



European insurers' Exposure to physical climate change risk

*EIOPA- Potential implications for non-life
business*



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1 Executive summary

The role of environmental risks in the prudential framework

The Discussion Paper aims to provide an assessment of the European insurance sector's exposure to climate-related hazards and inform future work in this field

1-Regulatory context



Building on its ambitious agenda for sustainable finance, and on the sensitivity analysis of asset-side transition risks published in 2020, EIOPA launched a **follow-up exercise** on physical risks in the second half of 2021. This discussion paper presents the **first results of this exercise**.

2-Scope of the analysis



- This report focuses on **assessing the materiality** of the insurance sector exposure to physical climate change risk under a financial stability perspective.
- It also presents and discusses the **current trends** in underwriting practices that are likely to be affected by climate change.

3-Next steps



EIOPA will continue its work with NCA and the industry to push the sustainable finance agenda forward and continue **bringing new results to help prepare the insurance sector for the effects of climate change**.

Summary of the report



Climate change and physical risks

- Global warming is causing changes in the insurance sector, affecting the assets and liabilities of insurers. Physical climate change risks may have different impacts on insurance companies depending on their characteristics (e.g. their core underwriting and investment allocation strategies, geographic focus, location, or size).

Approach and methodology adopted

- The methodology of this DP include a large data collection from industry focused on property, content and business interruption insurance against **windstorm, wildfire, river flood and coastal flood risks**.

Main findings of the analysis

- Firstly, the EIOPA considers that in order to assess the potential future impact of physical climate change risk on the insurance sector, it is essential to **understand the materiality of the current exposure to climate related perils** and the specificities of different markets and risks.
- In addition, the EIOPA also considers relevant to **analyze the current trends in the insurance sector**, in relation to how global warming is influencing weather related hazards.
- Finally, the qualitative information collected from participants show that **more than 50% have not undertaken any climate change analysis** and that a substantial share of the companies were unable to provide a qualitative assessment on global developments. In general, more information was provided in relation to their forward-looking expectations rather than on the already observed trends in relation to impact of climate change.

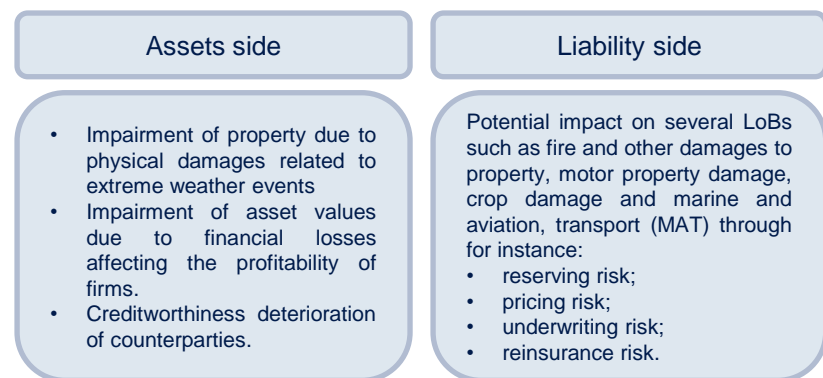
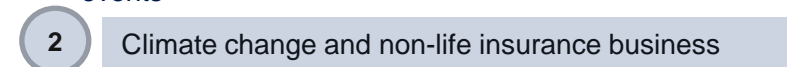
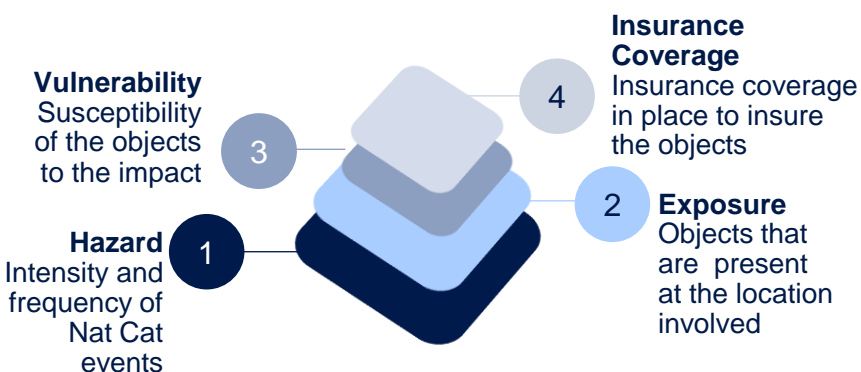
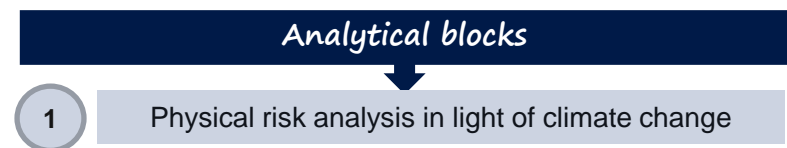


