What just happened? Our four key challenges for 2023 revisited

Introduction: Back to 2022

At the time of writing our Power Market Review last year, we highlighted four global challenges that the power sector faced. These included:

- **The Russian — Ukraine conflict:** We discussed the impact on the European generation mix from having to turn down dependence on Russian Gas, the constraints on importing from other sources due to the lack of infrastructure to facilitate this, the inevitable rising cost of gas from other sources and the impact on generation costs and wholesale markets that were expected to remain for some time. We were also faced with the need to reinstate coal generation capacity to make up for lost gas-fired capacity in order to keep the lights on. This was creating concerns among insurers in terms of market volatility and the challenges that they faced in terms of measuring exposures.
- **Global inflation:** Rising energy, commodity and production costs, increased demand for new power generation and transmission infrastructure, together with constrained post-COVID-19 supply chains, were impacting construction and operational costs around the globe. Insurers had significant concerns around the adequacy of insured values, increased claims costs and the need to reflect both in rates and retentions.
- **The energy transition:** The energy transition was driving the shift to new technology development and growth in new sectors such as Battery Storage, CCUS and Green Hydrogen production. Despite the clear narrative around the shift to clean energy, the question remained as to the rate of movement for the various technologies. The insurance market was under pressure to support the transition but from a position where it did not have the historical performance data from which to underwrite with confidence.
- **Climate change:** The impact on climate change, the world's greatest challenge, was being felt on a number of fronts. The human impact from natural catastrophes on exposed communities is clearly paramount but from a Power sector perspective, generators and utilities were experiencing a range of challenges from increasingly unpredictable and punishing weather conditions. The impact was felt across fuel supply chain disruption, as well as low water levels for hydros and cooling water, low wind levels for wind farms, storm damage to solar and high ambient temperatures reducing gas-fired plant efficiency. All fed market volatility.

The above have been felt throughout the final quarter of 2022 and the first half of 2023 on renewal preparations and terms across all our global customer base. As we warned at the time, strong strategies were required to address the above to:

- demonstrate clearly to the insurance market that the challenge was understood
- identify exposures to each and measures in place to mitigate where possible
- help insurers understand how this impacted their exposures.

What have we seen since?

This year the challenges for the sector are similar, although with some notable changes:

- **The positive:** there has been easing in the gas wholesale markets due to a restructuring of gas supplies away from Russia; global inflation is showing signs of easing as economies respond to higher interest rates; momentum behind the energy transition is clearly growing and the market is showing signs of a more supportive response to risk transfer needs from the sector.
- **Less positive:** the potential for global recession could create further uncertainty for generators and markets if industrial demand reduces; transmission networks will come under pressure from a higher reliance on intermittent power, as re-commissioned coal plants are turned off and output from more expensive gas fired plants is turned down; natural catastrophes from weather and non-weather-related events (mainly earthquake) continue at historically high levels, driving major losses across a wider geographic base — we also have the added uncertainty from the return of the El Nino ENSO this year.

So, whilst the challenges sound familiar, the landscape continues to evolve and change with a level of unpredictability that will continue to focus insurers on risk quality and information, well explained asset and revenue values, clear communication, and the need to ensure that terms reflect the exposure.

In this section we investigate the above in greater detail, assess how this will impact markets and consider the measures that can be taken to deliver the best results in an ever-more demanding insurance market.

Russian — Ukraine conflict

18 months on from the 24 February 2022 and the Ukraine — Russia conflict has no end in sight. Both sides are firmly pursuing their objectives with no political compromise or solution on the table. If anything, the situation seems to be escalating with greater support in terms of military hardware from Western supporters of Ukraine. Against this background we consider the ongoing and future impact of the conflict on the Power sector.

Have the energy strategies implemented between February and December 2022 been successful?

Last year we were in the eye of the energy crisis storm and there seemed to be significant doubt around the European Union's ability to implement effective sanctions against Russia, whilst also delivering:

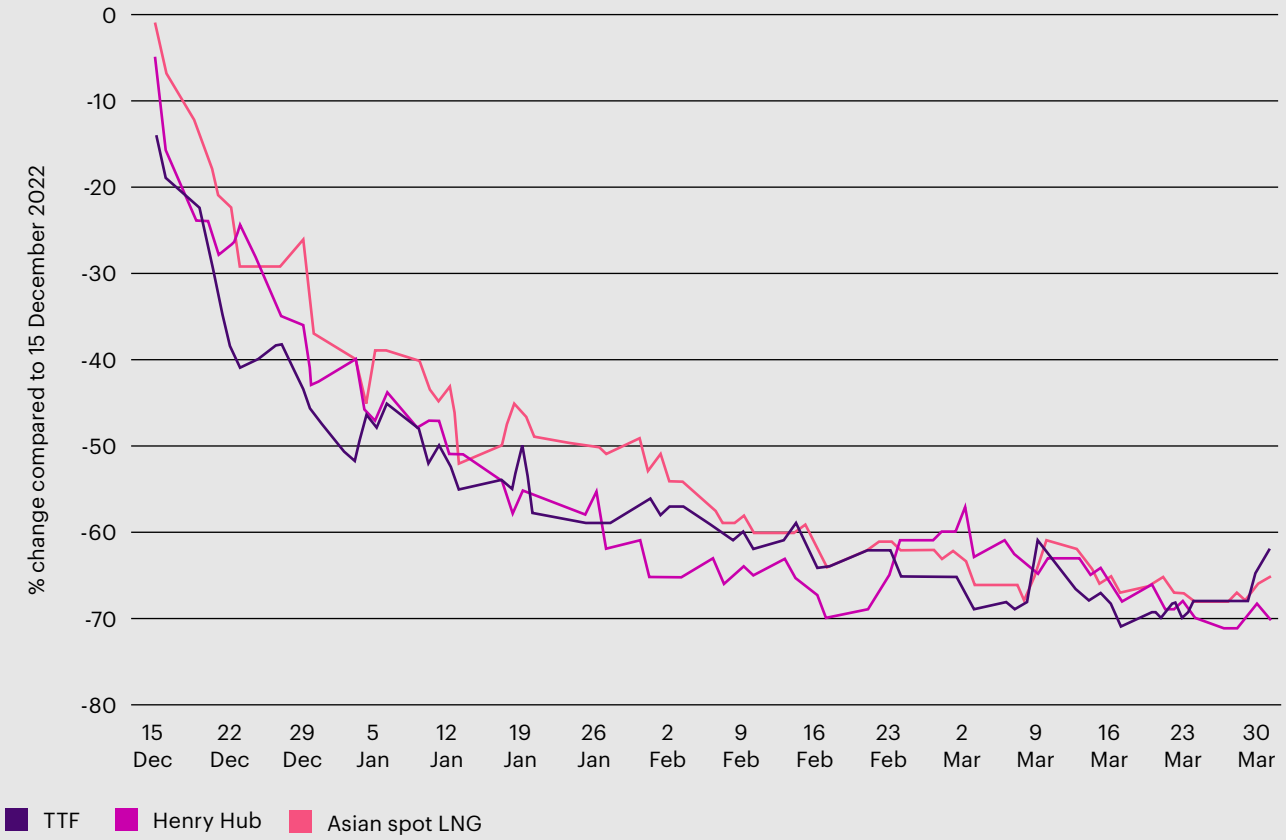
- affordable and competitive energy to consumers
- enhanced energy security and preparedness for emergencies
- strengthened EU energy resilience and autonomy

Forecasts suggested that it would take up to five years for power markets to settle, while Russian gas was replaced from alternate sources and the infrastructure needed to accommodate this was put in place. The EU however implemented a highly effective strategy and supporting legislation that enabled it to:

- broaden the EU gas supply base
- prevent excessive Energy company profits and reduce volatility through price/ revenue caps
- reduce demand and market stress by compelling commercial and residential users to reduce electricity use by 5% peak-time and 15% annually — measures now extended to March 2024
- achieve greater leverage on global markets and avoid inter-EU competition by consolidating buying strategies across states
- ensure gas storage facilities were 80% full by November 2022 and 90% full in subsequent winters and require states with gas storage capacity to share this with states that don't
- accelerate the transition to green energy through the "Fit for 55" package that will now reduce greenhouse gas emissions by at least 55% (previously 45%) by 2030
- improve EU TSO interconnection and the free flow of new renewable energy between states.[1]

