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CLIMATE REPORT 2021

TO WHAT EXTENT EXTREME WEATHER EVENTS IMPACT THE INSURANCE WORLD?

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Introduction

The year 2021 was marked by two key publications related to climate change: the *Sixth Assessment Report* of the Intergovernmental Panel on Climate Change (IPCC) and the *Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes* (1970-2019) of the World Meteorological Organization (WMO).

Therefore, it is an opportunity to review the climate events that marked this year. Due to the temporary cooling caused by the *La Niña* episode, this year is "only" fifth in the list of the warmest years ever recorded. However, this perceived lull should not be taken as a signal that the long-term trend of climate change is being reversed or even halted.

The **many climate records broken in 2021** are a sad reminder of this. The number and intensity of these events are increasing, with significant human and economic consequences, and the **annual costs to insurance companies are rising considerably**. From increasing insurance premiums to greening their investments and developing innovation, insurers are being forced to **mobilize various levers of action** to deal with climate change.

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1 A look back at the major publications of the year 2021

The year 2021 was marked by two significant and complementary publications on climate:

- The *6th Assessment Report* of the Intergovernmental Panel on Climate Change (IPCC) describing the most up-to-date scientific knowledge on climate change;
- The World Meteorological Organization's (WMO) *Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes* (1970-2019).

IPCC's report

The **IPCC**[1] is an intergovernmental body led by the Member States of the United Nations. It brings together numerous research teams whose mission is to assess the state of knowledge on climate change (causes, impacts, actions to limit and adapt to it). This information is regularly updated and compiled in a scientific report that feeds into international climate negotiations (approximately every five years).

In 2021, the IPCC's sixth report was published. Reporting on the latest scientific literature on climate change, one of its main conclusions relates to the global temperature increase: regardless of actions taken to limit greenhouse gas (GHG) emissions, a warming of 1.5°C is expected by 2040, and **global temperatures will continue to rise until at least 2050, due to human activities** (this link is now considered to be indisputable).

It also focuses on the inequalities that will be experienced in different regions of the world, as the increase in temperature is geographically uneven: for example, the temperature rise will be more intense over land areas and particularly in the Arctic. The sixth report thus differs from its predecessors in that it offers a detailed regional assessment of the effects of climate change: the detailed information will be given in an interactive atlas available on the IPCC website[1].

The latest report describes the progress of attribution science, which aims to define the role climate change has on "the intensification of weather and climate events such as extreme heat waves and heavy rainfall events"[2]. Furthermore, "it defines a new framework to capture what physical changes in climate - heat, cold, rain, snow, drought, wind, coastal flooding and others - imply for society and ecosystems"[3].

WMO's publication

In parallel to the sixth IPCC report, the World Meteorological Organization (WMO) published in 2021 the *Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes* (1970-2019)[4]. The WMO is a specialized agency of the United Nations dedicated to international cooperation on "the state and behaviour of the Earth's atmosphere, its interaction with the land and oceans, the weather and climate it produces, and the resulting distribution of water resources"[5]. Over a period of fifty years, this publication reviews all the human and economic losses attributable to extreme weather, water and climate events that have occurred.

[1] https://interactive-atlas.ipcc.ch/

Between 1970 and 2019, the WMO reports **11,000 disasters attributed to extreme weather**, climate and water events, **resulting in the deaths of more than two million people**. 91% of those deaths happened in so-called developing countries and caused a loss of $3.64 trillion[6].

As a result of climate change, these events are becoming more frequent as well as more intense and destructive. The report identifies **several actions to be taken**[7]:

- Taking climate change into account to determine the level of vulnerability of different regions (the intensity, regularity and trajectory of weather phenomena may change in the coming years)
- Strengthen mechanisms to insure against risks at national and international levels, especially for the most at-risk countries (least developed countries, small states, island territories)
- Develop integrated and proactive policies for gradual onset disasters (such as drought).

2 Throwback at the major global and national climate events in 2021

The year 2021 was marked by the ***La Niña*** **climate phenomenon**, causing a temporary cooling of the earth's surface[8]. However, it was different from previous years as average temperatures did not exceed them. However, this apparent lull should not be interpreted as a slowdown in climate change, as evidenced by the various record-breaking weather disruptions that marked the year.

On a global scale - a year of climate disasters

Around the world, numerous temperature records were set. Particularly in the Mediterranean (48.8°C in Sicily) but also in North America, where an unprecedented heat dome pushed temperatures up to 49.6°C in Lytton[9], British Columbia, and to 54.4°C in Death Valley.

Combined with severe droughts, these extreme temperatures have often been the cause of devastating fires, particularly in southern Europe (Greece, Spain, Turkey) but also in California, which experienced the "biggest fire" in its history[10].