[Access to the document](#)

2 | Climate change and physical risks

The “new normal” in the insurance sector

Global warming is causing changes in the insurance sector, affecting the assets and liabilities of insurers. An accurate assessment of physical climate-change related risks requires access to a unique set of granular data, scientific and actuarial expertise, new modelling methods as well as a deep understanding of the various business models employed in the insurance sector



When modelling physical climate-change risks, the next factors needs to be considered:

- The hazard:** probability of occurrence of weather-related events at a given location as well as their physical intensity or severity. Consequently, a large catalog of simulated events is derived using sampling techniques from the defined distribution.
- The level of exposure:**
 - determined by the presence of people, species or ecosystems, services, infrastructure or any other assets that could be adversely affected by the considered disaster
 - Information related to the location of the insured properties is considered one of the key determinants of the exposure at risk;
- Vulnerability of the exposures:** propensity of exposed population or physical assets to suffer adverse effects from the impact of natural events. The vulnerability is generally hazard-specific
- Insurance coverage:** determine the final financial and underwriting risk to which the insurance sector is exposed.

Physical climate change will have **different impacts on insurance companies** depending on their characteristics.

- As a consequence of the rising hazard, **underwriting strategies may need to be adapted**, as areas previously considered at low- or no-risk might be subject to emerging perils, such as wildfire
- The increase in **frequency** and **severity** of weather events worldwide would eventually also **affect the premiums**, terms and conditions of reinsurance treaties:
 - Reinsurers may decide to place specific caps on the reinsured exposures in high-risk areas potentially leading to a reinsurance gap.
 - Consequently, insurance undertakings may see a drastic increase in their reinsurance cost and be forced to increase their premiums or reassess the areas and regions considered insurable
- Changes to underwriting strategies** due to rising hazard or unaffordability of insurance due to increases in premiums might widen existing protection gaps or create new ones.
- Insurers might thus need to **explore innovative product design**, such as impact underwriting, to keep insurance available and affordable and to avoid the widening of protection gaps.

2 | Climate change and physical risks

Approach and methodology

Climate change physical risks are long-term risks for which a standardized methodology for assessment is not yet widely and fully developed. The impact of climate change is more directly traceable and potentially significant for the property insurance business (most significant in terms of sum insured)

Approach and methodology:

EIOPA launched an ad hoc data collection with specific focus on EEA property insurance to better understand the size and key characteristics of the primary insurance market, which allows a bottom-up assessment with comparability of results across companies and countries. EIOPA collected:

- Year-end 2020 data** on sum and number of buildings insured, number of contracts covering business interruption and content related losses, premiums, claims and expenses related to insurance contracts covering for European wildfire, windstorm, coastal and river flood risks for residential and commercial buildings.
- Historical information on three diverse European natural disasters** in terms of regions impacted, number of countries impacted, year of occurrence and perils have been gathered to assess past trends and understand if, and how, these events affected insurers' underwriting strategies.
- Insurers' views and expectations for the next 10-20 years** on the potential impact of long-term physical risks on their business strategies.

Perils:

The analysis focuses on four key weather related perils: **windstorm**, **wildfire** and **coastal and river flood**.

