Insurer Climate Risk Disclosure Survey for Reporting Year 2022

Section A

Group Name: Zurich American Insurance Company and Affiliates

Group No. 0212

Section B

NAIC Number	Company Name	Mailing Address
26247	American Guarantee and Liability Insurance Company Domicile: NY	1299 Zurich Way Schaumburg, IL 60196
40142	American Zurich Insurance Company Domicile: IL	1299 Zurich Way Schaumburg, IL 60196
34347	Colonial American Casualty and Surety Company Domicile: IL	1299 Zurich Way Schaumburg, IL 60196
21326	Empire Fire and Marine Insurance Company Domicile: IL	1299 Zurich Way Schaumburg, IL 60196
21334	Empire Indemnity Insurance Company Domicile: OK	1299 Zurich Way Schaumburg, IL 60196
39306	Fidelity and Deposit Company of Maryland Domicile: IL	1299 Zurich Way Schaumburg, IL 60196
26387	Steadfast Insurance Company Domicile: IL	1299 Zurich Way Schaumburg, IL 60196
16535	Zurich American Insurance Company Domicile: NY	1299 Zurich Way Schaumburg, IL 60196
39039	Rural Community Insurance Company Domicile: MN	3501 Thurston Avenue Anoka, MN 55303
90557	Zurich American Life Insurance Company Domicile: IL	150 Greenwich Street 4 World Trade Center 54th Floor New York, NY 10007
14178	Zurich American Life Insurance Company of New York Domicile: NY	150 Greenwich Street 4 World Trade Center 54th Floor New York, NY 10007
27855	Zurich American Insurance Company of Illinois Domicile: IL	1299 Zurich Way Schaumburg, IL 60196

NAIC Number	Company Name	Mailing Address
41181	Universal Underwriters Insurance Company Domicile: IL	1299 Zurich Way Schaumburg, IL 60196
40843	Universal Underwriters of Texas Insurance Company Domicile: IL	1299 Zurich Way Schaumburg, IL 60196

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Governance: Sustainability is embedded in our governance

The Board of Zurich Insurance Group Ltd has ultimate responsibility for the success of the Group and for delivering sustainable value within a framework of prudent and effective controls. It sets the Group's values and standards to meet the expectations of our stakeholders. As part of its strategic responsibility, the Board approves the Group's sustainability strategy and objectives, including related targets that have a material impact on the company or the Group. It is supported by its Board Committees within their respective core mandates:

– The Governance, Nominations and Sustainability Committee (GNSC) recommends the Group's sustainability strategy and objectives and exercises oversight on sustainability-related matters.
– The Audit Committee provides oversight on the integrated sustainability disclosure (ISD).
– The Risk and Investment Committee provides oversight of risks (including sustainability risks).
– The Remuneration Committee evaluates the Group's remuneration architecture, including incentive plans which are linked to appropriate performance criteria supporting the execution of the strategy of the Group.

The target card framework, used to assess individual performance of the ExCo members for the 2022 short-term incentive plan (STIP) awards, includes both financial and non-financial targets. The non-financial targets are related to customers and employees. In addition, consideration is given to execution against strategic priorities, including ESG factors and a risk-based review, to determine the final individual performance assessment outcome.

The Board of Zurich Insurance Group Ltd is a supervisory board in nature. Its members receive fixed remuneration as an annual fee, of which half of the basic fee is paid in cash and half in five-year sales-restricted shares which are not subject to the achievement of any specific performance conditions.

At management level, accountability for different areas of expertise, including sustainability aspects related to each of these areas, is assigned to an ExCo member or a Group CEO direct report. In addition, the Group CEO has designated the CEO EMEA & Bank Distribution as the ExCo-level sponsor for Sustainability (Sustainability ExCo sponsor). This role is supported by the Group head of Sustainability and the Group Sustainability team. The sponsorship includes driving the strategic sustainability approach of the Group and acting as a sounding board for strategic alignment of global sustainability priorities to assure a consistent approach and to facilitate oversight. The Sustainability ExCo sponsor is also responsible for monitoring progress with respect to the sustainability priorities and targets and reporting thereon to the Board's GNSC, the Group CEO and the ExCo.

By opting for an integrated approach, our existing governance bodies are responsible for sustainability-related topics that concern their field of expertise.

The implementation of the sustainability strategy and objectives in the businesses, functions, regions and countries is facilitated by the Sustainability Leaders Council (SLC). The SLC

comprises senior executives from across the Group and is chaired by the Group head of Sustainability and sponsored by the Sustainability ExCo sponsor.

Our planet: Drive positive impact

Significant reductions in greenhouse gas emissions are required to achieve the outcomes of the Paris Agreement and our ambition for a 1.5°C future. Through engagement and collaboration with our stakeholders, we use our underwriting activities, our investment activities and our own operations to tackle climate change. The risks and opportunities associated with climate change affect all parts of our business. Understanding, measuring and managing these impacts – while seizing the opportunities that arise from the transition to a climate-neutral world – is needed to create sustainable value for all our stakeholders.

This section presents our disclosure in line with the recommendations of the Financial Stability Board's TCFD. It outlines our understanding of the potential impacts of climate risk to our underwriting and investment activities and an assessment of the resilience of our strategy to climate change risk. Also outlined is the governance we have established to make climate and sustainability an executive-level responsibility, our climate risk management processes and finally the metrics and targets we have implemented to track delivery of our stated targets. While climate change is the focal point of this section, we are dedicated to environmental aspects in a broader sense, e.g., revenues resulting from sustainable solutions

Strategy

Our climate strategy focuses on supporting companies and people through the transition to a net-zero economy and demonstrates our commitment to using every lever of our business, from underwriting and investments to our own operations, to accelerate this transition.

Our climate-related strategy

Understanding and managing the impact of climate change is an important aspect of maintaining our long-term profitability. Our approach to climate risk is part of our risk management process across the Group. It is managed in a way that is consistent with other risks to which the Group is exposed. We integrate assessments of the evolving physical and transition risk landscape into our underwriting and investment strategies.

To manage our climate risks more effectively, we are investing in improving our understanding of them. Modeling the effects of physical risk on our portfolios is a key focus area. While climate change models are constantly improving, they remain less accurate at the smaller spatial resolutions needed to analyze in detail the impact of changes to natural catastrophes on our portfolio. In contrast, traditional commercial catastrophe models that form the basis of our current modeling are typically based on historical data and hence would not reflect future changes in trends. For this reason, we have started to combine climate change scenarios and natural catastrophe models to complement our framework with a view of climate change, and to integrate this view into our accumulation-risk and peril-region modeling.

A deep understanding of potential medium- to long-term impacts of climate change risk to our underwriting and investment portfolios is fundamental to formulating appropriate strategic responses. We undertake scenario analysis on our portfolios to understand what these impacts are.

Our first exploratory, scenario-based climate risk assessment, performed in 2021, considered outcomes from 2030 onward, with impacts quantified where possible. This exploratory exercise considered major aspects of our business, including underwriting, investment management and our own operations. In 2022, we reviewed the risk assessments performed in 2021 and updated them where needed. As the mix of our underwriting portfolio did not change significantly in 2022 compared with our 2020 baseline, the heatmap published in Annual Report 2021 remains valid. Besides monitoring, we prioritised strategic actions in our underwriting portfolio and strengthened the assessment of our investment portfolio by including additional asset classes. In terms of our own operations, we reviewed further risks, including the impact of climate change on our distributed workforce and our supply chain.

Outcomes of these analyses are used to determine appropriate responses and ensure the resilience of our strategy. We disclose the outcomes of these processes in line with TCFD recommendations and to demonstrate our understanding and management of these risks.

Introduction to climate-related risks

In alignment with TCFD recommendations, we broadly categorize climate-related risks as physical and/or transition risk and outline below the potential impacts of these risks on our business. In sections 4.1.5 to 4.1.9 we discuss in detail our own assessment and the expected impact from climate-related physical and transition risk. We outline our understanding of how climate change risk could impact our business activities, mainly focusing on the impact on demand (revenues) and losses (claims) from an insurance perspective and on assets from an investment perspective.

The section below should be read as an overview of expected effects of both physical and transition risks, while the scenario analysis provides more details on how each of these risks is expected to unfold and impact our business under different scenarios.

Physical risks

Greenhouse gas (GHG) emissions are leading to an increase in global surface temperatures, which is driving changes in climate and weather systems across the globe. Latest research shows that changes in extreme weather events can be attributed to human-induced increases in global surface temperatures and suggests continuing trends in emissions will further exacerbate the situation.

These developments will bring negative economic and societal impacts as extreme weather events increase in severity and frequency or undergo geographic shifts. The scientific understanding of how weather events will respond to climate change varies greatly, but we assume that further temperature increases will accelerate sea-level rise due to thermal expansion and melting of glaciers and icesheets. It will also lead to more extreme temperatures, heatwaves and droughts, impacting agricultural production and human productivity.1 As the warming atmosphere will also intensify evaporation, more extreme precipitation and variability in the global water cycle is seen as highly likely.

There is less certainty around how other weather events will react to climate change, such as tropical and extra-tropical cyclones, severe convective storms and hail. Secondary effects of climate change can also have negative impacts, such as extreme heat and drought leading to more wildfires, or the combination of sea-level rise and changes in hurricane intensity or tracks leading to higher storm-surge damage.

Up to 2030, we expect changes driven by climate change to become increasingly relevant. However, these changes stop short of becoming a dominant loss driver over and above what is currently embedded into our risk appetite. We expect the inherent volatility and natural variability of extreme weather events and socioeconomic trends will continue to have a stronger influence on loss experience. Natural variability comes both from random fluctuations of extreme but rare events and multi-year variations in regional climate systems, such as the El Niño Southern Oscillation or Atlantic-Multidecadal Oscillation. This variability is also embedded in historic loss trends and taken into account in our pricing and capital management.

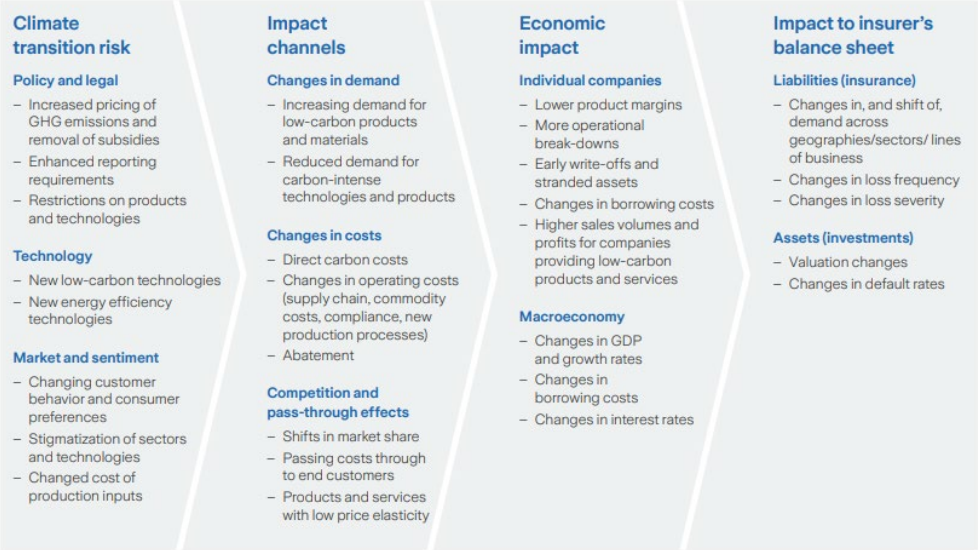
Socio-economic trends, such as an increase in asset values and accumulation through population growth and concentration in urban areas, also contribute to increases in losses over time. The impact of such trends is considered in pricing and modeling, such that annual policy renewals provide mitigation against increasing physical risks for shorttail business and mitigate transition risk to the underwriting portfolio.

Through certain lines of business, we can be directly impacted by the changes in physical risk caused by climate change. The impacts include, for example, increases in severity and frequency of natural catastrophes, such as tropical cyclones, flood or hail, which can lead to higher losses by customers covered by our property policies. Other lines are less sensitive to physical risk and, within these, only a minority of our losses are driven by natural catastrophes (see the current exposure to physical risk section.

Buildings may be at risk, due to their fixed locations, of suffering significant damage costs from the impact of climate change. We are currently exploring ways to assess physical risks for properties using our risk model on catastrophes and by integrating data into our central portfolio management system. The valuation of assets in our investment portfolio can also be affected by direct and indirect exposure to physical risk.

Businesses will be directly affected by impact on costs and revenues and the potential for supply chain disruptions and asset write-offs. The vulnerability of countries to physical risk, including costs associated with infrastructure and adaptation measures, disruptions and vulnerability to extreme weather events, may also have an impact on the valuation of sovereign debt.

Transition risks



If society moves to limit global warming in line with the Paris Agreement to below 2°C, and optimally to 1.5°C, the required decarbonization of the global economy will bring its own set of risks. The legal, policy, technological and market changes necessary for the transition will lead to significant shifts in economic activity and asset valuation.

The expected steep rise in carbon prices and removal of subsidies on carbon-intensive resources and activities in this transition could lead to reduced profitability, stranded assets and impairments in sectors that are difficult to decarbonize and where additional costs cannot be passed on to customers. This will, in turn, affect demand for insurance from shrinking sectors.

For example, the transition will shift demand for insurance toward low-carbon technologies and products, creating opportunities for companies that provide new solutions or are able to reduce their emissions more efficiently than competitors.

The aggregate effect of transition risk will vary greatly across individual actors, depending on their detailed business models, assets and transition strategy. This complicates the assessment of aggregate transition impacts. There will also be aggregate macro effects arising in a transitioning scenario, including the impact on economic activity, inflation and, potentially, government borrowing costs.

As new policy measures and technologies are rolled out, uncertainties around their effectiveness and unintended consequences are likely to increase, with higher market volatility and uncertain loss ratios among possible outcomes. Transition risk will be highly dependent on how predictable policy responses are and the time available for the economy to decarbonize. More disruptive impacts can be anticipated with a faster transition.

