	50,000,000	150,000,000	200,000,000
Gas	Fire + explosion/ VCE	North America	2,000,000	128,000,000	130,000,000
Wind	Hail	North America	90,000,000	0	90,000,000
Wind	Hail	North America	75,000,000	0	75,000,000
Wind	Hail	North America	60,000,000	0	60,000,000
Gas	Machinery Breakdown	Europe	0	60,000,000	60,000,000
Wind	Hail	North America	50,000,000	0	50,000,000
Wind	Collision	Netherlands	34,300,000	0	34,300,000
Geothermal	Machinery Breakdown	North America	30,000,000	0	30,000,000
Multifuel	Mechanical failure	Italy	3,390,000	24,300,000	27,690,000
Gas	Machinery Breakdown	Australasia	0	23,000,000	23,000,000

Source: WTW market intelligence/WTW Energy Loss Database as of July 25 2022 (figures include both insured and uninsured losses)

So what's causing these losses? As we have intimated before, there are a number of factors involved, including:

- Legacy technology issues in older gas-fired plants
- The increased development of new technology, with no test beds - the market is becoming increasingly focussed on modifications to existing technology
- Poor market experience with "First Year of Operations" risks is making many insurers sit this phase out for new sites
- Contractor quality from stretched order books is now a major market concern - contractor related losses have been causing concern in the market recently, with warranty levels coming under particular scrutiny
- Aging plant, as older less efficient plant makes way for renewables
- Maintenance "efficiencies" may be manifesting themselves
- Nat Cat losses, including storm, flood, earthquake, hail and, increasingly, wildfires

Perhaps it is not so surprising that the loss record in this sector continues to deteriorate. There are plants all over the world that are not only growing older but that have also undergone several changes in ownership, while COVID-19 remains a factor in increasing the severity of losses impacting supply chains across the world.

New technology upgrade concerns

Although deductible levels in the Power market are now generally thought to be sufficient by most insurers, they continue to be concerned by technology-specific issues. This is becoming evident in the case of certain OEM-manufactured turbines, particularly in cases where turbine blades have become liberated, causing damage and knock-on BI through the whole power train with the resulting downstream losses becoming increasingly significant. Of even greater concern to the market has been the wide variety of warranties negotiated by individual companies with the OEM; the result has been that there is little commonality or understanding in the market as to what the OEM warranty will or will not cover, or the degree of loss that the market is actually exposed to. As a result, deductible levels for these types of programmes have continued to increase.

This concern with OEM manufactured turbines is not, however, the market's only concern with upgrades and/or new technology. Especially for those programmes that have recently suffered losses, insurers are continuing to apply restrictive terms such as the imposition of total defects exclusions until the fleet leader has reached, for example, 8,000 hours of operations. This has consequently ignited a debate in the market as to what does or does not constitute unproven or prototype technology, with various insurers adopting different

underwriting stances. Brokers have therefore had to be alert to any changes, upgrades or modifications to their clients' assets and forewarn them in advance of what the market reaction might be; in some cases, this advice has resulted in the proposed modification/upgrade actually being cancelled.

Concerns relating to accurate values

Most readers will be fully aware of the impact of the current global inflationary pressures. These are already translating into significantly increased BI values for Power buyers, and insurers remain concerned that the values declared to them fully reflect the potential loss that they are exposed to. As a result, virtually every policy now has some form of BI cap, with insurers attempting to restrict cover to an Average Daily Value (ADV), although in many instances a margin is offered. Insurers are also much more interested in how BI values have been calculated; in some instances, when they have not been satisfied as to the accuracy of the figures presented, the buyer has simply found that the insurer has insisted on a higher rating increase to take this uncertainty into account. Bearing in mind the rapidly changing gas prices affecting power business, buyers are demanding cover on a replacement cost basis; however, such cover is not readily available, as insurers cannot quantify the exposure properly. Their concern is therefore that the current commodity price volatility could spiral out of control.

However, insurers are also concerned about asset values, and whether the amounts declared to them truly reflect their exposure. In particular, they are looking to distinguish between the overall property replacement values and the actual Estimated Maximum Loss (EML) that they are exposed to. Especially during the pandemic, insurers have been used to buyers simply applying a percentage increase to their values which they believe to be in line with inflation; however, they are now becoming increasingly concerned that this is often an unrealistic method to identify the nature of their actual exposure (that being said, insurers will still accept a percentage increase if it is linked to the relevant index). Otherwise insurers have access to MW tables to sense check values and then to benchmark this data with peer groups. Ideally an independent valuation should be carried out by the buyer, although this naturally comes at a cost.

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Although deductible levels in the Power market are now generally thought to be sufficient by most insurers, they continue to be concerned by technology-specific issues.

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To obtain optimum terms from the market, brokers are therefore having to persuade their clients to conduct accurate EML scenarios that may be at variance with their previous methodology. This can often accrue to the buyer's advantage; in one recent instance we found that replacement values had actually gone down because of a reduction in production costs and because the replacement infrastructure in the event of a loss would more probably be a renewables solution costing much less than simply replacing the existing plant. In any event, buyers should consider the services of an up to date risk engineer to ensure accurate replacement solutions as well as values. Then again, we also had an example recently where the values went down but the EML actually increased, due the increased costs of replacement blades and transportation costs.

Finally, it is often the case that the actual bid costs for a given plant can be very much at variance with the replacement cost, while the issue of whether sufficient spare parts are available in a particular region can also have an impact – if say there are three power plants in a region and only one replacement spare part is available, the first plant to have a loss will suffer a much reduced BI loss compared to the second or third one if that replacement part is itself not replaced in time.

All these issues suggest that a simple revaluation using today's inflation rate may mask the actual exposure facing insurers. Where brokers have encouraged a more detailed valuation/EML scenario exercise, this has generally been recognised by the market in terms of a more modest rating increase; when the old methodology has been applied, a more punitive rating increase has generally resulted.

Lack of competitive alternatives to existing leaders

As the loss record continues to deteriorate, and as the issue of identifying and supplying accurate valuation information continues to provide the market with significant challenges, perhaps it is not so surprising that we have not seen any challenges to the existing leaders in the Power market. Indeed, leading a programme continues to require a considerable degree of underwriting expertise, which remains concentrated in the hands of the existing leaders. During past underwriting cycles we have seen fresh capacity with leadership capability enter the market after a period of rating increases, eager to take advantage and build a new portfolio; this time round we have seen no such thing. No doubt the continuing poor loss record and overall lack of portfolio profitability has discouraged others from assuming leadership positions, while it seems clear that the existing leaders are in no mood to compete more vigorously amongst each other while the Power portfolio remains generally unprofitable.

This market stagnation in terms of fresh leadership is therefore preventing brokers from capitalising on the increased appetite in the following market that we referenced earlier.