Table 3: Current and short-term impact of climate change

Risk	Current impact of climate change		Short term projection	
	Impact	Most affected regions in Europe	Impact	Most affected regions in Europe
<i>Temperature-related</i>				
Wildfire	Yes	Southern, western and central Europe	Yes	Southern, western and central Europe
<i>Wind-related</i>				
Windstorm	No		Yes*	Northern, central and western Europe
<i>Water-related</i>				
Heavy precipitation	Yes	Northern and north-eastern Europe	Yes	Scandinavia and northern Europe in winter
River floods	Yes	North-western and parts of central Europe.	Yes	Most of Europe except of northern Europe and southern Spain
Hail	Plausible in some regions	Alpine countries including northern Italy and Balkan countries	Yes	Mediterranean, central and eastern Europe
Drought	Yes	Southern Europe	Yes	Most of Europe, especially of southern Europe and except northern Europe
<i>Solid mass-related</i>				
Subsidence	Yes	Soils with substantial fraction of clay (e.g. France)	Yes	Soils with substantial fraction of clay (e.g. France)

3 | Main Findings

Understanding the European Insurance Sector Exposures

The EIOPA highlights the importance to understand the materiality of the current exposures to climate-related perils and the specificities of different markets and risks

Focus of analysis	Main findings: exposure and coverage
Average Sum insured for residential and commercial buildings	<ul style="list-style-type: none"> • Large disparity in the number of contracts stipulated for residential and commercial buildings. • The number of contracts to cover damages to residential buildings caused by weather related natural disasters (wildfire, windstorm, river floods, etc.) is generally 4 to 5 times higher than those covering losses to commercial buildings. However, when looking at the sum of insured buildings, the commercial values are 4 times the residential average exposures. Moreover, the sum insured against content-related losses for commercial buildings are 3 to 7 times the residential exposures. • Even localized weather-related disasters occurring in highly industrial and insured areas could cause significant losses to the insurance sector.
Sum insured for residential and commercial buildings in terms of coverages, perils and regions	<ul style="list-style-type: none"> • Comparing building, content and BI insurance coverages against weather-related natural catastrophes in terms of sum insured at EEA level across perils, windstorm is the most insured peril (€ 42.6 trillion for building, content and BI), followed by river flood (€ 28.9 trillion), wildfire (€ 22.8 trillion) and coastal flood (€ 9.1 trillion). The relevance of windstorm can be explained by the fact that, historically, extratropical cyclones represent one of the biggest climate-related threats for European countries. • The largest residential and commercial buildings exposure insured against windstorm in Central Europe.² At EEA level, replacement value paid by insurers for residential properties (including building and content exposure) is slightly higher than the commercial exposures (including building, content and BI exposures) insured against wildfire, windstorm and coastal flood risks.
Sum insured for residential and commercial building by peril	<ul style="list-style-type: none"> • The overall sum insured against windstorm amounts to € 30.7 trillion for residential and commercial buildings. Close to 30% of the EEA insured exposures are in Germany, followed by France (18%) and Italy (9%). • At European level, residential and commercial properties worth €20.8 trillion are insured against river flood (i.e., second most important peril). The insured properties located in France and Germany account for more than 50% of the overall insured value. • For wildfire, the distribution of the sum of insured across the EEA countries is similar to the one observed for windstorm. More than 30% of the overall EEA sum insured against wildfire risk is located in Germany.
Gross Written Premiums (GWP)	<ul style="list-style-type: none"> • The GWP for fire and other damages to property account for more than 25% of non-life business written by the insurance companies included in the sample. • The largest premium volume is registered for residential buildings and content insurance coverages (EUR 13.5 billion) of which the large majority is written in Central Europe. The overall commercial premiums collected are less than one third of the EEA GWP.
Reinsurance ceded	<ul style="list-style-type: none"> • At EEA level, 19% of the GWP collected for climate events are ceded to reinsurance companies. Generally, ceded shares are higher for commercial rather than residential properties.The highest values are registered for wildfire risk (34% for commercial contracts and 21% for residential), followed by river flood (23%), coastal flood (23% for commercial and 14% for residential) and windstorm risk (19% for commercial and 15% for residential). • As catastrophe risk is usually ceded to reinsurance, an increase in extreme weather events can lead to greater demand for reinsurance capacity and higher reinsurance prices causing an increase in insurance tariffs, changes in reinsurance conditions and potential affordability and availability issues.