In the commercial real estate sector, transition risk will manifest from the need to adhere to tighter policies, carbon and energy costs, market preferences and challenges to achieve energy efficiency and may impact asset values.

The transition will also bring legal or litigation risks. Carbon-intense energy producers are already defending lawsuits seeking to hold them accountable for their alleged historical contribution to CO2e emissions. This current litigation could expand to other industries whose operations contribute to CO2 or other climate-impacting emissions. Companies may be sued for failing to disclose climate-related risks, for failing to mitigate the impact of their activities on climate change, for allegedly misrepresenting their level of climate impact, or for failing to adapt to the changing climate. Asset managers could be sued for financing climate change-inducing activities, or for inadequately driving emission reductions in their portfolios.

The global transition to a greener society will also bring with it new and emerging technologies. These could also present new opportunities as well as unanticipated risks and new environmental concerns from both a resourcing and disposal aspect. Extreme weather events could present new risks to employers regarding worker safety or to companies engaged in building design, engineering and construction. Governments could enact laws seeking to hold companies accountable for the climate impact of their supply chains.

Natural catastrophe modeling: current exposure to physical risk

Approach

Current exposures to physical climate risk are expressed through annual expected loss (AEL) and probable maximum loss (PML). Modeled exposures are shown below.[2] Our approach to modeling is discussed further in the section on managing risks from climate-related natural catastrophes (pages 154–155). We highlight how various drivers including exposed insurance portfolio and vulnerability changes, model updates, exposure data quality, foreign exchange rates and reinsurance can influence natural catastrophe modeling output (e.g., AEL, PML) over time.

Scope

The climate risk assessment is applied to our portfolios, namely the exposure of our Property and Casualty business to natural catastrophe perils, impacted by climate change that could materially impact us.

Quantification

AEL

AEL provides a view on the expected loss due to natural catastrophes per year, averaged over many years.

PML

PML is a tail metric that looks at severe, unexpected but still possible outcomes of natural catastrophes at a defined probability of occurrence.

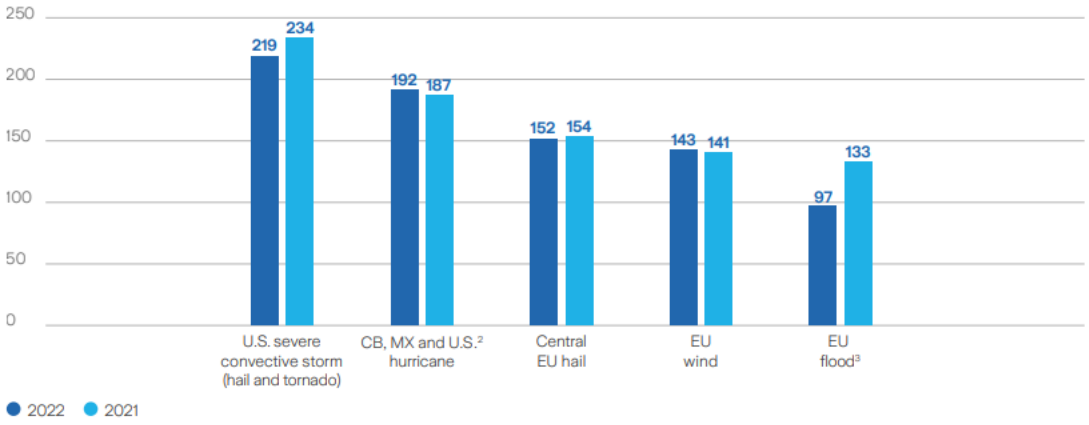
Monetary losses

Amount of monetary losses attributable to insurance payouts from natural catastrophes.

Figure 11

Annual expected loss for top five peril regions[1]

in USD millions



1 AEL excludes Farmers Re increased participation in the Farmers Exchanges' all lines quota share treaty from 1.75% to 8.50% as of 31 December, 2022. This increased Zurich Group's AEL for US severe convective storm by USD 72 million and for U.S. hurricane by USD 11 million.

2 The geographic scope is extended when compared with prior year reporting to include correlated exposure in the Caribbean (CB) and Mexico (MX) . The AEL for U.S. hurricane only is USD 183 million in 2022.

3 The 2021 reporting for flood in Europe was by country on a stand-alone basis. The UK as the largest country was not in the top five peril regions.

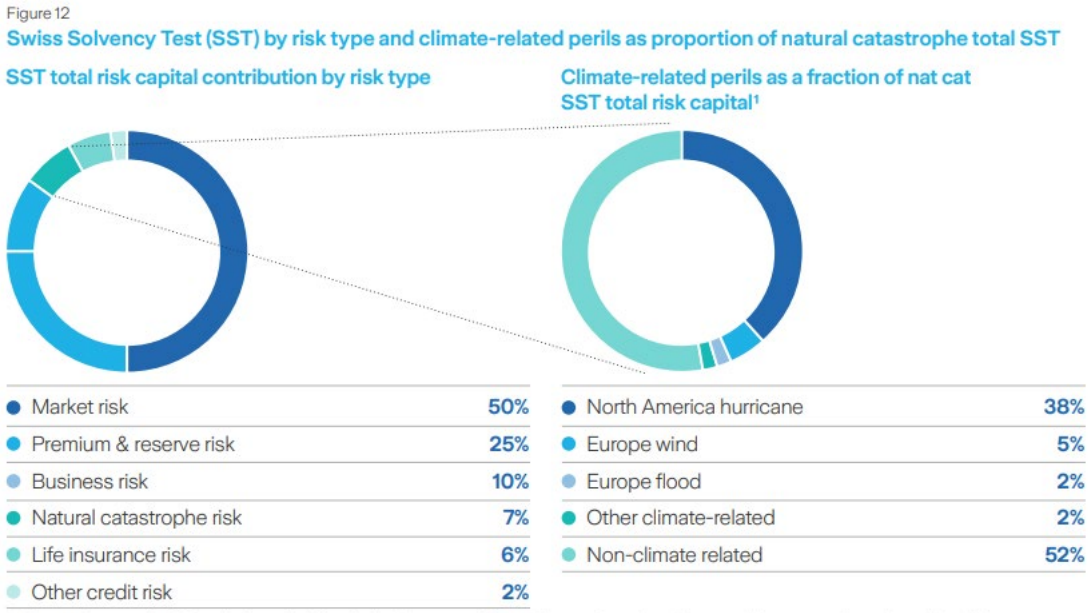
Our modelled AEL from climate-related natural catastrophes provides an indicator of our current exposure to perils that might be affected by climate change. The AEL analysis above reflects the current top five peril regions in the Group, net of reinsurance, before tax and excluding unallocated claim adjustment expenses. This analysis helps us manage risks related to insuring these perils, such as accumulation risk. Risk appetite limits by peril region are in place and exposure is currently within appetite.

Comparison to 2021 shows a decrease for U.S. severe convective storm driven by exposure reductions. Europe flood also decreased but primarily driven by an enhanced risk view. The other peril regions have been relatively stable since 2021 net of reinsurance. It is noted that the hurricane exposure for the U.S. only before reinsurance, decreased as per our underwriting strategy.

The graphs below show the materiality of catastrophe risk relative to other risk types and the materiality of our climate-related perils to overall catastrophe risk.

Figure 12

Swiss Solvency Test (SST) by risk type and climate-related perils as proportion of natural catastrophe total SST

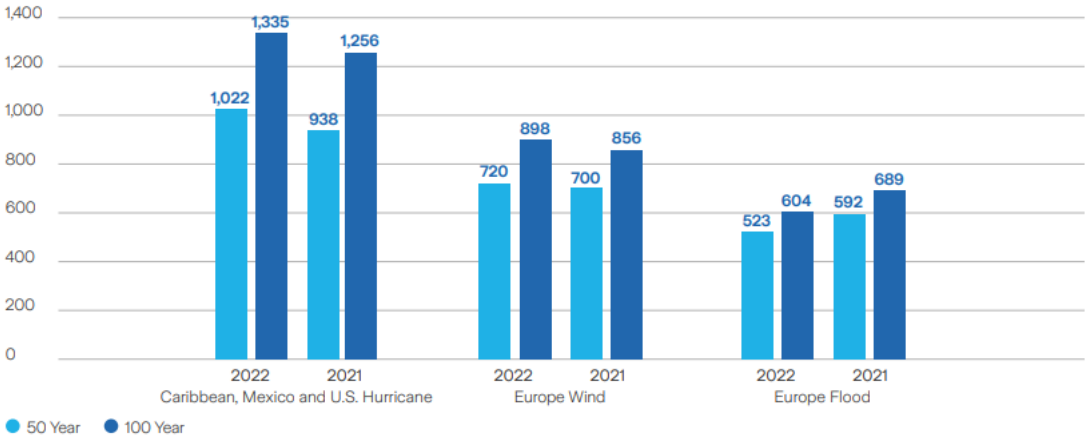


1 The natural catastrophe SST total risk capital is defined by the 1% worst annual losses. These are driven by peril regions with large potential losses beyond the 100-year return period (e.g. North America hurricane).

Figure 13

Probable maximum loss by top three peril regions¹

in USD millions



1 PML excludes Farmers Re increased participation in the Farmers Exchanges' all lines quota share treaty from 1.75% to 8.50% as of 31 December, 2022. This increased Zurich Group's PML for US hurricane exposure by USD 54 million for the 50-year PML and by USD 61 million for the 100-year PML.

The net annual aggregate 50- and 100-year PML are shown above for the top three peril regions measured by SST total capital contribution.

Comparison to 2021 shows an increase for Carribean, Mexico and U.S. hurricane net of reinsurance. It is noted that the hurricane exposure for the U.S. only before reinsurance, decreased as per our underwriting strategy. Europe flood decreased primarily driven by an enhanced risk view, while Europe wind was relatively stable net of reinsurance.

Our loss ratio for the full year 2022 was 63.7 percent with 1.5 percentage points attributable to the following natural catastrophe experienced in 2022 (Hurricane Ian). We follow the Group's Catastrophe Response Group (CRG) governance for natural catastrophe identification. Here we

report events where the total net loss is above USD 200 million. The Hurricane Ian event and figure has been reviewed by the CRG, a cross-functional committee which oversees and recommends to the ExCo the best-estimate ultimate loss for material catastrophes. The term "catastrophe" in the context of the CRG covers both man-made and natural catastrophe peril events that are relatively infrequent or are phenomena that produce unusually large aggregate losses.

An important aspect of our proprietary view on natural catastrophe risk is the evaluation of patterns and trends in catastrophe activity with time. Natural variability of event activity is an integral part of our view on natural catastrophe risk, as are statistically significant trends that may be detectable in our claims experience or credible, conclusive modeling of past, present and future climate as a driver of loss activity. We regularly revisit our risk views and underlying models on climate-related perils in order to reflect trends in the hazard, whereas exposure trends are naturally captured by exposure data updates. In 2022, we enhanced our risk view on European flood that reflects the loss correlation across countries. Natural variability is at the same time evaluated and kept up-to-date as part of the regular reviews of our natural catastrophe risk view, which underpins the structuring and purchase of reinsurance along with the profitability assessment and strategic capacity allocation for risk assumed from customers.

We follow a gross-line underwriting strategy and focus substantial time and resources on ensuring risk-adequate underwriting and pricing of the business we assume up-front, including consideration of potential climate changeinduced trends. Reinsurance is used as a means to maximize diversification of net retained risks and to protect shareholders against earnings volatility. We engage with a core panel of reinsurance partners to secure the required capacity at sustainable pricing over the medium term. Given our financial strength, we have the option to weigh the benefits and cost of reinsurance against other forms of risk financing and thus adapt to supply-side changes in the reinsurance market as a potential consequence of the macroeconomic response to climate change adaptation.

Portfolio-level climate risk scenario analysis

In the chapter below, we have labelled the sub-sections that are specific to one of our three impact areas: underwriting, investment management or own operations.

Approach

Our assessment of climate risk leverages both our Total Risk Profiling™ methodology and scenario analysis.[1] While Total Risk Profiling™ offers a short term (1–3 years) qualitative risk assessment, scenario analysis allows us to assess the strategic implications of climate change over the medium (up to 10 years) and longer term (to 2050) and improves our ability to assess the resilience of our business model to potential climate risks.

The scenarios used to analyze our underwriting and proprietary investment portfolios are drawn from the Network for Greening the Financial System (NGFS) suite, with scenarios chosen to cover a relevant set of emissions pathways. The emissions pathways of the selected scenarios correspond broadly to representative concentration pathways (RCP) 2.6 and 6.0.[2]

Scenarios used

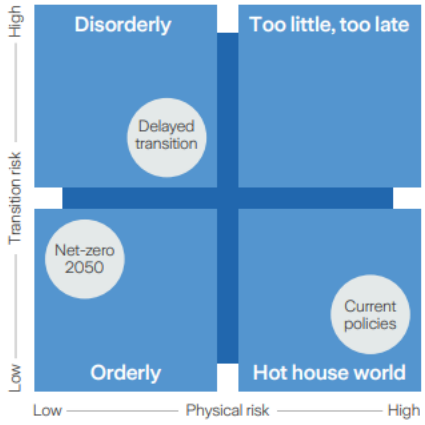
Net-zero 2050 limits global warming to 1.5°C through early adoption of stringent climate policies and innovation. Net-zero emissions reached around 2050, giving at least a 50 percent chance of limiting global warming to below 1.5°C by the end of the century, with no or low overshoot (<0.1 °C) of 1.5°C in earlier years.

Delayed transition assumes no new climate policies until 2030 with high regional variation in policy implementation. Emissions exceed the carbon budget temporarily and decline more rapidly to ensure a 67 percent chance of limiting global warming to below 2°C.

Current policies assumes that only currently implemented policies are preserved, leading to high physical risks. Emissions grow until 2080 leading to about 3°C of warming and severe physical risks.