Continued withdrawal of support for Coal programmes

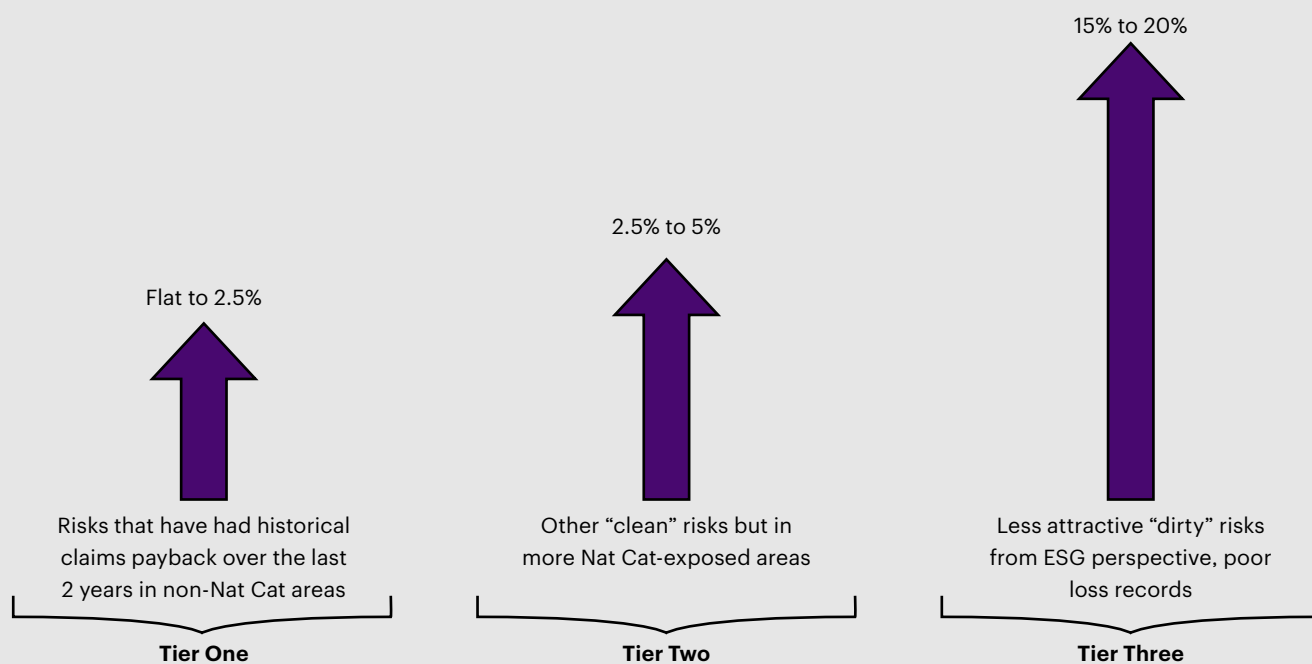
A further negative factor for coal-fired power plant owners is the well-publicised withdrawal from Coal of an increasing number of global insurers; added to this is an increased focus on the ESG credentials of clients that are transitioning away from coal towards more sustainable power generating assets. Although as we have mentioned earlier this is having a positive effect on non-Coal business, this is of course having a profoundly negative effect on those companies that still own such power plants. To secure sufficient capacity to design and place an effective insurance programme, these buyers and their brokers are having to demonstrate that they have a credible energy transition plan which can satisfy their insurers that their programme should continue to be supported. However, for those companies that continue to maintain coal plants at 30% or more of their overall total asset base, the long term outlook in terms of access to capacity remains bleak.

Governance issues

The well-publicised scrutiny of Lloyd's syndicate portfolios by the Lloyd's Performance Management Directorate (PMD) following a series of poor underwriting results in recent years has been strongly referenced in the last two editions of the Power Market Review. To a large extent, this scrutiny has now been eased, as most Property portfolios have demonstrated a significant increase in rating levels during this period. However, this does not mean that the issue of governance as a whole has also faded away. The requirement for much more detailed underwriting information, originally prompted by the PMD initiative from a Lloyd's perspective, has largely been retained; furthermore, most Power insurers remain relatively selective when it comes to this portfolio, despite the increased appetite of the following market that we referenced earlier. It remains the case that the most unattractive, loss-impacted business continues to receive heavy increases in both rates and deductibles, as underwriters are still accountable for their underwriting decisions to senior management, both within the Lloyd's and the wider London company market.



Figure 4: **A three-tier market – average rating increase in the Power Property market, Q3 2022**



Although by no means as punitive as in recent years, the Power market continues to experience rating increases almost across the entire portfolio

Source: WTW

We have examined the various factors that make up the key dynamics in today's Power insurance market, identifying both the positive and negative factors that are combining to maintain the hardening process in this market – even if the actual rate of hardening is now easing somewhat. So where does this leave average rating levels in today's market?

Figure 4 above shows that in very general terms, buyers are now facing a three-tiered market:

- **Tier One** represents those buyers whose programmes have already been subject to the rating increases of the last few years but who can demonstrate a clean loss record with assets located in low Nat Cat risk areas. We have seen some programmes renewed at existing terms within this tier, although the usual rating increase is approximately 2.5%.

- **Tier Two** represents other clean programmes for which the market still has an appetite, albeit not as pronounced as for Tier One. These programmes tend to feature assets located in a more Nat Cat-prone area than Tier One risks and/or those that have technology issues relating to various assets. Average rate increases for this tier are in the 2.5-5% range.
- **Tier Three** represents the least sought after "distressed" risks, including coal-fired power stations, those assets severely exposed to Nat Cat risk and those programmes which have incurred significant recent losses. Here insurers are looking for rating increases of anything up to 20%.

As ever, we should point out that these tiers are reflective of the general market trend and there will always be exceptions to the general rule. Much will depend on individual risk profiles, the degree of loyalty shown to the leading insurer in question, the supporting market appetite and the timing of the renewal process.

In any event, this is a marked improvement on the position this time last year from a buyer perspective, when rating increases for the most well-regarded business were averaging between 15-20% - a range now reserved for the worst regarded programmes.

Conclusion: the outlook for 2023

We have seen that the actual rate of increases in rating levels has continued to ease during the past year or so. Can we expect that process to continue as the January 1 renewal season approaches?

Perhaps. Although the loss record continues to give the market cause for concern, we do think that the actual rating increases will slow still further in the months ahead. However, that is by no means the same thing as suggesting that the overall programme premiums will be lower; the recent leap in commodity prices will ensure that BI values are set to rise exponentially during the course of the next few months, while asset values are also likely to increase further as inflation levels continue to rise. This will inevitably lead to an increase in premium levels for most programmes, even if rates continue to flatten (it is worth noting that BI rates often amount to over double the applicable PD rate). However, those European power companies switching to coal this winter as a result of the spike in gas prices may well face an additional challenge of securing sufficient capacity, as so many insurers are now reluctant or are forbidden to write coal business.

So what is the best way for buyers to mitigate this overall trend toward still further increases in the overall premium charged for their programmes? As ever our key message is to plan ahead:

- Engage your broker's experienced risk engineers early, to survey your site and provide comprehensive risk engineering surveys and support.
- Understand your risks and coverage requirements, to enable the most cost-effective programme to be designed – there is never any point in paying for what you don't need.
- Have a clear marketing strategy, including careful market management and early engagement with key insurers.
- Work with your broker to develop the best possible presentation of underwriting data to the insurance market.
- Start the placement process early and allow your broker the time to assemble the optimum risk transfer solution available.



