Our climate-related financial disclosures summarise the steps we have taken to manage climate-related risks and opportunities, and achieve our commitments towards net-zero carbon emissions.

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Overview

The climate-related financial disclosures provide a foundation to improve investors' and other stakeholders' ability to appropriately assess and price climate-related risk and opportunities.

Swiss Re has a long-standing commitment to sustainable, long-term value creation. Through our Group Sustainability Strategy, we have sharpened this commitment and have clearly defined sustainability as a strategic, long-term value driver.

We apply this approach throughout our re/insurance value chain, comprising both the liability and the asset sides of our balance sheet, our own operations and dialogue with our stakeholders.

Mitigating climate risk and advancing the energy transition: one of our top priorities

Climate change is an essential element in our Group Sustainability Strategy. "Mitigating climate risk and advancing the energy transition" is one of our three overarching 2030 Sustainability Ambitions. The 2030 Sustainability Ambitions cover three focus areas where we can have a significant positive impact in terms of supporting sustainability and strengthening resilience.

Swiss Re first detected the potential long-term challenges posed by climate change some 30 years ago, and this topic is now at the centre of our sustainability efforts. As a re/insurer, climate change is a key issue because it leads to an increase in the severity and a change in the patterns of natural catastrophes such as windstorms, floods, excessive rainfall, heatwaves and drought. In combination with growing asset concentrations in exposed areas and more widespread insurance protection, climate change will cause a steady rise in losses. For this reason, we have developed a Climate Action Plan (see Climate strategy, page 152).

Climate-related financial disclosures (TCFD)

Starting from the premise that climate change creates physical, liability and transition risks, the Task Force on Climate-related Financial Disclosures (TCFD) aims to offer consistent and effective financial disclosures that allow investors and other stakeholders to assess the climate risks faced by companies and to take appropriate action. We have played an active role in the TCFD since its creation by the Financial Stability Board, and began to implement the TCFD recommendations in our 2016 Financial Report. Since then, we have continued to expand our climate-related disclosures.

Tackling climate change and advancing the energy transition is challenging. In line with the Paris Agreement, we have committed to achieving net-zero CO_2 emissions (see box).

Our climate-related financial disclosures summarise the steps we have taken to achieve our commitments to net-zero CO_2 emissions. This chapter follows the structure of the TCFD recommendations (see table below). In each section, we focus on physical risks in our re/insurance business, transition risks in our re/insurance business, and transition risks in our investments.

Achieving net-zero CO_2 emissions[1]

Swiss Re has committed to achieving net-zero CO_2 emissions:

- Across the Group by 2050, by signing the UN Global Compact "Business Ambition for 1.5°C"[2]
- In our investment portfolio by 2050, as a founding member of the UN-convened Net-Zero Asset Owner Alliance
- In our operations by as early as 2030

You can read more about our Group Sustainability Strategy and our climate-related activities in our Sustainability Report 2020 at: https://reports.swissre.com/sustainability-report/2020

Climate-related financial disclosures of the Financial Stability Board

Governance	Strategy	Risk management	Metrics and targets
A) Board oversight	A) Climate-related risks and opportunities	A) Processes for identifying and assessing climate-related risks	A) Metrics to assess climate-related risks and opportunities
B) Management's role	B) Impact of climate-related risks and opportunities	B) Process for managing climate-related risks	B) Scope 1, 2 and 3 green-house gas emissions
	C) Resilience of strategy and climate-related scenarios	C) Integration into overall risk management	C) Targets

Source: TCFD

[1] Net-zero emissions means that for every tonne of CO_2 that cannot be reduced, a tonne needs to be removed from the atmosphere and permanently removed through so-called carbon removal approaches.
[2] This includes a commitment to setting science-based targets through the Science Based Targets initiative (SBTi).

Climate governance

Swiss Re's governance around climate-related risks and opportunities

At Swiss Re's highest governance level, four Board of Directors committees are charged with overseeing the implementation and execution of Swiss Re's Group Sustainability Strategy and Climate Action Plan.

The Chairman's and Governance Committee, presided over by the Chairman, has the overall responsibility for monitoring and reviewing the Group's strategic priorities on enabling sustainable progress, including initiatives and actions specifically addressing climate change.

The Compensation Committee establishes and reviews the compensation framework, guidelines and performance criteria. Performance criteria include sustainability and climate change-related topics.

The Finance and Risk Committee defines the Group Risk Policy, reviews risk capacity limits, monitors adherence to risk tolerance, and reviews all key risk issues and exposures, including those with a specific climate dimension.

The Investment Committee reviews Swiss Re's asset management-related activities and, as part of this, receives regular updates on Group Asset Management's Responsible Investing Strategy and implementation, including in the area of climate change.

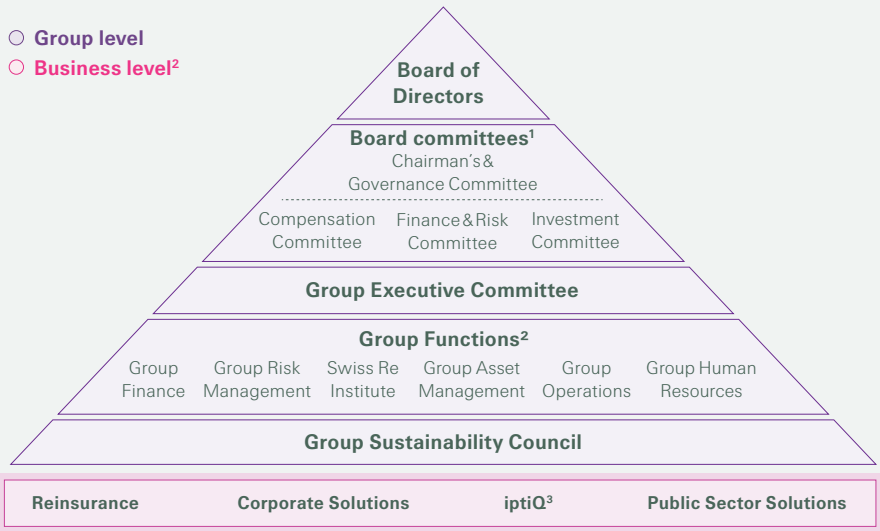
The Board of Directors oversees the development and adoption of sustainability policies and Swiss Re's climate strategies, while the Group Executive Committee (Group EC) ensures their implementation.

To optimise coordination and alignment at the Group level and to monitor progress on the implementation of the Group Sustainability Strategy, the Group EC has established the Group Sustainability Council (GSC), chaired by the Group Chief Risk Officer. The GSC is an advisory body to the Group EC. It is composed of Group EC members and other senior management representatives.

Group Functions also have specific responsibilities relating to climate change: a team located within Group Risk Management is responsible for coordinating sustainability-related activities across the Group. Group Risk Management is responsible for maintaining a suitable risk policy framework, including sustainability and climate-related risks. Swiss Re Institute, which is headed by our Group Chief Underwriting Officer, provides the basis for pricing and, more specifically, all weather-related physical risks, eg through a dedicated natural catastrophes team and proprietary natural catastrophe models. Group Asset Management is responsible for developing and implementing the Group's Responsible Investing Strategy, which includes a dedicated approach to climate change. Group Operations implements the net-zero strategy to manage the firm's operational carbon footprint.

At the business level, the Business Units Reinsurance and Corporate Solutions, the iptiQ Division and Public Sector Solutions implement the Group Sustainability Strategy, including the Climate Action Plan.

Swiss Re's sustainability and climate-related governance



[1] Only Board committees with allocated responsibilities related to sustainability and climate change are listed.
[2] Dedicated sustainability and climate change roles, networks and/or committees in all Group Functions and on Business level.
[3] The iptiQ Division has been in place since 1 January 2021. The Business Unit Life Capital was disbanded at the end of December 2020.

Sustainability and climate change-related KPIs linked to compensation

We have introduced sustainability as an additional assessment dimension for determining our Group Annual Performance Incentive (API) pool. This establishes a clear connection between sustainability and climate change-related targets and compensation for all employees, including Group EC members. The sustainability assessment in 2020 is primarily based on qualitative key performance indicators (KPIs) and targets. In 2021, the assessment will be expanded to include quantitative KPIs and targets. Our KPIs and targets are aligned with our 2030 Sustainability Ambitions and net-zero commitments. Please see pages 120–121 of this Financial Report for details on the API pool funding process, and pages 133–134 for details on performance outcomes of the qualitative assessment.

You can read more about our sustainability governance in our Sustainability Report 2020, page 82.

Climate strategy

We regularly assess the actual and potential impacts of climate-related risks and opportunities on our business, strategy and financial planning.

There is clear empirical evidence that the global climate has been changing and a far-reaching scientific consensus that this change has been due to human activity, primarily from the burning of fossil fuels and agriculture. Swiss Re recognises that climate change, if not mitigated, will potentially have disastrous effects on society and the global economy. In view of this, we are committed to playing an active role in the transition to a net-zero emissions economy and to supporting our private and public-sector clients in this transition and adaptation to unavoidable climate change.

Natural catastrophes are a key risk in our re/insurance business. The damage caused by storms, floods, droughts and other natural catastrophe perils (including wildfires) can affect millions of lives and the economies of entire countries. In 2020, our clients paid USD 4.1 billion of premiums[3] for natural catastrophe covers exceeding losses of USD 20 million. This represents approximately 10% of total premiums, which shows the importance our clients place on obtaining re/insurance protection against natural catastrophe risks.

On average, insured losses due to natural catastrophes have increased steadily over the past 20 years. The key reasons have been economic development, population growth, urbanisation and a higher concentration of assets in exposed areas. At the same time, the protection gap, ie the difference between insured and total economic losses, has remained substantial in all regions (see graph on page 173).

In view of the significance of climate change for our business, we have developed a Climate Action Plan as part of our Group Sustainability Strategy.

Our Climate Action Plan
Building on our Group Sustainability Strategy and our commitments and initiatives of recent years, our Climate Action Plan combines three objectives:

1. We aim to become the leading re/insurance company on physical climate risk.
2. We aim to become a leading provider of re/insurance solutions for low-carbon transition opportunities.
3. We build partnerships to develop scalable solutions to mitigate and adapt to climate change.

As our Climate Action Plan indicates, understanding the risks posed by climate change as well as identifying the potential to create and adapt suitable products and services for our clients continue to be priorities for Swiss Re. Our Climate Action Plan serves as Swiss Re's climate strategy.

Climate-related risks

Physical risks

Physical risks posed by climate change could potentially affect four areas of our business. They can:

- Influence modelling and pricing of weather-related natural perils
- Impact the economic viability of re/insurance for risks exposed to extreme weather events
- Impact real assets exposed to weather-related natural perils
- Reduce/disrupt our operations

Modelling and pricing of weather-related perils
Climate change will impact the frequency and severity of losses and consequently, our modelling and pricing of insurance risks need to be adjusted on a regular basis. By constantly assessing the climate-related physical and transition risks, the insurance industry plays an important role in keeping such risks insurable and affordable wherever possible. Reducing emissions as much as possible (by managing transition risks and accelerating related solutions) and adapting to unavoidable climate change (through, eg risk transfer solutions and other means) is essential.

