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Impact of climate change on reinsurance

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Agenda

- 1 Climate Change: General Overview
 - 2 Impact of Natural Catastrophes on reinsurance
 - 3 Sustainability at Hannover Re
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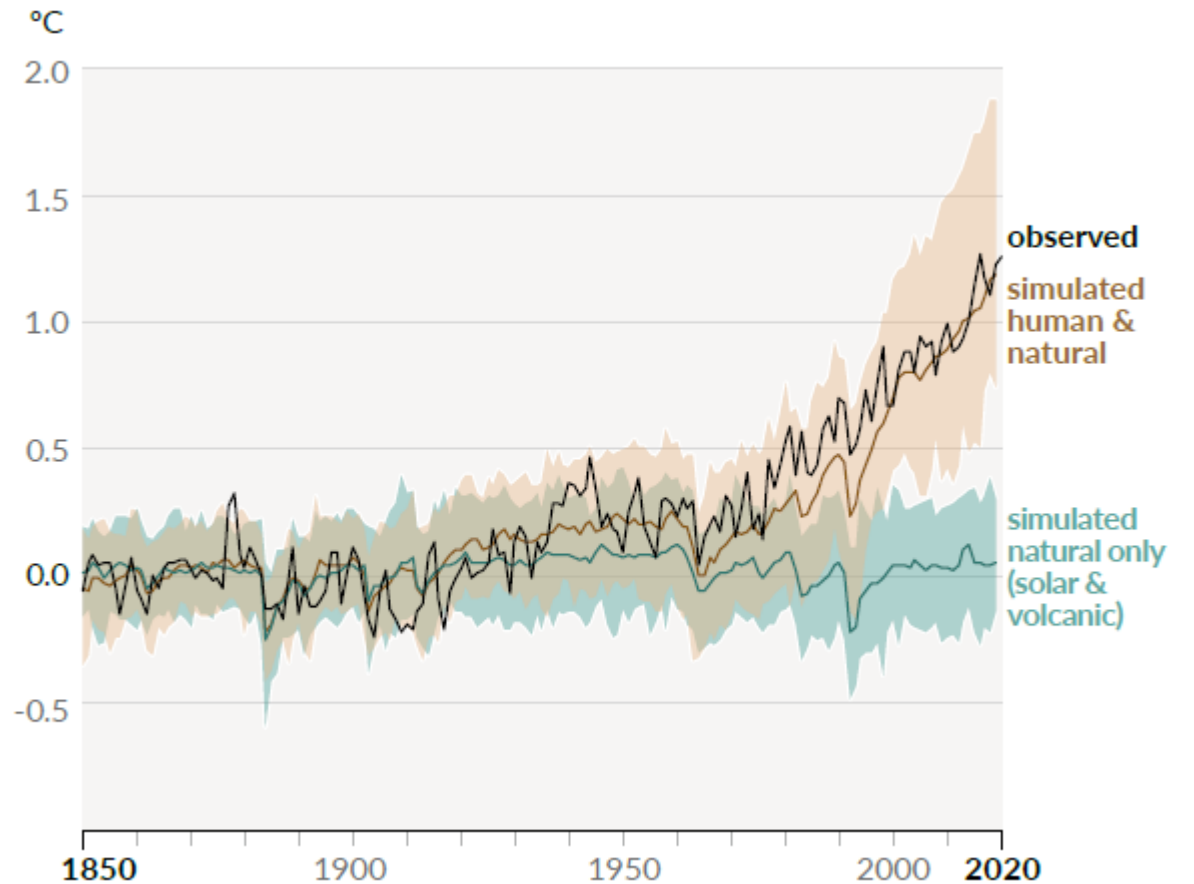
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Climate Change: General Overview

Climate Change

General Overview

- Climate is always changing for many reasons:
 - Natural variability (El Niño)
 - Natural forcings (EQ, volcanic eruptions, sun activity)
 - Human-caused forcings (greenhouse gas emission, atmosphere pollution)
- Recent changes are most likely due to human fingerprint and not to natural variability
- Increasing warming of the atmosphere, oceans, and land causes changes in the atmosphere, oceans, cryosphere, and biosphere
- The scientific evidence on global warming and the role of greenhouse gases is widely accepted