3

Main Findings

Current Trends in the Insurance Sector considering Climate Change

While it is not always straight-forward to trace a specific weather event to climate change, it is possible to affirm that climate change increases the occurrence's probability of extreme weather events (droughts, wildfires, etc.) in specific regions

General trends in the insurance sector

Global warming is influencing weather related hazards such as heatwaves, wildfire, drought, extreme precipitation and storms in certain regions.

- According to IPCC report¹ in 2020, the frequency and intensity of heavy precipitation events have increased worldwide since the 1950s, while agricultural and ecological droughts have amplified in some regions since the 1950s.
- Moreover, weather conditions that promote wildfires have become more probable in southern Europe, northern Eurasia, the USA, and Australia over the last century.
- Western and Central Europe are characterized by an increasing trend in river flooding, while Mediterranean countries experienced an increase in agricultural and ecological droughts.
- Globally, total economic losses and insured losses, caused by weather related events, have been on an upward trajectory in the last decades.

2020-2021 insured claims: most affected regions and perils

- **Affected regions and perils in 2020**
 - Extra-tropical winter storms are the most damaging events in Europe. According to EEA claims, Windstorm claims in 2020 accounted for close to 70% of total, followed by river flood claims (23%), wildfire (6%) and coastal floods (1%).
 - For windstorm and flood, at least 80% of commercial losses can be attributed to damages to buildings, while the remaining insured losses come from content (~15%) and business interruption related damages (~5%).
 - For all perils and type of coverages (building, BI, etc.), claims reported amounted to almost €4.1 billion, 68% of which was linked to residential properties or content losses.
 - Central and Southern European countries were the most impacted due to high windstorm and wildfire losses.
- **Affected regions and perils 2021**
 - In 2021 natural catastrophes caused severe economic and insured losses worldwide, accounting for more than € 211 billion and € 88 billion respectively, according to Swiss Re.
 - At European level, the highest damage was caused by severe summer floods that hit Central Europe with overall losses amounting to approximately €46 billion (of which only around EUR 11 billion were insured¹).
 - Total estimated losses in Germany accounted for two-thirds of the total damages.

Conclusions

As natural disaster insured losses in 2021 are significantly higher than in the previous year, extreme weather events will continue to put significant pressure on non-life insurers as they expect to become more frequent and severe due to climate change.

(1) Current and short-term impact of climate change" EIOPA methodological paper on potential inclusion of climate change in the Nat Cat standard formula, based on climate state and impact (CLIM) indicators published by the EEA and the JRC PESETA IV project (JRC, 2020).

(2) Source MunichRe: NatCat world map 2021 (munichre.com), Hurricanes, cold waves, tornadoes: Weather disasters in USA dominate natural disaster losses in 2021

3 Main Findings

Current physical risk and forward-looking expectations

EIOPA collected qualitative information from participants on observed developments, relevant for their non-life business, and their future expectations in light of climate change in relation to a broader set of weather-related hazards