Figure 14

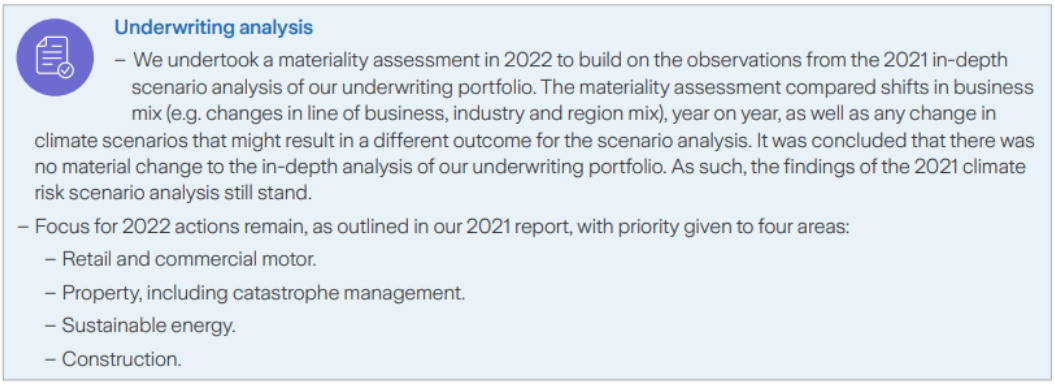
NGFS scenario framework[3]



The selected scenarios used for underwriting and investment management analyses cover a broad scope of potential risks and opportunities, including high and low physical and transition risks.

The scenarios used to understand physical risk impacts to our own operations are broadly aligned with those used for our insurance and investment analysis in terms of the RCP assumed (RCP 2.6 and 8.5)[4]. Our scenario analysis leverages a third-party model and associated data to assess both our insurance and investment businesses. A high-level overview of the model, data sources and key assumptions are provided in the risk management section (pages 154 to 156).

Portfolio-level climate risk scenario analysis – Underwriting



Following the detailed climate risk scenario assessment applied across the underwriting portfolio in 2021, we are taking the approach to update the full materiality assessment only in the event of a material change in either the underwriting portfolio or climate risk scenarios. For the purpose of this report, a material change in underwriting portfolio is defined as the change in industry or line of business mix of more than 5 percentage points for either the Group, or European P&C business and North America, independently.

From 2020 (the basis of our climate risk scenario analysis) to 2021, there was no material shift in the P&C underwriting portfolio industry or line of business mix. The main driver of premium increase was increased rates, changing commodity prices and inflation, for example in costs of construction rather than an increase in exposure or coverage.

Overall, the impact on demand for the current policies scenario would be immaterial to total P&C premiums. For the net-zero 2050 scenario, the impact of rate change in construction and property as well as a decline in premiums from the fossil fuel industry could drive increased upside opportunities. However, given the nature of rate change and commodity prices, we believe the impact would not be material when fully modeled.

For our Life business, an assessment of the 2021 Life portfolio showed a similar geographic mix to 2020. The most significant exposures are related to the life protection business in EMEA and LATAM (56 percent of protection gross written premiums). Corporate risk business continues to be well diversified across industry sectors. We therefore concluded that there was no material change to the risk profile of the Life business under the scenarios tested, compared with the previous assessment.

Our conclusion, therefore, is that there is no material change in 2022 to the results of the 2021 climate risk scenario analysis.

Figure 15

Potential climate change-related impacts to our underwriting portfolio under current policies and net-zero 2050 scenarios with strategically aligned responses

Sector	Line of business	Portfolio weight	Demand impacts: Current policies	Demand impacts: Net-zero 2050	Loss impacts: Current policies	Loss impacts: Net-zero 2050	Responses
All sectors	Retail and commercial motor						Monitor loss trends associated with electric vehicles to reflect appropriately in pricing. Optimize claims network for emerging technology.
All sectors	Property						Continue best-in-class CAT modeling, accumulation management and continued development of Zurich Resilience Solutions. Reshape portfolios in case of current policies.
Construction	–						Optimize expected growth in construction by continuing to balance risk across the portfolio and understanding risks associated with changing construction methods.
Financial services	–						Deepen ESG review as part of the underwriting process within Financial Lines, with a focus on customers' climate-related reporting.
Agriculture	–						Continue investment in models to develop insights at commodity, product and country level to help adjust the mix. Assess potential growth in private products.
Heavy industry and mining	–						Leverage carbon capture and storage as well as knowledge of energy for customers developing own solutions. Explore customer activities around transition to understand growth opportunities.
Fossil fuels	–						Understand customers' transition plans and how Zurich can support. Increased focus on risk engineering maintaining facilities that may be in run-off.
Power	–						Grow market share in renewables to maximize growth above that modelled. Continue to build on existing specialist knowledge to manage risk.
All sectors	Life protection						Focus on commercial sales to sectors with high growth, offer innovative life products with proactive measures and continuously monitor factors affecting vulnerability to climate.

Portfolio weight (% of GWP)

- High (>10%)
- Medium (5–10%)
- Low (<5%)

Impact thresholds

- High risk (managed through Group actions)
- Medium risk (managed through local actions)
- Low risk (managed through local actions)
- Low growth (managed through local actions)
- Medium growth (managed through local actions)
- High growth (managed through Group actions)

Definition of terms used:
- Sector: Industry group of the customer base except for transport, which was considered together with the total motor book and property that was considered across industry due to the overarching impact of physical risk associated with climate change.
- Weight in underwriting portfolio: Indicates how much the sector/geography/line of business being considered contributes to the overall underwriting portfolio.
- Demand impacts: high, medium and low risk relate to the potential decline in premium volume due to the various scenarios whereas high, medium and low growth indicates that there is a potential increase in premium due to the changing landscape driven by transition.
- Loss impacts: High, medium and low as above relate to the potential increase in losses in each sector if no strategic or mitigating action taken as part of the underwriting strategy.

Through the materiality assessment we concluded that the results of our 2021 climate risk scenario assessment remain unchanged. Overall impacts to P&C demand at Group-level in 2030 under the scenarios previously modelled and with no change in assumptions are still estimated to be of low materiality.

Demand impacts related to Life protection products are observed to be higher under the net-zero 2050 scenario. In both scenarios, impacts to Group-level P&C loss experience are observed to be more pronounced before mitigating actions are considered, due to the potential negative impact of physical losses related to weather events. In general, the diversification of our P&C business in terms of geographic footprint, industry mix and line of business limits our potential exposure at a total Group level. We would forgo growth opportunities highlighted in the current policies

scenario as these derive from increased use of fossil fuels and are therefore not aligned with our net-zero commitments.

Based on the outcome of our analysis on the Life and P&C book we do not expect material impacts to fee income received from Farmers Group Inc. through to 2030.

In 2022, we continued to prioritize areas of our portfolio identified during the climate risk scenario assessment 2021. We narrowed down the original nine areas of focus to four areas of markets and industries that are potentially the most material to our business, either due to the size of the underwriting portfolio or the potential impact of transition or physical risk on our portfolios.

These areas are:

– Retail and commercial motor.
– Property, including catastrophe management.
– Sustainable energy.
– Construction.

Retail and commercial motor: a closer look

Expanded focus on technological advancements in driving and vehicles.

Identified action following climate risk scenario analysis 2021 We increased focus on monitoring loss trends associated with electric vehicles (EVs) to reflect this appropriately in pricing. Additionally, we are seeking to optimize claims networks for emerging technology and expanded focus on technological advancements in driving and vehicles. **Rationale** Transition within the motor industry is largely focused on the shift from internal combustion engines (ICEs) to alternatively fuelled vehicles, mainly EVs. This shift to EVs goes hand in hand with the development and wide adoption of advanced driver assistance systems (ADAS) in new vehicles. In reviewing the impact of ADAS equipped vehicles, of which we identified EVs as a subset to ensure efficient analysis of both ADAS and EVs within the motor industry.	**Strategic action prioritized in 2022** We performed an in-depth review on claims experience with ADAS vehicles and will expand this to focus specifically on EVs during 2023.
Progress We established a global working group of subject matter experts to review relevant internal and external practices, for example, adjusting loss estimates or applying industry standard discounts for vehicles equipped with ADAS, formulate business goals, scan the market, conduct analyses and take action. The work is ongoing. As of December 31, 2022, we have acquired external vehicle data for two of our key motor portfolios in EMEA. In-house experts are quantifying the predictive value of the data for underwriting to support the transition to a more resource-efficient and sustainable economy.	
Ongoing focus We will continue our focus on e-mobility in four key areas: 1 Portfolio (e.g., Zurich's market share, overall market growth and adoption of EVs in fleets). 2 Pricing (e.g., discounts against ICE policies). 3 Performance (e.g., claim frequency). 4 Proposition (especially in high EV growth markets and segments).	

Property: a closer look

Physical impact of climate change continues to drive potential risk in the property book. Actions taken to counter this include a refined approach to managing natural catastrophe and optimizing exposure in key peril regions globally.

Identified action following climate risk scenario analysis 2021	Strategic action prioritized in 2022
We continued to develop our best-in-class catastrophe modeling and accumulation management, as well as focusing on building capabilities within Zurich Resilience Solutions, our risk management services unit. Please see section 5.1 for more information (page 174). **Rationale** Catastrophe management is key to creating a climate resilient underwriting portfolio and also allows us to inform customers of actions they should take to become more resilient in the face of potential impact from climate change.	We assigned a dedicated project team, led by the global head of property, to oversee the management of exposures in key peril regions and further enhance Zurich's catastrophe management framework. We are building on existing capabilities within the area of catastrophe management and leveraging our in-house climate science experts.
Outcome Following a comprehensive review, we prioritized action on capacity deployed within our North American business. We are on track to reduce U.S. windstorm average annual loss (AAL) by 10 percent by the end of 2023 and continue to take similar action in other regions.	
Ongoing focus Optimizing exposure in key peril regions remains a strong focus area and relies upon frequent, consistent and comprehensive review processes, which have been in place for many years and will continue to be a key part of our climate resilience strategy.	

Energy transition: a closer look

Our sustainable energy strategy underpins development of our energy book and helps support customers as they transition to lower-carbon operating models.

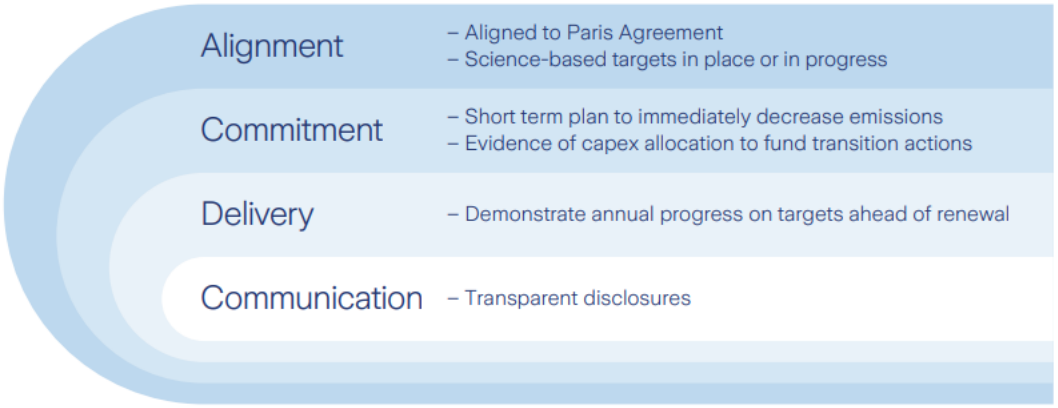
Identified action following climate risk scenario analysis 2021	Strategic action prioritized in 2022
Fossil fuels and power *Ways to support:* – We built a framework to help review customers' transition plans and look for ways to support them. – We took action to grow our market share in renewables to maximise growth above that modeled. We continued to build on existing specialist knowledge to manage risk.	The future of energy depends on the transition of traditional power and fossil fuel companies to sustainable ways of generating power. During 2022 we restructured our team of experts, blending the old world of energy with the new to mirror our customers and better help them accelerate the energy transition. We have expanded our sustainable energy offering, developing skills internally as well as hiring industry experts where needed, and built further knowledge and expertise in this rapidly changing market. Our sustainable energy strategy is built on three layers: – Engagement and review of transition plans. – Upskilling and cross skilling in sustainable energy within underwriting, risk engineering and claims. – Continued development of solutions to address emerging technologies in this area.

Outcome
We successfully grew our sustainable energy business in 2022. We operate across four hubs in the UK, U.S., Germany and Dubai, and service every industry within the area of sustainable energy, with the exception of offshore wind, which we are currently reviewing.

Our integrated approach to energy allows us to access traditional power and fossil fuel customers that are transitioning to sustainable energy. The world's largest wind power owners, for example, are mostly traditional power companies or integrated energy companies. We estimate sustainable energy now represents more than 10 percent of our overall portfolio and we expect this share to grow rapidly. To enable this growth, our experts are working together to share knowledge. In 2022, for example, our sustainable energy global lead engineer and team created a detailed technical database of more than 1,800 wind turbines – a number that highlights both the demand for solutions and the complexity involved in understanding associated risks.

We developed and implemented our alignment, commitment, delivery and communication (ACDC) approach to reviewing transition plans (see below). As of December 31, 2022, we reviewed more than 30 companies using this approach and identified next steps to take to engage with the underwriting community and customer relationship leaders.

Figure 16
Transition assessment framework



Upskilling, cross skilling and recruitment
In 2022, we created the role of sustainable energy global lead engineer, which is pivotal for our understanding of the current risk landscape. In addition to this, we hired additional employees across underwriting, claims and risk engineering to help build our integrated approach to sustainable energy.

Developing solutions and growing the business
Our global energy team created concepts for new products based on input from energy customers, through client meetings and at various conferences, for example, the Lillehammer Offshore Energy Claims Conference. We continue to work on bringing these solutions to market.

To drive and support growth in sustainable energy, the sustainable energy global lead engineer created an in-house equipment database to provide comprehensive details on the increasing amount of machinery coming to market in this area. He also represents Zurich on the Global Wind Energy Council.[1]

Ongoing focus
We continue to build the sustainable energy business across Zurich and are identifying new opportunities in emerging technology in this area. We expect to launch additional services throughout 2023.