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International Liabilities: competing pressures sustaining market momentum

Introduction: multiple market dynamics to consider

Despite the emergence of numerous competing factors impacting the International Liability market over the past twelve months, rating increases continues to prevail, albeit on a moderated scale. This follows a multi-year period of hard market conditions, most likely sustained beyond its natural lifespan by a series of macroeconomic and geopolitical factors that have served, in part, to mask the true direction and momentum of the current marketplace.

Notwithstanding this, it is apparent that the market is finally making a step-change and emerging from the hard market cycle shadow which, at times, has neutralised policyholders' ability to materially distinguish themselves from each other when it comes to renewal terms and conditions. Insurers are no longer pushing for the 'remedial' pricing corrections previously insisted upon and are instead seeking to write more risks, thereby paving the way for the rebalancing of the negotiation table - a market inflection which is ultimately underpinned by the convergence of multiple market forces.

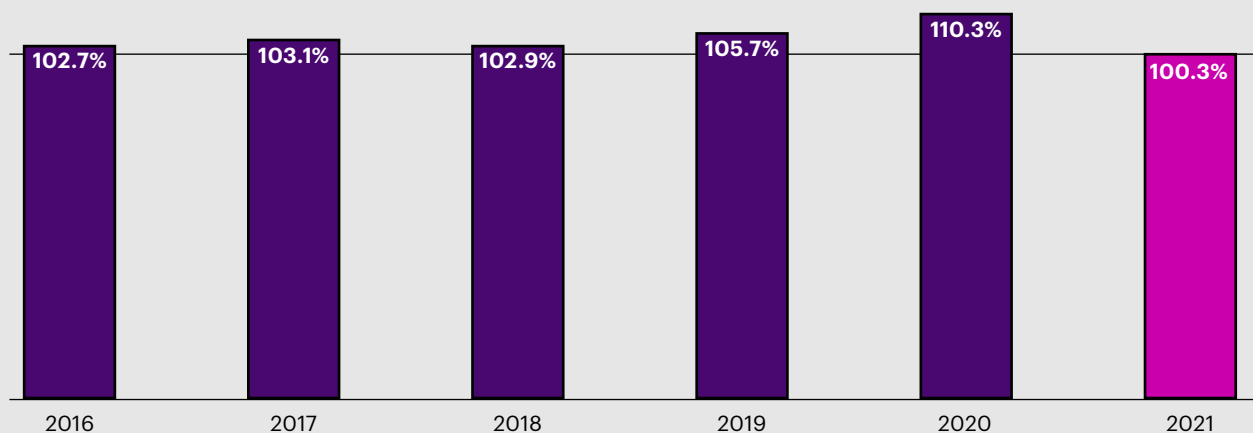
On the one hand a drive for more business

One of the most discernible market changes in the past twelve months has been the drive from insurers to increase Gross Written Premium (GWP) as insurers embark on an expansion of their underwriting portfolios - albeit a cautious one. This stands in stark contrast to insurers' attempts to slim down their portfolios over the past couple of renewal cycles; even though insurance companies remain more selective in their approach to risk compared with say five years ago, underwriters' overall risk appetite has notably broadened in the past year while their approach to applying premium increases and coverage limitations has markedly softened.

Return to over-subscribed placements

This increased appetite to write more risks is manifesting itself in multiple forms. Not only are insurers looking to participate on more programmes, but many are also seeking to increase their participation on existing programmes and, at times, to reconsider their position on certain coverage requirements in order to realise this ambition. Moreover, the increased capacity and line sizes available has meant a return to placements being oversubscribed at times, which has had a further positive impact on terms and conditions for policyholders.

Figure 1: Lloyd's Casualty Combined Ratios, 2016-21



Reference line = 100% combined ratio

Source: https://assets.lloyds.com/media/81b1778b-e821-4424-b21e-26e0bf095f10/Lloyds_AR21_220323.pdf (P28)

Effect of Russia-Ukraine conflict

An additional consideration is the conflict in Ukraine and the Russian sanctions regime which has subsequently ensued, leaving insurers eager to step up their interest in other territories in order to replace premium pertaining to Russian risks which can no longer be realised.

On the other...a push for more premium

However, this drive from insurers to write more risk is juxtaposed by a simultaneous drive to increase pricing, resulting in a somewhat contorted dynamic. Whilst the reason behind the push for more premium is not straightforward, it is possible to point to a couple of key drivers.

Recent results

Firstly, as per Figure 1 above, while Lloyd's results have generally improved over the past couple of years, the results posted for the Casualty sector continue to breach the 100% Combined Ratio mark which, quite simply, underlines the reason for the market's requirement to increase premiums. To put it another way, deteriorating underwriting results for International Liability risks are having the effect of sustaining the upward pressure on rates.

Inflation

Secondly, inflation is also having a significant impact in fuelling the drive for rate increases. Not only is inflation leading to increasingly large liability losses but it is also driving up operating costs more generally and therefore reducing non-existent profit margins even further. Consequently, most – if not all – insurers are now having to factor in an inflationary element to their rating models and subsequent renewal pricing.

The result of all of this is a cocktail of sustained but moderated premium increases, as insurers grapple with competing ambitions of growing their portfolios while simultaneously pushing for rate increases. To this end, the default rate change position has moderated away from the previously-experienced +20% to +40% range, with mid-single-digit to low-double-digit rises now the prevailing norm.

Impact of evolving capacity

Another factor at play is the evolving amount of capacity available to policyholders. While relatively stable, the emergence of some new markets, coupled with the broadening appetite and increasing limit deployment of certain existing insurers, has led to a modest increase in the limit generally available to policyholders in the Power sector, with the largest towers still exceeding the US\$1 billion mark. That said, Coal programmes continue to be subjected to a much smaller capacity pool, with only a fraction (at times as little as a tenth) of the total pool available for heavily-exposed thermal coal risks.

Ultimately the total limit available remains very much subject to the characteristics of the risk at hand and there remains a significant differential between the capacity available for programmes that already consist of a large indemnity limit compared to those that do not.

Available limit dictates competition

This is important because the limit available ultimately dictates the level of competition, which in turn provides a further ingredient to mix into the prevailing market dynamic. Where programme limits can be placed multiple times over, the existence of competition in the form of alternative capacity leads to downwards

pressure on rating levels. Conversely, where the overall limit requirement results in capacity scarcity, upward pressure on rating may ensue, leading to more expensive premiums for policyholders, particularly where ‘Swiss cheese’ gaps in programmes need to be filled at substantially more expensive terms. Similarly, the slim pickings of capacity available for risks with heavy exposures to the coal sector can leave some policyholders exposed to opportunistic and inflated pricing with little to no alternative options available to turn to.