[1] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131

Figure 1: **Key regional gas markets percentage change since December 2022**



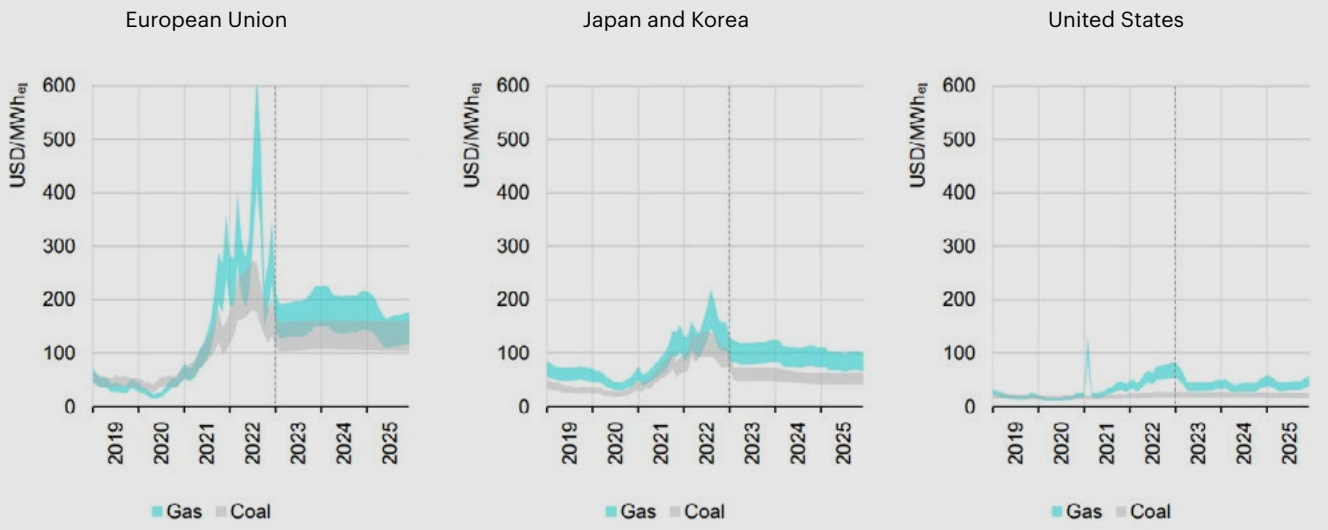
Source: https://www.iea.org/energy-system/fossil-fuels/natural-gas

Despite the above initiatives, it is impossible to replace most of the 40% of Europe's gas supply that came from Russia (there are still reduced imports coming though the Turkstream pipeline and LNG — 10bcm for the first five months of 2023 compared to 62 bcm and 42 bcm respectively for the same periods in 2021 and 2022[2], without it having a significant medium-term impact on wholesale prices across the world. Therefore, although there has been a 60% fall in European gas prices from the 2022 peak, they remain at historically high levels.

This being the case Figure 2 overleaf shows that as at January 2023, average forward price expectations for electricity from EU fossil fueled generation through to 2025 remain at multiples of historic levels. It can also be seen that whilst other regions are not impacted to the same level, due to gas self-sufficiency in the case of the US and Asia not being dependent on Russian gas, prices across the globe are expected to remain higher than pre-COVID-19 for some time. Importantly however, even though there will always been some volatility regionally from temporary supply constraints or increases in demand, over the longer term, the more acute stress present a year ago will have greatly subsided and the outlook is more stable.

[2] https://ecfr.eu/article/own-goal-how-russias-gas-war-has-backfired/#:~:text=In%20the%20first%20five%20months,period%20in%202021%20and%202022

Figure 2: **Generation costs of coal and gas-fired power plants including emissions costs, 2019-2025**



Large regional differences in thermal generation costs by 2025, with Europe about twice as high as Asia

Source: https://iea.blob.core.windows.net/assets/255e9cba-da84-4681-8c1f-458ca1a3d9ca/ElectricityMarketReport2023.pdf

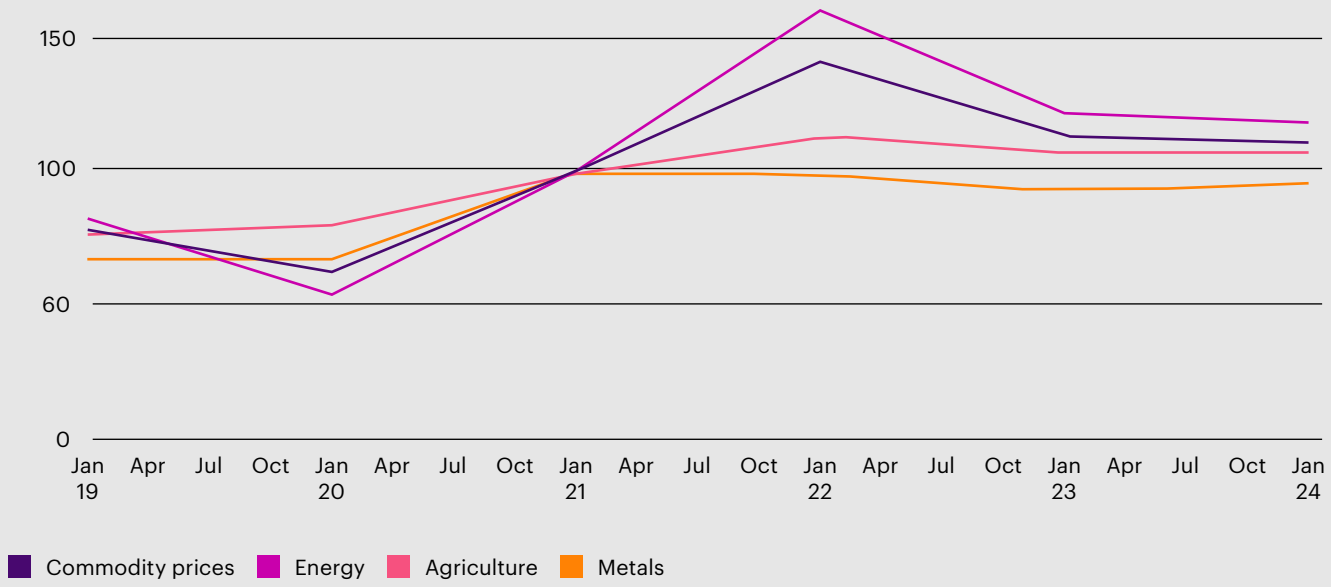
Strategies to avoid future volatility in Europe

Long-term redesigns of Europe's power market will be necessary to limit future volatility and ensure consumers and producers as well as generators have a more stable environment in which to operate. As well as shorter term fixes, European policy makers and regulators are considering several longer-term EU market reform options:

- **Central buyer model:** Under this model, open market trades are replaced with a single EU or national regulatory agency purchasing electricity from dispatchable sources at fixed prices under long-term contracts. Markets then buy off of the agency at an average price, taking out the volatility of individual traces. Benefits include lack of volatility and consistent and reliable supply of power.
- **Decoupled day-ahead markets:** This involves separate markets for energy resources with zero marginal costs (such as wind and solar) and marginal cost capacity (such as coal). Grid operators would then prioritize the dispatching of renewables, with fossil fuel generation being brought on to meet the residual demand.
- **Capacity remuneration mechanism:** To ensure a steady supply of dispatchable electricity when customers most need it, a grid operator provides subsidies to producers based on the forecast cost of keeping power capacity in the market. This ensures a secure power supply and protects consumers from paying for more capacity than necessary.

This should create a more reliable outlook for insurers that have suffered some unexpectedly high Business Interruption (BI) losses in recent years due to sustained wholesale market shifts and volatility that may have arisen mid-term and not been factored in at renewal. As a result, there has been increased frequency in insurers protecting their positions through the imposition of $/MW price caps on BI cover for risks exposed to market volatility. Caps are usually applied to monthly projected gross margin, with an allowance of around 15% — 20% to allow for some foreseeable market fluctuation. Insurers are also demanding much greater detail regarding Business Interruption exposures, including splits of revenue by month, availability of critical spares, relationships and loss responses arrangements with OEMs, and projected indemnity periods. Whilst even in a more benign electricity wholesale market these requirements are unlike to soften now, the reduced uncertainty should help power book profitability and help lead to a more stable rating environment.

Figure 3: **Commodity price forecasts, Jan 2019 to Jan 2024**



Note: 2023-24 are forecasts

Source: https://blogs.worldbank.org/developmenttalk/commodity-markets-outlook-eight-charts-0#:~:text=Commodity%20prices%20are%20expected%20to,remain%20broadly%20stable%20in%20202

Global inflation

Following the significant upward pressure on inflation globally that began during 2021 and accelerated during 2022, we are now beginning to see a reduction in rates across the globe as the contributing factors begin to subside. 2021 saw significant inflation due to reductions in supply chain output during lockdown that did not respond swiftly enough to meet the significant increase in demand across most sectors as COVID-19 restrictions were lifted. 2022 only saw the position deteriorate further due to the substantial increase in energy costs from the Russia — Ukraine conflict in February 2022[3].