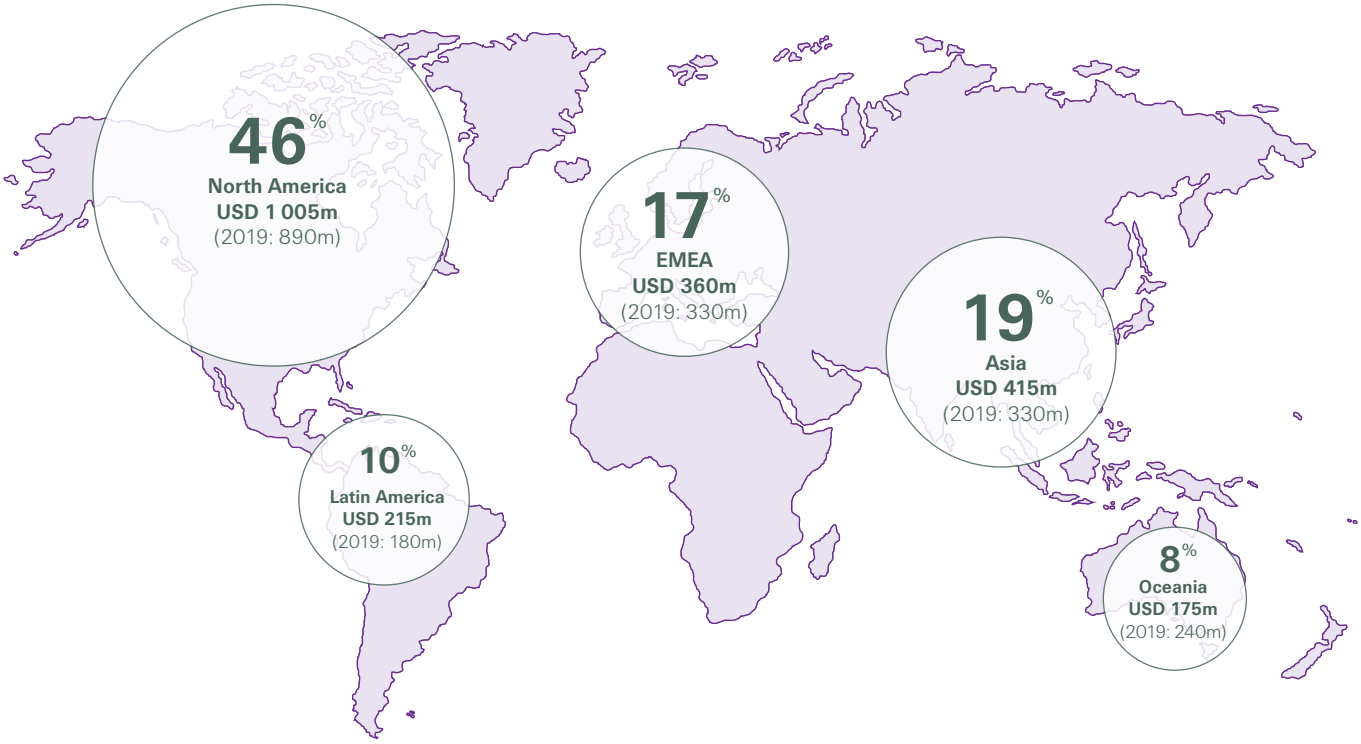
We assess the near-term materiality of potential climatic changes to our underwriting risk based on our proprietary loss modelling framework, with which we calculate the annual expected losses (AEL) and loss-frequency distributions of major natural catastrophes. The weather-related perils with the largest AEL for property insurance at present are disclosed on page 172 (North Atlantic hurricane, US tornado, European windstorm, Japanese cyclone, and European flood). Furthermore, the geographic distribution and peril split of Swiss Re's annual expected natural catastrophe losses for property insurance are shown in the figure on page 153. The largest contribution to Swiss Re's AEL for the most material weather-related perils comes from the North America region (46%), mainly dominated by hurricane risk, while Asia accounts for 19% of the AEL, with a significant contribution from typhoon risk. EMEA, where the major driver is European winter storms, and Latin America contribute with 17%, and 10%, respectively.

Please refer to page 172 (Climate metrics and targets) for additional natural catastrophe risk metrics.

[3] In previous years, we reported natural catastrophe premiums for our Property & Casualty (P&C) Reinsurance business only, but have now switched to Group-wide figures to provide a more complete picture.

Annual expected loss (AEL) for weather-related natural catastrophes

As a percentage of most material perils in North America, Latin America, Europe, Asia and Oceania (all numbers have been rounded).



North America

28% Tropical cyclone · **11%** Convective storms · **4%** Flood · **2%** Windstorm · **1%** All other perils

Latin America

8% Tropical cyclone · **1%** Flood · **<1%** All other perils

EMEA

8% Windstorm · **5%** Flood · **2%** Convective storms · **1%** All other perils

Asia

14% Tropical cyclone · **4%** Flood · **<1%** Convective storms · **<1%** All other perils

Oceania

2% Convective storms · **2%** Tropical cyclone · **2%** Flood · **2%** All other perils

Source: Swiss Re

In addition to property insurance, physical climate risks play an important role in a number of other areas. Agriculture insurance is one of those areas where perils like drought, excess rainfall, frost and hail play an important role.

For both property and agriculture lines of business, our models show that with the current climate, the dominant factor for Swiss Re's weather-related risk exposure remains natural variability, affecting both the frequency and severity of extreme events in all regions. We expect this to remain the case both in the short and medium term (ie 2025 and 2030), in line with the most recent scientific findings from the Intergovernmental Panel on Climate Change (IPCC).[4]

Swiss Re closely monitors climatic trends and other macro risk factors that are potentially material for the insurance industry over various time horizons. Physical climate change risks that affect our assessment and management of weather-related risks are summarised in the table below.

Classification of climate-change effects and their relevance for the re/insurance industry

Global warming response	Driver for change	Effects/ perils	Time horizon	Insurance impact, focus on property catastrophe
Direct				
	High confidence			
	Increasing **mean temperature**	Melting of glaciers and ice caps, thermal expansion: **sea level rise/storm surge** Reduced permafrost/slope stability: **landslides**	Slow but steady **increase over coming decades**	Low-medium property insurance impact: **no sudden/unprecedented events (adaptation!).** Localised effects in coastal and flooding zones
	Increasing **temperature variability**	Longer/more frequent **heat waves, droughts, water scarcity, wildfires,** health issues, increased mortality, potential political conflicts	Heat waves/droughts: **already observable and increasing trends over coming decades**	**Frequency perils**, mostly affecting primary insurance, quota share and stop-loss reinsurance. **Impact on insurance earnings**, rather than capital. Impact strongly varies due to heterogeneous original covers, with considerable **protection gap in flood insurance**
	Increased **moisture capacity in atmosphere** due to **higher temperatures**	More frequent **extreme rainfall and river floods**	Increasing regional trends already observable and **medium-severe impact likely by mid/end of century**	
	Confidence barrier			
	Impact on **climate cycles** (eg ENSO, AMO, NAO)	More frequent severe **tropical cyclones** Change of frequency/ severity of **winter storms**	**Severe impact likely by mid/end of century**	**Limited insurance impact** as of today where climate risk is managed actively. Mid/end of century significant impact on re/insurance covers, both for severity (affecting capital) and frequency (affecting earnings), in particular where associated flood risk is covered in full
	Increased convection	Increased **hail and tornado** risk		
Indirect				
	Reduced confidence			

Source: Swiss Re sigma 2/2020

[4] See IPCC Fifth Assessment Report, chapter 11, and the IPCC Special Report on the impacts of global warming of 1.5°C.

Confidence about observed and future climate trends is highest for risks related to the increase in global temperatures. For example, the melting of glaciers and ice caps, and thermal expansion of water in warmer temperatures are leading to rising sea levels. These can directly increase the magnitude of storm surges, a long-term risk for coastal regions. To date, the rise in sea levels has been relatively slow and will likely remain so in the near future, allowing time for measures to mitigate the risk of coastal flooding. The insurance impact today is limited to the property line of business, and is mostly localised in coastal and flooding zones (see the case study on sea level rise on page 156).

Another outcome of climate change for which there is high confidence is increased temperature extremes, which have brought longer and/or more frequent heat waves, droughts and periods of water scarcity. Heat waves affect agriculture, workforce productivity, infrastructure, water resources, health and mortality. In addition, hot and dry conditions exacerbate drought and wildfire risk, as seen in different regions in recent years (eg California, Portugal and Australia), with severe consequences for exposures in the wildland-urban interface. As losses from frequency perils often remain below the retention rates of reinsurance programmes, wildfire risk mostly affects primary insurers. The impact of wildfire risk and other frequency perils on a reinsurer is mostly through proportional covers such as quota shares and/or non-proportional aggregate covers.

Furthermore, rising temperatures allow the atmosphere to hold more water vapour, thus (on average) increasing the risk of extreme rainfall (including tropical cyclone-induced rainfall). However, there is less confidence in estimating the impact of rising temperatures on river flood risk, which is also impacted by other factors. Regional trends are already observable, but the insurance impact for flood-related losses is limited due to still-large protection gaps for this peril.

There is lower confidence in the understanding of trends for atmospheric and oceanographic circulation changes. These affect, for example, the frequency and intensity of tropical cyclones or European winter storms. While warmer sea surface temperatures will increase the probability of tropical cyclone formation and intensification, higher wind shear can offset this. These complex interactions introduce a "confidence barrier" that renders any insurance-related quantification of climate-change effects on high-severity perils like hurricanes very uncertain. Given their material impact, Swiss Re performs internal research and collaborates with leading scientists to tackle this challenge.

While several climate-change factors are beginning to affect the natural catastrophe risk landscape, we expect weather risks to remain assessable by scientific methods. This means we can continue to update our loss models now and in the future to assure adequate costing of extreme weather events. The in-house development of risk models for weather-related perils ensures full modelling transparency and the ability to efficiently assess and update models if new scientific evidence becomes available (see also page 168, Climate risk management).

Furthermore, since most of the re/insurance contracts with our clients have a duration of one year, updated risk views are quickly reflected in the costing of natural catastrophe risks.

Regarding the long-term time horizon (2050[5]), we expect a need for substantial adjustments to some of our weather risk models, based on evolving scientific knowledge. We are confident, however, that future research will continue to give us sufficient guidance on the magnitude and direction of these adjustments.

Impact on the economic viability of re/insurance protection

An increase in the frequency and severity of extreme weather events can restrict the affordability of re/insurance in certain regions, especially in coastal areas, by requiring a rise in premiums.

While there is significant uncertainty associated with climate projections, especially when it comes to storms making landfall, increases in the frequency and severity of tropical storms are likely. Natural variability is expected to remain the dominant factor in the short and medium term (2025 and 2030). In the longer term (2050), a rise in sea levels will lead to non-linear increases in storm surge risk for coastal areas. Additionally, warmer temperatures will lead to more extreme rainfall events that may increase flood risk.

If rises in re/insurance premiums necessitated by increasing extreme weather risks remain modest, ie re/insurance protection remains economically viable for our clients, the overall premium volume will potentially grow. Larger increases, however, will eventually reverse this effect by pushing re/insurance prices for certain exposed risks beyond the limits of economic viability. This is particularly relevant for areas with inadequate construction planning and development. In addition, timing is of crucial importance: if measures to exclude a particular risk are taken too early, we may offer our clients less insurance protection; if measures are taken too late, we may end up with higher claims.

Finally, the overall size of the re/insurance market will depend on future economic growth rates.