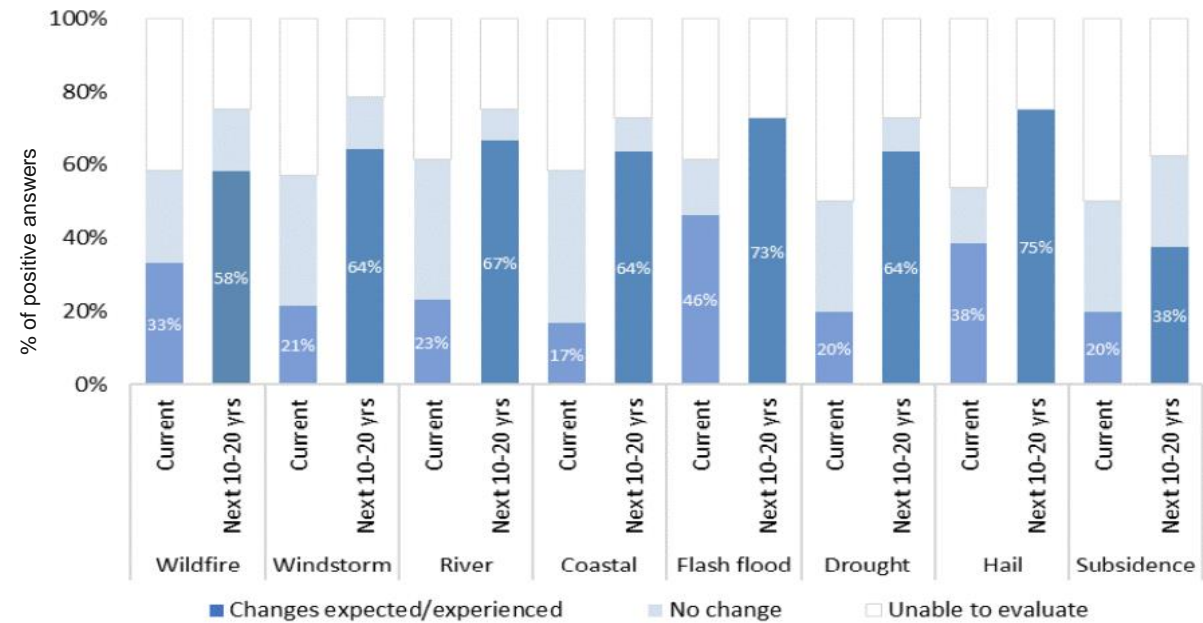
Qualitative Data Collection

44 large European groups and solo undertakings active in non-life insurance¹ provided information on observed trends attributable to climate change (e.g., increasing frequency, severity of weather-related disasters and/or magnitude of the insured losses) and if, and how, those trends have impacted or are expected to impact their non-life business.

Main Findings

- The results highlight that **more than 50% of participants have not undertaken any climate change analysis.**
- A **substantial share of the companies** were **unable to provide a qualitative assessment on global developments** and very often struggled to provide data and assessment at a level of granularity required for an in-depth assessment of the risks. However, participants **were able to provide detailed estimates for the most relevant markets and territories.**
- In general, **more information was provided in relation to their forward-looking expectations rather than on the already observed trends** in relation to impact of climate change.
- Among all non-life business lines, **participants expect that property will likely be the most affected line of business** by climate change.
- However, climate acute and chronic impacts are envisaged to affect non-life LoBs differently depending on the peril and the geographical area considered.

Observed and expected climate change impact at global level by peril



- **White bars** – share of participants that were unable to provide a qualitative assessment on the assessment of climate change on their business by hazard.
- **Light blue bars** – share of companies that did not experience any consequences of climate change on their business yet (or they do not foresee an impact in the next 10 to 20 years).
- **Dark blue bars** – share of participants that have already experienced an impact on their business due to climate change or will likely experience changes in the next 10 to 20 years.

Further detail on participants general expectations for specific risks: [▶](#)