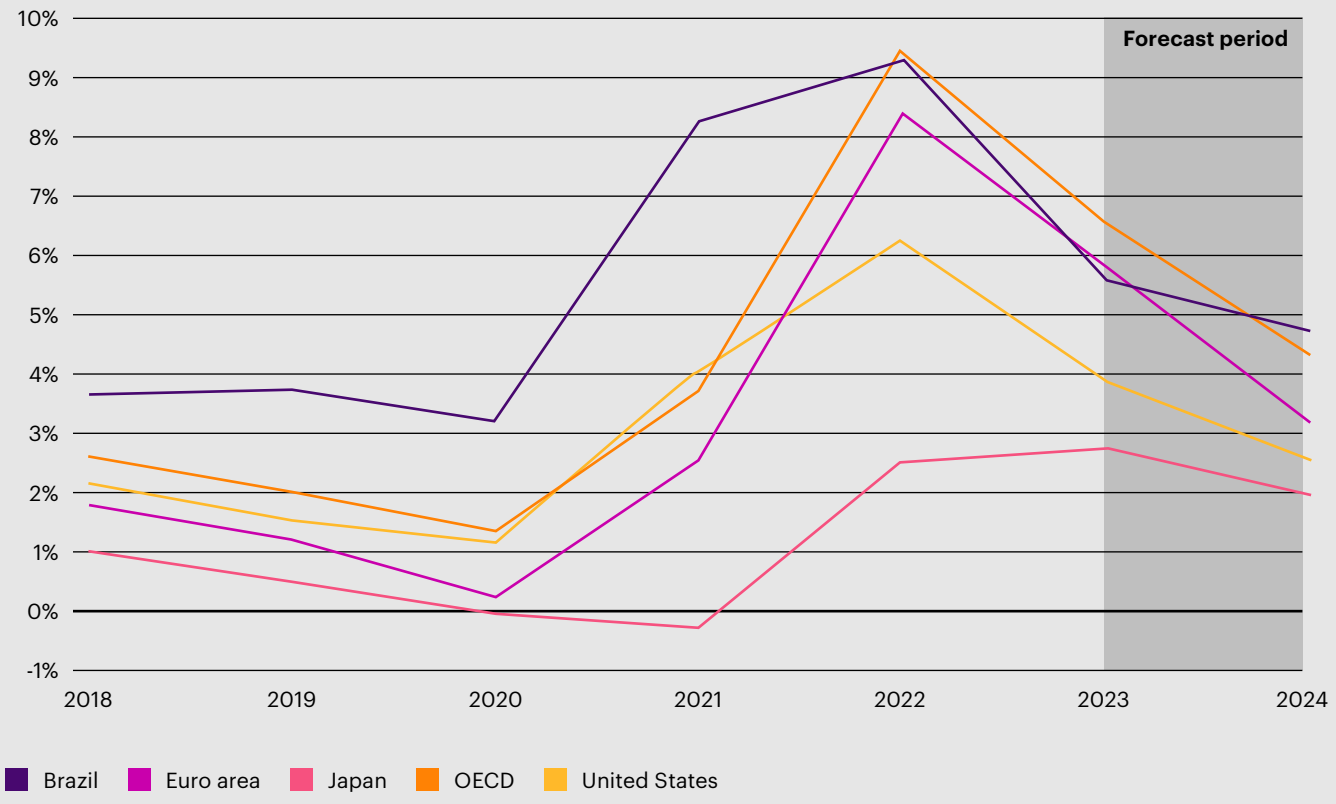
The downturn in Energy/ Power costs that we have seen during 2023 has however, eased pressure on production costs. Commodity prices have also seen a reduction since their historic peak in June 2022 and by the end of March 2023 were 30% lower. Commodity prices are expected to drop 21% in total during 2023 and to be generally stable during 2024[4].

Together with the delayed impact of higher interest rates, reduced credit growth and the resultant economic slowdown (Global GDP growth slowing from 3.3% in 2022 to 2.7% 2023 forecast) G20 inflation is expected to come down from 7.8% in 2022 to 6.1% by the end of 2023[5].

However, this is headline inflation, and the Power sector has issues of its own that are still very evident and bring additional pressure. This is mainly driven by a supply chain with a full global order book from ageing plants requiring upgrades and lifetime extensions, or new generation plants required to meet new dispatchable power needs following retirement of old units, the transition from coal or global electricity demands growth. The same can be said for other major items such as main transformers, the standard waiting time for which is now 24 months. This has not only required a review of values resulting from increased inflation but also a review of Estimated Maximum Loss scenarios as indemnity periods and expediting costs have grown.

[3] https://www.oecd-ilibrary.org/sites/ce188438-en/1/3/1/index.html?itemId=/content/publication/ce188438-en&_csp_=f8e326092da6dbbbef8fbfa1b8ad3d52&itemIGO=oecd&itemContentType=book
[4] https://blogs.worldbank.org/developmenttalk/commodity-markets-outlook-eight-charts-0#:~:text=Commodity%20prices%20are%20expected%20to,remain%20broadly%20stable%20in%202024.
[5] https://www.oecd.org/economic-outlook/june-2023/

Figure 4: **Headline inflation has started to fall, but core remains persistent**



Source: https://www.oecd.org/economic-outlook/june-2023/

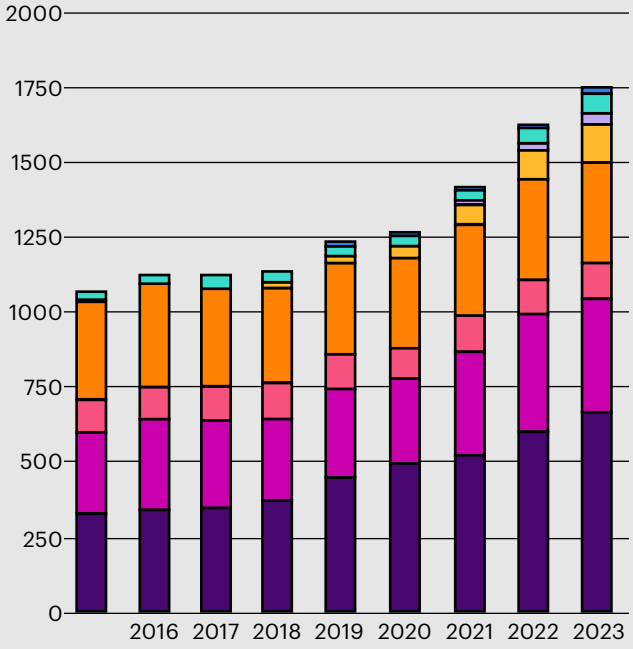
In term of Property values, increases of 8 — 10% have therefore been regarded as a minimum by many insurers this year, even where revaluations have been carried out in recent years. Certain classes of assets, particularly transmission infrastructure and hydro stations with substantial civils values, that had professional revaluations this year following several years of minor inflationary adjustments, saw increases of more than 40%. Whilst this is exceptional, it highlights the need for more regular reviews.

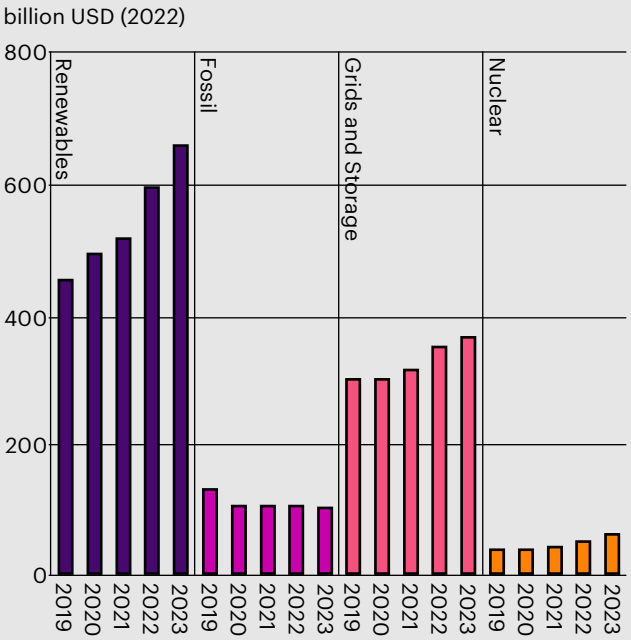
This is particularly the case given that, whilst there may be a case for the above generally more positive outlook for inflation, there remains uncertainty around the global economy. Inflation may be more resilient than hoped and further monetary policy hardening may yet be required to bring inflation under control. There also remains uncertainty around further impact from geopolitical tensions and trade restrictions, including the Russia — Ukraine conflict, that could yet have further impact on raw materials and the energy market (Russia still supplies approximately 20% of European gas), stronger than expected recovery in China's industrial sector and adverse weather events[6].

It is understandably a difficult step to take when considering the potential impact on already high insurance premium costs but ensuring that sums insured, Estimated Maximum Loss values and Limits are all correct is essential for an insurance programme to provide the peace of mind and protection it is there for.