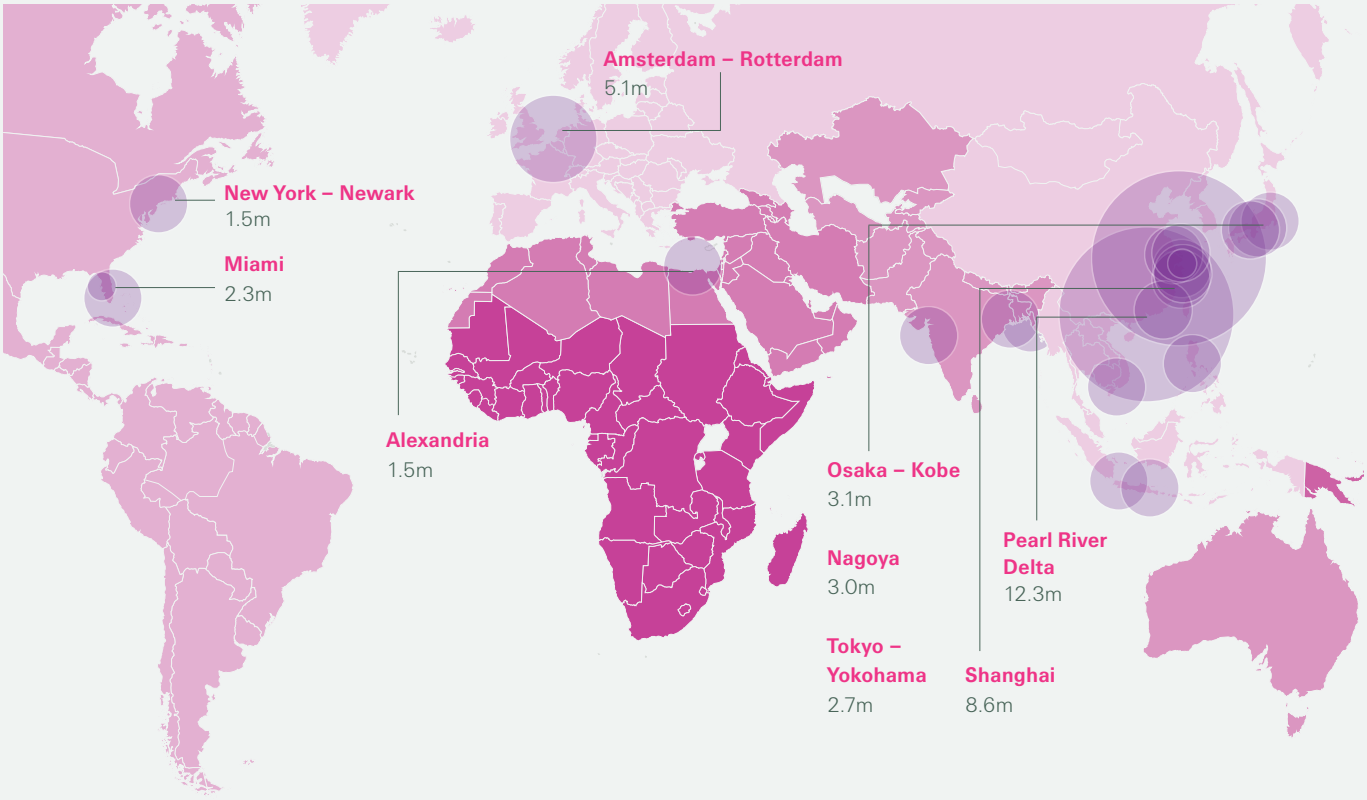
In line with independent external studies, we have shown through a series of scenario assessments (Economics of Climate Adaptation studies, ECA) that in many regions, climate adaptation measures need to be taken to limit expected increases in natural catastrophe damage and thus to ensure the economic viability of re/insurance in the future. This is one of the key reasons why Swiss Re actively engages with the United Nations, the public sector, clients, industry peers and employees to advocate cost-effective adaptation to climate change.

[5] In climate science, long-term often refers to a time horizon until 2100. However, to align with our net-zero commitments and the Paris Agreement, we chose to use "long-term" to mean until 2050.

Case Study: Sea level rise

Sea level rise is a direct consequence of a warming climate: caused by thermal expansion of water and the melting of glaciers and ice caps, sea level rise will directly increase the magnitude of storm surges and pose a long-term chronic risk for low-lying coastal regions. The relatively slow rise of sea levels allows time for the adaptation and implementation of flood-protection infrastructure that can reduce the risk of catastrophic coastal flooding. Up to 2050, the uncertainty range for climate change-driven sea level rise is relatively small with an expected rise of approximately 0.25 metres for a warming scenario that is aligned with the goals of the Paris Agreement (RCP2.6) and approximately 0.3 metres in a scenario where greenhouse gas emissions continue to rise throughout this century (RCP8.5).[1] Sea level rise is expected to accelerate significantly during the second half of the 21st century, especially if no adequate mitigation measures are implemented to limit global warming. For the re/insurance industry, the impact of sea level rise on resource-rich coastal cities and large agriculture deltas is of particular relevance. Adequate adaptation measures will be important to protect coastal exposures.[2] Such adaptation measures, including climate-resilient infrastructure, will help to ensure the availability and affordability of insurance in exposed coastal areas.

Largest population centres at risk of storm surge today and expected population growth by 2060



* Aggregated population growth is shown for the following regions: Europe, North America, Sub-Saharan Africa, North Africa and West Asia, Central and Southern Asia, East and Southeast Asia, Latin America and the Caribbean, Australia and New Zealand, Oceania.

Source: Swiss Re; United Nations Population Division, Department of Economic and Social Affairs, World Population Prospects 2019

From a re/insurance perspective, the most material risk associated with sea level rise is storm surge in large coastal cities. Today, approximately 230 million people, roughly 3% of the world's population, are exposed to storm surge risk. Storm surges cause, on average, more than USD 10 billion of losses per year, of which the majority remains uninsured today. The largest urban areas that are currently exposed to significant storm surge risk are shown on the map above.

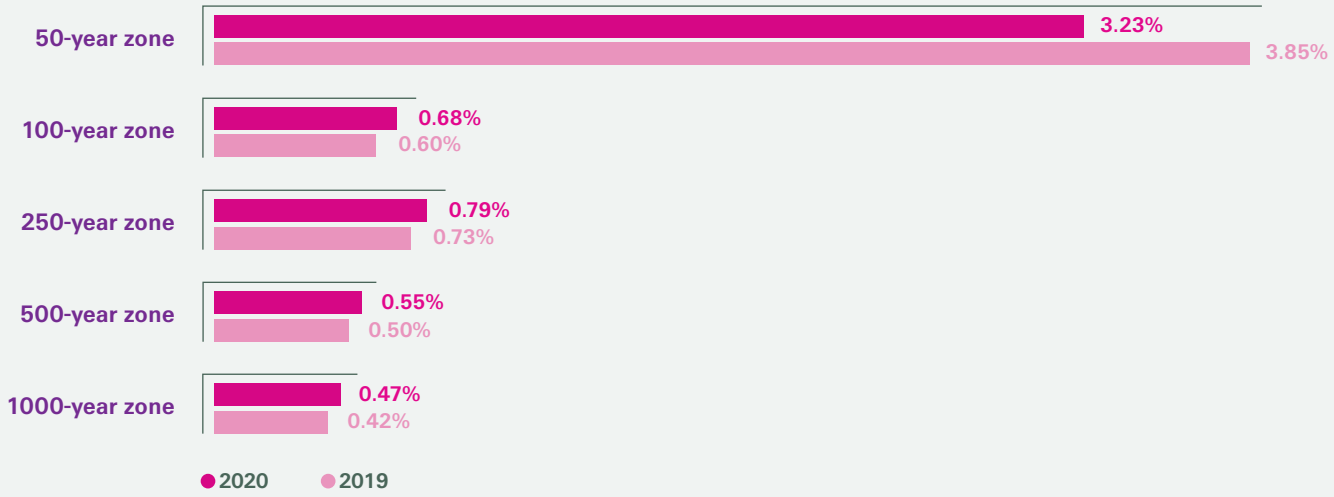
[1] RCP: Representative Concentration Pathway. RCP scenarios represent possible future concentration trajectories of greenhouse gases. The scenarios are named after the resulting radiative forcing at the end of the 21st century, eg 8.5W/m² for RCP8.5, where no mitigation measures nor technical innovation will limit temperature increases.

[2] For more details, see also IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities (2019), Figure 4.3.

According to the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (2019), population growth, urbanisation and a further rise in global mean sea levels of 21cm by 2060 would increase the global population living below the hundred-year extreme sea level (ESL) from about 190 million in 2000 to between 316 and 411 million in 2060. The largest absolute changes are in South and Southeast Asia, while the largest relative changes are expected in Africa, as shown on the map on page 156.

Swiss Re manages its exposure to sea level rise by developing up-to-date risk models and by managing its risk accumulation in the most exposed areas to ensure a well-diversified underwriting portfolio. Swiss Re's Global Storm Surge Zones help us and our clients to pinpoint storm surge risks globally in a quantitative way thanks to high-resolution data.

Estimate of insured property exposure in coastal storm-surge zones (as percentage of total insured property exposure)



Modelled without flood protection measures.
Source: Swiss Re

Impact on real assets exposed to weather-related perils

Real assets such as real estate or infrastructure are exposed to natural perils, such as hurricanes, tropical cyclones and floods. In addition to considering physical risks when acquiring new properties, we analyse these exposures across the investment portfolio based on our proprietary modelling capabilities used for our re/insurance underwriting. In the reporting year, we have extended this analysis to our private debt investments, including infrastructure loans and commercial mortgage lending, as well as commercial mortgage-backed securities. The results of both analyses suggest a very low exposure of our real asset holdings to natural perils in general and to climate-related perils in particular.

Our own operations

According to our in-house catastrophe loss models, severe weather risks are potentially of importance for some of our operations, mainly in Florida and on the northeastern coast of the US. However, even assuming an extreme climate change scenario, we do not expect any of these office locations to be exposed to risk levels that would undermine their economic viability. Additionally, robust and regularly tested business continuity plans are in place to mitigate the risk of climate-related disruptions. Strategies include transferring work and/or employees to unaffected Swiss Re locations, and providing temporary alternative office space. Working from home can also be a viable and effective alternative, as has been demonstrated during the COVID-19 pandemic, during which the majority of employees worked from home for many months.

Physical risks conclusion:
Although the physical risks arising from climate change can have significant economic consequences over time, especially from a wider societal perspective, they represent a limited and manageable risk for Swiss Re.

Transition risks in our re/insurance business

Transition risks may arise as a result of the extensive policy, legal, technology and market changes that are required to make the transition to a low-carbon and ultimately, a net-zero economy. We have assessed the most relevant transition risks that may potentially affect our business:

- Policy and legal risks
- Technology risks
- Market and reputational risks

For a re/insurer, financial risks arising from the transition to a low-carbon economy are mainly linked to the potential re-pricing of carbon-intensive financial assets, and the speed at which any such re-pricing might occur. To a lesser extent, re/insurers may also need to adapt to potential impacts on the liability side resulting from reductions in insurance premiums in carbon-intensive sectors.

Policy and legal risks

As the move towards achieving a net-zero emissions economy by mid-century or earlier gains momentum in both the public and private sector, material policy-triggered changes are expected for the real economy (eg power and energy, materials and processes, logistics and transportation, and agroforestry and land-use practices). Such policy changes may include regulations to increase energy and material efficiency, mandates to rapidly scale up renewable energy and clean mobility, the removal of fossil fuel subsidies, the introduction of carbon pricing, policies addressing land-use change and agricultural practices, as well as the scaling up of carbon removal technologies. This requires a solid understanding of the related policy and legal risks as well as the proactive management of related risks and opportunities. Certain policy risks might also influence the risk quality of some underlying assets in the mid- to long-term (eg due to increased cost pressure and reduced asset maintenance).

Climate-related litigation risks

We identified potential climate-related litigation risks as an emerging risk over a decade ago and assessed its potential relevance through our own research. Climate change litigation activities against large greenhouse gas emitters have increased in recent years without any significant impact on insurance. As a result, we have not faced any new claims from climate-related litigation in recent years and the results of the litigation, which in the majority of the cases remain in favour of the defendants, suggest that this trend may continue. However, this warrants ongoing monitoring, especially as the analytical capabilities for allocation of responsibility for greenhouse gas emitters could further develop with potential regulatory changes.

Technology risks

The re/insurance sector is likely to experience the technological transition in two ways.

Firstly, new technologies by definition do not have loss histories and thus may be challenging to cost accurately. Research and development is thus required to develop possible loss scenarios and the related expenses. Once these are developed and tested, new technologies are likely to present the sector with an opportunity for growth (see Climate-related opportunities, pages 161–162).