4 | Why Management Solutions

Differential Proposal

Management Solutions has extensive knowledge in matters of Sustainability

- 1 Detailed knowledge of the field of Sustainability, and in particular of climate change (+50 projects)** with a fundamental focus on alignment with TCFD, on carbon footprint measurement exercises for financial institutions and climate risk measurement methodologies
- 2 Collaboration with international organizations in the field of sustainability**
MS works with multiple international institutions of recognized prestige in this field to increase the level of knowledge of the sector, acting as a reference consultant for the World Bank in carrying out consulting and training activities for financial institutions in TCFD and foreign exchange risk management. climate or being the only consulting company that participates in the definition of the Spanish Climate Index together with the Institute of Spanish Actuaries.
- 3 Specialist R&D team**
R&D team specialized in definition and implementation of climate risk measurement methodologies and analysis of physical and transition risk scenarios, as well as in the preparation of benchmarks in different sectors. What's more, various publications have been made and they have participated as speakers in different international forums.
- 4 Comprehensive knowledge of Risk Control and Management Function and its methodologies**
Reference consultant in risk measurement, management and control methodologies. A notable part of the global activity of Management Solutions is directly related to the execution of projects of Control and Risk Management,
- 5 Extensive experience in the insurance industry**
Extensive knowledge of the insurance industry (+250 consultants and 100 clients) with recurring collaborations in the main players of the market in both the Spanish and American markets.

A | Annex

Abbreviation	Meaning
EEA	European Economic Area
EBA	European Banking Authority
EIOPA	European Insurance Occupational Pension Authority
GWP	Gross written premiums
IPCC	Intergovernmental Panel on Climate Change
LoB	Line of business
Nat Cat	Natural Catasprophe
NCA	National Competent Authority

A | Annex

Current physical risk and forward-looking expectations

EIOPA collected qualitative information from participants on observed developments, relevant for their non-life business, and their future expectations in light of climate change in relation to a broader set of weather-related hazards.

Wildstorm

- **General Expectations:** Participants highlighted that there is a high level of uncertainty with regards to the future development of windstorm risk. Nevertheless, an increase in storms frequency and length is expected to increase over the North Sea with potential negative consequences in Northern Europe exposure (particularly in the UK, Denmark, Finland, Ireland, Norway, Belgium and Luxembourg).
- **Impacts in insurance:** All property-related line of businesses are expected to be impacted, in particular, property, motor, forestry, infrastructure and transport. In the long-term, there is a risk of increased claims payments.
- **Management Actions:** Insurance companies are closely monitoring (or planning to monitor) the evolution of this risk in most EEA countries. The large majority of the participants operating in Czechia, Finland and Luxemburg have already increased their premiums.

Wildfire

- **General Expectations:** Although participants did not consider wildfire a material peril, Southern European countries have felt an increasing trend over the last 5-10 years.
- **Impacts in insurance:** A substantial increase in frequency and impact on agriculture, forestry insurance, fire and other damage to property and BI for both commercial and residential businesses particularly in Southern countries (Italy, Spain, Greece, etc.).
- **Management Actions:** This risk is already actively monitored especially in Greece and Cyprus, where insurance companies increased (or are planning to increase) their premiums and introduced new policy restrictions. As wildfire risk is generally covered by general fire or property insurance, an increase in risk may lead to changes to the underwriting or pricing practices in the future.

Flood

- **General Expectations:** Participants expect an increase in frequency in most European regions, with potential negative consequences on the insurance portfolio in terms of higher claims to pay.
- **Impacts in insurance:** Raising property, content and motor claims may impact several LoBs (e.g., fire and other damages to property) and, if premiums are not adjusted accordingly, it could cause profitability issues. Moreover, in the long term, poor risk management may result in uninsurable properties and geographical areas.
- **Management Actions:** Several insurers report that they have already taken action (or are currently under consideration). Premiums have been increased (or under consideration) in Italy¹, Ireland and to a lower extent in Germany, Greece and Cyprus; risk selection process have been modified in Belgium, Czechia and Ireland (and changes are planned in Cyprus, Greece and Italy).

Drought

- **General Expectations:** Given the impact of prolonged and more frequent dry periods due to climate change for agricultural insurance, the assessment of drought risk is gaining more importance by insurers.
- **Impacts in insurance:** The lack of precipitation caused by global warming may negatively impact the agricultural / crop insurance portfolios.
- **Management Actions:** This peril is monitored especially in France and Belgium (under consideration in Cyprus), where some companies have already taken additional management actions to limit their exposures (i.e., premiums increase, changes in the re-insurance agreements and risk selection process and rising policy holders' awareness).



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ManagementSolutions

Making things happen

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