Increasing underwriting discipline

Notwithstanding the inconsistencies of the various growth, pricing and capacity dynamics discussed above, there is at least uniformity in the increasing underwriting discipline apparent across the market. Information requirements are becoming increasingly stringent (particularly around ESG) while underwriters place ever-increasing reliance on risk engineering and survey reports.

Furthermore, a drive for rate adequacy remains a key contributor to the technical underwriting environment that now prevails, which itself is underpinned by a focus on pricing, coverage conditions and exogenous pressures such as climate change considerations, the conflict in Ukraine and remote working conditions.

Coverage constraints

The recent hard market cycle saw certain soft market coverage extensions removed from policy wordings as underwriters sought to limit their portfolio exposures. While this has not yet been reversed, the rebalancing of the negotiation table has enabled certain coverage extensions to be obtainable again, as and when a valid case can be made around the specifics of a given risk exposure, its risk management and/or its mitigation.

Climate change exclusions

However, two types of clauses have become more commonplace over the past twelve months. The first is climate change exclusions which have become increasingly prevalent in the policy wordings of programmes for policyholders in the Power sector, particularly since the London Market Association (LMA) has published its own climate change clause.

PFAS exclusions

The second is PFAS (Perfluoroalkyl and Polyfluoroalkyl Substances) exclusions, which, while not as commonly applied, have become increasingly prevalent and are already an automatic requirement for certain insurers. That being said, where sufficient information can be provided there is scope to limit (or at least reduce) the application of unnecessary exclusions.

Growing focus on ESG

In conjunction with the evolving considerations in respect of policy coverage and conditions, the geopolitical backdrop of climate change and ESG considerations are playing an increasingly prominent role in the insurance placement process. This is very much the case in the Power sector, with insurer policies on ESG having become ever more embedded in the underwriting process, with some insurers even retaining in-house ESG experts to assess policyholders’ ESG credentials in advance of placement negotiations. While at the moment the primary focus remains on the ‘E’ of ESG, it is likely that the ‘S’ and the ‘G’ will begin to feature more prominently in forthcoming renewal cycles.

Value of ESG strategy

Some policyholders have less scope for overcoming certain ESG hurdles than others, for example those with thermal coal exposures that preclude certain insurers from quoting altogether because of production and/or revenue thresholds being breached. However, the value of a clear and compelling ESG strategy that sets out an achievable energy transition journey is critical in maximising available capacity and unlocking the best possible terms from the market. Importantly, where policyholders are unable to provide this, the lack of capacity available can result in a material reduction in the policyholder’s ability to arbitrage alternative quotes, particularly on larger limit programmes.

Insurer thresholds becoming increasingly challenging

It is worth noting that, as with most complex matters, ESG policies do not necessarily have a binary application, as demonstrated by the consideration that some insurers are willing to lend to unavoidable delays to the delivery of ESG milestones experienced by some policyholders as a result of the conflict in Ukraine. However, respective insurer thresholds on certain ESG-related exposures (such as thermal coal) are generally becoming increasingly challenging to circumvent, as senior management take ownership of managing the exemptions process; this is now resulting in very little room for manoeuvre during the placement process.

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A drive for rate adequacy remains a key contributor to the technical underwriting environment that now prevails.

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Conclusion: a clear differentiation now emerging

Overall, while the overall message - rates continue to increase, but are moderating – seems simple enough, the reality of the current market dynamics is far from straightforward. The multitude of factors at play has the impact of obscuring what is really driving the momentum, which can be problematic when it comes to navigating renewal negotiations. Nevertheless, an important corner has been turned insofar as there is now clear a differentiation in both pricing and capacity allocation amongst risks, providing policyholders with good risk profiles and risk management strategies the opportunity to distinguish themselves from their peers in a way that can translate into more favourable terms from insurers.

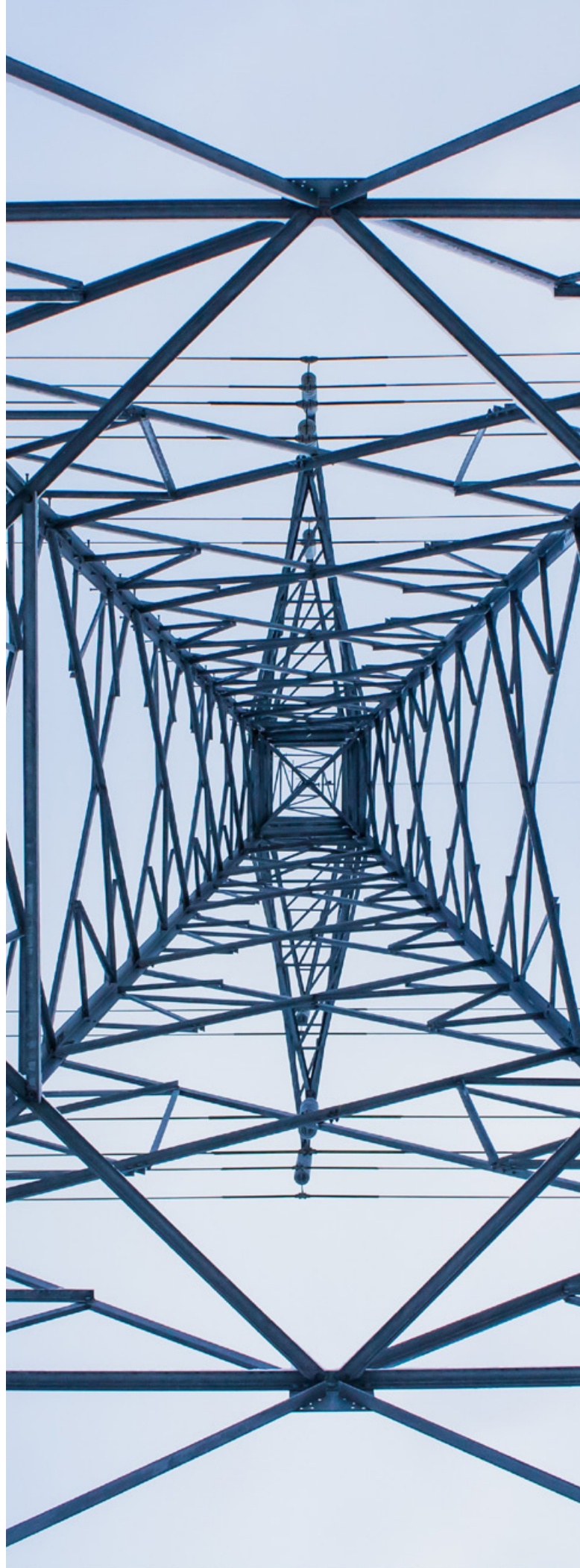
As such, it is more important than ever for policyholders to think strategically about their risk placement strategy. This will need to account for several factors, including:

- Ensuring that a **high-quality underwriting submission** forms part of the approach to market, so that the policyholder's risk profile can be positively distinguished from other risks
- Incorporating a **clear and robust ESG strategy** into the underwriting information provided, in order to maximise the pool of potential insurers able to offer capacity
- **Reconsidering the programme design** as a means to achieving the optimal programme structure, so that evolving insurer appetite can be capitalised upon
- **Balancing the benefits** of alternative (sometimes more competitively-priced) capacity with long-term insurer relationships in order to smooth out pricing volatility and maximise the value of insurer partnerships

In summary, while rate increases may be beginning to moderate, the complexities of various emerging and developing factors mean that in order for policyholders to be able to extract maximum value in what remains a challenging and complex marketplace, they will need to remain strategic in their approach to market and ensure they instruct a broker with the experience and sectorial expertise needed to deliver the best possible results.