Secondly, new low-carbon technologies are likely to gradually displace traditional, fossil fuel-based ones. This will alter the market and, as a result, gradually change the nature of re/insured assets.

This transition does not, however, automatically translate into a financial risk for us. For example, motor insurance is one of the most important business lines of the primary insurance sector globally. According to Swiss Re's sigma database, in 2020 it represented approximately 21% of global non-life direct premiums written, but for the reinsurance sector the share is much lower at 14%.

Driven by intensifying efforts to curb climate change, the global motor vehicle inventory will shift from combustion to electric engines. In a Swiss Re study on the casualty risk trends in the automotive industry, we noted that the move from conventional (pure combustion engine) cars to more electrically-based mobility is a transition that is likely to intensify in the coming years. This development will entail the implementation of a variety of new technologies, from new lightweight materials to advanced battery systems.

Consequently, while the automotive industry as a whole is undergoing significant change, the impact on insurance portfolios is expected to be gradual. As motor insurance contracts are renewed annually, re/insurers will be able to develop the appropriate underwriting experience, loss adjustment and claims handling.

To address the residual risk, we have started to develop a carbon risk steering mechanism. Its key component will be a carbon risk model designed to measure our carbon intensity and the associated risks embedded in our re/insurance business. For further information about the mechanism and related policies, see page 168, Climate risk management, and page 172, Climate metrics and targets.

Market and reputational risks
With policy, legal and technological changes as a backdrop, consumer and investment preferences will further shift toward less carbon-intensive products and services over time. Changes in market volumes will be reflected in the demand for insurance. In addition, to support their decision-making, investors and other stakeholders will expect greater transparency and more information regarding re/insurers' exposure to emission-intensive sectors as well as their contribution to low emissions-related risk transfer solutions. Finally, particularly in fossil fuel-dependent societies, a late and sudden transition without appropriate mitigation measures may result in setbacks such as social unrest leading to an overall market decline.

Non-investment transition risks for the real economy and their relevance for the re/insurance industry

Transition risks	Financial impacts on real economy	Impacts on insurance liabilities
Policy and legal • Removal of fossil fuel subsidies and introduction of CO_2 taxes • CO_2 regulation and mandates • Exposure to litigation for historical and current CO_2 emissions • Emission disclosure requirements	• Write-offs, asset impairment, and early retirement of existing assets due to policy changes (ie stranded assets) • Increased operating costs (eg higher compliance costs, increased insurance premium) • Increased costs and/or reduced demand for products and services resulting from fines and judgments against CO_2-intensive sectors • Increased regulatory pressure for disclosure	• Climate policy-induced economic effects may lead to higher claims for certain lines of business (eg credit insurance) • Increased operating risk and lower risk quality for impaired assets may impact property insurance (eg due to increased cost pressure and reduced asset maintenance) • Increased litigation risks may become relevant for casualty insurance (eg general liability, D&O insurance) • Requirements to disclose climate-related impacts of insurance business activities
Technology • Substitution of existing products and services with lower emissions options • Costs to transition to lower emissions technology	• Write-offs, early retirement of existing assets • Research and development (R&D) expenditures in new and alternative technologies	• Shift in predominant energy technologies could lead to a change in the liability structure and diversification for insurers • New technologies without established loss histories may increase uncertainties in property and engineering lines of business
Market and reputation • Uncertainty in market signals and in client behaviour • Increased stakeholder concern	• Reduced demand for goods and services due to shift in consumer preferences • Change in revenue mix and sources, resulting in decreased revenues • Reduction in capital availability • Increased reputational risk for high-emission sectors	• Premium volume in engineering and property insurance will shift from CO_2-intensive assets and activities to CO_2-efficient ones • Reputational risk for insurers via insured emissions (eg insurance of thermal coal) may further intensify • Potential societal backlash due to transition in fossil fuel-dependent societies causing market decline (eg due to political unrest)

Source: Swiss Re, adapted from TCFD

Transition risks in our re/insurance business conclusion:
Overall, it is our view that the transition to a low-carbon economy is not likely to present a significant financial risk for Swiss Re's re/insurance business. We expect that the associated risks can be managed effectively, primarily due to the annual renewal of contracts.

Transition risks in our investments

Climate-related risks can impact the value of our investments and are therefore considered an important part of our Responsible Investing strategy. One of the key risks faced by asset owners is that a changing regulatory environment may result in a specific company or a particularly exposed industry becoming a stranded asset in investment portfolios, ie the devaluation of investments driven by unfavourable changes, such as increased taxes or new regulations.

The market environment is expected to shift to address climate change mitigation and adaptation requirements to limit the global rise in temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. Governments and regulators have accelerated the development of proposals to steer and transition climate change-related market activities towards more sustainable alternatives. Japan and China's net-zero emissions pledges and the UK's Ten Point Plan for a Green Industrial Revolution, which aims to make the UK the number one centre for green technology and finance, are just three recent examples.

We continue to focus on policy and legal risks, as well as technology risks, as we mainly expect changes within these two dimensions to potentially impact asset values. Hence, we aim to identify those industries and groups of companies that are most exposed to these risks and may thus require adjustments in the near to medium term.

Industries and companies that are particularly exposed to policy and legal changes, as well as technological developments, have elevated risk exposures either in their production process, their raw materials, their transportation/logistics or distribution and store operations due to high carbon footprints in these areas. Furthermore, industries may face increased compliance costs in the production and distribution process, as well as costs arising from product demand substitution. All of these changes may cause increased price volatility of the underlying assets.

At Swiss Re, we have been measuring the weighted average carbon intensity of our corporate bond and listed equity portfolio since the end of 2015, and of our government bond portfolio since 2020.[6] Detailed measurement results are presented in the Climate metrics and targets section (pages 176–177). Consistent with reaching net-zero greenhouse gas (GHG) emissions by 2050, the Intergovernmental Panel on Climate Change (IPCC)[7] developed model emission pathways and corresponding development ranges for CO_2 emissions and related indicators. The reduction of the carbon intensities of our corporate bond and listed equity portfolio achieved since 2015 is well aligned with the CO_2 emission reduction required according to IPCC in order to limit global warming to 1.5°C.

To enhance how we assess the alignment of our portfolio with the 1.5°C target, we have further strengthened our approach, taking additional forward-looking indicators into account. Companies may mitigate exposure to climate risk by adapting to market forces or adhering to new and evolving requirements. The forward-looking indicators allow us to analyse climate risk-exposed industries down to the issuer level. They inform us about the preparedness of companies for a transition to a net-zero emissions economy and identify potential leaders and laggards in such a transition. Although aware of the limitations related to data quality and coverage, we assess the sectoral temperature alignment of our corporate bond and listed equity portfolio. The evaluation of the companies' alignment is based on the pre-defined 1.5°C carbon budget considering their reported as well as modelled future emissions. This informs us about the sectoral trajectory related to the transition to a net-zero emissions economy and hence the alignment with the 1.5°C target. While many issuers have set carbon reduction targets, are actively working towards lowering their energy consumption or are already on a pathway consistent with the targeted temperature trajectory, others continue to contribute substantially to excess emissions not consistent with the 1.5°C target. Even though our analyses show that a transition to a net-zero emissions economy may be challenging and costly, we consider the developments as identified to be encouraging.

Since 2015, Swiss Re has taken decisive action to actively manage our climate-related risks and take advantage of related opportunities, such as the avoidance of coal-related investments or investing into green, social and sustainability bonds. Actions taken are described in detail in the chapters on Climate risk management (pages 170–171) and Climate metrics and targets (pages 174–175).

Transition risks in our investments conclusion:
While regulators and governments have started implementing policy and legal adjustments, we do not consider the transition to a net-zero emissions economy to pose a significant financial risk for Swiss Re's investment portfolio. This view is based on having proactively implemented a strong mitigation strategy, which is regularly reviewed and adjusted, as well as the constant monitoring of our portfolio.

[6] Corporate bond and listed equities: weighted average carbon intensity = (company CO_2e emissions/company revenue) * (investment/portfolio); government bonds: weighted average carbon intensity = (country CO_2e emissions /country GDP PPP-adjusted) * (investment/portfolio).
[7] IPCC (2018) "Global Warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty": https://www.ipcc.ch/sr15/chapter/spm/

Climate-related opportunities
Climate change does not just create risks, but also presents new opportunities. Developing corresponding products and services is a core part of our Group Sustainability Strategy, 2030 Sustainability Ambitions and Climate Action Plan. With our offerings, we pursue two different but complementary objectives: adapting to the effects of climate change and supporting the transition to a low-carbon economy.

Opportunities related to physical risks in our re/insurance business
Since most of our re/insurance contracts are renewed on an annual basis, we can offer our clients effective natural catastrophe protection that can help them cope with current climate risks. The same applies to our weather insurance solutions. In addition, we undertake special efforts to help expand re/insurance protection by focusing on non-traditional clients (in particular from the public sector), underdeveloped markets and innovative risk transfer instruments.

Business solutions that tackle physical climate risk

Examples of recent transactions that tackle physical climate risk include:

Protecting the Netherlands from storm surge: Swiss Re is insuring the refurbishment, required for climate adaptation, of the almost 90-year-old, 32-kilometre Afsluitdijk dam in the Netherlands, which protects large parts of the country against sea level rise and storm surge. In addition, the Afsluitdijk will serve as a test centre for renewable tidal energy where water emptied from Lake Ijssel meets the Wadden Sea.

Making India's Nagaland state resilient to excess rainfall: Swiss Re provided India's Nagaland State Disaster Management Authority (NSDMA) with parametric reinsurance protection during the 2020 monsoon season. Using rainfall intensity data derived from satellite observations, payouts are made to regions in proportion to the amount of recorded rainfall, which mirrors the anticipated levels of loss.

Providing flood protection in Germany: In 2020, iptiQ, Swiss Re's B2B2C business, entered into a partnership with one of Germany's leading broker pool providers specialising in homeowner's insurance to provide flood protection for properties located in the country's highest flood risk zone (ZÜRS 4).

Protecting farmers' livelihoods from drought: Swiss Re has partnered with a provider of satellite-based soil moisture data to develop the Soil Moisture Deficit Index, which in turn is used as a parametric trigger to determine payouts to farmers when soil moisture levels fall below a pre-determined level. This innovative, yet easy to use insurance solution is providing a growing number of farmers in Europe with affordable access to financial protection from drought.

Helping Mexico become more resilient to natural catastrophes: In March 2020, the World Bank issued four tranches of catastrophe bonds providing the Government of Mexico with financial protection of up to a record USD 485 million against losses from natural catastrophes – of which USD 250 million was allocated to named storms and the remainder to earthquakes – with Swiss Re acting as the transformer between Mexico's state-owned insurer and the World Bank. In addition, proceeds of the catastrophe bonds are used to finance sustainable development projects supported by the World Bank.

You can read more about these solutions in the Sustainability Report, pages 24–35.

Opportunities related to transition risks in our re/insurance business
The transition to a net-zero emissions economy offers business opportunities for a re/insurer across a range of sectors such as power and energy, materials and processes, logistics and transport, and agroforestry and food. While Swiss Re is active in all types of renewable energy re/insurance, over the years we have become a recognised lead market for offshore wind risks. In 2015, Swiss Re Corporate Solutions established a Centre of Competence for Wind Power and, through this focused investment, we have built up and refined the technical expertise required to understand and manage these risks. For example, in 2020, we were the lead insurer for the construction of the 640-megawatt Yunlin wind project eight kilometres off the coast of Taiwan. Thanks to our involvement in this project and our expertise in offshore wind, we have also been selected as the preferred insurer for the construction of the 350-megawatt Guanyin offshore wind project near the Taipei airport, which is set to enter the construction phase in 2022. In addition, we insured the Changfang and Xidao offshore wind farm off the coast of Taiwan. Over the next decade, we expect many new development opportunities to arise, which are likely to create demand for re/insurance protection in numerous lines of business, such as credit, engineering, property, and liability.