[6] https://ecfr.eu/article/own-goal-how-russias-gas-war-has-backfired/#:~:text=In%20the%20first%20five%20months,period%20in%202021%20and%202022

Figure 5 and 6: **Annual clean Energy Investment 2015 — 2023 and Power Investment 2019- 2023**





Source: https://www.iea.org/reports/world-energy-investment-2023/overview-and-key-findings

Energy Transition

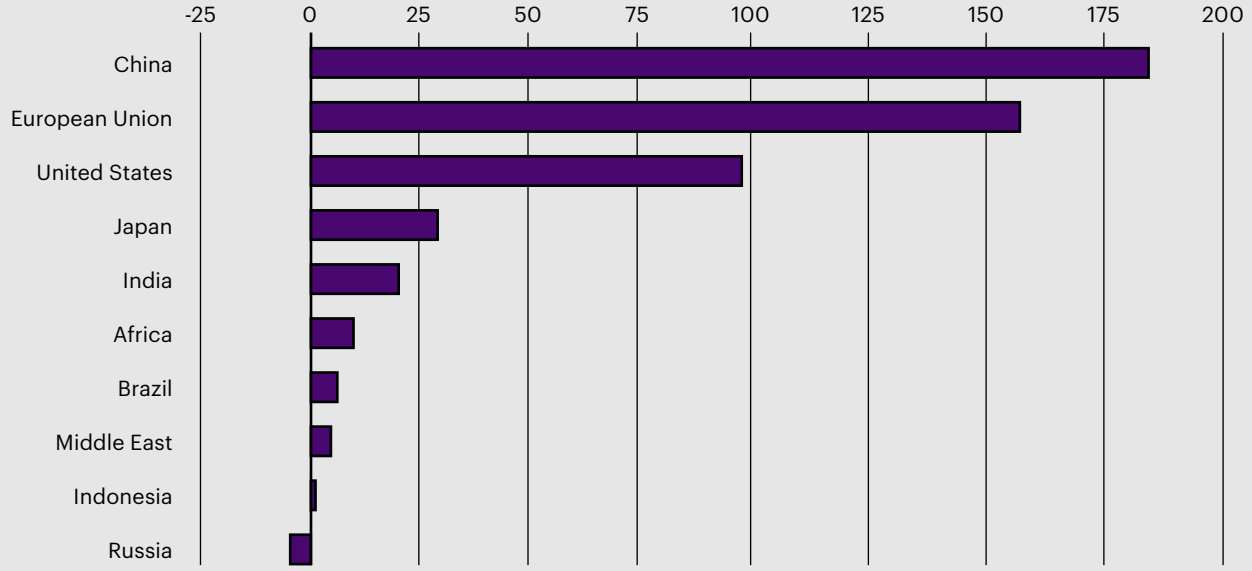
The push for supremacy of Renewables over fossil fueled generation continues at pace with the IEA's expectations of annual clean energy investment having risen much faster than expected in 2021[7]. Annual investment growth in renewables now sits at 24%, compared to 15% for fossil fuels, driven substantially by the energy crisis and a desire to reduce exposures to geopolitical factors, the growing concerns around climate change and increasing focus by investors on ESG.

As a result, of the US$2.8 trillion the IEA estimate will be invested in energy in 2023, they believe more than US$1.7 trillion will go to clean energy (renewables, nuclear, grid enhancement, storage, low emissions fuels, efficiency improvements and end-use renewables and electrification) and US$1 trillion will go to unabated fossil fuel supply and power generation. Only five years ago the ratio was 1:1. In terms of investment purely in new power generation the contrast is even more stark, with approximately 90% of all investment in 2023 expected to be in low emissions power, Solar being the stand-out technology, attracting over US$1 billion of investment daily or US$380 million over the year.

However, there will be discrepancies; although for some countries a big part of the route to energy security will be through renewables, for others, including China, a part of the answer still lies in coal[8]. China suffered painful electricity market constraints in 2021 due to heatwave and drought that drove electricity demand to record levels (a 26.8% jump in residential use) and low rainfall leading to historically low water levels in key hydro reservoirs and lakes fed by the Yangtze River, the levels of which are expected to continue to shrink. Coal supply therefore is expected to see an increase in investment during 2023 of 10%, putting it well above pre-pandemic levels. Overall, the trend for new coal generation is still on the decline but 2023 has seen the largest number of new coal-fired plant approvals since 2016 with 40GW in total, almost all of which will be in China with ten new plants.

[7] https://www.iea.org/reports/world-energy-investment-2023/overview-and-key-findings
[8] https://www.scmp.com/economy/china-economy/article/3190313/chinas-power-crisis-why-it-happening-and-what-does-it-mean

Figure 7: **largest invstors in renewable energy, 2023**



Source: https://www.iea.org/energy-system/fossil-fuels/natural-gas

However, for 2023 China still remains the largest investor in renewable energy by some margin, with China's National Energy Administration expecting the percentage of non-fossil fuel power generation to rise to 51.9% from 49.6% in 2022.

This is illustrated in Figure 7 above, which also highlights the glaring reality of the divide in investment between advanced and developing economies, or what can also be regarded as a north-south divide in terms of the geographies where the investment is taking place. There are some possible exceptions to the rule, such as the substantial growth in solar in India, and rising investment in Brazil and the Middle East but many countries are still lagging behind and so the growth alone over existing annual levels of investment in China, Europe and the US since 2021 outstrips the total investment by all other nations put together.

Transition headwinds

A number of countries are being held back by high interest rates and cost of capital, financially challenged utilities, uncertainty around policy framework and electricity market design.

The situation is complex and the regional discrepancies from country to country around the rates at which the energy transition is being rolled out depend on numerous factors, which are often inter-related, including:

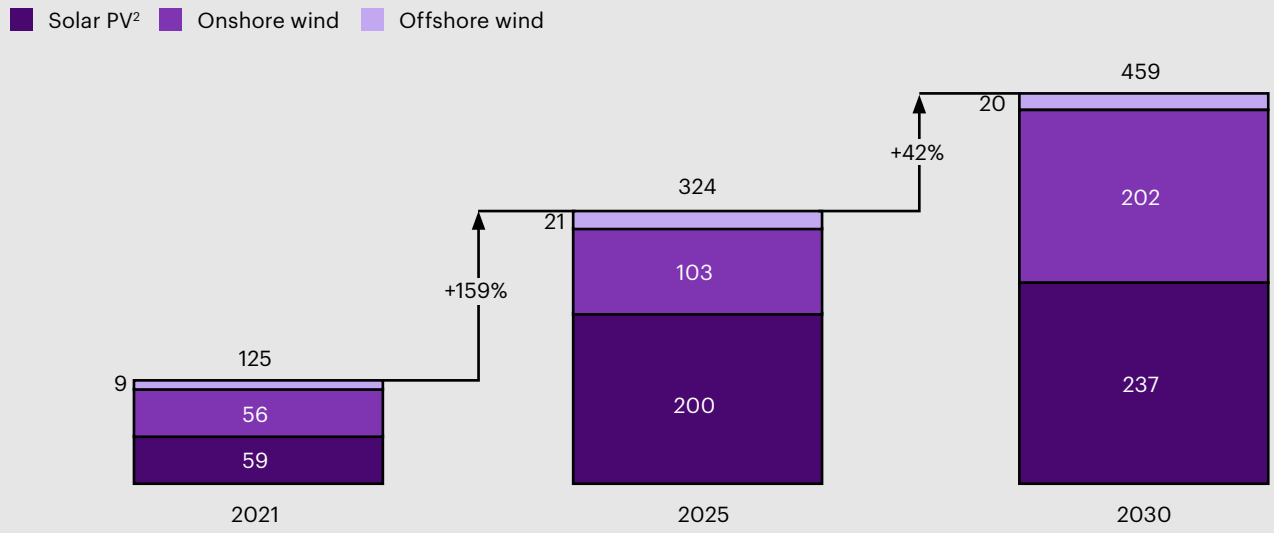
- Policy and regulation and the extent to which they incentivize and facilitate transition roll out.
- Accessibility of finance.
- Levels of investment in supporting networks/ infrastructure and their ability to support the roll out.
- Popular opinion in different countries around the energy transition and how it impacts consumers.
- Geopolitics and energy security and how each country sees it can most effectively protect itself against this.

The presence of regulatory support and financial incentives is a key differentiator. For example, while the benefits of the investment incentives and regulatory support provided by the US Inflation Reduction Act and EU's Green Industrial Deal (target of 55% power production from renewables by 2030) are evident, many countries do not have the same supportive frameworks that provide the longer-term security needed to support investment decisions:

- **Japan:** Offshore wind market is on hold while rules for offshore auctioning of permits are reconsidered and Vestas plans for a Nagasaki-based turbine manufacturing facility were cancelled when orders from previous winners did not materialize[9].

[9] https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/renewable-energy-development-in-a-net-zero-world-disrupted-supply-chains

Figure 8: **Wind and solar capacity addition by year of FID, GW**



Note: Figures may not sum, because of rounding.
Estimated annual final investment decisions for projects demonstrate dramatic activity in renewables markets globally

Source: https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2022

- **Mexico:** Regulatory and financial uncertainty arose during the current administration that put the support packages on hold and frozen investment in new solar by cancelling planned auctions and no longer issues permits for new sites. This follows a period from 2017 to 2022 when the total percentage of wind and solar energy in Mexico quadrupled from 3% to 12% following investment of over US$10bn during 2017 and 2018[10].

This regulatory inertia can in turn arise from various important factors that cannot be ignored or swept aside in an ideological target of change required to save the planet. Beyond the environmental challenges there are social and political hurdles that for many countries will remain insurmountable for many years to come. These hurdles include financial constraints for developing countries that are still reeling from the financial impact on public finances of COVID-19, or others that, like China, have unpredictable, changing climates that can heavily impact future wind and water levels that have an abundance of cheap coal or gas. Regional politics and popular opinion also play a major part, with some developing countries feeling that it is the advanced nations that have caused the climate change and that they have no right to dictate energy policy to those that are struggling with the challenges of having to rapidly expand generation output to meet or help drive rising living standards. This will inevitably mean that for those countries, that are home for up to 80% of the world's population and that are having to work hard to deliver the conditions for economic growth and improving living standards, fossil fuels will remain the cheapest and most practical solution to affordable and reliable energy.