Construction & engineering lines: a closer look

We recognize the investment required to support the energy transition and tackle the accompanying challenges, while decarbonizing both operational and embodied emissions.

Identified action following climate risk scenario analysis 2021	Strategic action prioritized in 2022
We continued to balance risk across the portfolio and understand the risks associated with changing construction methods.	We focused on growth and innovation within our construction business line through talent acquisition and new product development, with heavy focus on the U.S. market as a first step.

Case study

In November 2021, Zurich construction in North America launched its proprietary policies for mass timber master builders risk and project builders risk. These policies offer customized coverage and market-leading capacity of up to USD 50 million for qualified risks using mass timber, a low-carbon alternative to concrete and steel. The product launch resulted in USD 1.85 million in new business.

Zurich construction in North America also launched a weather parametric product which provides non-physical damage coverage for perils including rain, wind, heat, cold and snow accumulation. We have seen interest from customers in the weather parametric product as a complement to builders risk insurance due to the continued uptick of severe weather events across North America. We continue to build out our peril offerings based on customer and broker needs.

Zurich construction in North America is a key pillar of our sustainable energy strategy, offering up to USD 100 million of capacity for qualified on-shore renewable energy risks, including wind, solar and biomass. Growing demand in the U.S. marketplace has accelerated due to various federal tax incentives and enhanced commitment from the government and population to renewable energy fuelled by uncertainty and supply chain challenges abroad.

We created the role of head of construction innovation and sustainability, which will be responsible for managing the growth of our parametric, mass timber and renewable energy products. This position will also be responsible for developing and deploying new sustainable product solutions for construction.

We have continued to focus on maximising opportunities and mitigating risks identified through the climate risk assessment 2021. We believe we are well positioned to further develop in these areas in 2023, whilst at the same time embedding net-zero underwriting across our business, in line with the NZIA's target setting protocol released in January 2023.

Portfolio-level climate risk scenario analysis – Investment Management

Proprietary investment portfolio analysis

- Scenarios indicate climate change-related risk to asset valuation would not pose a major risk to our capital position.
- Under the current policies scenario, physical risk is confined to a few sectors and regions (agriculture and tropical areas) where we have limited exposure.
- Under the net-zero 2050 scenario, the aggregated risk is limited, though some businesses would experience a large negative impact on their market valuation.
- In response to carbon risks, we made a long-term commitment to decarbonize our investment portfolio to net-zero greenhouse gas emissions by 2050, consistent with a maximum temperature rise of 1.5˚C above pre-industrial temperatures.

The scenarios, as currently modeled, indicate that climate change-related risk to asset valuation would not pose a major risk to our capital position, either at aggregate portfolio or individual asset class level. This conclusion considers impacts across three major asset classes (listed equities, corporate credit and real estate) covering 36 percent of the investment portfolio, excludes the potential mitigating effect on liability valuation and is made in accordance with our Total Risk Profiling™ methodology. This methodology defines a major risk as a risk that could have a negative impact of at least USD 5 billion on the Group's economic capital position at either aggregate portfolio or individual asset class level.

In the current policies scenario, physical risk is limited over the time horizon of the analysis (2021–2050), with the exception of a few sectors and regions (e.g., agriculture and tropical regions) to which we have limited investment exposure in our listed equity, corporate credit and real estate portfolios.

In the net-zero 2050 scenario, the aggregate impact is also low. This is because transitioning is assumed to be relatively frictionless, without bottlenecks or supply side issues and businesses are assumed to be able to pass on cost increases to customers without negative impact. While some industries and businesses would experience a large negative impact on their market valuations in these scenarios, it would only generate limited aggregate risks.

The impact of climate risk on our sovereign debt exposure has been analyzed independently of other asset classes. The transition risk scenarios (net-zero 2050) are mildly inflationary due to a rising cost of carbon, resulting in slightly higher sovereign bond yields (by around 15 basis points for our investment sovereign bond portfolio) compared with the baseline. In the physical risk scenario (current policies), interest rates are slightly lower (by around 10 basis points) than the baseline due to a small negative effect on economic activity. The corresponding impact on the valuation of the sovereign debt portfolio is limited in all scenarios (less than 1.5 percent in the worst affected transition scenarios).

Given the scale of transformation required, an orderly and smooth transition, such as that described by the net-zero 2050 and delayed transition scenarios, may be difficult to achieve and periods of higher volatility are likely. There remains the potential for significant spill-over effects from the most affected sectors and regions, as well as a potentially positive – but possibly also disruptive – impact stemming from the development of new technology and gains in productivity. As the scenarios highlight, there will also be potentially large divergence across businesses and sectors, with the transition presenting both opportunities and risk.

Listed equities: a closer look

We applied the three scenarios and a third-party model to our global listed equity portfolio in comparison with a broad market benchmark, resulting in similar outcomes as in 2021. The relatively small changes in the overall impact on the value of our global listed equity portfolio (compared with the 2021 Annual Report) arise mainly from changes within the sectors of the portfolios.

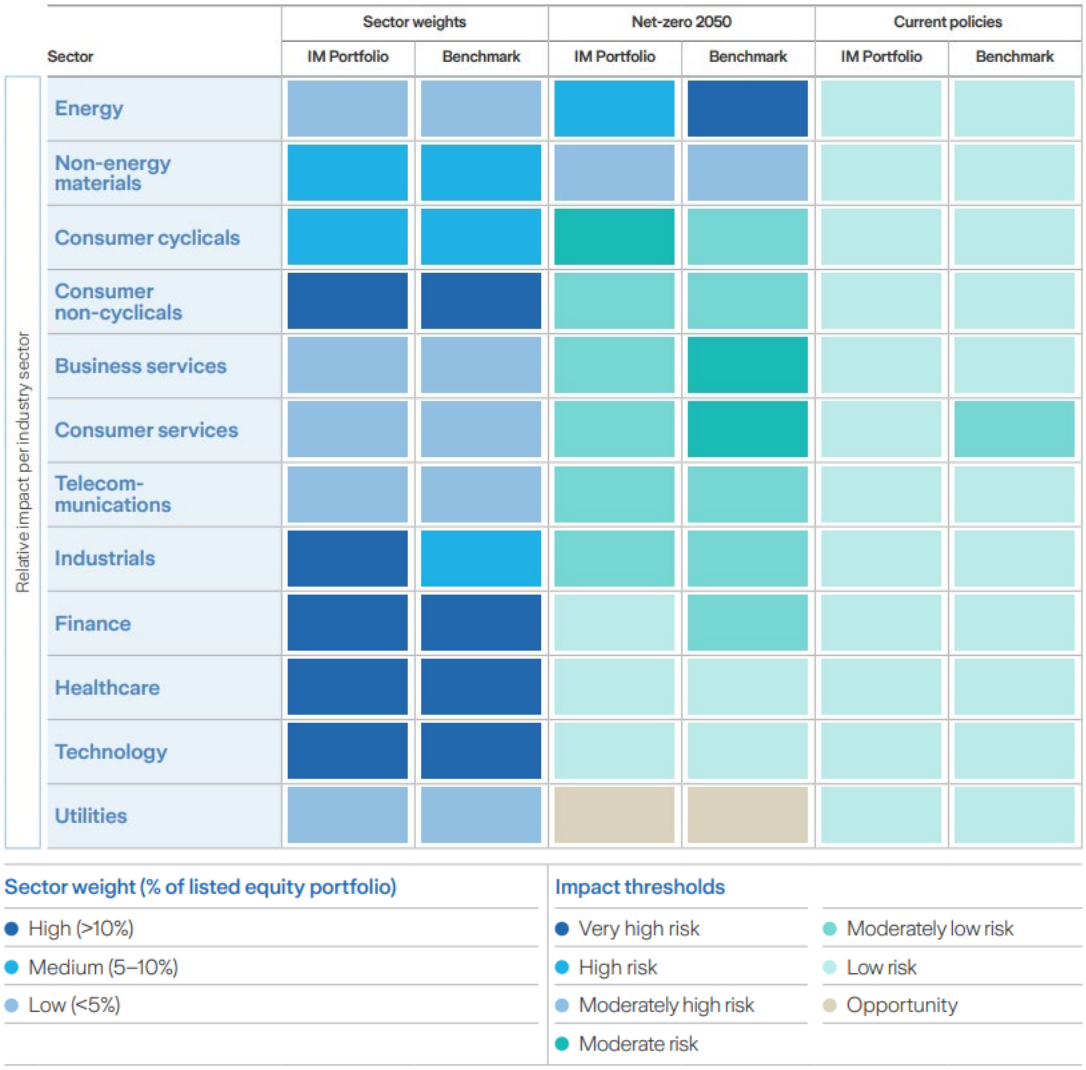
We found transition risk to be material for businesses that operate in carbon-intensive sectors, have relatively high emissions and are less able to absorb, reduce or pass on carbon costs. The climate risk scenario analysis also sheds light on transition opportunities, including those that stem from greening the economy.

In contrast to transition risk, additional physical risk relative to today’s level is estimated to be relatively limited over the time span considered, even in the current policies scenario. This is because it takes time for more significant, additional effects from climate change to materialize. More severe impact will therefore be restricted to a few regions and sectors, such as the agricultural sector and tropical regions, to which we have limited investment exposure across all

asset classes. As shown on the next page, the largest relative impact on the valuation of our global listed equity portfolio is found in the net-zero 2050 scenario. The impact is somewhat higher than in the delayed transition scenario, due to the discounting of future impact and a heavily front-loaded, albeit gradual, rise in the price of carbon. From a financial materiality perspective, we observed only minor impacts to our listed equity portfolio.

Figure 17

Estimated impact on listed equity portfolio across net-zero 2050 and current policies scenarios in comparison to a well-diversified global equity benchmark[1]



The results demonstrate how the relatively higher transition risks to our listed equity portfolio are limited to only a few sectors, including energy, non-energy materials and consumer cyclicals (which includes vehicles). This result is not a reflection of the relative weighting of our book but captures the general impact on the economy, and consequently market pricing, in a transition risk scenario.

By contrast, services sectors, including healthcare and finance but also consumer and business services, see less impact. The relative resilience of services appears reasonable given their limited direct exposures, but there are a few caveats to this result. For the finance sector, only

direct exposure to climate-related risk is considered. Indirect exposure through the valuation of assets and financial interlinkages is not captured. Additionally, if rapid transitioning were to lead to energy scarcity, bottlenecks in the economy and rising costs for energy and materials, this could impact sentiment and demand and have broader effects on the economy, including on the services sector.

The applied model highlights that an early-transition scenario can lead to transition opportunities and risks within industry sectors. Within the energy, utilities and non-energy materials sectors, which experience significant and negative median impacts, the characteristics of individual counterparties also have a strong impact on their exposure to climate risk. In the utilities sector, for example, some utilities experience significant decreases in value, as their high CO2e emissions intensity leaves them in a weak competitive position relative to less emission-intensive rivals, leading to reduced profitability and market share. Other utilities with lower emission intensity benefit from increased electricity demand, higher electricity prices and the opportunity to gain market share at the expense of more emission-intensive rivals. This variance in individual counterparty impacts also occurs in other sectors, including industrials and consumer cyclicals, where median impacts are small.

Overall, the impacts on our global equity portfolio are somewhat smaller than those of a broad market benchmark. This is due to a number of different reasons, including differing sector weights and geographic exposure. Other contributing factors are a different security selection resulting from our long-standing practice of ESG integration as part of our responsible investment approach, as well as our climate-related exclusion screens. Since 2017, we have divested from companies that derive more than 30 percent of their revenues from the mining of, or generate more than 30 percent of electricity from, thermal coal, oil sands and oil shale.

Corporate credit: a closer look

Applying the various scenarios and third-party model to our global corporate credit portfolio in comparison with a broad market benchmark results in a similar distribution of outcomes as those for our listed equity portfolio. The portfolio tends to hold relatively lower risk than the benchmark.

Transition risk is found to be moderate for businesses that operate in carbon-intensive sectors, have relatively high emissions and are less able to absorb, reduce or pass on carbon costs and physical risk. In the physical risk scenario (current policies), the impact is relatively low across all sectors.

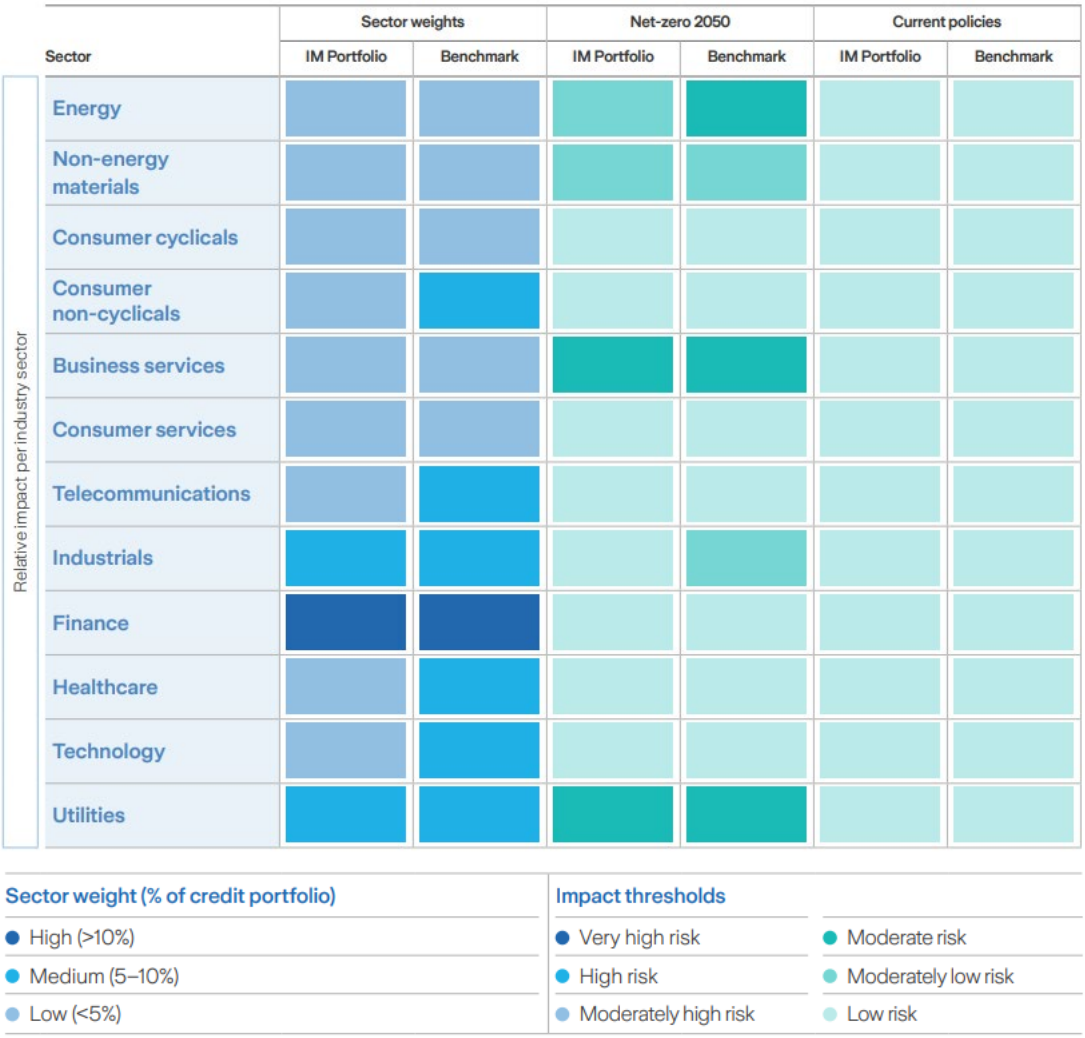
For the most affected sectors, the materially lower impact on corporate credit relative to equity can be explained by the relatively short maturity of the corporate bond portfolio. These bonds tend to experience smaller impacts simply because they mature before the strongest impacts materialize. Risk associated with the refinancing of debt is not considered in the current modeling approach.