Business solutions that tackle energy transition risks

Examples of recent transactions that tackle energy transition risks include:

Enabling the expansion of offshore wind in Taiwan: Swiss Re Corporate Solutions and Reinsurance joined forces to provide both primary and reinsurance cover for a 640-megawatt offshore wind project off the coast of Taiwan. Construction of the wind farm began in 2020, and once it is completed in 2021, the Yunlin wind farm will consist of 80 wind turbines, which are expected to power approximately 605 000 households.

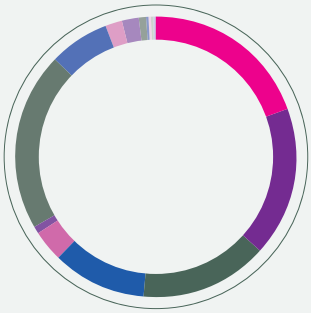
Protecting solar panels in Puerto Rico: Swiss Re Corporate Solutions provided a leading residential solar and energy storage service provider with parametric named storm coverage for its solar panels in Puerto Rico. In addition to providing protection against the risk of physical damage caused by storms, the insurance solution offered protection against the risk of a downed power grid that would prevent the transfer of excess energy from the solar panels into the grid as well as the risk that customers might miss their lease payments following a devastating hurricane.

Financing solar utility-scale projects in the US: Swiss Re Corporate Solutions and its data partner, kWh Analytics, successfully developed a ten-year Solar Revenue Put for an investor in large, utility-scale solar projects. The Solar Revenue Put is an insurance product that guarantees up to 95% of a solar farm's expected output, helping to mitigate a central risk of generating solar power – lack of sunshine. It was the first time that this product was used in the financing or refinancing of solar projects within the US private-placement debt market.

Promoting greener shipping technologies with marine insurance: In 2020, Spain's leading shipping company unveiled its first fast ferry powered by liquefied natural gas, which generates up to 30% less CO_2 emissions, 99% less sulphur, and up to 85% less nitrogen oxide than the heavy fuel oil typically used in the shipping industry. Swiss Re's Global Marine division provided reinsurance cover for the construction of this ship as well as hull reinsurance, supporting efforts to meet the International Maritime Organization's target to reduce the industry's overall greenhouse gas emissions by 50% relative to 2008 levels, by 2050.

Opportunities for our investments
We expect our consistent and broad-based integration of environmental, social and governance (ESG) criteria along the investment process to contribute to an improved risk/return relationship in our investment portfolio, particularly over the longer term. We address sustainability risks such as climate change to make the portfolio more resilient against financial market shocks. This is of crucial importance as such risk factors are not yet fully reflected in current market valuations. As part of our adaptation strategy, we consider investment opportunities that enable the transition to a net-zero emissions economy.

Green bonds

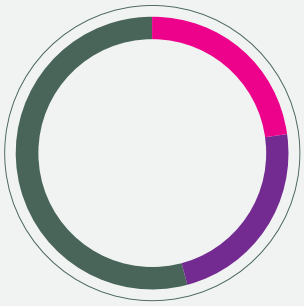


Green bond proceeds are used exclusively to finance environmentally sustainable projects that address key areas of concern, including not only climate change, but also natural resource conservation, biodiversity conservation, and pollution prevention and control. We support the transition to a net-zero emissions economy by investing in green bonds following the ICMA Green Bond Principles. As of 31 December 2020, we held USD 2.3 billion of green bonds and are targeting a portfolio[1] of USD 4.0 billion by the end of 2024. We have embraced the opportunity to participate in the impressive average market growth of 54% p.a. since 2014.[2,3]

- **19.5%** Sovereign
- **17.3%** Agency
- **14.7%** Supranational
- **10.9%** Regional governments
- **3.6%** Agency securitised
- **0.9%** Municipals
- **20.5%** Financials
- **6.9%** Utilities
- **2.0%** Information technology
- **1.9%** Non-cyclical services
- **0.9%** Basic industries
- **0.3%** General industrials
- **0.3%** Non-cyclical consumer goods
- **0.2%** Resources
- **0.1%** Cyclical services

[1] Consisting of green, social and sustainability bonds.
[2] Moody's, "Sustainable Finance – Global: Sustainable bond volumes to top USD 650 billion in 2021", 4 February 2021.
[3] Moody's – Green bonds: Key numbers and trends, 2018.

Renewable and social infrastructure loans



For our infrastructure loan allocation, we work with best-in-class managers to gain access to, and provide financing for, renewable energy projects that reflect our risk appetite, generate attractive long-term returns and help build a more sustainable energy supply for the future. As of 31 December 2020, we held USD 468 million of renewables, making up approximately 23% of our infrastructure loan portfolio, of which 51% are in solar panels and 49% in wind farms. In 2020, we established a new target to deploy an additional USD 750 million to renewable and social infrastructure loans by the end of 2024.

- **23%** Renewable energy infrastructure
- **23%** Social infrastructure
- **54%** Others

→ **49%**
→ **51%**

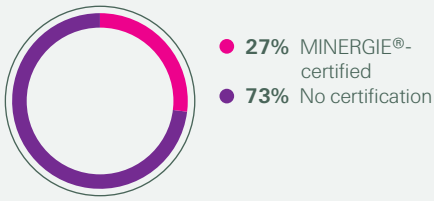
Real estate

Our real estate investment portfolio comprises commercial and residential buildings with a total market value of USD 5.4 billion as of 31 December 2020. These are predominantly located in Switzerland, the US, Germany, Australia, the UK, and Central and Eastern Europe (CEE). As sustainability considerations are a key pillar of long-term sustainable value creation, we incorporate them into decision-making throughout the whole operating model, including external investment manager due diligence.

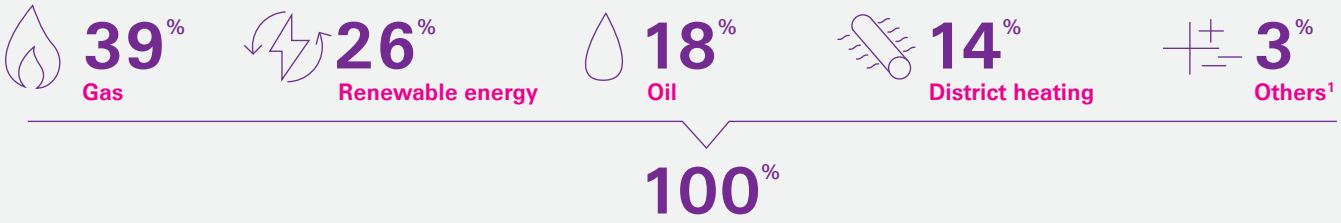
New property investments are evaluated from an environmental and social perspective, which includes both a property's current and potential future status as it relates to energy efficiency, public transport connectivity, use of sustainable materials, occupier well-being and community engagement. Ongoing business plan execution and asset management of properties already in the portfolio always incorporate different ways to improve sustainability characteristics, as economically and financially sensible.

For real estate investments in Switzerland, we apply the following sustainability criteria: analysis of energy sources as a percentage of market value and MINERGIE® certifications. MINERGIE® is a Swiss sustainability label for new and refurbished buildings. By the end of 2020, the combined market value of our MINERGIE®-certified buildings reached USD 0.6 billion, or 27% of our Swiss portfolio of direct real estate investments by value, which corresponds to an energy consumption floor area of 87 075m². The Swiss portfolio is gradually shifting away from fossil fuels as a heating source to either renewable energy (26%) or district heating (14%). Whenever this is not possible, gas (39%) is considered as an alternative, given its smaller carbon footprint compared to oil (18%).

Switzerland



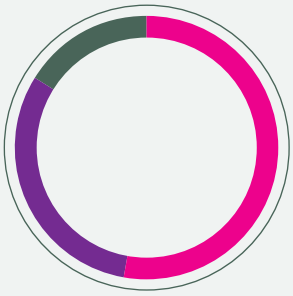
Energy sources



[1] Includes wood pellets, projects under construction, land and non-heated assets.

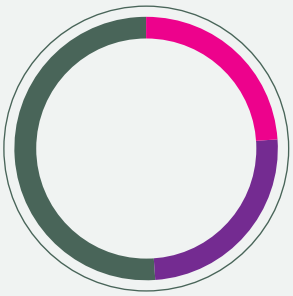
The externally managed real estate portfolio is predominantly invested in Australia, CEE, the UK and the US, and contains 50% green buildings based on regional energy labels. The Australian portfolio is the most advanced, followed by the UK portfolio.

Australia



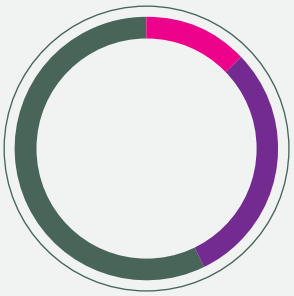
- **53%** NABERS Energy 5
- **31%** NABERS Energy 4/4.5
- **16%** NABERS Energy < 4 or not certified

UK



- **24%** BREEAM "Excellent"
- **25%** BREEAM "Very Good"
- **51%** Not certified

US



- **13%** LEED "Gold"
- **30%** LEED "Silver"
- **57%** Not certified

In the US, our approach to sustainability includes some of the most recognised certificates and guidelines such as the LEED certification of the US Green Building Council (USGBC). We also benchmark our US portfolio against GRESB, an industry-driven organisation transforming the way capital markets assess ESG performance of real assets.[1]

[1] Due to a change in our investment setup, the 2020 GRESB Assessment does not reflect the portfolio's performance appropriately for 2020.

Swiss Re's climate resilience under different scenarios

The TCFD requests that companies describe the resilience of their strategy, taking into account different climate-related scenarios including a 2°C or lower increase.

Swiss Re aligns its scenario analysis for physical climate risks with the Representative Concentration Pathway (RCP) and Shared Socio-Economic Pathway (SSP) scenarios adopted by the Intergovernmental Panel on Climate Change (IPCC).[8] Differences between projected physical impacts across various scenarios in the near- to mid-term are minor, but a considerable divergence is expected for the second half of the 21st century. Furthermore, there is significant uncertainty within a single scenario, mainly caused by different modelling assumptions used in various climate models.[9]

In principle, it would be possible for Swiss Re to compute the potential long-term effects caused by climate change on AEL based on today's re/insurance book. However, given the many factors that shape our future re/insurance books, a stand-alone climate-change scenario analysis would be incomplete for the following reasons:

Looking at climate effects in isolation would mean ignoring the other factors that will shape Swiss Re's future re/insurance book and thus also our future AEL. These factors include our strategy and risk appetite (which can be redefined during the annual renewal process of property re/insurance business), market conditions, capital costs, insurance penetration, storm hardening and other climate adaptation measures. Since our re/insurance book and current AEL are the result of a complex interaction between all of these factors, any future scenario would have to consider all of them, in the process rendering the effect of climate change on the resulting AEL marginal. Moreover, the future AEL for Swiss Re's weather-related re/insurance book will depend both on our future market share and scenario projections of overall business volume.[10] Independent studies have shown a wide range for future market business volumes, thus rendering long-term projections very challenging.

The complex dynamics become apparent when considering that over the next decades, significant population growth is expected in Asia and Africa. At the same time, the population in Europe and North America is unlikely to grow considerably or may even start to decline, as projected by the United Nations Department of Economics and Social Affairs. Over the same time period, real GDP per capita is expected to increase by more than 45% in the United States and will likely more than double in China by 2050 based on Swiss Re estimates. Global urbanisation will increase from approximately 56% today to almost 70% by mid-century.[11]

These socio-economic dynamics will lead to vast changes of insured value distributions and the re/insurance landscape in general. From a re/insurance perspective, socio-economic dynamics will often overshadow slowly evolving climate trends and thus limit the decision-power of quantitative climate scenario analyses and stress tests in which only changes to climatic conditions of natural hazards are considered. For example, based on climate projections, the overall frequency of North Atlantic hurricanes is expected to decrease by more than 10% for a global mean temperature increase of 2°C. At the same time, the frequency of the most intense hurricanes (category 4 and 5 hurricanes) is expected to increase by about 10%.[12] These climatic changes to the most material natural perils for the re/insurance industry need to be analysed in conjunction with vast socio-economic changes that occur over the same timeframes.