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International Construction: hardening market dynamic continues

Introduction

Following the dramatic changes experienced by the Power Construction market in the last couple of years, the insurance premium rates and broad levels of cover which have been readily available over the last two decades have now made way for restricted and challenging policy terms, combined with increased rates and deductibles/excesses, as insurers seek to mitigate the impact of prior years to their portfolios.

Effect of COVID-19 and Nat Cat losses

Whilst the full extent of the impact of COVID-19 is not yet known, the pandemic and continuing natural catastrophe losses have undoubtedly accelerated the market's transition. Current indications from the market demonstrate that these conditions will persist during the latter half of 2022, as the global market continues to assess its impact. Pandemic exclusions are now commonplace and often as a direct result of treaty restrictions, irrespective of the likelihood of exposure.

Inflation

In more recent times, the worldwide construction and power industry has been thriving, with industry turnover peaking above pre-pandemic levels. However, the sector

now faces new challenges, as demand for construction materials outstrips supply, resulting in unprecedented increases in price and lead times. Reinstatement values are now being closely scrutinised and are leading to insurers applying above-inflationary increases to material damage classes.

The disruption to supply chains is mainly being experienced as the shipping industry recovers from the impact of the global pandemic. And in the UK these issues have been compounded by Brexit, which has seen increases in bureaucracy, customs checks and trading difficulties, leaving many UK builders solely reliant on domestic production. The worldwide shortage of HGV drivers is adding further complications to these issues.

As insurers respond to higher reinstatement values they are seeking to apply above-inflationary increases to material damage classes, including Erection All Risk, Property Damage, Business Interruption, and Third Party Liability. Material damage inflation appears to have superseded traditional concerns regarding injury cost inflation in pushing rate increases, which is the first time this has happened in a long while.

Reduced overall capacity

The 2021/2022 reinsurance treaty renewals resulted in a flattening of capacity, with global PML levels of approximately US\$4 billion on a best risk basis. Insurers are tending now to not use their full capacity available for the vast majority of risks, preferring to use a percentage of “best risk” capacity only, thereby reducing available global capacity by a considerable margin.

Less enthusiasm for leading business

A distinct reduction in the number of underwriters willing to lead risks and commit meaningful capacity is also a feature of today’s market. Many are not willing to maintain a lead position, thereby reducing vital market competition.

Indeed, reduced line sizes are now being offered on major projects by some insurers, who are calculating their line on a Total Insured Values (TIV) basis rather than its Probable Maximum Loss (PML). This is resulting in much reduced line sizes being offered and leads to capacity-driven placements, with corresponding impacts on coverage and premium, and/or on first-loss limit placements at MPL or MFL levels which will not incorporate full reinstatement values.

Rates and deductibles increase

In 2021 the market experienced rating increases of on average 5% to 10% across the global portfolio, although we have seen higher increases for risks in areas where underwriters had concerns over supply chain and risk management. Deductibles have also increased, often by 15% to 20% for specific technology risks, commissioning periods and natural perils.

Focus on stricter coverage conditions

The transitioning market conditions have led insurers to impose stricter coverage conditions, aligned with those considered “standard” for many years. Each risk is continuing to be underwritten on a case-by-case basis, with pricing being influenced by project type and geography.

Sanctions exclusions

A feature of today’s insurance policies is a sanctions exclusion, preventing claims payment, benefit or assistance, if to do so breaches any UK, EU, UN, US or other sanction. The Russia - Ukraine conflict has caused significant disruption to companies with assets and business operations in Ukraine, Russia, and the surrounding countries/regions. The conflict has also led to insurers’ application of sanctions imposed against Russia’s and Belarus’ financial institutions, state-owned entities, businesses and other targets by the United States, the United Kingdom, the European Union, and their allies. Companies that conduct business or have assets in Ukraine, Russia, or Belarus have inevitably been impacted by the conflict and subsequent sanctions. It is anticipated that this will continue to evolve over the coming months and years, resulting in new versions and revisions of sanctions exclusions being applied.

Approach to Defects cover

With all market cycles, changes in terms are a gradual process. To address adverse claims experience, insurers use three main levers: premiums, deductible levels and coverage. Once the market began to harden, premiums rates rose significantly, deductibles increased (depending upon type of risk) and coverage was restricted - especially with regard to those which insurers felt left them more vulnerable in the event of a claim. For Construction insurers, this has particularly the case in respect of cover for Defects (i.e. design, faulty workmanship or defects in materials), the emphasis now being on a far stricter approach in terms of providing post-completion risks during Maintenance, Warranty or Defects Liability periods. The widest form, Guarantee Maintenance, continues to be hard to obtain and only achieved with very detailed technical information and support to demonstrate a compelling and justifiable reason coverage at this level. A few insurers are believing that by providing Guarantee Maintenance cover this would replace or substitute either a Contractor’s obligation to repair or a manufacturer’s warranty; this the reason for the cover being selectively provided, even in softer overall market conditions. Our current experience suggests that the same concerns apply (and will continue to do so) to coverage in respect of the widest form of Defects exclusions (commonly LEG3 or DE5). Similarly to Maintenance covers, it will only be achieved where detailed supporting evidence can be provided that this coverage is necessary.

Construction losses

Fire and Explosion perils are the most common causes of loss, accounting for over a quarter of losses by value on engineering and construction projects. There is no change in the frequency of losses occurring on projects, but the increasing value of claims is causing a higher impact on results.

The impact of climate change means natural catastrophes are also resulting in large claims; for example, storm damage now accounts for one in ten claims. Natural catastrophes are now a key priority for engineering and construction firms.



Conclusion: a strong global appetite for renewables

Important political and economic drivers, combined with the urgent need to cut greenhouse gas emissions, are creating a strong global appetite for renewable energy sources, including hydrogen, offshore wind and waste-to-energy projects. However, numerous challenges are being faced by governments, developers and contractors across the world, from technical and economic restrictions in repurposing energy pipelines and infrastructure to an increase in renewable energy disputes relating to issues of waste quality, efficiency, delays and terminations.

The fast-growing renewable energy market is an exciting yet challenging area for the engineering sector and its insurers. As the demand for green energy has increased, solar and wind projects have grown in scale and locations ever more remote. Key insurers in this market, have reassuringly committed to continue to provide coverage and capacity, as investment and development in these sectors facilitates global economic growth.