Severe storms, cyclones and hurricanes also caused devastation in many parts of the world. In the United States, Hurricane Ida in September caused unprecedented damage in Louisiana and New York[11]. A few months later, on the night of December 11th, the country was hit by a series of historic proportions tornadoes, one of which travelled 322 km and became the second-longest tornado in its history[12]. A week later, in the Philippines, the 9th typhoon of the year - super typhoon Rai - took its toll even though the cyclone season was over. Rated as a Category 5 typhoon on the Saffir-Simpson scale, it affected more than 700,000 people[13].

At the same time, many abnormally intense rainfall events have been recorded, often resulting in destructive flooding. This was the case in Germany and Belgium, where 228 deaths were recorded as a result of bad weather that was not only more predictable but also more intense due to climate change, according to researchers from the *World Weather Attribution*[14]. In Hunan province, China, 720mm of rain fell in a few days, more than the average annual rainfall for the region[15].

Finally, for the first time since records began, the highest point of the Greenland ice sheet experienced a rain event and ice melt accelerated[16].

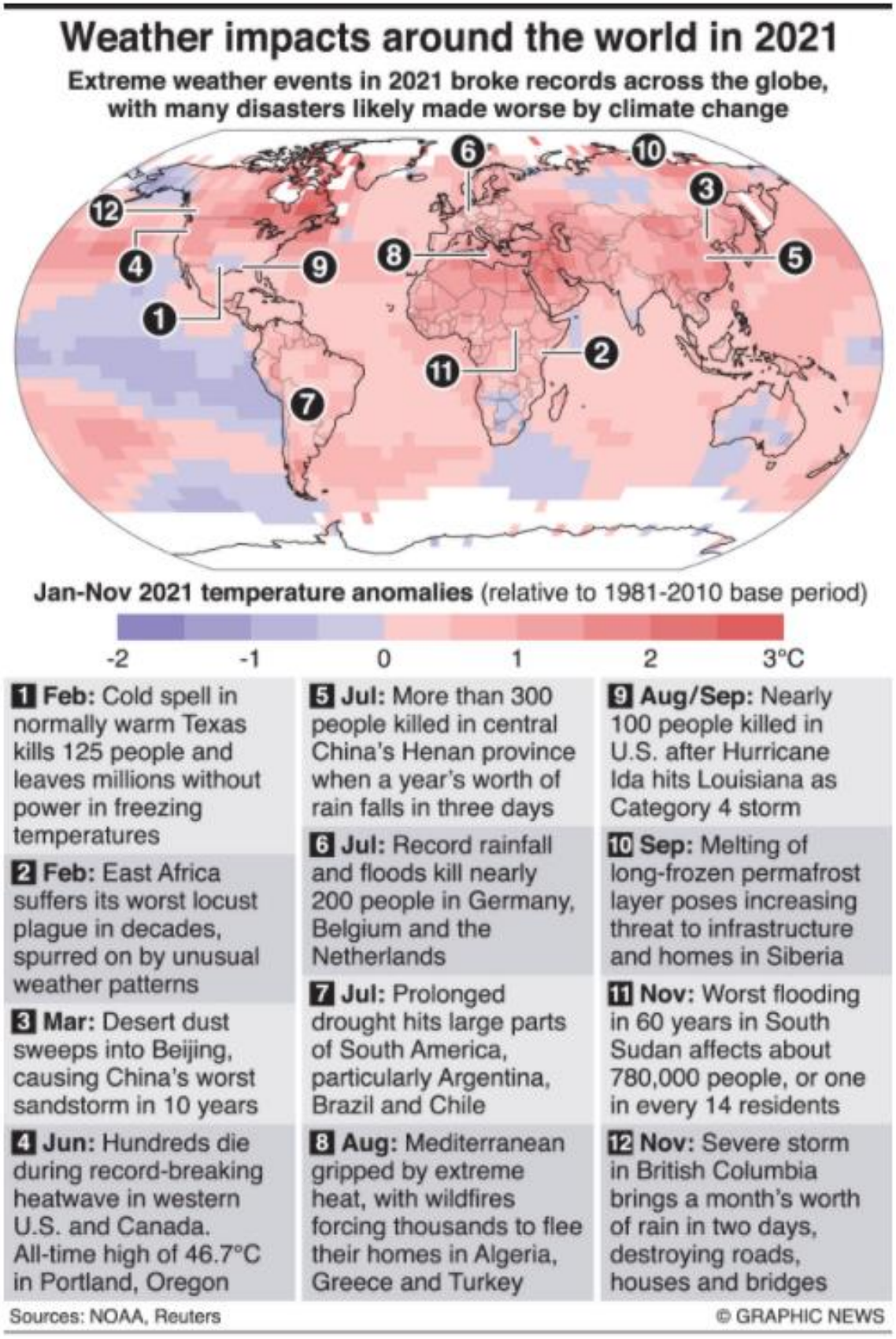

Figure 1: Weather impacts around the world in 2021. Source: NOAA, Reuters, 15/12/2021, "Extreme weather around the world in 2021", *Graphic News.*

Across France - a calmer year, but not a return to normality

2020 was the hottest year ever measured in mainland France, marked by exceptional heatwaves but also by storm Alex, which hit Brittany and the Alpes Maritimes at the end of September 2020, killing more than ten people and causing more than 1.5 billion euros in damage[17]. 2021 was less troubled: it was the 21st hottest year in France, which put the end to 6 consecutive exceptionally hot summers, and had the amount of rain normal to the country's average (1981-2010) [18].