It is important to state that in a warming climate there is significant uncertainty around projected changes to severe weather events such as hurricanes, as also outlined in the section on modelling and pricing of weather-related perils (pages 152–155). Therefore, Swiss Re relies on several processes and strategies to minimise the impact of such uncertainty on its underwriting business.

How we ensure resilience of our underwriting business in a changing climate

1. Diversification of insured natural hazards with regard to regions, lines of business, sectors and clients.
2. Flexible management and steering of weather-related exposure through limited duration of re/insurance contracts (typically one-year contracts for property insurance).
3. Regular updates of Swiss Re's in-house risk models to ensure adequate costing of natural hazards for the current and near-term climate and socio-economic environment.
4. A *qualitative* scenario process to assess the most material impacts of climatic and socio-economic trends that affect insured risks. This is supported by *quantitative* assessments on the likely range of expected changes to assess their materiality over different time horizons and emission pathways.

[8] RCP scenarios represent possible future concentration trajectories of greenhouse gases. The scenarios are named after the resulting radiative forcing at the end of the 21st century, eg 8.5W/m² for RCP8.5, where no mitigation measures nor technical innovation will limit temperature increases. SSP narratives describe alternative pathways for future society.
[9] IPCC Fifth Assessment Report (AR5), Chapter 11, 2013.
[10] See, eg Kunreuther, Howard; Michel-Kerjan, Erwann; and Ranger, Nicola, "Insuring Future Climate Catastrophes" (2012). Published Articles & Papers. Paper 171.
[11] United Nations, Department of Economic and Social Affairs, Population Division (2018). World Urbanization Prospects: The 2018 Revision.
[12] Knutson, T., and Co-authors, 2020: Tropical Cyclones and Climate Change Assessment: Part II: Projected Response to Anthropogenic Warming. Bull. Amer. Meteor. Soc., 101, E303–E322.

Qualitative scenarios help us focus our attention and modelling improvements on relevant factors that will affect the physical risk landscape. Relevant regional key risks and potential for risk reduction through adaptation were identified by IPCC in the Fifth Assessment Report (AR5).[13]

For the regions where Swiss Re is most exposed to weather-related risks (see AEL figure, page 153), a noticeable increase in flood damage is expected, especially beyond 2040 if no adequate adaptation measures are taken. Wildfire hazards in different regions have already reached medium-to-high risk levels and will continue to contribute to increasing economic and insured losses. Drought conditions will affect crop productivity and agriculture insurance and can lead to more land subsidence affecting property insurance. Swiss Re discussed the increasing relevance of these secondary perils in the face of climate change in recent sigma publications (sigma 2/2019, sigma 2/2020).

On a societal level, our Economics of Climate Adaptation studies have shown that climate change can lead to an increase of economic losses in specific locations due to weather risks of up to 30% within the next 25 years. More importantly though, economic development, urbanisation, higher population densities and asset concentrations in flood plains are expected to be the dominant factors in increasing weather-related economic losses. As these factors become more pronounced, our models will gradually factor in this trend, since they are updated and refined at regular intervals.

In addition, we have also started to assess different transition risk and opportunity scenarios that are relevant to the transition to a low, and ultimately net-zero, carbon economy. We focus on reducing our carbon intensity in both our investments and insurance activities and explore ways to accelerate this transition by allocating our investments and providing risk transfer solutions accordingly.

Scenario analysis conclusion:
We do not consider climate change to be a single factor posing a fundamental threat to the resilience of our business. It is one of many important factors we need to take into consideration when shaping our future business strategy. A key condition for our ability to continue acting as an ultimate risk-taker is diversification with regard to regions, lines of business, sectors and clients. In a world of strong or unmitigated climate change, however, the proportion of weather-related risks we could re/insure would decline and the protection gap would likely increase further. In light of the above, we are developing qualitative scenarios for physical and transition risks to be considered as part of our strategic business planning.

[13] See eg Figure SPM.8 in IPCC AR5 Synthesis Report: Climate Change, Summary for Policymakers (2014).

Climate risk management

The processes we use to identify, assess and manage climate-related risks are integrated into our risk management, underwriting and asset management.

Sound risk management, underwriting and asset management lie at the core of the re/insurance business. This enables us to use our existing processes and instruments to address climate-related risks.

Physical risks

To assess our P&C businesses accurately and to structure sound risk transfer solutions, we need to clearly understand the economic impact of natural catastrophes and the potential effect of climate change on their frequency and severity.

Natural catastrophes constitute one of the core risks modelled in Swiss Re's risk landscape. Besides man-made risks, natural catastrophe risks are the key risk category in our P&C re/insurance risk landscape.

We have an internal property risk modelling team that builds, maintains and updates sophisticated models for all relevant natural catastrophe risks (flood, tropical cyclones, windstorms, earthquakes). The models are based on current scientific knowledge and are regularly updated to include new scientific findings – including from our research collaborations with academic institutions – and to make use of advances in computing and modelling capabilities.

Swiss Re's proprietary and fully integrated risk models are important tools for managing the business: we use them to determine the economic capital required to support the risks on our books as well as to allocate risk-taking capacity to our different lines of business.

Transition risks in our re/insurance business

To ensure appropriate risk identification of transition risks and assess potential impacts on our business, we continue to monitor and identify such risks in risk management and casualty underwriting, as well as for relevant legal developments.

For all types of transition risks described on pages 158 and 159, we have risk monitoring in place. Technological developments are monitored through Swiss Re's respective underwriting units and pricing of associated covers is reviewed on an annual basis.

General sustainability risks in our re/insurance business

Our Sustainable Business Risk (SBR) Framework is an advanced risk management instrument that allows us to identify, assess and address social and environmental risks associated with our transactions, both on the underwriting and investment side. Two policies of our SBR Framework are particularly relevant in the context of climate change: the thermal coal policy and the oil and gas policy.

In 2018, we introduced a thermal coal policy, pledging not to provide re/insurance to businesses with more than 30% exposure to thermal coal utilities or mining. The policy applies to both old and new thermal coal projects and across all lines of business. While it is easier to implement this policy in some parts of our business, for others the transition will take some time and require a continued and constructive dialogue with our clients. In 2020, we continued to implement the thermal coal policy for treaty business (see also Climate metrics and targets, pages 172–173). In this context, we had over 400 engagements with insureds, brokers, investors and regulators across all regions on the topic of thermal coal.

In addition, we started implementing our updated oil and gas policy to shift away from highly carbon-intensive oil and gas production (see box). From July 2021, we will no longer provide individual insurance covers for those oil and gas companies that are responsible for the world's 5% most carbon-intensive oil and gas production. From July 2023, we will no longer provide individual insurance covers for those oil and gas companies that are responsible for the world's 10% most carbon-intensive oil and gas production.

Our oil and gas policy also prevents us from offering any re/insurance cover for offshore drilling activities in the Arctic.

Our climate-related policies are initial steps towards the development of a comprehensive carbon-risk steering mechanism to manage and reduce the carbon intensity and associated risks embedded in our re/insurance business. In 2020, we made progress in applying a carbon footprinting methodology we had previously helped develop in a project with peers via the CRO Forum in our direct and facultative liability portfolios. This methodology will support our carbon risk steering towards reaching net-zero emissions on the liability side of our business by 2050. For further information on the carbon footprint of our direct insurance portfolio, see Climate metrics and targets, page 172.

Phasing out the most severe oil and gas transition risks

We implemented a project with the Norwegian energy research company Rystad Energy where we have studied the value chain CO_2 intensities associated with the production of the world's oil and gas companies. We found that the carbon emission intensities over the value chain of various hydrocarbons (naturally-occurring compounds that form the basis of crude oil, natural gas, coal and other important energy sources) can vary substantially. This analysis provided the basis for our updated oil and gas policy. Read more about this in our Sustainability Report 2020, page 39.

To learn more about our SBR Framework, carbon risk steering mechanism and thermal coal and oil and gas policies, please visit our Sustainability Report 2020, pages 36–43.

Investments

Swiss Re is a long-term investor. As a result, it is important that we also take a long-term view on the risk factors that may have an adverse impact on our portfolio, such as climate change. Together with sustainability, climate change is therefore a core topic for our Asset Management.

We are committed to investing our assets responsibly in a controlled and structured way by integrating ESG considerations along the entire investment process. For more information on our approach to ESG integration, refer to our Responsible Investing homepage (www.swissre.com/responsible-investing) as well as pages 45–51 of our Sustainability Report 2020.

As a founding member of the UN-convened Net-Zero Asset Owner Alliance (AOA) launched in 2019, we have committed to having a net-zero emissions investment portfolio by 2050 in accordance with Article 2.1c of the Paris Agreement (www.swissre.com/ri-climate-action-aoa). Our commitment includes supporting the net-zero transition of economic sectors by advocating for and engaging on corporate and industry action. We consider engagement with investee companies to be a particularly effective instrument for enabling them to strengthen their long-term business performance. Swiss Re was instrumental to the development of the Alliance Inaugural 2025 Target Setting Protocol (TSP)[14], a guide for individual and collective target setting and reporting by AOA members for the period from 2020 to 2025. In accordance with the TSP, we have defined targets for financing the transition, our engagement activities, the sub-portfolio, and investments in the coal sector, taking scientific evidence into account to the extent possible (for details, see Climate metrics and targets, pages 174–175).

Our dedicated approach to climate risk management involves the systematic monitoring of the carbon footprint of our government bond, corporate bond and listed equity portfolio. For our corporate bond and listed equity portfolio, we also track related forward-looking indicators. In 2020, we further strengthened our approach to assessing the alignment of our portfolio with a 1.5°C target by evaluating the temperature alignment of our corporate bond and listed equity portfolio. As part of our active risk management, we no longer invest in coal and oil sands-related companies that are above the set thresholds, and monitor related investments that are below these thresholds (for specific information on the thresholds please refer to page 175). And consistent with our Group-wide Sustainable Business Risk Framework, we have defined further fossil fuel-related guidelines, such as avoiding investments in the 10% most carbon intensive oil and gas companies (for details, see page 169). Additional actions to support the transition to a net-zero emissions economy are described in Opportunities for our investments (pages 163–165) and Climate metrics and targets (pages 174–175).

[14] https://www.unepfi.org/wordpress/wp-content/uploads/2021/01/Alliance-Target-Setting-Protocol-2021.pdf

Our investment-related climate strategy




Set targets[1]	Take actions	Measure	Report
Define targets to reach net-zero emissions in alignment with 1.5°C by 2050 at the latest	**Actively manage transition and physical risks, and support real economy transition to net zero**	**Measure and monitor trajectory of needed development towards net zero**	**Inform shareholders and other stakeholders transparently on developments**
• Financing targets	• Renewable infrastructure loan investment target[2] and implementation • Green bond investment target[3] and implementation	• Renewable infrastructure loan investments • Green bond investments	• Financial Report: TCFD • Sustainability Report
• Voting & engagement targets	• Exercise voting rights & engage	• Voting & engagement records	• Responsible Investing homepage

• Sub-portfolio targets
  • Corporate bonds
  • Listed equities
  • Real estate
• Sector targets
	• Corporate bonds & listed equities coal phase-out & coal expansion restriction
	• Infrastructure loan & private placement fossil fuel[4] guidelines
		• Carbon Footprint
		  • Corporate bonds
		  • Listed equities
		  • Real estate
		  • Government bonds
		• Fossil fuel exposure
		• Forward-looking indicators
			• Assessments and questionnaires (eg PRI, CDP)

1 In alignment with the Net-Zero Asset Owner Alliance Inaugural 2025 Target Setting Protocol.
2 Investment target also includes social infrastructure loans.
3 Investment target also includes social and sustainability bonds.
4 Fossil fuel: coal, oil & gas (including oil sands).