- Change in global surface temperature (annual average) as observed and simulated using human & natural and only natural factors (both 1850-2020)
- Source: IPCC

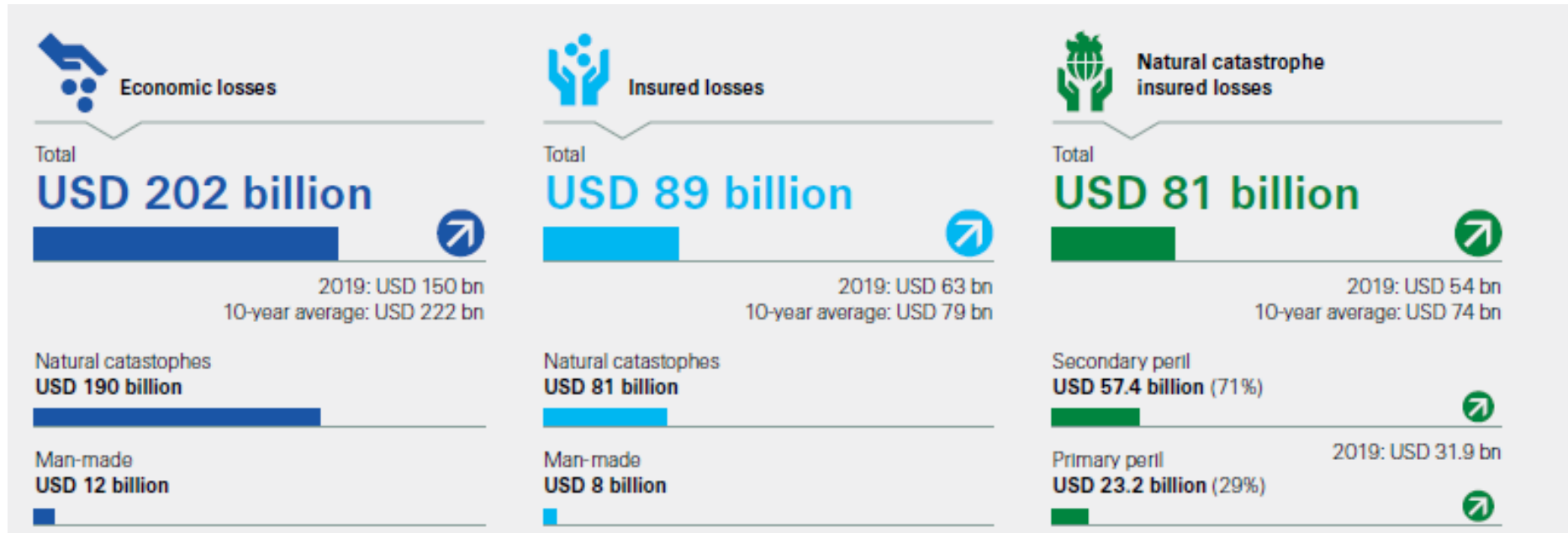
Climate Change

Effects on climate

- Increase in the frequency and intensity of global weather and climate extremes such as (marine) heat waves, heavy precipitation, droughts, and tropical cyclones, as well as the reduction in Arctic sea ice, snow cover, and permafrost
- further intensify of the global water cycle, including its variability, global monsoon precipitation and the severity of wet and dry events
- With increasing CO2 emissions, carbon sinks in the oceans and on land become less effective, causing CO2 to accumulate in the atmosphere
- As consequences of climate change, impacts such as the collapse of ice sheets, abrupt changes in ocean circulation, increased extreme events, and significantly higher warming can no longer be ruled out