In contrast to the listed equity portfolio, the corporate debt portfolio shows a higher diversification and lower exposure to carbon-intensive sectors, and hence has a lower exposure to sectors impacted by climate risk.

While the overall impact of climate risk on our corporate bond portfolio, based on the third-party model we applied, is fairly limited, we nevertheless consider it prudent to take strategic actions as detailed in the section covering our strategic implications.

Figure 18

Estimated impact on corporate bond portfolio across net-zero 2050 and current policies scenarios in comparison to a well-diversified global benchmark[1]



Real Estate: a closer look

The impact from the third-party model on our real estate investments indicates only minor exposure to climate risk. This is confirmed by additional analyses using Zurich's own physical risk models, which cover wind (U.S. tropical cyclone and EU extra-tropical cyclone) and flood (pluvial and fluvial for U.S. und EU) and comprise more than 80 percent of our real estate investments. Zurich's physical risk models will be developed further in 2023 and applied to all

real estate investments. As communicated last year, we piloted transition risk assessments by implementing the Carbon Risk Real Estate Monitor (CRREM) 2 methodology. The ability to use CRREM on a dedicated carbon management platform allows us to monitor, report and mitigate transition risks. More than 80 percent of our real estate investments are in Europe, with an overweight in Switzerland and Germany. Under different climate scenarios, our portfolio is most exposed to rising temperatures in southern Europe. More tenants will rely on electricity to run fans, ventilation and air conditioning systems to stay cool. Retrofitting and constructing smarter and more energy-efficient buildings is therefore a first step to mitigate electricity shortage and higher costs in our properties in Spain, Portugal and Italy.

As an example of ongoing mitigation efforts, in Milan, Italy, we are repositioning a building with 11,000 square meters through renovation. The building is currently undergoing a renovation phase with the aim to receive a gold-level certification from Leadership in Energy and Environmental Design (LEED). The renovation includes modifying part of the envelope and replacing the existing mechanical system to improve performance and efficiency and bring the building in line with the requirements of the Paris Agreement. Carbon intensity can be reduced by more than 50 percent, significantly reducing the risk of stranding this asset.

Recent research has also found that prime office and residential sectors are most exposed to urban heat islands. The most exposed country to a rise in sea levels is the Netherlands.

Our main focus is the rapid decarbonization of our Swiss portfolio, which still uses mostly oil and gas for heating and producing warm water in residential buildings. To transform this portfolio, we have initiated several strategic investment programs to achieve our 2025 emission reduction target. In addition, we are continuing with our energy optimization project in Switzerland. The project, which started in 2014, has already led to a reduction in carbon emissions of more than 20 percent, compared with our 2010 baseline.

Overall, the applied model suggests a manageable level of risk across all scenarios and results in a valuation impact of minor materiality accumulated for listed equity, corporate credit and real estate. The applied model identifies relatively more material risk for exposed sectors where these risks are relatively well understood and an increasing body of climate risk-related ESG research provides ongoing insights. We also believe that an early transition to a climate-neutral economy may provide opportunities in a wider variety of business models and industry sectors than the applied model assumes. Our portfolio continues to be well diversified across sectors and geographies and is managed with an ESG integration lens, which includes information about both climate change risks and opportunities.

Our portfolio is also managed to become net-zero by 2050, with the progressing decarbonization successively shielding it from the companies that are lagging in the transition. The analysis supports various hypotheses: earlieraction scenarios materially increase transition risks, but in turn reduce the long-term impacts of physical risks. Even in a challenging transition risk scenario, the overall negative effect on the listed equity portfolio is moderate and concentrated in sectors that are most CO2e-emission intensive but also play the largest role in actively driving the transition. Emissions in the economy are disproportionally concentrated in a few sectors (utilities, energy, materials, agriculture, forestry and land use) and so, too, are financed emissions

in a global equity portfolio. In our listed equity portfolio, 62 percent of financed emissions in the top emitting sectors (building materials, energy, chemicals and utilities) represent only 12 percent of market value as of 2021. However, in-depth analysis of sectors shows that there are also investment opportunities in these sectors, such as renewable energy producers in utilities.

Overall, the risk appears well diversified, though the portfolio requires ongoing monitoring and active management as risks materialize.

Our strategic response to carbon risks is our long-term commitment to decarbonize our investment portfolio to netzero greenhouse gas emissions by 2050, consistent with a maximum temperature rise of 1.5˚C above pre-industrial temperatures. As a founding member of the Net-Zero Asset Owner Alliance (NZAOA), we have set intermediate investment portfolio targets. The work of the NZAOA is collaborative, uniting global investors, civil society leaders and academics in a collective ambition.

Our priorities include:
– Reducing exposure to coal-based business models.
– Enhancing our systematic approach to investee engagement and policy advocacy.
– Implementing the TCFD recommendations.

While increasing the resilience of our portfolio against transition risks, our decarbonization strategy also contributes to limiting the physical risks showcased in the current policies scenario, which may materialize in our portfolio over the long term. Moreover, our new commitment to invest 5 percent of Group total investments in impact investments, including climate solution investments,2 further underpins our efforts to minimize the long-term impacts of climate change by focusing on proactively deploying capital toward addressing specific, measurable societal and environmental goals.

Portfolio-level climate risk scenario analysis – own Operations

Own Operations
– In 2022, we conducted an additional assessment to consider climate risks for our workforce around the world. The results of this analysis show that remediating strategies currently in force are sufficient to mitigate climate risk.

Physical risk assessment scope and approach

Approach We performed a scenario-based assessment of physical risk using a third-party model and data,[1] with quantification performed for 2030 and 2050.
Scenarios used We conducted an assessment of physical perils to understand exposure level and criticality under two scenarios: net-zero 2050 and delayed transition.
Scope The assessment considered: – Offices supporting more than 250 employees (41 office locations). – All strategic data centers (10 locations). – Supplier locations including those providing critical services to the Group (focusing on the known service locations) and suppliers that together comprise 75 percent of managed procurement spend (346 locations).
Quantification The assessment identified the number of employees or percentage of locations (relative to the overall total) exposed to the qualitative hazard levels for our offices, data centers and supplier locations. The qualitative hazard levels are based on specific physical parameters for each peril and include flood, wind, temperature, drought, hail, wildfire, precipitation, thunderstorms (lightning) and coastal flooding.

In 2021, in an assessment of potential impacts from climate change, we found our operations and processes to be resilient to the observed impacts. These impacts, on a global scale, resemble climate patterns that already exist today.

Existing business resilience activities were determined to manage physical risks well. These activities focus on protecting and recovering critical business assets and resources of a wide-range of existing and developing risks, including those related to the impacts of climate change.

In 2022, we determined the outputs from the 2021 assessment remain valid and conducted an additional assessment to consider climate risks for our distributed workforce. In response to the COVID-19 pandemic, organizations, including Zurich, have adapted their working practices to keep their employees safe, most notably through increased working from home.

Planning for the continuity of critical business services with a hybrid workforce has, in some ways, increased resilience by adopting more remote work practices. But in other ways, this has added to complexity, given the limited control businesses have over dispersed work locations.

Our analysis of potential climate impacts to our distributed workforce considers the following:
– The incident impacts employee homes but the office remains accessible (e.g., localised flooding in an area where a number of employees live).
– The incident impacts both the homes of the employees and access to the office locations (e.g., rolling power outages across an extended region).

To develop new strategies and assess the potential effectiveness of our existing strategies, we assume the following as part of our analysis:
– Most of our employees live within a 70 kilometer radius of a Zurich office location.
– Hybrid working since the COVID-19 pandemic remains the preferred working option with most employees retaining the ability to work from home and in an office.
– The geographic separation provided by this hybrid working model is already a mitigating measure as an event would need to be widescale to impact all employees.
– Most employees are not wholly reliant on public transport.

Our analysis indicates the in-force remediating strategies are suitable, though the evolution of certain perils in certain areas may require the installation of mobile electricity generators in office locations to maintain use of hard- and software in the event of power disruptions.

As part of our ongoing monitoring of climate risk, we considered the changing nature of our supplier landscape which can lead to changes in our physical risk profile. No material changes were observed. Overall, the existing processes remain sufficient to manage risk exposure.

Ongoing activities related to enhancing our resilience capabilities and improving our third-party governance and oversight will continue to support us in identifying and responding to the ongoing impacts of climate change.

Transition risk exposure is limited given the low-carbon intensity of the operations of the insurance sector and our approach to continuously improve the way we manage operational sustainability risks and opportunities.

Further climate risk scenario analysis

Our climate risk assessment includes consideration of both litigation and reputational risks.

Litigation risk: Though not a focus of our scenario analysis, some current litigation drivers were considered in specific areas of our in-depth analysis. None were identified as a material risk driver in the medium term. We closely monitor developments potentially impacting litigation-related risks and take actions to address them proactively.

Reputational risk: Given our ambitions to address the impacts of climate change, we acknowledge we are under higher public scrutiny and any perceived or real failure to live up to our set objectives and targets could have a particularly significant impact on our reputation. To reduce the risk of failing to deliver our targets, we put controls in place and monitor progress through the governance structures described in Chapter 3 of the integrated sustainability disclosure.

We believe strong internal focus on delivery, coupled with public disclosure on progress, mitigates this risk.

Portfolio-level climate risk scenario analysis – conclusion

Our initial scenario-based climate risk assessment has strengthened our understanding of the potential impacts of climate risk on our business. The assessment suggests our customer-focused approach and diversified portfolios, supported by strong risk management practices, provide the resilience and flexibility necessary to be able to adapt to the impacts observed. This has been confirmed by our monitoring of these risks throughout 2022, though we have identified specific areas for further action, mainly in our underwriting and operations. The additional assessments of asset classes in investment management confirms the resilience of our portfolio.

Highly carbon-intensive pockets of our insurance and proprietary investment portfolios experience elevated exposure to transition risk, however we believe our in force thermal coal, oil sands and oil shale exclusion policy allows us to address this exposure whilst aligning with our commitment to a low-carbon future. The adaptive nature of our business resilience program means processes will adapt to changing physical risk profiles ensuring operational resilience.

We caveat these conclusions by acknowledging the hypothetical nature of these scenarios, the uncertainty inherent in scenario modeling over the timeframes considered and the somewhat conservative modeling of physical and transition risk. As the effects of climate change gradually increase over the coming decades, adaptation efforts at the individual, company and state level will increase and provide resilience against expected impacts. This is likely to reduce societal and economic losses, however the details heavily depend on uncertain societal and technological developments. On the other hand, exceeding tipping points, such as accelerated melting of

Antarctic ice sheets or permafrost thawing, could lead to large-scale discontinuities in the global climate systems and accelerate the impacts from physical climate risk. We believe our strategy of continually analyzing changing risk profiles and retaining customer focus gives us the flexibility required to maintain our resilience and continue to meet the needs of our customers as climate-related risk profiles evolve.

Governance

As outlined in the governance section of the ISD (see pages 129 to 130), sustainability, and, therefore, climate-related topics, are integrated into our existing governance structure. We ensure climate change is discussed with our Board and committees where and when required. In 2022, climate risk was discussed at committee and Board level in relation to the update of the Group's Sustainability framework, sustainability reporting in addition to the regular bi-annual update to the GNSC (including a detailed session on the scenario-based climate risk assessment of Underwriting) and more specific climate risk updates (including climate risk within specific regions). Outcomes of scenario-based climate risk assessments and monitoring are considered as part of strategy setting processes. Further information on sustainability risk and its governance is set out in the risk review (see pages 198 to 229).

Risk Management

Integration of climate risk within the overall risk management framework

We consider impacts from climate change to be drivers for other risks, such as market or natural catastrophe risks, which are managed within our existing risk management framework. Our approach to managing climate risk is embedded in our multi-disciplinary, Group-wide risk management framework, following the same objectives of informed and disciplined risk taking. The risk management framework is based on a governance process that sets forth clear responsibilities for taking, managing, monitoring and reporting risks. These responsibilities are:

– To identify, assess, manage, monitor and report risks, including climate change, that can have an impact on the achievement of our strategic objectives, the Group applies a proprietary Total Risk Profiling™ methodology. This medium- to long-term (typically one to three years) assessment considers our planning horizon and allows us to classify risks according to their materiality based on the estimated severity and the likelihood of the risk materializing. Further, it supports the definition and implementation of mitigating actions. At Group level, this is an annual process, followed by regular reviews and updates by management.