However, **2021 does not mark a return to normal**. Although the temperature was only slightly above the 1981-2010 normals on average over the year (+0.2°C), it should be noted that there were 2.5 times as many monthly records for heat as for cold - abnormally unbalanced ratio[19].

In addition, **extreme climate events affected the country**:

- Abnormally hot episodes marked the months of February and March, favouring the early flowering of plants which were then damaged by the late frost in April (causing a drop in annual production for some farmers) [20]
- Ardèche region experienced a particularly strong and destructive so-called Cévenol episode (extended and exacerbated entailing floods) [21]
- The Pyrenees region experienced exceptionally heavy snowfall in December[22].

Several episodes of heavy rainfall also remind us that France should be subject to more episodes of intense rain or snow fall (=precipitation) in the future. Particularly intense precipitation was observed in September in the cities of Agen, Paris and Reims, but also at the beginning of the year when a record rainfall accumulation was recorded in the South-West[23]. Unusual for the season, storm Zyprian also hit the Brittany region in early July[24].

3 How insurance sector will adapt in the world of +2°C?

1. The consequences of climate change for the insurance sector

Insurers, who are responsible for compensating for damage caused by natural hazards, **are in the front line of global warming**. Therefore, they have developed, in response, quantitative indicators to measure the material and financial impacts of the resulting events.

In 2021, *France Assureurs* (formerly the *French Insurance Federation*) published a study on the impacts of climate change on insurance by 2050. After looking back at the compensation paid out by insurers due to natural hazards since 1989, the study provides figures on the increasing cost of these hazards over the next 30 years, presenting conclusions for each hazard (drought, flooding, marine submersion, storms)[25]. The conclusion is as follows: "the costs linked to climate hazards could double over the next 30 years in France and represent 143 billion euros"[26]. Climate change, combined with other socio-economic factors, is a major factor in the increase of this cost[27].

In parallel, the French Prudential Supervision and Resolution Authority (ACPR) conducted a so-called climate stress test from July 2020 to April 2021, aimed at evaluating the financial risks caused by certain natural disasters (drought, floods, marine submersions) for the banking and insurance industries[28]. The results of this study indicate that "**the cost of claims could be multiplied by 5 to 6 in certain French departments between 2020 and 2050**"[29].

These conclusions are supported by a third report entitled *The economics of climate change*, published on 22 April 2021 by the reinsurance company Swiss Re. According to its findings, insured losses from natural disasters in Europe could at least double by 2040[30].

All three studies lead to similar conclusions: a sharp increase in insurance costs is expected as a result of climate change, which the Axa Future Risks Report of 2021 identified as the main risk of the next five to ten years[31]. **In 2021, this increase is already being felt: the year was particularly expensive for the insurance industry**. Among the weather-related hazards in 2021 mentioned above, storm Ida cost $65 billion, while the July floods in Germany and Belgium caused $43 billion in losses, and the floods in Henan province, China, cost an estimated $17.6 billion[32].

Swiss Re underlines the fact that, although the hazards described as *primary risks* (cyclones, earthquakes, etc.) have impressive consequences and attract a lot of attention, it is actually the so-called *second zone* risks (floods, drought, frost, fires, etc.) that represent the majority of insured losses[33]. Among them, drought is of particular concern to insurers and has been singled out by the France Assureurs report as the risk with the greatest increase in insurance costs[34].

Because of this increase, the insurance industry is concerned about its capacity to cover future hazards. In 2015, the CEO of Axa declared that "a world at +2°C could still be insurable [but] a world at 4°C would certainly no longer be insurable".

2. Towards higher insurance premiums and a refusal to insure the most exposed areas?

To cope with the increase in climate-related disasters, several solutions are available to insurers, such as increasing insurance premiums or refusing to insure the most exposed areas.

Insurance premiums increase

The Swiss Re study shows that climate change could have a significant impact on insurance rates: "premiums in property and casualty reinsurance, all segments combined, are expected to more than double worldwide to reach 4,300 billion dollars in 2040, compared to 1,800 billion in 2020". Property premiums alone could increase by 22%[35]. Consumers who cannot afford to cover this increase may be forced to forego insurance coverage[36].