Climate Change

Natural Catastrophes in 2020

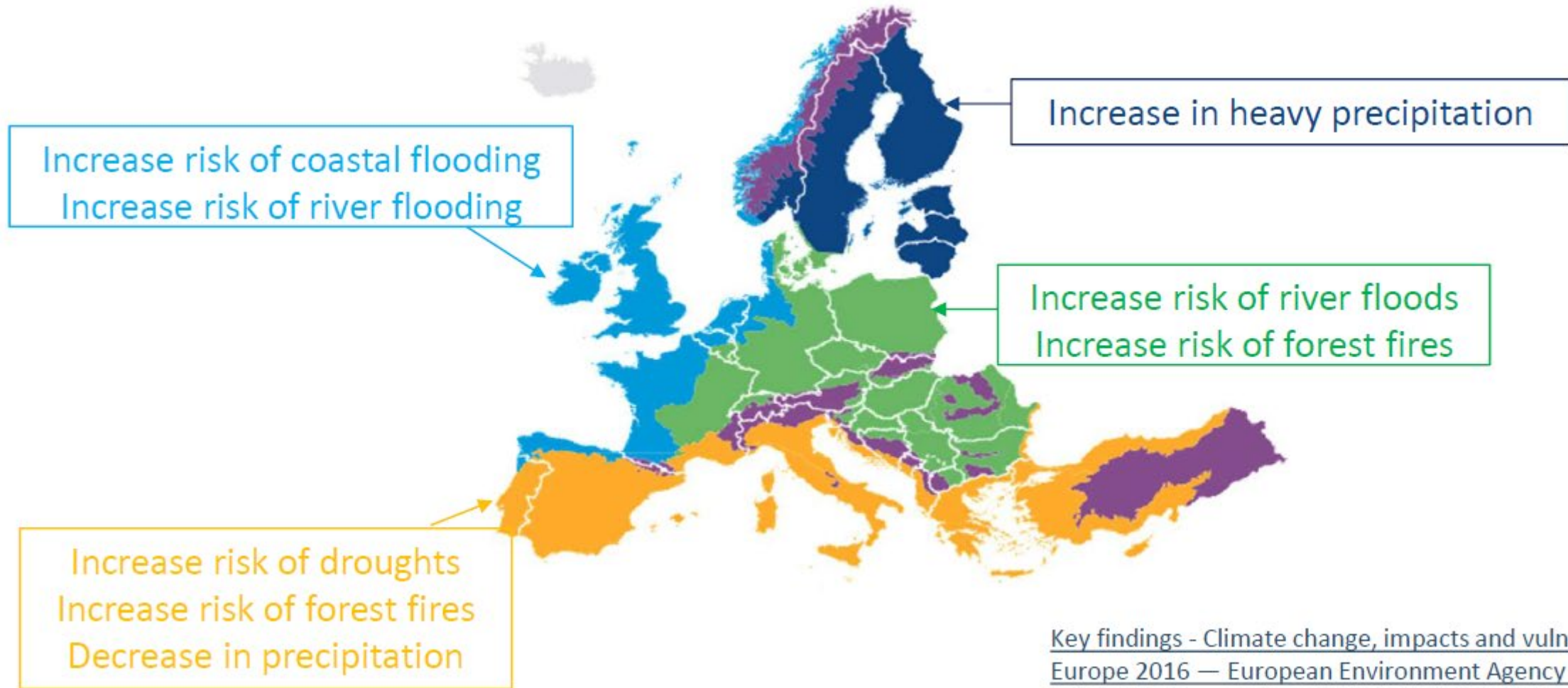


Source: Swiss Re institute

- All years between 2002-2020 are in top-20 warmest years since measurements began (in 1880)
- In 2020, there was no major peak event in terms of primary perils, but it was above the 10-year average. A year of many small to medium events, the so-called secondary perils.

Climate Change

Impact of the Climate Change in European region: regional patterns



Key findings - Climate change, impacts and vulnerability in Europe 2016 — European Environment Agency (europa.eu)

Climate Change

Why is global insurance industry action needed?

- Climate change effects are long-term and are here to stay
- Climate change factors are not fully taken into account in economic models
- Inaction / failure to adapt will have severe global consequences
- Emerging countries are particularly exposed

Climate Change and initiatives to mitigate its consequences

Industry initiatives

Some of insurance industry initiatives:

- Net-Zero Insurance Alliance (work in progress): accelerating the transition to a net-zero emissions economy, in line with the 1.5°C target of the Paris Agreement
- As investors, transitioning investment portfolios to net-zero greenhouse gas emissions by 2050
- EIOPA: further initiatives on including climate change risks in ORSA in a more detailed way (roundtable Dec 2020)
- Close the Protection Gap initiative