Source: Swiss Re

Climate metrics and targets

We use a number of metrics and targets to assess and manage relevant climate-related risks and opportunities.

We assess and manage climate-related risks and opportunities in our re/insurance business, our investments and in our own operations.

Re/insurance

Annual expected losses (AEL)

AEL for weather-related natural perils can be used as an indicator for our average current climate-related risk exposure. However, AEL figures do not, by definition, provide an adequate measure for the potential risk of individual years with exceptionally intense natural catastrophe losses. Adequate metrics for the risk of individual rare natural catastrophes are Value at Risk (VaR) or Tail Value at Risk (Tail VaR). For example, the 99.5% VaR measures the loss likely to be exceeded in only one year out of two hundred, see also page 71, where the results of insurance risk stress tests are provided for peak insurance risks.

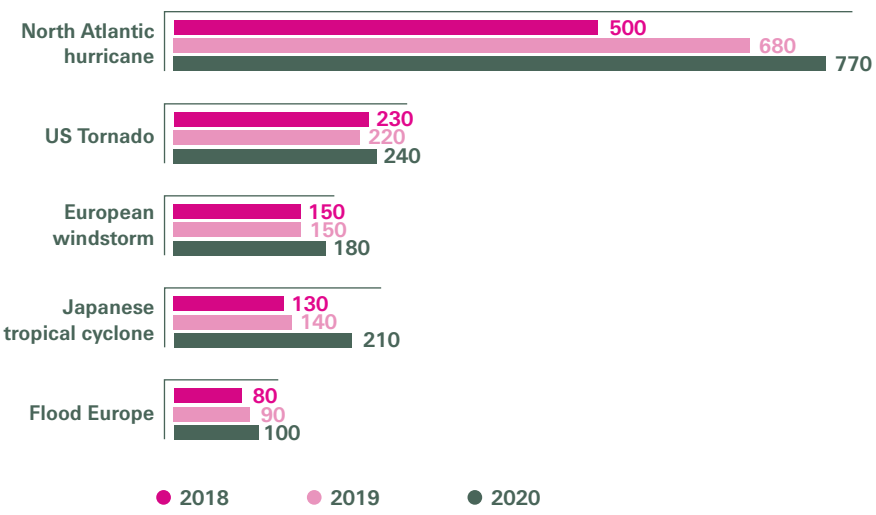
The AEL figures are the result of expected weather activities, the vulnerability of insured assets and operations, their values and the volume and structure of our insurance products. Changes in the AEL figures will show the evolution of our climate risk exposure. This could be due to climate change, but also due to changes in the vulnerability of insured assets and operations, their values or changes in our business strategy. AEL figures are updated on an annual basis.

The five weather-related perils with the highest gross AEL for our business as of the end of 2020 are indicated in the diagram on the right.

First steps to align our underwriting portfolio with the Paris Agreement

We have started to develop a carbon risk steering mechanism with the goal to align our underwriting portfolio with the Paris Agreement and decarbonise it by 2050. The first step was the introduction of a thermal coal policy, followed by the revision of our oil and gas policy (see page 169, Climate risk management, for details). In 2020, we applied for the first time the carbon footprinting methodology we had previously co-developed with the CRO Forum to underwriting. We applied the methodology in our direct insurance portfolios. Based on this methodology, we estimate the weighted average carbon intensity of our direct insurance portfolios at 120 tonnes of CO_2 equivalent per million USD of revenue (120 tonnes CO_2e/USDm revenue). We will gradually expand the scope of this metric. Once fully implemented, this will help us steer the overall carbon footprint embedded in our re/insurance businesses. Ultimately, it will support us in reaching net-zero emissions by 2050 on the liability side of our balance sheet.

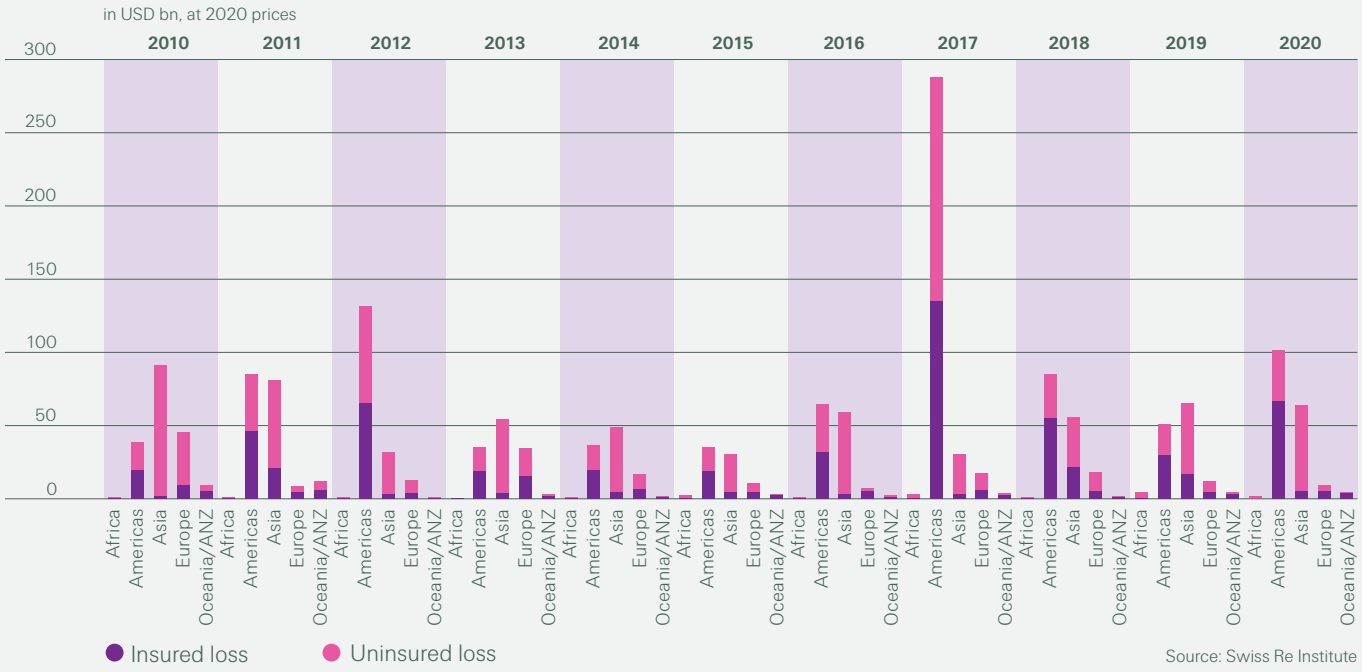
Annual expected losses for weather-related perils, Swiss Re Group (USD m)



Source: Swiss Re

Weather-related catastrophes: insured vs uninsured losses

There is a substantial protection gap between total economic losses from weather-related catastrophes and insured losses in all regions. This data does not represent a company-specific metric but is an important overall risk indicator (see table below).



Source: Swiss Re Institute

Another important step we took in 2020 to advance our carbon steering mechanism was the development of an exit strategy for thermal coal in our treaty business. This complements the policies we have already developed with a focus on our direct and facultative business. Together, they put us on course to reach our Group-wide target of completely phasing out our thermal coal business in OECD countries by 2030, and in the rest of the world by 2040.

Our approach defines thresholds for coal exposures in treaties across our property, engineering, casualty, credit and surety and marine cargo lines of business. The initial coal exposure thresholds will become effective in 2023 and vary depending on the line of business and the geographical area. These thresholds will then be gradually lowered until the final phase-out targets are reached.

These coal-related actions in our treaty business are important steps on our path to reaching a net-zero emissions re/insurance portfolio by 2050. They are also in line with the commitment we made in 2019 by becoming a member of the Powering Past Coal Alliance.

Climate-related commitments to the United Nations and the Insurance Development Forum

Reflecting our efforts to help expand re/insurance protection by working with public-sector clients, we made a commitment to the United Nations to advise up to 50 sovereigns and sub-sovereigns on climate risk resilience and to offer them USD 10 billion of insurance cover against this risk by 2020. You can see the progress we have made against this goal in the table below.

In addition, Swiss Re and a number of our industry peers have endorsed the joint Tripartite Agreement between the Insurance Development Forum (IDF), the UN Development Programme, and the government of Germany, in which they commit to increasing insurance protection in climate-exposed countries. Industry members collectively committed to offer up to USD 5 billion of risk capacity for climate risk insurance to contribute to the G7 InsuResilience target of protecting 500 million individuals against climate risk by 2025. In 2020, the Tripartite formed 13 country teams, with three more in the exploration phase. Swiss Re contributed to the projects alongside ten other industry members.

Total climate protection offered to (sub-)sovereigns since 2014

	by 2018	by 2019	by 2020
Number of (sub-)sovereigns advised	96	120	130
Amount of climate protection offered (in USD)	8.2 billion	10.0 billion	10.7 billion

Investments

Through our dedicated climate strategy, we are working to achieve a net-zero emissions investment portfolio by 2050 by setting intermediate targets every five years and regularly reporting on progress. In accordance with the AOA's TSP, we set targets for the years 2020 to 2025. For our corporate bond, listed equity and real estate sub-portfolio targets, we set the base year at the end of 2018, reflecting previous portfolio actions.

Our investment-related climate targets and actions for 2020–2025

	Targets by 2025 aligned with the Net-Zero Asset Owner Alliance Inaugural 2025 Target Setting Protocol	**Actions**
Financing Transition	• Green bonds: USD 4bn[1] • Renewable infrastructure loans: +USD 750m[2]	• Green bonds: constant market monitoring to identify potential investments • Renewable infrastructure loans: constant market monitoring to identify potential investments
Engagement	Engagement topic: alignment with 1.5°C target	• Engagement with investee companies delegated to investment managers based on Swiss Re Engagement Framework and portfolio monitoring results • Direct engagement with investment managers • Engagement collaboration through Climate Action 100+
Sub-Portfolio	• Corporate bonds & listed equities: –35% carbon intensity[3] • Real estate: –5% carbon intensity[4]	• Corporate bonds & listed equities: constant portfolio monitoring to identify optimisation opportunities, also aligned with engagement targets and actions • Real estate: ongoing portfolio improvements through refurbishments and energy usage optimisations
Sector	• Corporate bonds & listed equities: coal phase-out by 2030 • Infrastructure loans & private placements: maturity limitation for fossil fuel[5]-related investments	• Corporate bonds & listed equities: coal maturities to run off by 2030, ongoing monitoring • Corporate bonds & listed equities: expansion restrictions for capital expenditures >USD 100 million for coal mining, coal-fired capacity >300 megawatts for coal-based power generation • Infrastructure loans & private placements: fossil fuel[5] guideline application in investment decisions

[1] Investment target also includes social and sustainability bonds.
[2] Investment target also includes social infrastructure loans.
[3] Base year 2018.
[4] Base year 2018.
[5] Fossil fuel: coal, oil & gas (including oil sands).

Financing transition targets
Green bond proceeds are used to finance environmentally sustainable projects and thereby facilitate the transition towards a net-zero emissions economy. By the end of 2020, we held USD 2.3 billion in green bonds. As part of our adaptation strategy, our mandate also considers social and sustainability bonds. This enables us not only to support the environment, but also underserved groups or populations, thus generating a positive impact on society.

Our ambition is to achieve our investment target of USD 4 billion for green, social and sustainability bonds by the end of 2024.

Infrastructure loans are an attractive asset class for our investment portfolio given their credit quality and inherent liquidity premium. Renewable infrastructure loans in particular are used to finance environmentally sustainable infrastructure projects. By the end of 2020, we held USD 468 million of renewable energy infrastructure loans and an additional USD 455 million were allocated to social infrastructure, such as hospitals, student dorms or affordable housing projects.