Refusal to insure certain geographical zones

Insurers could also stop insuring the most exposed and therefore most expensive areas. In the United States, some insurers have threatened to stop ensuring buildings that have not passed mandatory safety inspections following the collapse of a building in Surfside, Florida, that was likely weakened by the corrosive effects of saltwater. While climate change is not directly responsible for this collapse, the incident has opened up a dialogue on the issue of rising sea levels in the region, which could damage many coastal buildings. For example, water reaching buildings built on the seafront and worsening the corrosive effect[37]. Some insurers have also started to flee areas often affected by violent fires (California)[38].

In France, the 28 December 2021 law on compensation for natural disasters aims to counter this trend by allowing "any person who has been refused insurance because of the extent of the risk of natural disaster to which their property is exposed [to] challenge the insurer's decision in front of the French Central Pricing Office (BCT), which will impose the contract on the insurer"[39]. This law also extended the deadline for declaring a state of natural disaster and reduced the deadline for insurers to pay claims to insured persons.

It should be noted that **natural disaster coverage is already the one with the greatest protection deficit**, with 76% of protection needs not being insured worldwide. In Germany, for example, only 46% of the property is insured against floods[40].

The notion of national solidarity

Furthermore, the notion of national solidarity can be leveraged to offset the difficulties encountered by the insurance sector due to climate change and natural disasters. Thus, the bill on the reform of the tools for managing climate risks in agriculture, currently being examined by the National Assembly, **aims to reform French crop insurance in order to provide "coverage against climate risks that is accessible to all farmers"** via the implementation of a "new universal compensation scheme for crop losses resulting from climate hazards" based on "national solidarity and equitable risk-sharing between the State, farmers and insurers". So-called "catastrophic" risks will thus be directly covered by the State[41].

3. Increased consideration of climate risks by insurance companies

To reduce their exposure to climate risks, some insurers choose to integrate climate risks into their extra-financial policies.

Industrial exclusion policies

To reduce their exposure to climate risk, some insurers are choosing to reduce their business with the most exposed companies, particularly in the area of transition risk[2].

The Insure Our Future group - a global coalition of NGOs that aims to pressure insurance companies to get out of oil, coal and gas and support the energy transition[42] - has asked these companies to demonstrate their commitment by "immediately excluding all new oil and gas production from their underwriting".

[2] These are the uncertain financial impacts (positive and negative) that result from the effects of the low-carbon economic model implementation on industry players.

At the end of 2019, Axa had already announced that it was strengthening its environmental policy by limiting its links with the coal industry[43], as did Swiss Re, which is set to become the first reinsurer to move away from coal entirely by 2030 (OECD countries) and 2040 (rest of the world)[44]. It also aims for a 35% reduction in the carbon footprint of its portfolio by 2025.

An encouragement to take greater consideration of climate risks

To encourage this trend and to push investors to define their investments according to sustainability criteria, mechanisms to encourage investors to be more transparent about their investments are being developed at the national and international levels. It aims to reorient investors towards more sustainable practices by encouraging reporting.

At the international level, the Task Force on Climate-Related Financial Disclosure (TCFD) is a reporting framework for financial players that encourages them to consider and communicate their approach to "identifying, managing and addressing climate factors"[45]. This working group published in 2017 a set of recognized recommendations for moving financial practices towards improved sustainability performance.

4. Towards a promotion of innovation and an evolution of practices?

To adapt to climate change, insurers must also improve their current practices and focus on innovation.

On the one hand, mergers between insurers and reinsurers would allow reinsurers to quickly restore "their capitalization and better distribution of risks related to climate change over the entire value chain (industrial interest) and to have sufficiently strong players from a financial point of view to support economic activity when necessary (sovereignty issue)". In France, “mutual insurance companies, which have a long-term investment strategy, are undoubtedly the best placed to strengthen the reinsurance sector and lead to the creation of financially solid French giants ready to face the hazards of climate risk”[3].

On the other hand, some insurers are turning to the catastrophe bond, or **Cat Bond**: a bond with high returns but also high risks. The Generali Group has innovated in this area by committing to invest the capital in projects and insurance products that have a positive impact on the environment: "in practice, a Green Cat Bond offers protection against the damage of natural disasters today, while helping to curb their rise in the future"[46].

Finally, insurance companies can be forward-looking by adapting their risk management. As we have seen from the various studies published in 2021 on the rising costs of insurance, the insurance models that worked in the past are becoming less and less suitable. New players in the industry, such as Descartes Underwriting, have seized on the climate change issue to create new risk modelling systems based on artificial intelligence[47] and new types of insurance, such as parametric insurance. The latter is based on thresholds, predefined with the insured companies, which, once exceeded (wind speeds, water height etc.) are immediately detected thanks to the developed model, and then compensated[48].

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