As if this was not enough to put some off, there are other more serious practical factors that make hesitance to commit heavily to energy reform understandable even for advanced nations.

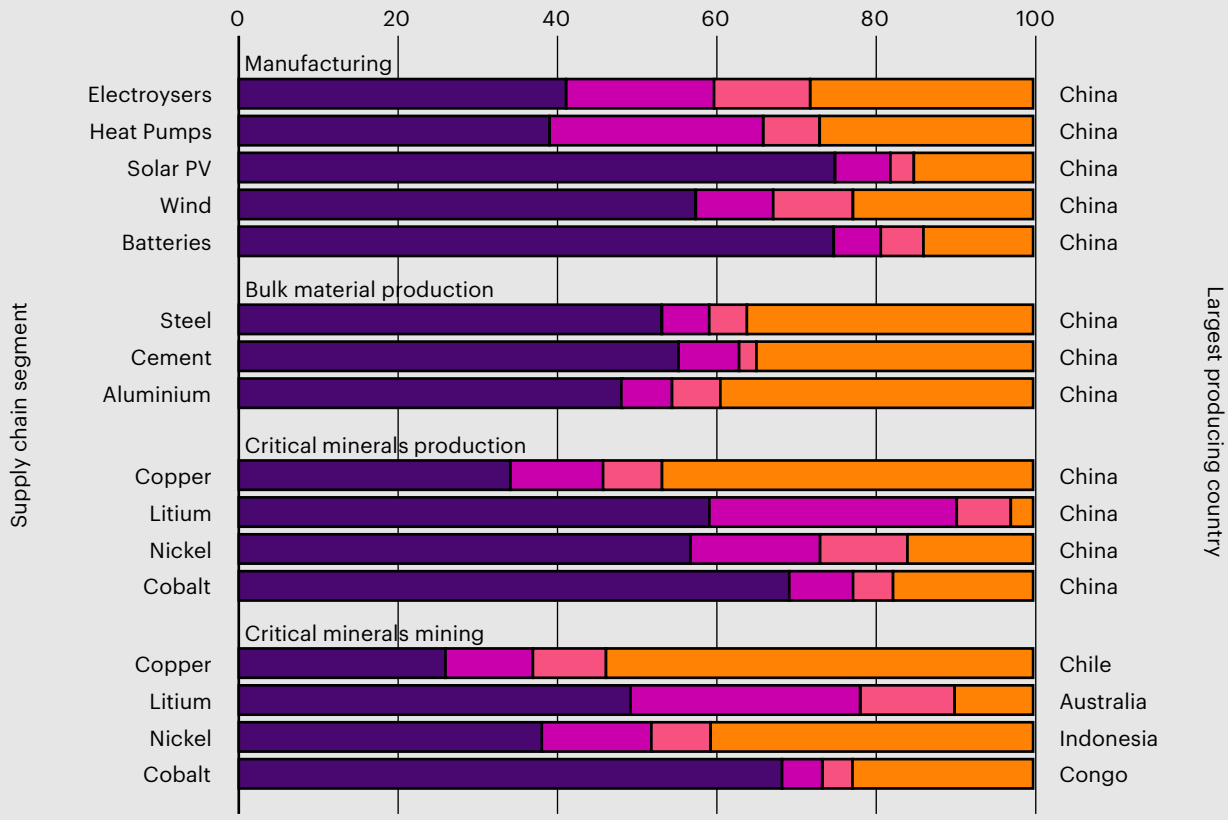
Supply chain challenges

Simply put, demand across the whole range of transition initiatives, from the generation of clean energy to the infrastructure enhancements needed to build smart grids that can deal with intermittent power supplies to the electrification of vehicles, is going to continue to outstrip supply for some time.

McKinsey, in their 2023 Renewable Energy Supply Chain report[11], believe that planned investment between now and 2030 will lead power generation from committed solar and on and offshore wind projects to triple from 125 GW to 459 GW. Growth of this magnitude in a sector with substantial investment demands requires clarity of and the pinning down of project costs to prove viability. To achieve this, stability and reliability in supply chains is essential; however, this has been lacking in recent years, with fluctuations in pricing of raw materials and exchange rates (including currency devaluations) that manufacturers and contractors will seek to pass on to customers.

[10] https://www.forbes.com/sites/nathanielparishflannery/2023/05/23/why-is-mexicos-president-so-hostile-to-solar-energy-investment/?sh=5b3a67bf1813
[11] https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/renewable-energy-development-in-a-net-zero-world-disrupted-supply-chains

Figure 9: **Geographic concentration by supply chain segment, 2021**



Source: https://www.iea.org/data-and-statistics/charts/geographic-concentration-by-supply-chain-segment-2021

Concerns will also exist with much of the key elements of the supply chain, both in terms of manufacturing base for Solar PV and turbines concentrated in China, that some will see as a significant potential threat to security of supply, given the tensions around Taiwan. In addition, the supply of many of the raw materials required for a range of transition technologies including wind, solar and battery storage arises from a number of less developed nations whose production bases have not been mechanized and will be challenged to meet the inevitable growth in demand that will arise from the current pipeline of projects.

To counter this, strategies are being put in place by Europe and the US to expand, diversify and improve the efficiency of the supply base but this will take a number of years to put in place and that will not be up and running in time to satisfy current timetables. In the meantime the supply chain constraints will drive inflation and greater volatility around project costs that is already being seen with renewables costs having risen for the first time over the past two years for the first time in many years.

Technology challenges

Whilst the transition and options have been in discussion for a number of years, there are still a number of the technologies on which the transition depends that are at a relatively early stage of development. The ramping up of scale to meet the size of the investment pipeline and projects is also going to put even greater demands on suppliers as they seek to not only develop new, more efficient and larger-scale technology but to do so from an already stressed manufacturing base. This has not scaled up in line with the order book and also suffers from the lack of experienced workforce to both manufacture and build the projects.

There are many good examples, most recently in the challenges in gas and larger wind turbines, where the pressure to constantly evolve technology has resulted in lack of reliability and significant losses both during construction and operational phases. This together with warranties generally limited in value and to the replacement cost of replacing the defective parts (not including downstream damage or consequential loss) can be a significant barrier for insurers approached to provide cover. This still applies to key transition technologies including Battery Storage[12], Green Hydrogen and CCUS[13].

[12] https://www.epo.org/news-events/in-focus/green-tech/energy-transition-technologies.html
[13] https://wiki.energytransition.org/the-book/challenges/technological-challenges-of-the-energiewende/

Climate change

El Niño is here...

Climate change is the key driver of energy policy around the globe. The drive towards Net Zero and the meeting of 2030 and 2050 Paris Agreement targets needs to be the focus of huge investment as economies move to keep global warming well below 2 degrees Celsius above pre-industrial levels and below 1.5 degrees Celsius, if possible, by the end of the century.

However, the World Meteorological Organisation (WMO, believes a shift from La Niña to El Niño weather patterns during 2023 has raised the probability that over the next five years there will be at least one year in which the annual average near-surface global temperature exceeds 1.5 degrees Celsius above pre-industrial averages to 66%[14]. La Niña conditions have helped reduce global warming trends over the past three years but this is now set to change following the end of La Niña and arrival of El Niño in June 2023.

Key findings of the report included:

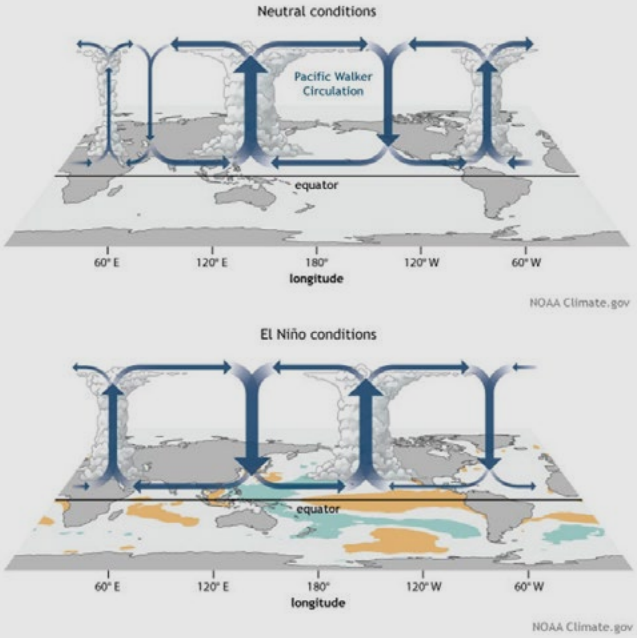
- La Niña conditions have helped reduce the development of global warming trends over the past three years but this is now set to change following the end of La Niña in March 2023.
- El Niño warming effects tend to be felt a year after it commences, so that will be 2024 in this case.
- Annual mean near-surface temperatures are predicted to be between 1.1 and 1.8 degrees higher than the pre-industrial average for the next five years.
- There is a 98% chance that the hottest year on record, set in 2016 during the last exceptionally strong El Niño, will be exceeded over the next five years.
- There is a 98% chance that the forthcoming five-year mean will be higher than for the last five years.
- Arctic warming is expected to be disproportionately high.
- May to September average rainfall for 2023-27 compared to 1991 to 2020 is expected to be higher in regions such as Sahel, northern Europe, Alaska and northern Siberia and lower in regions such as the Amazon and parts of Australia.