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Regional market round-up: uncertainties remain

Beijing

Domestic market

Chinese insurance market capacity for domestic Power & Utilities business has remained stable during 2022. From some renewal tenders of major power companies' master programmes, we can see that a tendency for the leading risk carriers to focus more on underwriting profit rather than market share, which gives more opportunities and share to second or third tier insurers; Business Interruption cover is not usually included in these master programmes. We did not see many power generation losses in China during 2021-2022.

The insurance premium rates for Power business fluctuate to a relatively small degree, depending on premium volume and loss record. Although the energy price has surged globally since 2021, Chinese electricity prices have been maintained at the same level for the last two years; power companies are not allowed to increase the electricity tariff for civil and commercial consumers. Most coal-fired and combined cycle gas turbine power plants are suffering operating losses and have the task of reducing overall costs, including insurance expense. Insurers prefer to choose options with higher deductibles for renewal and new Construction risks.

Overseas market

The Chinese insurance market capacity for Overseas Power reduced significantly in 2022, especially for non-Chinese business. There were some huge insurance claims relating to overseas projects in 2021, most of them involving the power business. The reinsurance treaties of most Chinese insurers have been changed to apply a strict definition of "Chinese interest". Construction work or ownership of less than 40%, not actually operated by Chinese companies, and financed from Chinese banks, can no longer be considered as "Chinese interest" anymore. Chinese underwriters take a more conservative view for overseas risks in terms of premium rate and capacity and are much more cautious about high indemnity Business Interruption limits. The premium rate levels for overseas Chinese Power business are much higher than the similar risks in mainland China; indeed, some of them are getting closer to the international market level. Some underwriters prefer to

follow the international market leaders, while others have stopped writing non-Chinese business since the end of 2021. At present, not many Chinese insurers can provide reinsurance capacity for non-Chinese Power business.

A One Belt One Road co-insurance pool for overseas risks was established in China about a year ago, which was founded by China Re and other major Chinese risk carriers, which aims to provide reinsurance capacity for overseas Chinese investment and EPC projects, particular for cover in respect of Delay Start-up and Terrorism risks. Some overseas power projects have been supported by this reinsurance pool.

Coal-fired power

Currently, over 60% of Chinese power is generated by coal-fired power plants. The loss record for these coal-fired power risks has been generally favourable during 2021-2022; premium rates remain stable, although some Power clients are pressing for rating reductions. Some Chinese insurers are using the underwriting profit generated by their coal-fired Power portfolio to balance losses from other businesses. We have not seen any new Chinese investment in overseas coal-fired construction power projects since 2021, since the Chinese government made its commitment to its carbon-neutral target.

Hydropower

The attitude of the Chinese insurance market is quite different for large and small Hydropower risks. Insurers are pleased to provide competitive terms for medium and large hydropower projects, which have better resistance for natural hazards. The loss record for small hydropower projects has been poor for the last few years, so some insurers are now declining to accept small Hydropower risks. Some pumped storage hydropower plants are being constructed in China, with more planned during the next few years.

Combined Cycle Gas Turbine Power Plants (CCPP)

Due to lack of reinsurance treaty support, Chinese market capacity for large CCPP projects mainly relies on the international market; as a result, the premium rate and deductibles are closer to international levels. However, for small CCPP power units (less than 150MW), the Chinese market can provide more competitive terms, including lower rates and deductibles.



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Dubai and the wider Middle East

In 2022 the regional Power market in Dubai has continued very much in the same way that 2021 ended. Despite some regional Power losses, generally underwriting results have been profitable; as a result, standard market rating increases have decreased, from 20% to closer to 10% on average for the most sought after business and loss free programmes. And for the very best business, brokers are sometimes able to deliver flat renewals by challenging leads and restructuring deals. Capacity remains stable, at approximately US\$1.45 billion for UAE-domiciled business and US\$900 million for other regional business.

It feels like we have a little less “headline news” for this year’s Review than in previous years; however, for the region this is no bad thing. After a few years of turbulence, we are finally seeing some stability in a region which has always been known to be rather dynamic. This stability has been good for business and good for our clients, with many success stories for regional domiciled risks in 2022.

After a few years of hardening, meaning that rates are now much closer to technical, conditions are now much more favourable for underwriters. As such the major global insurers are setting their stall out to lead more P&U business and are deploying maximum capacity whenever possible.

Some Asian insurers to deploy capacity in the Dubai International Financial Centre (DIFC) following recognised leaders and one particular Japanese insurer is more often than not deploying large lines when there is an element of Japanese interest.



There continues to be a steady support for regional business from the indigenous following markets, who are still providing very reliable follow capacity for the majority of our regional portfolio. We continue to bring a cross sell approach to get best results. Meanwhile, MGA capacity continues to flow, and regional capacity has once again been bolstered by the introduction two new MGAs.

Middle East insurers begin to write Israel business

Since the Abraham agreement between Israel & the UAE in 2020 we are now seeing Israel-domiciled risks being underwritten in the DIFC for the first time ever. This is obviously going to be new business for regional markets, which is why we are seeing an enthused attitude toward a change in access points when acceptable to cedants.

No “Clause for Concern”

We are seeing certain market clauses now start to re-appear such as Long Term Agreements and Low Claims Bonuses which is often the first clue that we are heading for softer market conditions.