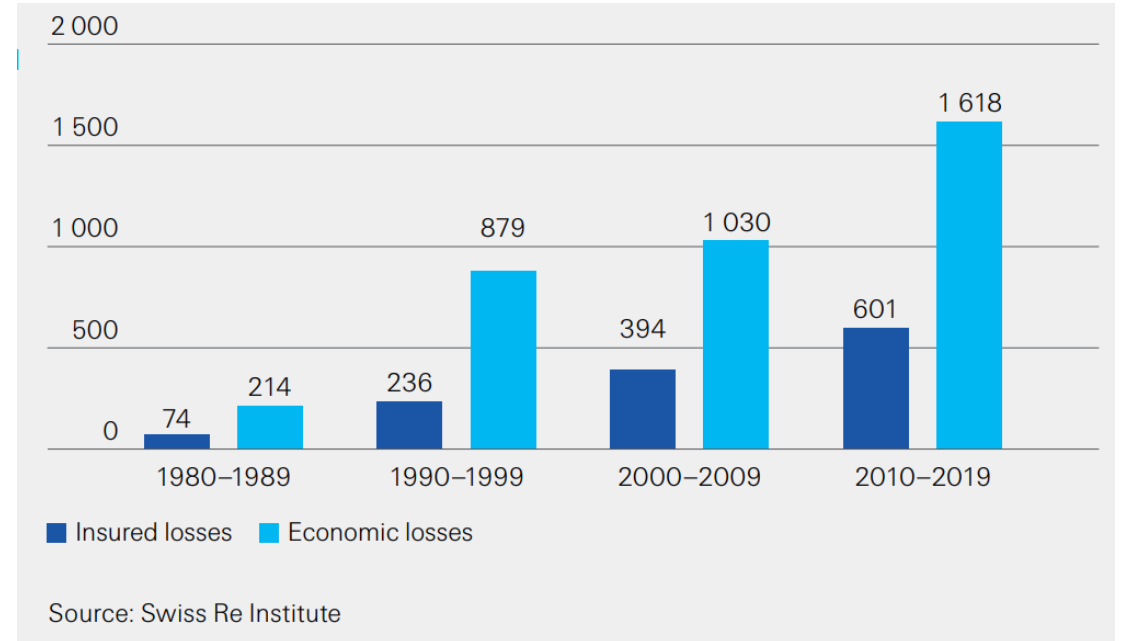
Useful sources

- <https://www.ipcc.ch/> - The Intergovernmental Panel on Climate Change (IPCC)
- <https://www.eiopa.europa.eu/> - discussion paper on Insurance stress test methodology, incl. stress test framework on climate change
- <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> - Paris Agreement on climate change
- <https://www.thecroforum.org/> - climate change as part of ERI
- <https://www.insdevforum.org/> - Insurance Development Forum

Climate Change in vulnerable countries

Our Answer: Close the Protection Gap initiative

- Growing Nat Cat events frequency – poorer countries especially at risk under the threat of global warming
- On average over the past 10 years only 5% of Nat Cat losses are covered in poorer countries (50% in high-income countries)
- “protection gap” stable in the past 10 years but always higher in poorer countries
- Institutions creating a favorable environment for PPPs to tackle the resilience challenge in poorer countries:
 - Insurance Development Forum (IDF)
 - German Cooperation Minister (BMZ)
 - German Bank for Reconstruction (KfW)
 - UK Department for International Development (DfID)
 - United Nations Development Programme (UNDP)



Global economic versus insured losses resulting from weather-related catastrophes (in USD billion, 2019 prices)

Climate Change

Close the protection Gap initiative

We can contribute to bringing HR's purpose to life!

Why is the world better off with Hannover Re around?