– To take the longer-term nature of climate change into account, we complement our Total Risk Profiling™ methodology with portfolio-level scenario analysis of climate risk. This provides an outlook on much longer-term risk developments (up to 10 years and even out to 30 years) relevant to our underwriting and investment portfolios, as outlined in the strategy section (see pages 132 to 153). The details of our risk management framework are outlined in the risk review (see pages 198 to 229).

Managing risks from climate-related natural catastrophes

As outlined in the strategy section (see pages 132 to 153), changes in physical risks related to much longer-term1 impacts of climate change could, over time, impact us through the property-related business via changes in severity and probability of climate-related natural catastrophes. This is, in part, mitigated by the flexible nature of our underwriting portfolio, with contracts that are typically renewed annually. We recognize that there are shorter-term physical risks related to climate change, such as a rise in sea levels, but the science indicates that the greatest changes in physical risks related to climate change will occur over the much longer-term. We have established sophisticated natural catastrophe modeling capabilities to manage our underwriting selection, ensuring accumulations stay within intended exposure limits and assessing the capital requirement due to natural catastrophes. The resulting view of natural catastrophe risk also underpins profitability assessments and strategic capacity allocation and guides the type and quantity of reinsurance we buy. To ensure global consistency, natural catastrophe exposures are modeled in the Group Risk Management function.

Third-party models provide a starting point for the assessment of natural catastrophe risk. However, they are generally built for the market average and need validation and adjustment by specialized teams to reflect the best view of risk. We have been a leader in natural catastrophe model validation since 2005 when we developed our proprietary 'Zurich View' of risk. This gives us nearly two decades of experience in applying a structured and quantitative approach to optimize our risk view. To arrive at the Zurich View, models are adjusted in terms of frequency, severity and event uncertainty.

Adjustment factors address potential losses from non-modeled, property-related exposures or secondary perils to the extent not covered by the third-party models. Every catastrophe event provides an opportunity to learn from our own claims experience and the modeling framework provides a place to capture the new insights. We constantly review and expand the scope and sophistication of our modeling and strive to improve data quality by leveraging technology.

We supplement internal know-how with external knowledge (e.g., the Advisory Council for Catastrophes). We are a shareholder in PERILS AG, Switzerland, a catastrophe exposure and loss data aggregation and estimation firm. We are also a member of the open-source initiative Oasis Loss Modeling Framework.

Catastrophe models based on historical data do not capture potential, much longer-term shifts of extreme weather events related to climate change. However, when combined with general circulation models (GCMs), which build representations of the Earth's physical climate systems, catastrophe models can help us understand the risk of future climate conditions. The quality of GCMs continues to evolve as scientific understanding of the Earth's climate systems increases and as progress is made in computing power and artificial intelligence. This science is evolving, and we have strengthened our catastrophe modeling team with dedicated resources to create methodologies to integrate forwardlooking aspects into our modeling approach.

Portfolio-level, scenario-based climate risk assessment

Assessments of the resilience of our business model to potential climate risks over much longer periods of time are performed using scenario analysis. To ensure a consistent Group view on

potential climate change pathways, scenarios selected for this analysis underpin all assessments Group wide, unless other local regulatory requirements exist. Assessment granularity and timeframes can be tailored to the specific requirements of the assessment. In line with established governance, the ExCo sponsor for Sustainability reviews the outcomes of the climate change scenario analysis, reports key outcomes and agrees actions with the ExCo for Group CEO approval.

The ExCo sponsor for Sustainability reports outcomes and actions to the Board's Governance, Nominations and Sustainability Committee (GNSC). The GNSC makes recommendations to the Board, as required. An integrated modeling approach, leveraging a third-party model, is adopted for the analysis of our underwriting and proprietary investment portfolios to ensure, as much as possible, the consistent use of assumptions. To quantify impacts on Group assets, the model adopts a bottom-up approach to analyze the exposures of businesses and industries to physical and transition risk. To provide a map of vulnerabilities, it uses asset-level data on relevant risk drivers, including carbon emissions, abatement options, exposure to physical risks (including location-based exposure to acute physical risks), exposure to the greening of the economy, dependency on fossil fuels and competitiveness.

The strength of this bottom-up approach is that it provides a coherent framework for analyzing climate change-related risk at the industry and corporate sector level. Given the flexibility of our business model, in both our underwriting and asset portfolios, the static balance sheet approach to scenario-based climate risk assessments is done in the full recognition that the analysis is a theoretical "what if" analysis. It is a useful analysis to stretch management thinking about the much longer-term outlook and to address consistency of disclosures expected through the TCFD framework, but it does not provide insights from an immediate solvency, financial or capacity management perspective.

Data underpinning the assessment of impacts on group assets are used in conjunction with premium and loss data to model impacts on our insurance business in a bespoke process.

Figure 19
Underwriting analysis process

– We adopt a static, balance-sheet approach to better allow for the potential much longer-term impacts of climate change to be isolated. This implies quantified impacts assume no strategic reaction from us to the risks identified, and no movements in pricing to adapt to changing conditions.
– Zurich performed scenario analysis for underwriting using a monitoring review based on 2021 premium data and qualitative review of the scenario-based assumptions on sector growth trends. Scenario analysis for investment management has been performed using year-end 2021 financial data with latest available emissions data (mostly 2020). For our own operations, internal physical risk analysis of proprietary and third-party data was used.
– Modeled impacts of acute physical risks on expected losses are, to every extent possible, based on our own natural catastrophe modeling. We work with a third-party model which enables us to search publicly available hazard data by type of hazard. We will expand our in-house modeling to cover all types of physical risks and this will be included in our own catastrophe modeling results.
– While the bottom-up approach adopted by the underlying model facilitates granular analysis of climate changerelated risk, the model displays characteristics that present a somewhat conservative view of impacts, namely:
    – The assumption of smooth transitioning, as capital moves from carbon-intensive to low-carbon activities without bottlenecks or frictions (e.g., costs are passed to consumers), leads to a muted 'cost of transition', despite a very steep rise in the price of carbon (toward USD 700 per metric tons CO2e).
    – The assumption of perfect information, where action is only taken once new policies are in place, omits an important uncertainty effect.
    – Modeling of physical risk considers three acute hazards (coastal flood, inland flood and tropical cyclones), is location based and does not consider supply chain impacts. This means aggregate estimates of physical risk are somewhat limited.

Metrics and targets

We use numerous indicators across our underwriting and investment activities, as well as our own operations, to monitor, assess and manage climate-related impacts to, and of, our business. This section outlines the main targets underpinning our climate strategy and lists the key performance indicators (KPIs) we track.

Our targets

Outlined below are the principle targets we have set to align our business activities with the goals of the Paris Agreement. In line with the efforts of the NZAOA, we aim to establish, to the extent permissible by applicable laws and regulations, intermediate, science-based targets for our investment portfolio. Those targets are also described in our roadmaps, which provide a transparent picture of our progress toward set targets and positions.

Target	Definition	Target years	Base year
Reduction of financed emissions	Our emission reduction targets cover both listed equity and corporate bond investments as well as direct real estate investments. By 2025, we aim to: – Reduce the intensity of emissions (scope 1 & 2) of listed equity and corporate bond investments by 25%, in terms of metric tons of CO2e per USD million invested. – Reduce the intensity of emissions of direct real estate investments by 30%, in terms of kilograms of CO2e per square meter.	By 2025 (interim) By 2050 (net-zero)	2019
Engagement targets[1]	We strongly believe that simply divesting from companies with carbon-intensive footprints is less effective than engaging with them to drive the shift to sustainable practices. Many of these companies have the knowledge and engineering capabilities required to make a green transition and harnessing this can benefit sustainability goals. – Engage with companies that produce 65% of portfolio emissions and lack targets aligned with the Paris Agreement. – Require these companies to set targets aligned with the Paris Agreement. – Collaborate with asset managers to highlight best practice for climate-conscious active ownership and work together for a just transition. Over a period of at least two years, we will engage with companies directly and through organizations such as Climate Action 100+ and the NZAOA. Should engagement fail and companies refuse to set targets after due dialogue, we will vote against board members at shareholder meetings and where relevant, as a last resort, will divest.	By 2025	2019
Financing the transition[1]	Our targets for financing climate solutions enhance our existing long-term engagement to provide green financing solutions under our impact investing strategy and also counts investments in green certified buildings. – Increase allocation to investments in climate solutions. – Avoid 5 million metric tons of CO2e emissions per year through impact investments. – Contribute to a market environment that enables a growing pipeline of climate solution investments suitable to institutional investors, based on our experience of building a multi-asset class impact portfolio. In 2022, we set ourselves an additional target to allocate 5% of invested assets to impact investments by 2025.	Ongoing	2019
Reduction in operational carbon emissions	Our targets for our own operations[1] against a 2019 baseline as follows: – Total emissions: absolute reduction in all operational emissions of 60% by 2025 (increased from 50%) and 70% by 2029. – Scope 1 & 2: reduction in emissions from the fleet and onsite heating as well as from purchased electricity, heat and steam (e.g., district heating) of 62% by 2025 and 80% by 2029. – Scope 3: reduction in operational emissions resulting from air, rental and rail business travel, employee commuting, strategic data centers, printed paper and waste, as well as indirect energy impacts of 60% by 2025 and 67% by 2029.	By 2025 (interim) By 2029	2019

Our performance metrics

This section highlights the key metrics we use to measure and manage climate-related risks and opportunities. They represent a combination of metrics derived from the SASB and WEF IBC standards expanded with further metrics of our own, in line with guidance on metrics from the TCFD.

As a founding member of the NZIA, we intend to report our insurance-associated emissions and to independently set targets as we move toward net-zero within our underwriting book. Referring

to the agreed methodology to measure insurance-associated emissions, published by the Partnership for Carbon Accounting Financials (PCAF) in November 2022, we have already started to set a baseline using our underwriting portfolio. We are working through the protocols for target setting announced in January by the NZIA to develop our interim targets and reporting thereof.

Our products related to energy efficiency and low-carbon technology, separately priced, amount to USD 155 million of gross written premiums and policy fees in 2022 (USD 121 million in 2021). This is driven mainly by an increase in the number of customers shifting from ICE to EV products across the market. Coupled with the first reporting in 2022 of the approved individual coverage to more exposed individuals solution in occupational accident for truckers and independent service providers.

Underwriting and Investment Management

Our thermal coal, oil sands and oil shale engagement campaign officially ended after a two-year period in June 2021.3 Fifty-five companies were placed on an engagement status of "ongoing," as their transition plans require monitoring. Out of these 55 companies, and as of the 2021 reporting cut off, we did the following to understand their progress against their transition plans:

– Added 5 companies to our exclusion screen as we no longer consider the company's progress against its stated transition plans to be credible.
– Cleared 10 companies, as they were no longer relevant for our policy, due to their decreasing thermal coal businesses.
– For an additional 10 companies the business relationships ended for reasons unrelated to our policy.
– Began monitoring the remaining 30 companies. Though these companies meet the thresholds of our policy, we have elected to maintain ongoing monitoring as they have not explicitly ruled out future increases in use of thermal coal or oil sands. We are now targeting some of these companies under our net-zero engagement campaign.

In line with our thermal coal, oil sands and oil shale policy, we continue to screen new investments and potential customers for involvement in policy-relevant activities. We will not insure or invest in companies that exceed our thresholds and do not have near-term commitments in place to bring themselves below these limits.

As such, companies will be added to our exclusion screen before any business relationship has been established. This will not impact the amount of divestments or phased-out insurance premiums.

Existing customers and investee companies have the potential to become relevant for our exclusion policy through mergers or divestments. We will continue to monitor for such developments using third-party data sources, however we will not separately report on such cases due to their low impact on our portfolio.

Figure 20

Our engagement approach[1]

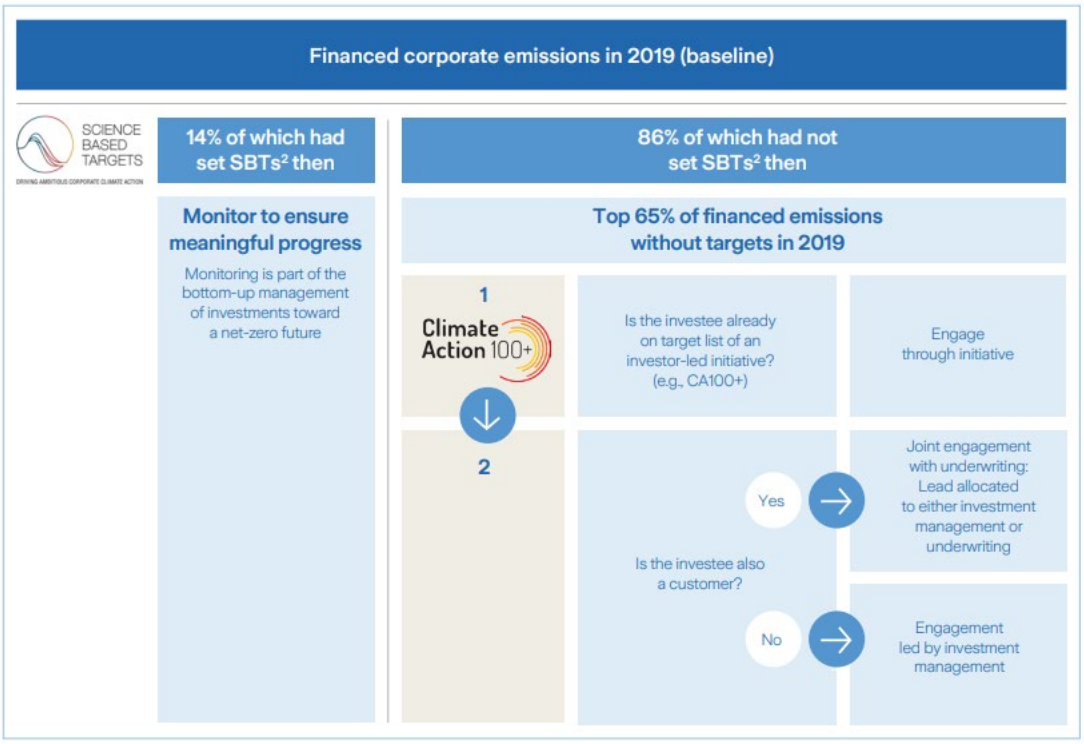


Table 4

Engagement progress

	2022	2021
Engagement started	54%	46%
Engagement not started	11%	19%
= Target	**65%**	**65%**
Started engagements undertaken...		
Collectively	25%	25%
Bilaterally	29%	21%
...with outcome		
Failed[1]	16%	16%
Ongoing	21%	18%
Succeeded[2]	18%	12%

Note: All % corresponding to % of financed emissions in 2019 (baseline) without net-zero targets, cumulative progress since 31.12.2019.