El Niño explained

El Niño and La Niña, arising in the Pacific Ocean, are the single most important causes of changes in weather across the planet.

As can be seen from Figure 10 above, La Niña is characterized by more neutral conditions, with trade winds blowing west across the equator, pushing warm water away from South America towards Indonesia and Papua New Guinea. Since 2020 this pattern of sea and air currents has been clear with strong winds and hotter water in the west. This has set weather patterns for the past three years.

Figure 10: **La Niña versus El Niño conditions**



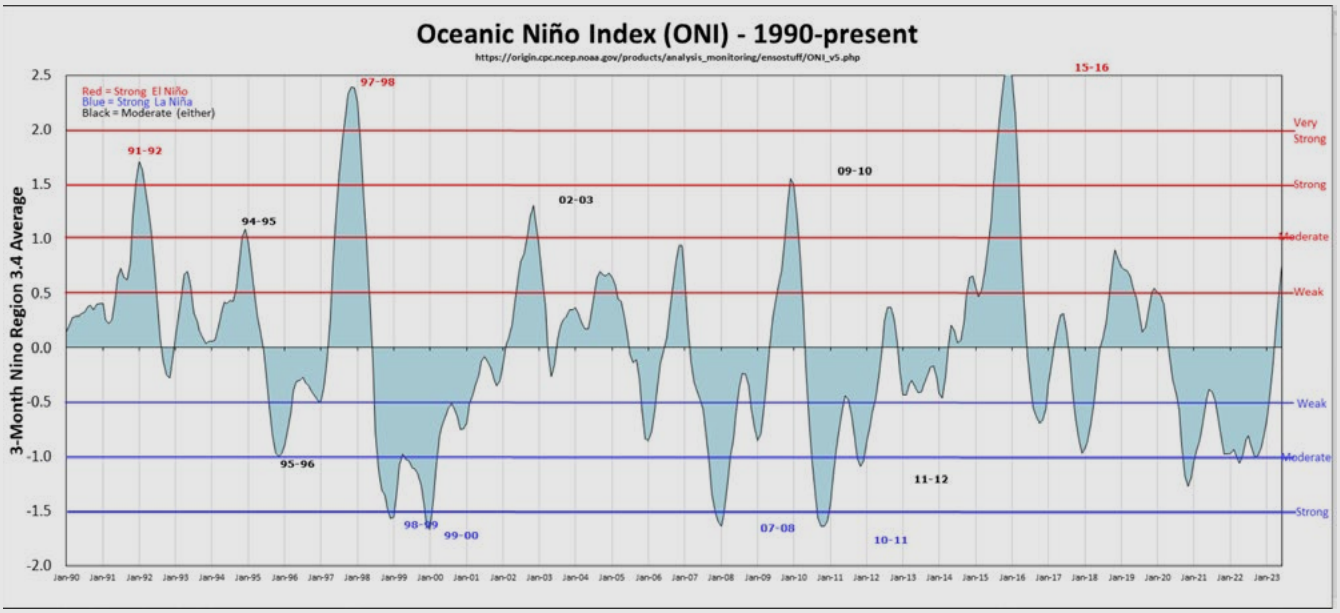
Source: https://www.climate.gov/

During El Niño the trade winds pushing warm water to the west reduce and the massive pool of warm water sitting in the west flows back eastwards to the central Pacific. The slower than usual trade winds also allow water temperature to heat up more. Typically, the atmosphere above the Pacific has a single loop formed by air rising in the west that then rises and is channeled back to the east, where it comes back down off the cost of South America, rejoining the trade winds. However, the conditions of El Niño split that single loop into two, with a single central convection column rising from the middle of the Pacific (rather than the west) pushing air both east and west. The impact of this column rising from the central Pacific is so significant and its effects are felt so far afield due to the enormous size of the Pacific and the heat it holds. The atmosphere absorbs more heat and the oceans less, with the effect that two to three months into the new pattern global surface temperatures start to rise. The currents also affect the trajectory of jet streams over continents and with them, their storm systems.

Whilst El Niños may be similar in structure, they are known to have their own characteristics. Patterns that tend to repeat though include drought to Indonesia, Australia, Central America and northern South America and heavy rains to the southern United States, Southern South America, the Horn of Arica and Asia.

[14] https://public.wmo.int/en/media/press-release/wmo-update-prepare-el-ni%C3%B1o

Figure 11: **ONI index, 1990-present**



Source: TBC

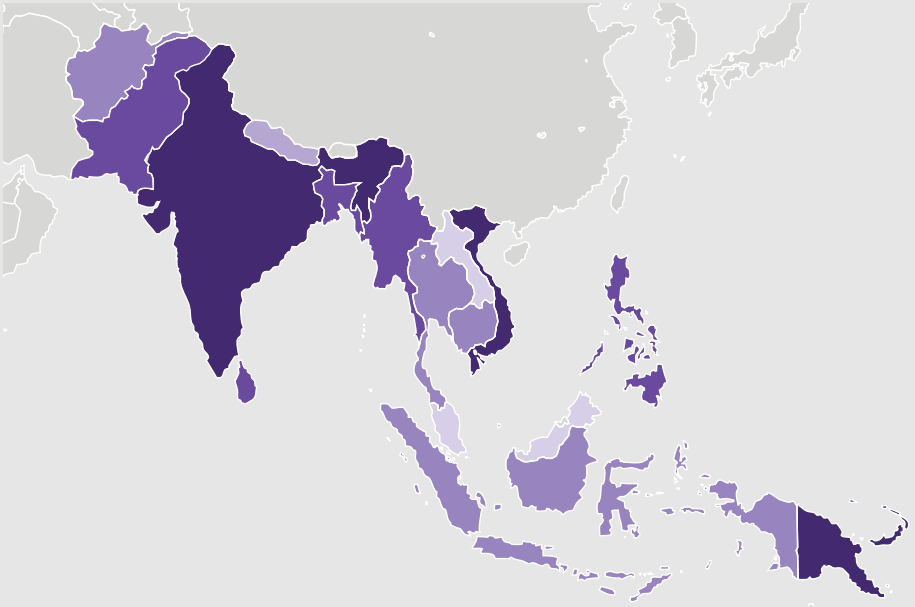
Will it be a strong El Niño?

Whilst rising global temperatures after two to three months are referenced earlier in this article, and the WMO suggests that the true impact won't usually be felt for up to a year, there are already signs that it's kicking in.

In August 2023, several publications attributed the tropical storm Hillary that impacted California to a dangerous mix of global warming and El Niño that resulted in water 3.5-5 degrees Celsius hotter than usual in the area below Baja California and west of Mexico. It was the first hurricane or tropical storm to make landfall in California since 1939, with record rainfall in San Diego and Los Angeles and Death Valley receiving annual rain levels in a single day.

The warmer temperatures that created the conditions for the event also ran deep, which is significant as higher subsurface temperatures are usually a sign of a stronger El Niño.

Figure 12: **Impact of last El Niño on South East Asia**



Countries in South-East Asia, South Asia and the Pacific affected by flooding, landslides,drought and tropical cyclones, and the severity of the impact based on the number of deaths, the number of people affected and total economic damage.

Note: Data unavailable for countries not coloured.
In emerging Asia, India and Vietnam were amoung the biggest victims of the last strong El Nino event in 2015-16

Source: TBC

What will be the impact and who will feel it most?

As mentioned earlier, the reality is that El Niño events are not all the same in terms of their impact and their arrival doesn't mean the same impact on everyone. For example, some regions will have droughts and others record rainfall, some (not necessarily much more frequent but heavier) storms and others less wind than usual. It is also notable that of the five worst years for climate related catastrophes in the US (see table later in the section), none occurred during an El Niño year. This is not to say that it is an indicator that this will be a more positive period for the US or that bad losses won't happen, but it is statistically significant.

On the same basis, if we look to the areas most affected by the last strong El Niño in 2015, it was South-East Asia, South Asia and the Pacific who saw substantial destruction to coastal and agricultural communities from flooding, tropical cyclones and drought.

Global natural catastrophes in 2023

In August 2023 Swiss Re issued an update of insured global natural catastrophe losses for the first half of 2023[15].