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Beyond risk sharing – we team up with new partners from the public, private and non-governmental sectors to create opportunities in the form of risk covers for poor and vulnerable populations

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Impact of Natural Catastrophes on reinsurance

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Impact of Natural Catastrophes

Secondary perils in the frontline

- Primary perils:
 - Tropical Cyclones,
 - Earthquakes
 - European winter storms
 - Usually better modelled and understood
- Secondary perils:
 - Events with high frequency and low to medium severity
 - In 2020, 71% of insured Nat Cat loss was related to secondary-perils events
 - Costliest secondary peril: SCS (severe convective storms)
 - Secondary peril with the largest increase in losses: wildfires
 - The impact of secondary perils is often not fully captured, especially when developing countries are concerned



Source: the New York Times



Source: <https://ec.europa.eu/jrc/en/peseta-iv/droughts>

Impact of Natural Catastrophes

Impact on insurance and reinsurance

- **Main UW risk: underestimation of future losses when using historical data / incomplete models**
 - Unmodelled loss components
 - Incorrect assumptions on exposure data
- **Will weather-related risks remain insurable in the long term?**
 - Understanding of long-term effects of climate change is essential
 - Short-term nature of most insurance/reinsurance Nat Cat related products allows for quick adjustments
 - The rise in small and mid-size losses from secondary perils is a challenge (prop and aggregate covers)
- **Level of confidence in the risk assessment:**
 - Timescale: how quick will the changes happen in the future?
 - Is historical data still reliable? How shall it be adjusted for future projections?
- **What perils can be directly impacted by climate change?**
 - Science is confident about the direct link between climate change and risks related to increased temperature
 - Climate change and river-flooding / rainfall: less confidence, too many other factors involved

Impact of Natural Catastrophes

Impact on insurance and reinsurance

- **Factors that increase effective exposure:**

- GDP growth
- Increase of the value of Property
- Increase of productivity
- Urbanization and population growth
- Expansion in coastal areas and previously undeveloped natural areas

- **Factors influencing loss development after an event:**

- Overwhelming the economy by the magnitude of a loss
- Failure to mitigate losses due to lack of adequate preparation
- Globalization affects dependency in the production chain, which can cause long-term business interruptions
- Social inflation
- Political pressure

Identify the trends and make clear decisions

Solution example France

French Nat Cat Scheme of 1982

- Natural disaster cover is compulsory in all property insurance policies
- The insurance rates are set by the government, same to all covered, regardless of the risk (solidarity principle)
- Caisse Centrale de Réassurance (CCR) is a PPP that provides reinsurance to cedents operating in France with the State's backing

- Ceding companies buy Windstorm coverages separately from these Drought and Flood coverages (French Nat Cat)
- French ceding companies benefit first from a 50% Quota Share from the national Reinsurer CCR and a Stop Loss, which retention can vary (around 200%)
- Sub-layer to the Stop Loss programs is being bought on the private market

Reinsurance Underwriting

Identify the trends and make clear decisions when possible...

- Keep track of scientific findings relevant for the risk assessment
 - for modelled perils, done in the adjustment of the Cat models by MOD
- Review and adjust the loadings for secondary perils taking into account regional patterns / future trends
- Examine historical data when using it (e.g. a reference loss) to avoid underestimation and loss creep:
 - Is the data accurately indexed?
 - Are there other factors that would impact a similar loss today (urbanisation, GDP growth)?
- Monitor changing patterns in claims developments / UW info:
 - Granularity of data is important to analyse for new trends
- Account for local risk prevention measures (or lack of it)
- Engage in the dialogue with local regulators and authorities – new business possible through PPP?
 - parametric insurance
 - new types of coverages (water supply, CO2 Liability, Power outage)

The impact of climate change on the insurance market

Use case flood in 2021

- Flood event in Europe in July 2021
 - Heavy rains in Europe caused severe flooding in rural areas and larger cities
 - The economic loss nears USD 25 billion, making it the most expensive weather event in European history
 - For example, in Polish cities with largely concreted areas and lack of infiltration, the sewage system was unable to counteract flooding
 - The dry soils and the ongoing decline in the groundwater level in Poland mean that water can no longer percolate



Heavy Rainfall Causes Flooding in Szczecin, Poland

(Source: <https://notesfrompoland.com/2020/06/30/warsaw-hit-by-floods-as-government-blames-absent-opposition-mayor/>)

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Sustainability at Hannover Re