As part of our climate-positive investments, we have for the first time set a target to increase our renewable energy and social infrastructure loan portfolio by USD 750 million by the end of 2024.

Engagement targets
We believe that engagement with the real economy is an integral component to support the limitation of global warming to 1.5°C. In 2020, we therefore established an Engagement Framework aligned with the engagement targets defined in the AOA's TSP. For details on our external managers' engagement activities related to our two topics "Alignment of Business Model with 1.5°C Target" and "Disclosure of ESG Key Metrics", please refer to the Sustainability Report 2020, pages 50–51.

Sub-portfolio targets
As Swiss Re committed to have a net-zero emissions investment portfolio by 2050, we established an intermediate portfolio emission reduction target for the period from 2020 to 2025. Informed by IPCC's pathways consistent with the 1.5°C target, we defined a carbon intensity reduction target of –35% for our corporate bond and listed equity portfolio, to be achieved by 2025 with 2018 as the base year. This is also well in line with the AOA's TSP recommendation of a reduction of at least –16% to –29%. Having chosen 2018 as the base year for our target, we included an additional 5% reduction for the one year of difference to the AOA's base year.

Furthermore, we set a carbon intensity reduction target for our Swiss and German real estate investment portfolio of –5% with 2018 as the base year, to be achieved by 2025. This builds on our analysis showing that the portfolio emission intensity is already well aligned with the 1.5°C trajectory.

Sector targets
Coal assets are particularly carbon intensive and susceptible to stranded asset risk given the long life of these assets, as well as the evolving regulations on carbon emissions. To ensure we actively manage such risks, we have stopped investing in companies that use at least 30% thermal coal for power generation or produce 30% or more of their revenues from thermal coal mining. We also exclude oil sands companies that generate 20% or more of their revenues from such operations from the investment universe. Furthermore, in 2019, we extended our mitigation approach by implementing an absolute coal threshold to identify large carbon emitters with a diversified business mix, where relative thresholds may provide inadequate guidance. We do not invest in mining companies producing at least 20 million tonnes of coal per year and power utility generators with more than 10 gigawatts of installed coal fire capacity. Additionally, as part of the updated oil and gas policy of our Group-wide Sustainable Business Risk Framework, we divested from the world's 10% most carbon-intensive oil and gas companies in 2020.

Our long-term objective for 2030 is to fully exit coal-related assets, such as coal mining and coal-based power generation, for our listed equity and corporate bond portfolio via normal portfolio reallocations. To increase efforts to mitigate transition risks in our portfolio, we have also begun to limit investments in companies active in coal mining or coal-based power generation that are planning to expand their capacity. We therefore apply a threshold for capital expenditures above USD 100 million for coal mining expansion, and one of 300 megawatts for coal-fired capacity, applicable to our listed equity and corporate bond portfolios.

To further strengthen our mitigation strategy in less liquid asset classes, we developed dedicated fossil fuel guidelines for our infrastructure loan and our private placement portfolios in 2020. This is particularly important as both have a long-term investment horizon. For upstream (exploration and production), midstream (transportation and storage) and downstream (refinement and distribution) investments, we are limiting the maturities for fossil fuel-related assets. The guidelines ensure an investment universe that is in line with our commitment to a net-zero emissions investment portfolio by 2050.

Carbon footprint of our investment portfolio

In line with TCFD guidelines, we monitor the carbon footprint of our corporate bond and listed equity portfolio on an ongoing basis. For the carbon footprints of these portfolios, we use the metric "weighted average carbon intensity", which defines the portfolio carbon intensity based on relative investment share. We also monitor any coal-related activities in our private equity investments.

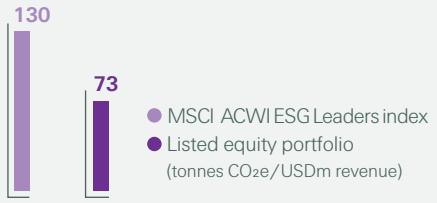
Carbon footprint of our corporate bond portfolio

The US corporate bond portfolio remains below its corresponding benchmark in terms of weighted average carbon intensity, given its continued underweight in high carbon intensity holdings.

Since 2019, the UK corporate bond portfolio carbon intensity further decreased, whereas the index carbon intensity remained relatively stable.

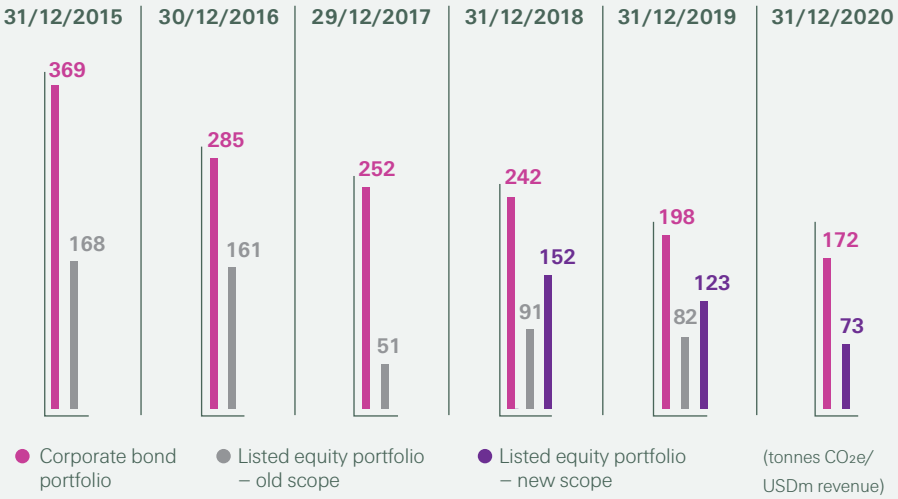
Carbon footprint of our listed equity portfolio

The portfolio of listed equities continues to be significantly less carbon intensive than the corresponding benchmark due to its focus on high quality companies with low carbon intensity.



Carbon footprint of our corporate bond and listed equity portfolio

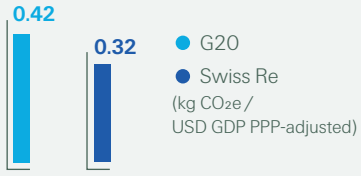
Since the end of 2015, carbon intensities in both the corporate bond and the listed equity portfolio decreased substantially as part of our fossil fuel divestment. In 2020, carbon footprints for both, the corporate bond and listed equity portfolios, further decreased. In alignment with the AOA's TSP, we adjusted the carbon footprint scope of our listed equity portfolio to include ETFs and exclude strategic holdings.



To take our dedicated approach towards climate risk management one step further, we started to measure the carbon intensity of our government bonds in 2020. We implemented a widely adopted approach for these bonds, which constitute the largest holding within our investment portfolio. Here, the metric "weighted average carbon intensity" is also defined as the portfolio carbon intensity based on relative investment share but is combined with an additional element allowing for the comparison of the carbon intensity of economies. The greenhouse gas emissions of a specific bond's issuing country are divided by its gross domestic product adjusted by purchasing power parity (PPP). This enables the equitable comparison of carbon intensity in terms of physical production and corresponding environmental impact.

Carbon footprint of our government bond portfolio

The composition of our government bond portfolio is impacted by the fact that asset-liability management is at the core of our investment approach. In 2020, Swiss Re's government bond portfolio was less carbon intensive than the G20[1] countries due to our higher allocation to low carbon intensity countries.



[1] G20 carbon intensity calculated as total of emissions of the G20 divided by the total PPP-adjusted GDP.

Greenhouse gas emissions from our own operations (Scope 1, 2 and 3)
Reducing our operational carbon footprint is an important part of our Group Sustainability Strategy. In 2003, Swiss Re was one of the first major companies to become carbon neutral.

Successful conclusion of our Greenhouse Neutral Programme
Our first implementation plan to become carbon neutral was our Greenhouse Neutral Programme, starting in 2003 and ending in 2020. Throughout the course of the programme, we publicly reported on our Scope 1 and 2 greenhouse gas emissions, plus a major source of Scope 3 emissions (business travel). From 2003 to 2013, we cut CO_2 emissions per employee (full-time equivalent, FTE) by 49.3%. From 2013 onward, we expanded our reporting to include further Scope 3 emissions such as waste and paper. By the end of 2020, we had reduced CO_2 emissions by another 59.6% (2019: 10%) per employee relative to the 2013 level. As the 2020 data is distorted by the impact of the COVID-19 pandemic, we also show the figures per end of 2019 where relevant (see table on next page).

By the end of 2020, we achieved 100% renewable power sourcing for our operations. All remaining emissions are compensated by purchasing high-quality carbon offsets (carbon avoidance certificates) in line with our carbon neutrality claim.

CO2NetZero Programme to reduce our operational footprint to net zero

Swiss Re has committed to reducing its operational CO_2 footprint to net-zero emissions by 2030. To achieve this goal, we will "do our best, remove the rest" under our CO2NetZero Programme. "Doing our best" means we will intensify our efforts to reduce emissions. A special focus lies on our business travel emissions, which are currently responsible for the bulk of our operational carbon footprint. We have set ourselves the company-wide target of reducing our flight emissions by 30% in 2021, relative to the 2018 level, and will define a new, ambitious target for the post-pandemic period. "Removing the rest" means we are moving from buying conventional carbon offsets to supporting carbon removal projects to compensate for any unavoided emissions.

Carbon removal is a new form of emission compensation that extracts CO_2 out of the atmosphere and stores it permanently. This is a prerequisite for balancing remaining gross emissions in any net-zero emissions target, including the Paris Agreement.

Carbon removal is currently much more expensive than conventional carbon offsetting, as the carbon removal industry is still in its infancy. To cover the first-mover price for carbon removal certificates, we are stepping up our internal carbon levy from less than USD 10 per tonne of CO_2 to USD 100 per tonne of CO_2 in 2021. Swiss Re is the first multinational company with a triple-digit real internal carbon price on both its direct emissions and indirect operational emissions (such as business travel). A real carbon price – unlike the more commonly used shadow carbon price – impacts budgets and is therefore particularly effective in fostering low-carbon decision-making within the company. Externally, a triple-digit carbon price signals to our stakeholders that Swiss Re is a credible partner when it comes to addressing climate risks. The new carbon steering levy will gradually increase to USD 200 per tonne of CO_2 by 2030. This price transparency and the 10-year planning horizon will allow us to enter into long-term purchase agreements with carbon removal service providers, which sends a particularly strong market signal to the emerging carbon removal industry.

CO_2 emissions per employee (full-time equivalent, FTE), Swiss Re Group

		2013[1] kg/FTE	2019[1] kg/FTE	**2020 kg/FTE**	Change in % since 2019	Change in % 2013–2019[2]	Change in % 2013–2020
Scope 1	Heating	396	202	**172**	–15.2	–49.0	–56.6
Scope 2	Power	313	137	**44**	–68.0	–56.2	–86.0
Scope 3	Business travel	3 724	3 849	**1 626**	–57.8	3.4	–56.3
	Copy paper	34	10	**6**	–45.8	–70.6	–83.6
	Waste	50	33	**18**	–47.0	–34.0	–64.9
	Water	13	9	**7**	–28.0	–30.8	–50.6
	Technical gases	97	98	**38**	–61.8	1.0	–61.4
	Commuting	1 225	926	**454**	–51.0	–24.4	–62.9
Total		5 852	5 266	**2 363**	–55.1	–10.0	–59.6

[1] The figures for 2013 and 2019 have been restated due to the sale of our ReAssure business in the UK and the adjustment of how we handle renewable electricity credentials. An overview of the restatement is available in the Sustainability Report, page 90.
[2] Because of the distorting effect of the COVID-19 crisis, we also show the figures per end of 2019.

You can learn more about our Greenhouse Neutral Programme and net-zero commitment for operations in our Sustainability Report 2020, pages 60–69.