Its key findings were that:

- Losses were up from US$48 billion in 2022 to US$50 billion, the second highest year since 2011.
- US severe convective storms (SCS) accounted for 68% of global insured losses, highlighting the increasing impact of secondary perils.
- There were ten US SCS events with losses in excess of US$1 billion each, well above the ten-year six-month average of six such events — total insured losses were US$34 billion.
- Exposure to secondary perils was also highlighted by events in and around Auckland, New Zealand that generated insured weather-related losses of US$2.3 billion, the worst since 1970.
- The Turkey/Syria earthquake was the single most costly disaster both in terms of economic (US$34 billion) and insured loss (US$5.3 billion).
- The average annual growth trend for insured natural catastrophe losses is 5–7%, which owes much to the warming climate and greater concentrations of higher values in urbanized areas.

Figure 13: **Economic and insured losses, H1 2023**

	H1 2023	H1 2022	H1 previous 10-y avg	% change vs 10-y avg
Economic losses	**125**	**129**	**89**	**41%**
Natural catastrophes	120	123	82	46%
Man-made catastrophes	5	6	/	-23%
Insured losses	**54**	**52**	**38**	**42%**
natural catastrophies	50	48	32	54%
Man-made catastrophies	4	5	6	28%

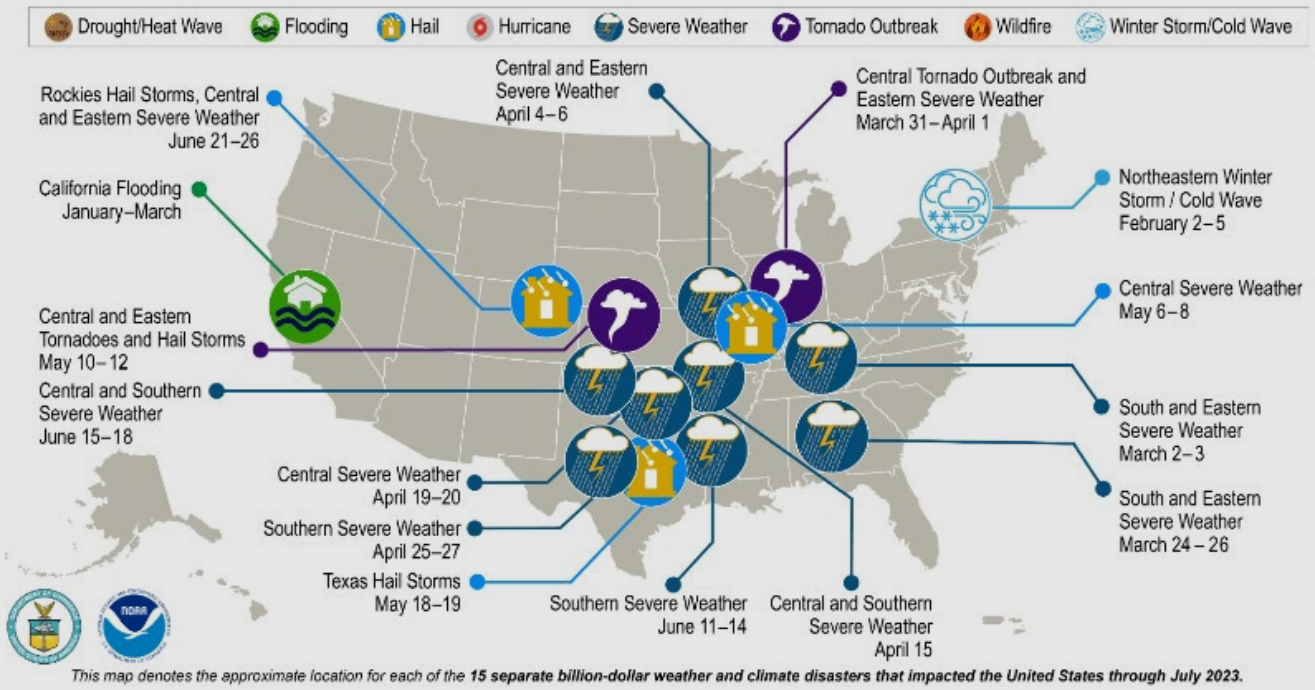
Catastrophe versus man-made and insured versus uninsured losses

The H1 estimated picture for all global losses is as per Figure 13 above. The numbers are for H1 2023 and H1 2022, as well as the ten-year H1 average. The numbers have also been split between Economic and Insured losses and Nat Cat and man-made.

This highlights the magnitude and challenge of the Nat Cat exposure both for insureds and insurers, with Nat Cat representing 92% of the total estimated losses.

[15] https://www.swissre.com/press-release/Severe-thunderstorms-account-for-up-to-70-of-all-insured-natural-catastrophe-losses-in-first-half-of-2023-Swiss-Re-Institute-estimates/cea79f3c-6486-41a8-9c6e-09df260efe30

Figure 14: **US2023 billion-dollar weather and climate disasters**



Source: https://www.ncei.noaa.gov/access/billions/summary-stats/US/2023

Focus on the US

In addition to the ten CSC events noted above, NOAA estimates that there were a further five excess of US$1 billion events in the US in H1, all of which were weather related. The events, illustrated below, include winter storms, thunderstorms, flood, hail and tornados. With 13 storm losses generating a total estimated cost of just under US$33.4 billion, they represent 87% by frequency and 84% by quantum. The California floods are estimated at US$4.6 billion and the February "Cold Wave" that impacted the north-east, is estimated at US$1.8 billion.

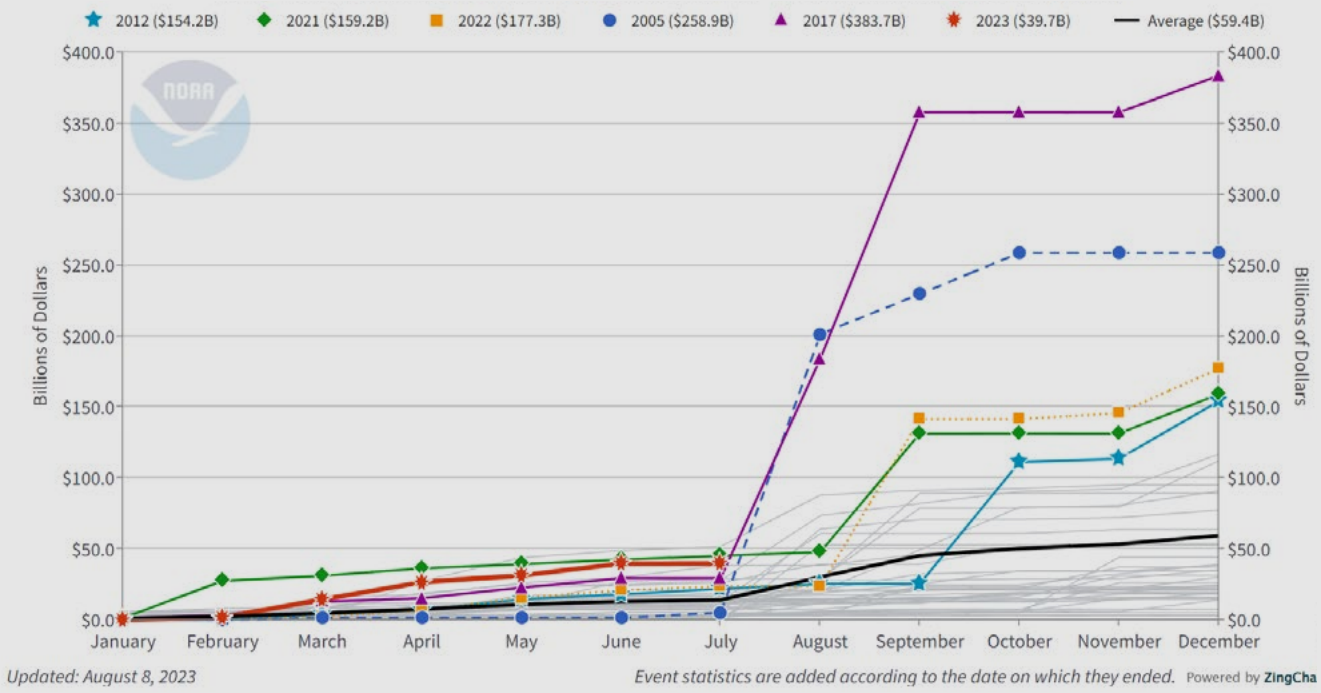
What does the future hold?

Figure 15 overleaf tracks the profile of the development of historic annual Nat Cat losses through the year. The next months as the Atlantic Hurricane Season progresses will likely dictate the outcome for 2023, with the US statistics for H1 showing that, until July, 2023 was keeping pace with the worst five years. Much will no doubt depend on the impact of El Niño.

Impact on the insurance market and strategies for addressing underwriter challenges

The challenges that we have just covered have many implications for our customers and the Power sector globally. Some challenges are here right now and some are still developing but they all have the potential to impact Power market insurers. Generally speaking, whatever is not good for them from a risk perspective is not going to be good for power sector customers. It is therefore becoming increasingly important for risk transfer strategies to be as effective as possible, that consideration of the insurance market and its challenges be at the heart of our and our customer's strategies.