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North America

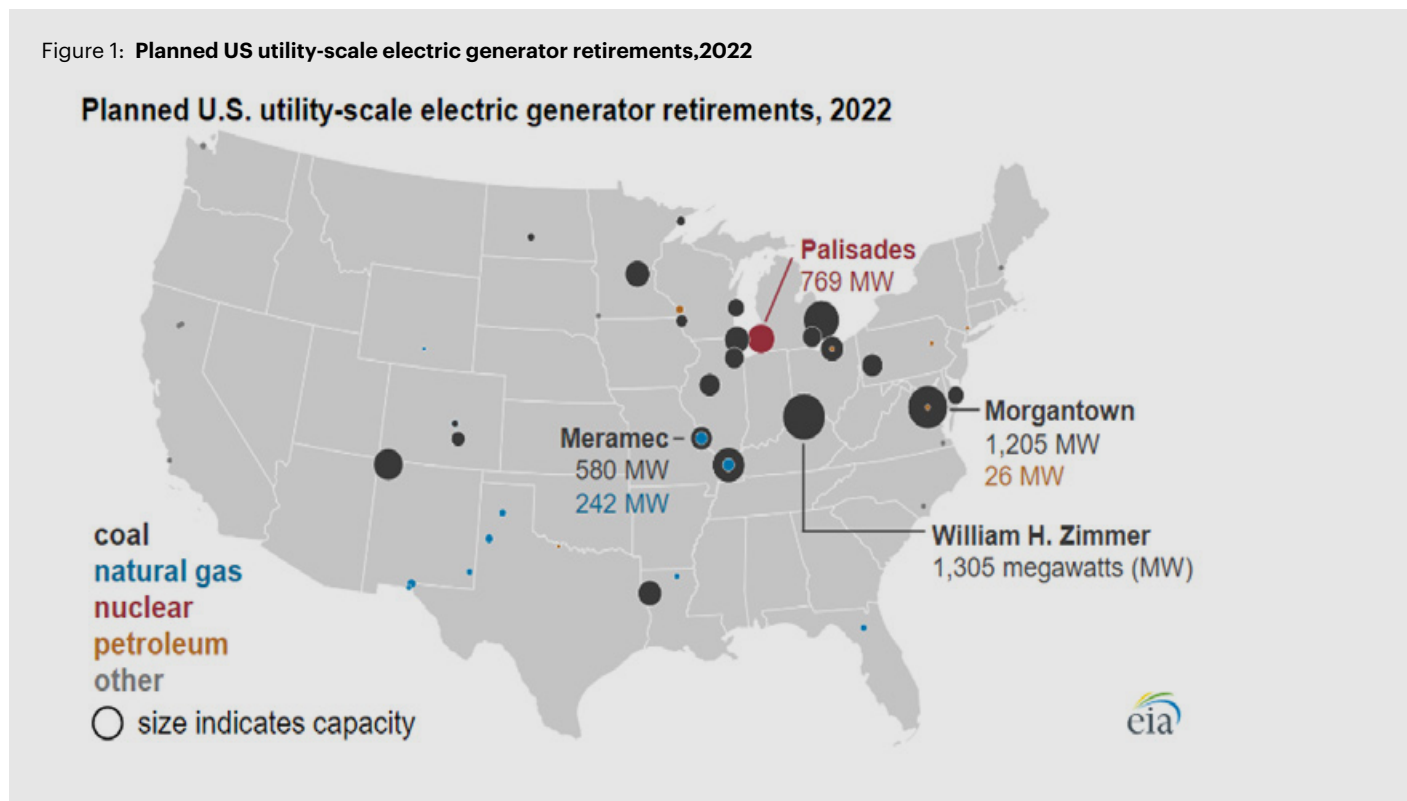
Market developments

The conventional Power market in North America continues to follow the global growth in renewables and social and environmental development. The market still treads a delicate balance between grid stability, social impacts, and consumer prices. Over the past 12 months many clients, owning both natural gas and coal power plants, saw record revenues, as nearly 12.6 GW of coal capacity is expected to close in 2022¹. The Great Lakes (MISO/PJM) have had the biggest impact. This continued pressure in base load production is driving demand for peaking plants, both natural gas and coal fired facilities, leading to record revenue years.

Because the current model is focused on regional plant retirements and the projected increase in power demand, power producers will continue to see favorable pricing. This squeeze in MW-day prices will drive uncertainty in Business Interruption estimates which, when combined with supply chain effects on replacement values, are likely to contribute to a slight pressure on insurance pricing.

¹ <https://www.reuters.com/business/environment/coal-make-up-85-total-us-power-capacity-be-retired-2022-eia-2022-01-11/>

Figure 1: Planned US utility-scale electric generator retirements, 2022



Source: <https://www.eia.gov/todayinenergy/detail.php?id=50838>

Coverage

Key insurers across the Power Generation market continue to focus on the growing revenues that many in the industry are seeing. Commodity-driven prices, most notably in natural gas, are expected to trend lower over the next 12-18 months where the EIA states: “We expect natural gas prices to decline slightly in 2023, averaging \$3.63/MMBtu, as growth in dry natural gas production outpaces growth in domestic demand and exports.” A lower trend in operating expenses will trigger greater margins.

As margins increase through reduced operating expenses and increased power prices, insurers will look at revenue projections closely. Failure to review and project revenue change will leave some in the industry under-insured for both small and large claims alike.

With a number of high-profile steam turbine losses globally, buyers’ risk profiles will change. Engineering analysis will play key roles in underwriting decisions, while operations and maintenance practices will be heavily scrutinized. This will especially be the case for steam turbines, including general maintenance, overhauls and testing.

Insurer profitability

Insurer profitability has progressed as Property and Casualty rates continue to climb both broadly and specifically in the Power market. Key mutual insurance companies either increased annual credits or added one-time credits, while other publicly-traded insurers continued to see improved Combined Ratios and record profitability.

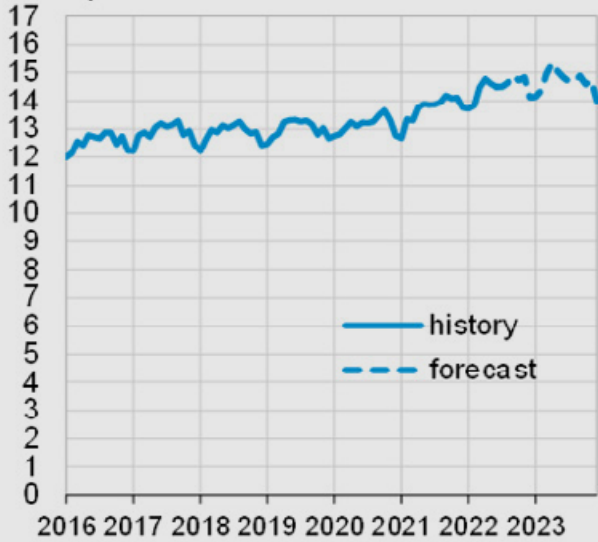
Rate increases over the last few years have helped provide stability, as interests rates continued to decline, which forced many insurers to focus on underwriting profit rather than the combination of investment and underwriting profit. As conditions change and profitability continues to rise, a renewed pressure to grow should provide some relief for the market.

2023 outlook

Broader economic market conditions will continue to filter into the power sector, with rising consumer utility costs front and center of the challenges that they will be facing. Utility companies continue to push the balance of grid security and stability, with a social push for ESG trends. According to the EIA Short Term Energy Outlook, power consumer trends are expected to decrease in 2H2023, but the overall trend is upwards.

Figure 2: US Electricity price trends and forecast

U.S. monthly nominal residential electricity price
cents per kilowatthour



Annual growth in nominal residential electricity prices
percent



Source: https://www.eia.gov/outlooks/steo/pdf/steo_full.pdf (P33)

Within the insurance market, insurers will seek rate changes in line with loss cost trends which continue to rise due to inflation, nuclear verdicts and other factors. No line of business is immune to increased loss cost trends; Workers Compensation is likely to remain as being deemed rate adequate by insurers and is the only line of coverage expected to be at or below a 0% rate change in the US.



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Miami – Latin America

Capacity

Available capacity has remained stable for Power Generating risks in Latin America; insurers remain extremely cautious in its deployment, with their main focus remaining on loss experience and Nat Cat exposure. Furthermore, Hydro is still being scrutinized; after an important loss in Latin America a couple of years ago, the market has become very cautious in that respect. Meanwhile, in general the first year of operation for projects is also being treated very prudently by the market, while alternatives for lower Business Interruption deductibles are no longer being provided, with only the more conservative options remaining in play.

Excellent quality information should be submitted to present buyers' risks in the way that the market is expecting and is therefore one of the keys to a successful placement. This should preferably be managed through specialized power risk engineers, provided either by the broker or by the market. Furthermore, the involvement of these engineers will provide a continuous follow up of risk improvement recommendations, which is another important factor in persuading insurers to deploy their capacity.