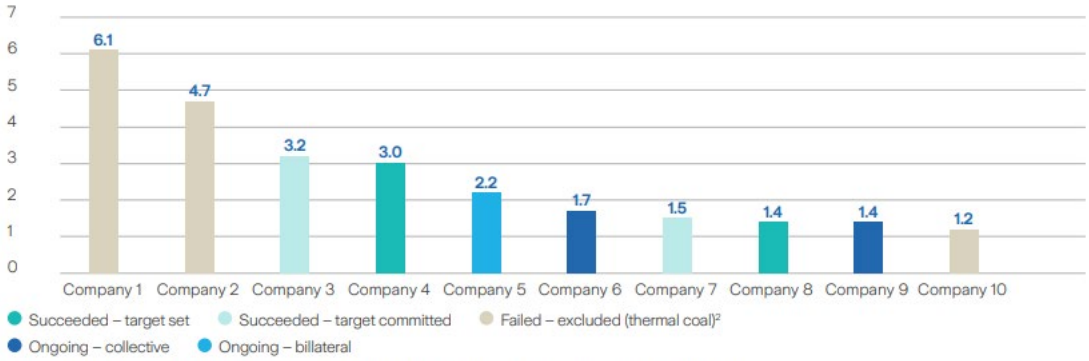
1 Engagement failed under the thermal coal, oil sands and oil shale policy if it became clear the company would neither move under the 30% threshold nor set net-zero targets and was hence excluded; or that a company approached under the net-zero program refuses to set science-based net-zero targets.

2 Engagement succeeded if a company has publicly committed to science-based net-zero targets (under SBTi) or an equivalent scientific verification body.

Figure 21

Engagement progress for top 10 emitters without science-based targets (SBTs)[1,2]

Financed emissions %



1 Company grouping according to Zurich proprietary methodology, which considers ownership and operational control structures.
2 Failed engagement under thermal coal program means the company was added to the restricted list and hence equity exposure was divested and credit exposure put in run-off

Figure 22

Top 10 emitters without science-based targets (SBTs) by sector and region[1]

Top 10 emitters by sector

Utility	68%
Metal and mining	12%
Government owned, no guarantee	14%
Energy	6%

Top 10 emitters by region

EMEA	49%
Americas	5%
APAC	46%

1 Corresponding to financed emissions in 2019 (baseline data).

In 2022, we advanced our bilateral net-zero engagement campaign (as illustrated above in table 4). We focused on companies with heavy emissions to understand the company's current emission intensity and their transition plans. In cases where the company has not yet established such a plan, Zurich will work with the company to set up a transition plan.

In addition to direct company engagement, we also participated in working groups supporting sector and asset manager engagement, bilaterally and as part of the NZAOA asset manager workstream. We contributed to an NZAOA paper outlining how asset owners can engage their asset managers on climate change lobbying. The paper will provide guidelines for the investor community to help them drive greater alignment between the systemic long-term interests of asset owners and the policy engagement and public discourse practices undertaken by Alliance members and their asset managers.

We also engage with our asset managers (individually and as part of the AOA) on topics related to climate change. These can include:
– Asking asset managers to set their own science-based targets.

– Joining the Net-Zero Asset Manager initiative.
– Becoming a signatory to CA100+.
– Making sure asset managers' active ownership policies (proxy voting and engagement) are suitable for managing climate transition risks and are conducive to climate change mitigation and the transition to a climate-neutral economy.

Investment Management

This section presents a progress update on our investment-related targets. Please note that parentheses around percentages or points indicate a reduction.

In 2021, we set intermediate targets for 2025 following the guidance of the AOA for the asset classes of listed equity, corporate bonds and real estate. Since the announcement, we have been working on local objective setting, implementation and data improvements. We have broken down the global portfolio target by local business unit and region. This allows us to capture factors such as local market considerations, sector diversification and past and projected pathways of emissions.

We strongly believe that simply divesting from companies with carbon-intense footprints is less effective than engaging with them to drive the shift to sustainable practices. The findings from our engagement efforts, as described above, will help guide us through portfolio construction and rebalancing actions, benchmark changes and, where relevant and as a last resort, divestments. We aim to reach our targets by phasing out exposures to already restricted names under our thermal coal, oil sands and oil shale policy. Our restricted equity exposure has been divested by the end of 2021 across all local entities (monitored and reviewed periodically), while our corporate credit was either sold or the securities allowed to mature. We are taking portfolio construction actions that allow for potential switches of issuers with a lower CO2e footprint and potential divestments for those cases where no valid transition plans are in place and hence where engagement fails.

Table 5
Assets under Management: corporate portfolio[1]

	In scope AuM 2022 (USDbn)	In scope AuM 2019 (baseline) (USDbn)	Difference (2022 to baseline)
Zurich corporate portfolio	47.7	58.5	(19%)
By investment asset class[2]			
Listed equity	6.4	10.6	(39%)
Corporate bonds	41.2	47.9	(14%)
By region			
APAC	5.0	4.5	12%
EMEA	29.5	38.2	(23%)
Americas	13.2	15.9	(17%)
By sector			
Utilities	4.0	4.4	(9%)
Government-owned company	1.7	2.7	(37%)
Energy	1.9	2.1	(13%)

1 AuM covers companies: listed equities and listed croporate credit.
2 Corporate portfolio has been newly split by listed equity and corporate bond. Prior year data were calculated retrospectively.

Table 6

Absolute and relative emissions of the corporate portfolio[1]

	Absolute emissions			Relative emissions			
	Absolute financed emissions 2022 (million metric tons CO2e)[2]	Absolute financed emissions 2019 (baseline) (million metric tons CO2e)	Difference (2022 to baseline)	Relative emission intensity 2022 (metric tons CO2e/1 million market value)	Relative emission intensity 2019 (baseline) (metric tons CO2e/1 million market value)	Difference (2022 to baseline)	Target
Zurich Corporate Portfolio	5.7	7.9	(29%)	119	136	(12%)	(25%)
By investment asset class							
Listed equity	0.5	1.0	(44%)	84	90	(7%)	
Corporate bonds[3]	5.1	7.0	(26%)	125	146	(15%)	
By region							
APAC	1.3	1.8	(27%)	261	400	(35%)	
EMEA	3.2	4.5	(29%)	108	118	(8%)	
Americas	1.2	1.7	(29%)	89	105	(15%)	
By sector							
Utilities[3]	2.2	2.7	(19%)	547	616	(11%)	
Government-owned company	0.9	1.4	(38%)	518	529	(2%)	
Energy[3]	0.7	0.7	9%	383	305	26%	

1 In order to provide a comprehensive overivew, details incl. prior-year data are shown in the appendix.
2 Financed emissions cover scope 1+2 of underlying companies (listed equities and listed corporate credit) attributed with enterprise value methodology and matched based on most recently available emission data.
3 Emission reporting for Zurich-validated green bonds in the Utility and Energy sectors was refined in 2022 to reflect the nature of the financed projects. Please see the green bond validation methodology in our white paper www.zurich.com/-/media/project/zurich/dotcom/sustainability/docs/responsible-investment-at-zurich

Since 2019, we have achieved a reduction in the emission intensity of –12 percent. Zurich's absolute financed emissions declined over the same period by –29 percent. This reduction in financed emissions was mainly driven by i) disposals and changes in our portfolio and ii) structural emission reductions of our investee companies. We observe a meaningful drop in emissions from companies in run-off under the coal/oil sands policy due to maturing assets but also active portfolio management.

The reduction of 2020 emissions benefited from the effect of the COVID-19 pandemic, which resulted in the largest-ever decline in global emissions. With economic activities picking up again in 2021 global CO2e emissions have rebounded.1 As per our methodology, we use the latest available corporate emission data as of January, when portfolio-level financed emissions are calculated on an annual basis. Hence, we see the effect of higher reported emissions from companies, compared with the emissions data available last year, to calculate the financed emissions per year end. Despite this reversing effect, we still see a reduction of emissions from issuers.

However, the large financial market correction experienced in 2022 caused a percentage-decline in the enterprise values of our investee companies, which exceeded the noted decline in financed emissions. This larger drop in enterprise value adversely impacted our financed emission intensity metric, which uses enterprise value as the denominator. For further details on our methodology, please see the box on page 165.

Previous years have demonstrated the need to consider both absolute and relative indicators when measuring the emission performance of portfolios. Relative indicators are sensitive to changes in company valuation, whereas absolute emissions are sensitive to strategic shifts in asset allocation. In the long run, it remains our view that alignment with the NZAOA

methodology will provide us with a stable and robust metric describing the trajectory our emission reduction pathway.

Table 7
Corporate portfolio with science-based commitments[1]

	% of financed emissions with SBT 2022[1]	% of financed emissions with SBT 2019 (baseline)	Difference (2022 to baseline)	% of financed emissions in run-off under coal/oil sands policy 2022
Zurich Corporate Portfolio	23.3	14.3	63%	8.0
By investment asset class				
Listed equity	25.9	22.6	14%	
Corporate bonds	23.0	13.2	75%	
By region				
APAC	6.5	1.2	462%	31.5
EMEA	35.7	22.9	56%	0.6
Americas	8.2	5.3	57%	1.9
By sector				
Utilities	19.3	14.4	35%	19.6
Government-owned company	27.5	5.4	406%	1.4
Energy	-	-	0%	0.9

1 Committed or set targets under SBTi.

Table 8
Assets under Management: real estate portfolio

	In scope AuM 2021 (USDbn)[1]	In scope AuM 2019 (baseline) (USDbn)	Difference (2021 to baseline)
Zurich global real estate portfolio	11.1	11.7	(5%)
By region[2]			
EMEA	9.4	10.0	(6%)
Americas	1.7	1.7	3%

1 Real estate emissions are only available with a four-quarter lag. Emissions in 2022 will be reported in the 2023 Annual Report. Includes investment portfolio buildings only, as own-use buildings fall under our net-zero program and reporting for our own operations.
2 Direct real estate holdings form the base for the emission reduction targets. There are no applicable figures for the APAC region available.

Table 9
Absolute and relative emissions of the real estate portfolio

	Absolute emissions			Relative emissions			
	Absolute emissions 2021 (metric tons CO2e)[1,2]	Absolute emissions 2019 (baseline) (metric tons CO2e)	Diff (2021 to baseline)	Relative emission intensity 2021 (kg CO2e/sqm)[3]	Relative emission intensity 2019 (baseline) (kg CO2e/sqm)	Diff (2021 to baseline)	Target
Zurich global real estate portfolio[4]	39,362	53,181	(26%)	17.2	21.6	(20%)	(30%)
By region[5]							
EMEA	27,897	41,153	(32%)	18.2	22.9	(21%)	
Americas	11,465	12,028	(5%)	15.3	18.0	(15%)	

1 The CO2 emissions are calculated according to the location-based method. In cases where the data is available or properties use onsite/offsite renewable energies, the market-based methodology is applied.
2 The emission factors are retrieved from the International Energy Agency (IEA, 2020) with exception of Switzerland for local calculation references (Intep, REIDA 2022 and local authorities) which are aligned with IEA.
3 The relative emissions intensity is calculated based on gross floor area (GFA) of the buildings.
4 Real estate emissions are only available with a four-quarter lag. Emissions in 2022 will be reported in the 2023 report. Includes investment portfolio buildings only, as own-use buildings are part of our operational emissions target.
5 Direct real estate holdings form the base for the emission reduction targets. There are no applicable figures for the APAC region available.

For our direct real estate portfolio, we are aiming to reduce our relative emission intensity by 30 percent by 2025, from a 2019 baseline. Our target includes scope 1 and 2 emissions, the so called ‘operational emissions.’1 Since 2019, we have reduced our carbon emissions by 20 percent and are progressing well toward our 2025 target.

Our carbon emissions have decreased by 15.7 percent compared with the results in 2020, even as occupancy levels increased in our buildings due to the easing of COVID-19 restrictions. The decrease was largely due to a higher share of green electricity, which has tripled since 2019, in line with our strategy. We achieved further reductions through energy efficiency initiatives and refurbishment projects.

Absolute emissions

$$\Sigma_{i=1}^{n}\left(\frac{C_i}{EV_i} \times I_i\right)$$

Relative emissions (intensity)

$$\frac{\Sigma_{i=1}^{n}\left(\frac{C_i}{EV_i} \times I_i\right)}{\Sigma_{i=1}^{n} I_i}$$

Key

I: Current value of investment on issuer i

EV: Enterprise value of issuer i

C: Carbon emissions* of issuer i

* Carbon emissions = scope 1 and scope 2 emissions

Emission reduction target-setting methodology and scope

Following the release of the NZAOA protocol, we announced our initial set of interim (2025) targets in March 2021. The targets cover the following:

- Listed equity, listed corporate debt and direct real estate.
- Thirty-six percent of our assets under management in the baseline year of 2019.

We chose to calculate corporate-financed emissions and the resulting relative emissions intensity using the protocol's preferred approach, which is based on enterprise value, not revenue.