Figure 15: **1980-2023 Unites States Billion Dollar Disaster Year to Date Evet Cost (CPI adjusted)**



Source: https://www.ncei.noaa.gov/access/billions/summary-stats/US/2023

We are truly heading into increasingly challenging and unchartered waters — and on a totally global scale. There is nothing that has come before that will be in anyway comparable to the complexity of decision making as the multiple moving parts of geo-politics, regulation, climate change, technology advance, energy transition, changes to business models and power markets (to name but a few) begin to emerge. The sector will need all of the help and support it can get to navigate the perils effectively and when it comes to risk, the wealth of experience and skills of its brokers and insurer partners should be drawn upon deeply to ensure power companies have the right strategy to deliver the optimum solution.

In the extensive table outlined at the end of this article, each challenge is considered against the impact on the market; strategies are identified that should be put in place to address the challenges that the power industry and its insurers face and the possible outcomes, both good and bad, depending on the route taken. The decisions may rest with the power sector but brokers are here to help ensure that companies understand the options and take the right route.

Russia — Ukraine		
Impact	Strategy	Market Response
Power market volatility Whilst the impact was felt most noticeably in Europe with MWh prices at multiples of pre-conflict averages, it was still felt beyond, with global energy markets being impacted by increases in prices driven by fossil fuel demand from Europe following the turning down of gas supplies from Russia. Clearly there are measures in play to address volatility and as can be seen from current and futures markets, the positive impact of this is already being felt. This should result in a more stable and predictable environment for all and fewer "nasty surprises for the market". This is critical as the past years has made it extremely difficult for insurers to understand and rate risks, the insecurity around which has fed through to higher rates.	• Clear messaging on type of revenue streams (PPAs/ Spot Market etc.) • Where exposed to wholesale market volatility, explanation of the state of the market and factors that impact local markets. • Where PPAs apply, appreciate that this is a real positive in terms of clarity of exposure for the market and emphasize it. • Provide revenue data broken down monthly to show profile of revenue seasonally and across future years. • Make clear how strong OEM relationships and good spares arrangements will mitigate loss.	**Positive** (e.g. MWh caps avoided, lower rate increases, less pressure on deductibles) where: Good revenue data provided and local market dynamics understood; PPAs provide stable and clearly understood revenue stream; Market volatility was considered low. **Negative** (e.g. rate increases, higher retentions, application of tighter MWh price caps) where: Volatility is unpredictably high; Market dynamics are not well understood; Lack of detail around monthly revenue and split; poor strategic spares and exposure to supply chain challenges.

Global Inflation		
Impact	Strategy	Market Response
The market continues to struggle with ongoing inflation and although this is easing there are likely to be many Insureds that are lagging behind. This is made more challenging by a sense in the market that, often, declared values are based on original construction values. However, it is well understood that contract values for plants will often be reduced in return for longer term service commitments which, whilst positive, do mean that the starting value for insurance programmes is below the realistic cost of construction. It is also clear that deductibles for major GTs/STs, Transformers etc. are at the same or similar levels to those that applied over a decade ago, whilst damage repair costs have increased at a steady rate. The inevitability of this is that the value of the deductible to insurers has been eroded over time. This only serves to exacerbate market frustrations with adequacy of values.	• Engage with insurers to demonstrate an appreciation of the challenges. • Provide clarity around how you intend to address this and ensure that your values remain a fair reflection of rebuild costs. • Demonstrate how renewal values have been arrived at. • Be clear about the details of any LTSA's/ OEM relationships etc. that ensure replacement parts/ repairs at pre-agreed rates. • Ensure Limits and EMLs are reviewed ahead of renewal to ensure they keep pace with increasing costs of reinstatement.	**Positive** • Recent valuations, risks whose values benchmark well against trusted peers, regular annual value adjustments): • Greater trust in clients and your risks. • Less market challenge and more positive base for renewal negotiations. • Better sense of partnership from market will deliver the most positive outcome in terms of renewal rating with less pressure on markets to reflect uncertainty in rating. **Negative** • Low annual adjustments, no recent valuations, values that stand out as low against peer benchmarks) • Lack of confidence in declared values and strained market relationships/ reputational risk/ lack of market appetite • Imposition of Average Clause with low trigger • Subjectivities for cover to be dependent on valuations within a certain period of renewal • Higher increases in rates to reflect probability of higher loss than values suggest.

Energy Transition		
Impact	Strategy	Market Response
The market is struggling on several fronts: a wide range of new technologies together with a number of manufacturers/variants trying to achieve similar outcomes in different ways. The sector is moving towards greater focus on larger H class gas turbines with enhancements and larger output and potential for loss. Greater intermittency is straining thermal plants through changing operating regimes. For new technologies, there is a lack of data on plant performance, reliability and potential for loss. There is uncertainty around the impact on risk of strained supply chains that could impact manufacturing and build quality. The risk base is burgeoning, as new plants being built across a wide range of territories; this is expanding demand and also leading to new builds, which are now appearing in less favorable/ riskier Nat Cat exposed locations. There are huge challenges in terms of managing/ underwriting the sheer volume of risks/opportunities, with an underwriter base that is having to draw upon less experienced talent. There is also pressure from senior management and shareholders to be supportive of the energy transition despite the challenges.	• Essential to have more frequent/ better market contact. • Have a clear placement plan that allows time for underwriters with an ever-growing volume and complexity of risks to work through. • Identify early and address any market concerns that may exist around new or future investments or changes in the operational risk profile of existing plants. • Ensure good quality Risk Engineering based underwriting information, that provides a fair and detailed assessment of your risks and exposures including positive risk features as well as any areas of concern/ risk recommendations. • Ensure you engage early with your broker to ensure that they are able to put a strategy in place to address the above. • Enable your broker to help with the messaging of these challenges to internal stakeholder, enabling expectations around the impact of new risks on insurers panels, programme structures, risk retention levels and costs. • Collate and clearly present good risk summaries that insurers can work through more efficiently.	**Positive** • Early and clear visibility by insurers of changes in risk profile, provision of good information, time to consider and review new technologies, Opportunity for discussions around any challenges they may face to enable them to manage): • Market stress avoided, questions can be asked and answers provided in good time. • Allows engagement of client and/ or broker engineers to with insurer engineers where value is added. • Enables considered underwriting of risk and time for underwriters to fight your corner through management referrals where guidelines require. • Best underwriting outcome from a more confident market. **Negative** • Failure of client/ broker to grasp significance of new/ changing risk, Lack of preparation and inadequate risk information, Stressed timelines): • Underwriter has no time to adequately understand or assess the exposure resulting in late questions and challenged timelines. • Technologies that are out of appetite can't be given a fair hearing for existing clients. • Either will result in less attractive terms or declinatures.

Climate Change		
Impact	Strategy	Market Response
Climate change is a key concern for all underwriters as weather losses continue to deteriorate. The frequency and severity of major events are increasing and rates will follow. Locations previously considered less exposed are now being impacted (e.g. California storm and more widespread wild fires). Reinsurance costs are increasing and aggregates reducing, putting pressure on existing cost and cover levels for risks in more exposed territories. Building standards/ protection against major events and risk mitigation plans are under greater scrutiny.	• It is increasingly important for Insureds to understand their exposure by spending time assessing and quantifying it. • Where previous losses have occurred ensure that you are able to provide details of the scale of the circumstances surrounding the event and what action has been taken to prevent against future even of similar or greater magnitude. • As costs rise, Cat cover that may have been bought to policy limit or higher than needed sub-limits need to be reviewed — are you paying for or concerned about potential loss of cover that in fact you don't need? • Engage your broker to carry out Cat loss modelling that is available across a range of exposures including storm, flood, quake. This can also be extended to include Cat exposed supply chains. • Ensure accuracy of models are as accurate as possible by ensuring that all assumptions relied on by the modellers are as bespoke to your sites/ risks as possible. Provide risk detail and protections that will be reflected in the loss expectancy. Models can also be used to inform the business case around risk protection/ Cat resilience. • Share findings with internal stakeholders and ensure that the ground is prepared for options to be priced and seriously considered where there is a cost benefit.	**Positive** • Clear information on risk protection, flood/ storm defences/ plans and quake build standards. • Quality modelling information that provides additional risk insight, preparedness to consider options/ flexibility around limits where appropriate. • Underwriters have the information needed to consider the risk including insight into being able to demonstrate that changing weather has been factored into risk planning as well as past events. • Sound models that can help back up underwriting decisions. • Ability for underwriter to offer best terms and develop options that the risk-informed Insured is in a position to consider. **Negative** (No qualitative or quantitative information on Cat exposure, no flexibility to propose or consider options, Lack of information on risk mitigations since previous events): • Underwriter will not be in a position to do anything other than consider the exposure against the outcome of their Cat model. • Insured is unable to challenge underwriters' perception/ Cat pricing/ aggregate allocations. • Insured is unable to assess the impact or value of any coverage restrictions. • This approach will never deliver the optimum result and the Insured will have no effective strategy to respond.

This concludes the review of the power sector. It is hoped that it has provided some clarity around the key issues that brokers, the market and the power sector face. There may seem a lot to consider and it is very likely that there will always be more along the way, but it is never too early to start preparations for the next renewal. With so much to plan for, we recommend strongly that a well defined plan be put in place as soon as possible each year to ensure success and that your brokers and insurers are at the heart of this.

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