Business Interruption (BI) valuations

In the current atmosphere of inflation in the Latin American economy, correct valuations for property values are an absolute priority; a specialized evaluation firm can help to perform this in the most independent way. In addition, analytical services provided by brokers can help to measure the total cost of insurance that a client bears and can help to revise the required limits, all contributing to making insurance buying more efficient from a client's perspective.

As buyers' business activities increases back to pre-pandemic levels, their focus should remain on ensuring a correct declaration of insured values for BI; attention should particularly be given to:

- how the definition of average daily value of any component of the BI values is set
- checking to which extent the coverage protects the exposure

Another important BI component which is applicable at times in Latin America is the potential obligation under Power Purchase Agreements for the power generator to purchase replacement power in the spot market in case the contracted plant cannot generate because of unavailability of the generation project.

Indeed, each component of a BI exposure in the power industry needs regular reporting to check the initial declared values against the updated exposures in terms of both values and the indemnity period; some restrictions in logistical equipment flow can potentially cause longer delays than initially set out in the original indemnity period, which may suggest that a longer period is required.

Single digit rises or decreases available for the best programs

The tendency to decrease line sizes and to focus on natural catastrophe limits remains. Machinery Breakdown coverage continues to be scrutinized. Renewals for excellent risks are expected to have single digit rate increases or even small decreases; however, portfolios with losses or technical complications are still experiencing double digit rate increases and can face more limited capacity. We are not aware of any major Power claims in the Latin American region in the first half of 2022; however, some major claims in recent years remain on insurers' books.

Brazil market flexibilization

In terms of quality of policy wordings, last year we mentioned the on-going market flexibilization in Brazil, which will allow an offering of tailor-made wordings in a broader fashion, even though it is expected that its implementation could take some time to become operative.

Coal fired plant capacity continues to contract

An increasing number of global insurers with offices in the Latin American region will no longer provide underwriting services for the construction/operation of any new coal-fired power plants. The market offering for these projects has therefore become even more limited, making it more of a challenge to provide capacity. An important differentiator to accessing capacity will be the transition plans which a buyer has in place to move away from coal fired generation, in which case insurers can still consider supporting the buyer's programme during this transition phase.



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Introduction

During the first three quarters of 2022, the Asian Power market has continued where it left off in 2021, with rates still rising. However, the final quarter of 2021 saw a slowing of rate rises for straightforward renewals with clean loss records and no Nat Cat exposures. While premium increases are still being applied, a greater degree of flexibility is being shown for coverage terms and pricing on clean loss accounts. This is in line with the tapering effect that we have been reporting over the last two quarters, as markets seek to protect their top line following two years of significant rate increases. An increasing number of clients experienced premium increases of less than 10%, and actual rate reductions were achieved on a few placements in exchange of increased deductibles. In contrast, programmes that have had poor loss records are still being heavily penalized, with marked rate increases coupled with upwards adjustment on both Property and BI deductibles.

In the first half of 2022, insurers continued to underwrite with caution, but the market is also showing a slightly greater appetite and easing restrictions for clean/good quality business. We have seen discounts such as a Prompt Pay or No Claims Bonus credits, which had disappeared during the past two years, now back on the table.

Although there is still a high level of underwriting discipline, we are getting to a point where some competitive tension between insurers has been introduced, due to the engagement of global insurance markets to increase access to capacity rather than simply rely on regional markets. This development is further encouraged by the recent emergence of pockets of new capacity and increased growth targets in certain areas.

As a result, we have seen the return of over-placement and signing issues (where over-subscription or more than 100% capacity leads to markets being signed to a lower amount than their written line) on some sought after programmes. Additionally, regional insurance markets are re-emerging as hubs, having witnessed the return to profitability of the London market over the past 18 months. One significant change of underwriting approach has been that updated asset valuations are being required by insurers to verify the accuracy of Sums Insured due to material cost escalation resulting from recent global geopolitical events; otherwise, a Full Average Clause is to be applied.

Rating increases remain in the range of 5% to 10% for programmes with a minimum five-year clean loss record for H1 2022.

As for risk and analytics, we have seen lenders pushing for more engineering and risk & analytics works. Besides the classic risk engineering reports, lenders expect clients to conduct earthquake and other catastrophe related analytics in order to justify the changes of terms from the Common Terms Agreement.

Coal-fired power plants

Stand-alone Coal placements continued to experience extreme challenges. As an increasing number of insurers have no appetite for such placements, regardless of risk quality or loss history; as a result, larger retentions and further rate increases are expected to persist. Insurers are re-aligning underwriting in support of revised ESG policies, further reducing capacity, in some cases earlier than anticipated. With demand for capacity exceeding supply, rates are often considerably higher than expiring policies, and are felt more acutely by companies without an established relationship with the insurer. In our experience, restructuring of programmes and a strategic approach using global insurance markets has become commonplace.

A major global American insurer's Net Zero commitment announced earlier this year came sooner than expected and has further worsened the already challenging environment for Coal insurance. We are expecting further price increases as the impact of this major global insurer's new ESG policy, especially with regard to those Coal risks currently led by them in Asia. As Coal leaders become scarce, we believe this major global insurer will take this opportunity to push higher rate increases while they still can underwrite Coal business.

WTW Climate Transition Pathways

Since WTW launched our Climate Transition Pathways ("CTP") framework last year, our Coal clients have been actively engaging with us on this topic due to the increasing pressure from lenders about insurance capacity. They are hoping WTW will guide them in the accreditation to assess the alignment of their transition plans to the goals of the Paris Agreement, and in return reap the benefit of CTP accreditation, i.e. accessing the insurance capacity provided by insurance companies who support WTW CTP.

We strongly believe this CTP will be the long-term solution for our Coal clients because while we provide guidance to organisations planning their transition to a low-carbon economy, such accredited accreditation framework provides insurance companies and financial institutions with a consistent approach to identifying business with robust low-carbon transition plans which are in line with their ESG guidelines.

All of our Coal clients have been introduced to the CTP framework and two of them are already in the advanced phase of engaging CDP (Carbon Disclosure Project) Assessor. These coal plants are fully aware that as a Special Purpose Vehicle created by the Joint-Venture, they will not be able to achieve the accreditation due to the stand-alone arrangement (there will be neither energy transition plan nor renewable projects investment). We therefore engaged with the shareholders in most of the cases and we have seen nothing less than 100% supportive from the shareholders on our CTP.

WTW are helping our clients to manage the CTP process at a micro level to meet the accreditation, supporting them on the metrics/requirements of the accreditation which is complex; which is why our CTP team is taking them through that journey with WTW.



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About WTW

At WTW (NASDAQ: WTW), we provide data-driven, insight-led solutions in the areas of people, risk and capital. Leveraging the global view and local expertise of our colleagues serving 140 countries and markets, we help you sharpen your strategy, enhance organisational resilience, motivate your workforce and maximise performance. Working shoulder to shoulder with you, we uncover opportunities for sustainable success — and provide perspective that moves you. Learn more at wtwco.com.



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