Sustainability at Hannover Re

Sustainability topics are highly dynamic and interconnected

Challenges and Perspectives



Regulatory requirements



Governance structure



Investors



NGOs



Employees

Impact on Hannover Re

- Regulatory ESG developments and disclosure requirements are constantly accelerating
 - Key drivers: EU Action Plan, EU Green Deal, SDGs and EU sustainable finance strategy
 - Specifically: EU Taxonomy, CSRD, Solvency II, Sustainability Corporate Governance
 - All ESG regulation is complex, interconnected and of high interest to regulators and stakeholders
 - Increasing/new reporting obligations (CSRD, EU taxonomy, potentially TCFD)
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- ESG is to be integrated into governance structure, strategies and risk management systems
 - In 2019, BaFin released a Guidance Notice on Dealing with Sustainability risks
 - In 2021, a BaFin questionnaire has been sent to HR, further actions possible
 - Mitigation of adverse impacts, scenario analysis, stress testing are expected to become mandatory
-
- EU action plan strives to redirect capital into sustainable investments
 - Increasing pressure and demand from investors related to ESG topics (due to own regulatory requirements)
 - Poor management of ESG topics is increasingly seen as a risk factor (investment risk)
 - Rising number on ESG related calls with investors/analysts
 - Investors often resort to evaluations of ESG-rating agencies (screening tools)
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- Increasing pressure by NGOs may lead to reputational risks
 - Hot topics: fossil fuels, human/labour rights, biodiversity, diversity of Executive Board / management
 - HR has been subject to six incidents of negative media coverage in social media since January 2021
 - NGO driven counter-motion at 2021's AGM
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- Employees are taking “soft” factors more and more into account when choosing their employer of choice (CSR, culture, benefits, reputation)

Sustainability at Hannover Re

How do ESG-rating agencies see us?

Institutional investors / foundations often do not perform their own ESG research. They resort to assessments of specific ESG-rating agencies. Hannover Re is currently rated by a number of ESG-rating agencies:

Rating

- ISS ESG:
- CDP:
- VigeoEiris:
- MSCI:



Results 2020/2021

Status “prime” at C+

rate us at C

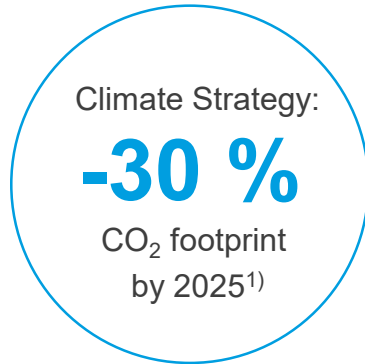
rate us, but we don't have permission to disclose results

As of 2021, we received an MSCI ESG Rating of A

- We are a member of the FTSE4Good Index, the Global Challenges Index, and are listed in major STOXX indices
- We were included in the newly created sustainability index of Deutsche Börse, the DAX50 ESG, since 2020
- We also participate in a number of initiatives and score cards

Goals set in core business and own operations

Our ambition



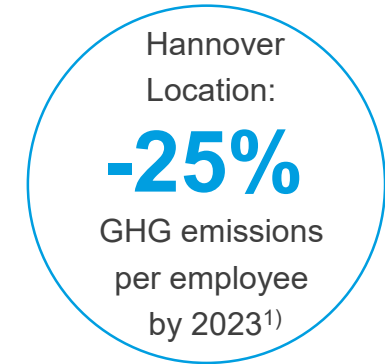
Asset Management

- PRI Signatory since 2020
- Negative screening / active divestment since 2012
- Definition of ESG-Exclusions for issuers
- Our climate strategy in asset management:
 - Decarbonisation¹⁾
 - Active investment in sustainable assets
 - Engagement



Underwriting

- PSI Signatory since 2021
- Phased exit plan from thermal coal until 2038 for the **entire P&C portfolio** approved
- Definition of exclusions in our ESG manual for **facultative** business²⁾



Own operations

- Hannover Office:
 - Since 2012: certified according to ISO 14001
 - Since 2016: Carbon neutral and yearly EMAS III Environmental Statement
- Compensation of air travel related CO₂ emissions³⁾
- Expansion of data recording to at least 75% of the global workforce and reduction of GHG emissions at Hannover location by 25% per employee by 2023¹⁾

1) compared to the base year of 2019

2) additional sector policies apply

3) for our locations in Germany, Australia, India, Japan, Malaysia and Shanghai

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The current regulation does not define any sanctions, only reporting standards. However, the overarching goal is to reduce carbon emissions.

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