While a revenue-based carbon intensity measure is a good way to compare companies based on their size and underlying technology, NZAOA members believe the enterprise value approach is a better way to convert a corporation's operational emissions (scope 1+2) into the "financed emissions." This can be attributed to a company's underlying equity and/or debt investors, who are ready to take additional responsibility for these emissions. To calculate corporate financed emissions, we use the following methodology:

- Scope 1+2 emissions in line with the GHG protocol are provided by S&P Trucost.
- Enterprise value is defined as the sum of market capitalization of common stock at fiscal year end, the market capitalization of preferred equity at fiscal year end, and the book values of debt and minorities' interests minus the cash and cash equivalents held by the enterprise. When enterprise value is not available (for example for financial companies) it is substituted with market capitalization. Enterprise value data is provided by S&P Trucost.

Market value is defined as the market value of listed equities and listed corporate debt at fiscal year end.

While all financial data (enterprise value and market value) is calculated as of December 31 of the reporting year, we use the latest available corporate emission data available as of January each year, when portfolio-level financed emissions are calculated on an annual basis. This means that emissions data is systematically lagging. For example, financed emissions for 2022 will be largely based on full-year 2021 emissions data, as full-year 2022 emissions data will only be made available by investees in H1 2024, and tends to flow to data providers via CDP submissions in the fourth quarter of a given year.

To increase transparency and improve the quality of our portfolio, we are aiming to increase the share of green certified buildings in our global real estate portfolio to 30 percent by 2025. We are also working on enhancing the completeness of our data and reported a coverage ratio1 of 65 percent for 2021.

Table 10
Green certified buildings[1]

	% green certified buildings 2022	% green certified buildings 2021	% green certified buildings 2020	% green certified buildings 2019	Target 2025
Zurich Global Real Estate Portfolio[1]	25%	19%	22%	25%	30%
APAC	0%	-	-	-	
EMEA	27%	20%	23%	28%	
Americas	17%	19%	18%	17%	

1 Market-value weighted and based on balance sheet investments, incl. buildings used by Zurich.

As a founding member of the NZAOA, we apply the NZAOA methodology to listed equity, corporate bonds and direct real estate. Given the importance of sovereign debt for institutional investors, we are currently working with the NZAOA to develop a methodology that allows targets to be expanded to sovereign debt.

Climate solutions are investments in economic activities that contribute substantially to climate change mitigation or adaptation. These are solutions that reduce greenhouse gases by avoiding emissions and/or by sequestering carbon dioxide already in the atmosphere. Further examples of solutions include investments in climate change adaptation that contribute to enhancing adaptive capacity, strengthen resilience and reduce vulnerability to climate change.

Our targets for financing climate solutions enhance our existing long-term engagement to provide green financing solutions under our impact investing strategy and also counts investments in green certified buildings. For further information on our impact investment approach.

Table 11
Financing the transition 2022

	2022	2021	2020	2019 (baseline)	Diff (to baseline)	Target
Climate solution investments (USDm)	8,675	8,203	8,054	7,408	17.1%	upward trend
of which green impact investments[1]	4,640	5,115	4,424	3,662	26.7%	
of which green certified buildings[2,3]	4,035	3,088	3,631	3,747	7.7%	
Million metric tons CO2e avoided through climate-related impact investments[4]	3.2	4.6	2.9	2.8	13.1%	5

1 Values refer to the environmental share of Zurich's impact investments displayed in table 13: Impact investing portfolio.
2 Green certified buildings based on balance sheet investments, incl. buildings used by Zurich.
3 Values refer to the share of green certified buildings of Zurich's global real estate portfolio displayed in table 10: Green certified buildings.
4 Impact numbers for 2021 and following include methodology upgrade, as explained in Zurich's impact measurement methodology paper: www.zurich.com/-/media/project/zurich/dotcom/sustainability/docs/zurich-impact-measurement-framework.pdf

The following section shows the progress we have made with our responsible investment strategy in 2022 and over the last six years.

Our responsible investment strategy is aimed at successfully managing Zurich's proprietary investment assets, while mitigating costs to the environment and delivering benefits to society. Our strategy is based on three pillars:
– ESG integration: integrate ESG factors into the investment process – across asset classes and alongside traditional financial metrics while generating superior risk-adjusted, long-term financial returns.

– Impact investing: build an impact investing portfolio that makes a positive contribution to the environment and society, to improve the lives of 5 million people and to help avoid the emission of 5 million metric tons of CO2e per year.
– Advancing together: make responsible investment mainstream through collaborative engagement with other industry participants and engaging with policy makers to build markets in which ESG risk is priced efficiently and decarbonization is incentivized.

In 2022, we committed to allocating 5 percent of our proprietary assets to impact investments by 2025. Zurich evaluates impact investments within the context of specific asset classes and creates dedicated strategies for impact investments for each class. We continue to grow our existing global impact investment portfolio and evaluate new prospective opportunities across asset classes to broaden our approach.

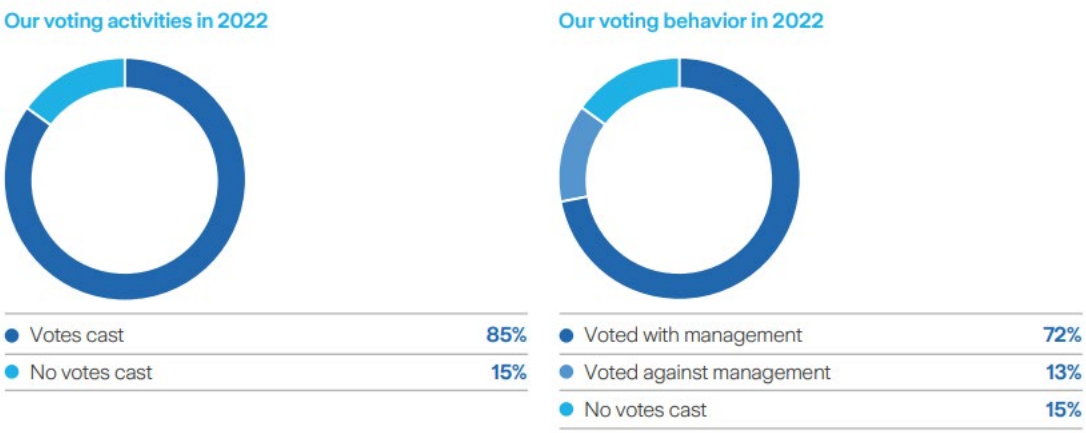
Table 12
Investment portfolio managed by responsible investors

	2022	2021	Change	2020	2019	2018
Assets managed by responsible investor[1]	99.6%	99.6%	0pts	99.6%	98.2%	97.5%
Total amount of impact investments (USD millions)	6,328	7,037	(10%)	5,770	4,555	3,790
% of investment portfolio	3.8%	3.3%	13ppts	2.5%	2.2%	1.9%
Investment portfolio (USD millions)[2]	168,478	211,334	(20%)	226,389	204,803	195,472

1 A United Nations supported PRI signatory or asset manager that fulfills our minimum requirements for ESG integration. Please see our responsible investment white paper: www.zurich.com/-/media/project/zurich/dotcom/sustainability/docs/responsible-investment-at-zurich
2 Investment portfolio is calculated on a market basis, and is different from the total Group investments reported in the consolidated financial statements, which is calculated on an accounting basis and doesn't include cash and cash equivalents.

As part of our active ownership strategy, we require all our managers for listed equities to exercise their voting rights on directly held equities. For our in-house asset management, we ensure that outcomes of engagements are linked to the proxy voting process to form a consistent active-ownership approach. This means that where engagement as part of our net-zero program fails and companies refuse to set targets after due dialogue, we will vote against board members at shareholder meetings.

Figure 23
Proxy voting 2022



In 2022, we voted 85 percent of our in-scope equity. Close to 80 percent of our equity investments are in scope for proxy voting, please see proxy voting policy for further details. The share of voted equity remains stable when compared to 2021, reflecting last year's successful full

roll out of proxy voting to Zurich's externally managed equity portfolios. We measure the votes we cast based on assets under management. Reasons for votes not cast are a combination of portfolio turnover, cost/benefit considerations and voting restrictions (such as demands to vote in person, share blocking or requirements that increase the cost of voting).

Impact investments are investment opportunities that allow us to intentionally target a specific and measurable social or environmental impact. Zurich has set a target to help avoid 5 million metric tons of CO2-equivalent emissions per year, and, separately, make a positive contribution to the lives and livelihoods of 5 million people through its impact investing portfolio. We also committed to investing 5 percent of our proprietary investment portfolio to impact investments by 2025, which will help grow our allocation to climate solutions and investments benefiting society.

We are proud that our impact investment approach won three awards in 2022, recognizing our thought leadership as institutional investor in this area.

Environmental Finance Bond Awards 2022 Winner Investor of the year (asset owner)

Environmental Finance Sustainable Investment Awards 2022 Winner Re/insurer of the year

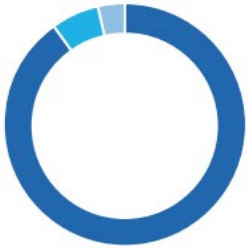
Environmental Finance IMPACT Awards 2022 Winner Re/insurer of the year

In 2022, our impact investing portfolio of USD 6.3 billion helped avoid a total of 3.2 million metric tons of CO2e emissions and benefited 4.7 million people.

Figure 24

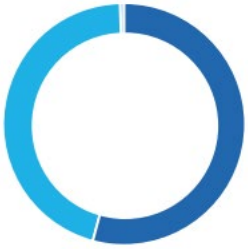
Impact metrics

3.2 million metric tons CO2e emissions avoided



Green, Social and Sustainability bonds	90.1%
Impact private equity	6.4%
Impact infrastructure private debt	3.5%

4.7 million people benefited by positive contribution to the lives and livelihoods



Green, Social and Sustainability bonds	54.4%
Impact private equity	45.3%
Impact infrastructure private debt	0.2%

Table 13
Impact investing portfolio

	2022	2021	Change	2019	2018	2017
Total amount of impact investments (USD millions)	6,328	7,037	(10%)	4,555	3,790	2,830
Total amount of impact investments – environmental share	73%	73%	–	–	–	–
Total amount of impact investments – social share	27%	27%	–	–	–	–
Green, social & sustainability bonds (USD millions)	5,247	5,846	(10%)	3,645	3,104	2,714
Impact private equity (USD millions)	213	211	1%	163	145	116
Impact infrastructure private debt (USD millions)	867	980	(12%)	747	540	–

Responsible investment will only truly have an impact if financial market participants advance together to take this approach mainstream. Supporting collaborative initiatives and working together with other industry participants to advance responsible investment practices forms an integral part of our approach. We have signed the UN-backed PRI as well as the Principles for Sustainable Insurance (PSI) and collaborate with several industry initiatives and research bodies. Most notably, we are a founding member of the NZAOA, as well as the Investor's Leaders Group (ILG), facilitated by the Cambridge Institute for Sustainability Leadership. We co-chaired the Executive Committee of the Green and Social Bond Principles for the first six years after its formation and represent asset owners on the Advisory Board of the Operating Principles for Impact Management. In 2022, we actively participated in 20 membership organizations. Our colleagues spoke about responsible investment at 24 conferences and other industry events around the globe.

Own Operations

Please see the table below for progress on Group targets for our own operations against a 2019 baseline. Please note that parentheses around percentages or points indicate a reduction.

The Group has set the following targets for its operations against a 2019 baseline:

Table 14

Absolute carbon emissions coming from our own operations[1,2]

Key performance indicator	Unit of measurement	2021	2020	2019 (base year)[1]	2021 change relative to base year	Target reduction 2025	Target reduction 2029
Absolute carbon emissions Absolute reduction in all operational emissions	CO2e (metric tons)	48,555	72,027	180,805	(73%)[2]	60%	70%
Scope 1 + 2 emissions Reduction in emissions from the fleet and onsite heating as well as from purchased electricity, heat and steam (e.g., district heating)	CO2e (metric tons)	21,424	28,262	48,290	(56%)[2]	62%	80%
Scope 3 emissions Reduction in operational emissions resulting from air, rental and rail business travel, employee commuting, strategic data centers, printed paper and waste, as well as indirect energy impact	CO2e (metric tons)	27,131	43,766	132,515	(80%)[2]	60%	67%

1 Cover-More, Farmers Group, Inc. and its subsidiaries, joint ventures and third party vendors are out of scope.
2 During the annual audit of our environmental data 2021 performed in the first half of 2022, a number of data quality improvement opportunities were revealed. Therefore the 2021 results also include restated 2019 and 2020 data.

For details please see: www.zurich.com/sustainability/planet/net-zero-in-operations

In 2021, carbon emissions have continued on a downward trend, extending our overperformance against future targets. This is largely due to the full-year impact of the COVID-19 pandemic and the resulting lockdowns and travel bans. Commuting emissions are the largest source of emissions for Zurich. Commuting data was collected from an all employee global survey conducted in 2020, to understand 2019 commuting behavior. As employees continue to work partly from home, we have once again applied assumptions to the 2019 results. An additional survey was not warranted. Air travel, as the second-largest contributor to Zurich's emissions, has shown real reductions of 91 percent. With our ambition to keep air travel 70 percent below pre-pandemic levels, we intend to maintain the majority of these real reductions in 2022 and onwards even as restrictions on travel from the pandemic are lifted. Fleet emissions declined compared with 2019, in line with a reduction in overall distances travelled and due in part to the transition to more sustainable vehicles.

The most notable emissions reductions unrelated to the COVID-19 pandemic are attributed to progress made with purchasing more renewable power. We have increased the share of renewable power we use to 98 percent in 2021, nearing our 2022 goal of 100 percent.

In 2022, we restated 2019 and 2020 data to try to close coverage gaps and address the findings of the reasonable assurance audit. During the assurance audit on our 2021 data, we agreed, together with the auditors, to make improvements to the quality of a number of data points that only became available after the reporting period closed for the previous year. We focused on solutions to address data in a material manner, however we looked at materiality from a global perspective, from individual emissions categories and from a country perspective. We also found and addressed a system error in the calculation of 2019 commuting emissions. This resulted in an increase to our global base year emissions of approximately 10 percent.