Insurer Climate Risk Disclosure Survey for Reporting Year 2021

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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4. Our planet: Drive positive impact

Linda Freiner
Group Head of Sustainability

Climate change is perhaps the most complex risk facing society today. It is intergenerational, international, and interdependent. We strive to be a leader in helping the world better manage climate risk and improve resilience to the adverse consequences of climate change.

Significant reductions in greenhouse gas emissions are required to achieve the outcomes of the Paris Agreement, with current political will as demonstrated in COP26 falling short of what is required to achieve a 1.5°C future. Through engagement and collaboration with our stakeholders, we remain committed to aligning our underwriting activities, our investment activities and our own operations with a 1.5°C future. The risks and opportunities associated with climate change affect our products, services, and operations. Understanding, measuring, and managing these impacts – while seizing the opportunities that arise from the transition to a climate-neutral world – is important to sustainable value creation for all our stakeholders.

TCFD This section presents our disclosure in line with the recommendations of the Financial Stability Board's Taskforce on Climate-related Financial Disclosure (TCFD). It outlines our understanding of potential climate risk impacts to our insurance 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 forms the focal point of this section, we are dedicated to environmental aspects in a broader sense.

Read more about our broader approach to sustainability
in our Sustainability Report 2021[1] and on www.zurich.com/sustainability

Our goals

1. **Setting ambitious science-based CO2e reduction targets**
2. **Innovating for sustainable solutions**
3. **Deeply understanding and integrating climate risk into the way we conduct business**

1. Setting ambitious science-based CO2e reduction targets

We became a founding member of the Net-Zero Insurance Alliance (NZIA)[2] in 2021 and in doing so, committed to individually transition our underwriting portfolios to net-zero GHG emissions by 2050.

Further, we announced interim 2025 climate targets for investments and operations to curb emissions in line with the Paris Agreement ambition to limit global warming to 1.5°C.

Our achievements in 2021:

–21%
reduction in corporate financed emission intensity (vs. 2019 baseline)

4.6m tCO2e
avoided through USD 5.1bn in climate-related impact investments

–6%
reduction real estate emission intensity (vs. 2019 baseline)[3]

USD 8.2bn
investments in climate solutions

–59%
(not: reductions) in operational emissions (vs. 2019 baseline)[3]

2. Innovating for sustainable solutions

We continued to provide sustainable solutions to our customers to enhance resilience and advocate for solutions to prevent or minimize damage and harm from climate-related perils. We continued to focus on the development of insurance and risk management solutions for new technologies, business models and approaches that are needed to achieve a climate-neutral economy.

Additionally, we have defined internal criteria[4] for sustainable solutions (products and services) based on environmental and social features.

USD 289m
associated with sustainable solutions meeting our stringent criteria

1 www.zurich.com/en/sustainability/reporting-and-news/reports-publications
2 www.unepfi.org/net-zero-insurance/
3 In 2020.
4 For a thorough definition, see the metrics and targets section, pages 157 to 158.

4. Our planet: Drive positive impact (continued)

3. Deeply understanding and integrating climate risk into the way we conduct business

We progressed in our efforts to develop a deeper understanding of potential climate risk impacts to our business by performing our first portfolio-level scenario-based climate risk assessment.

This exploratory exercise considered all aspects of our business, including underwriting, investment and our own operations.

The assessment suggests our customer-focused approach and diversified portfolios, supported by strong risk management practices, provide the resilience and flexibility to adapt to the impacts observed.

4.1 Strategy

TCFD “The actual and potential impacts of climate-related risks and opportunities on the organization’s businesses, strategy and financial planning.

Our three-pillar climate strategy is reflected across our organization and reinforces our move in 2019 to become the first insurer to sign the Business Ambition for 1.5°C commitment[1]. 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 available to accelerate this transition.

4.1.1 Our climate-related strategy

1. Setting ambitious science-based CO2e reduction targets

Aligning our business practices with the outcomes of the Paris Agreement is critical to delivering the low-carbon transition and achieving a 1.5°C future. Ambitious science-based targets are a key element of our climate strategy in recognition of the pivotal role they play in this effort.

Climate targets for our underwriting portfolio

Climate targets for our investment portfolio

Climate targets for our own operations

Climate targets for our underwriting portfolio

We are a founding member of the NZIA and, as such, have committed to:

– Transition all operational and attributable greenhouse gas (GHG) emissions[2] from our insurance and reinsurance underwriting portfolios to net-zero emissions by 2050.
– Establish, to the extent permissible by applicable laws and regulations, our intermediate, science-based targets every five years in line with Article 4.9 of the Paris Agreement.

Climate targets for our investment portfolio

As a founding member of the Net-Zero Asset Owner Alliance (NZAOA)[3], we are on a journey to holding a net-zero investment portfolio by 2050 and in 2021, set interim targets based on the NZAOA Protocol’s recommendations. Our roadmap to achieve these targets includes:

– Reducing emissions of our portfolio by 2025 both for listed equity and corporate bond investments by 25 percent in terms of tons of CO2e per million USD invested, as well as direct real estate investments by 30 percent in terms of kg of CO2e per square meter.
– Engagement with companies to promote change toward sustainable practices and aligning their business to the Paris Agreement.
– Direct investment in climate solutions (impact investment and green real estate).

Read about our targets and progress
in the metrics and targets section, pages 160 to 166

Climate targets for our own operations

While the Group’s operations have been carbon neutral since 2014, we announced further greenhouse gas emissions reduction targets in 2021:

– 50 percent by 2025 against a 2019 baseline.
– 70 percent by 2029 against a 2019 baseline.

Read about our progress
in the metrics and targets section, page 166

1 UN Global Compact – Business Ambition for 1.5°C: www.unglobalcompact.org/take-action/events/climate-action-summit-2019/business-ambition
2 GHG emissions here refers to insurers’ and reinsurers’ scope 1, 2 and 3 emissions. Insurers’ and reinsurers’ scope 3 emissions should include their customers’ scope 1 and 2 and scope 3 emissions, where significant, and where data allows.
3 www.unepfi.org/net-zero-alliance/resources/alliance-2025-target-setting-protocol/

4. Our planet: Drive positive impact (continued)

2. Innovating for sustainable solutions

We believe insurance is key to facilitating the change required to achieve the low-carbon transition. We work with customers and collaborate with public and private organizations to enhance resilience and advocate for solutions to prevent or minimize damage and harm from climate-related perils. We develop insurance and risk management solutions for new technologies, business models and approaches that are needed to achieve a climate-neutral economy. We also use capital markets to search for and fund solutions to many pressing social or environmental issues. We apply our leading impact investing approach to build a portfolio of green impact investments that helps avoid five million tons of CO2e per year. We are working with the NZAOA to increase the pipeline of investment opportunities in climate solutions that are suitable for institutional investors.

Unit-linked sustainability solutions

We launched a set of innovative unit-linked sustainability solutions that leverage our responsible investment expertise for the benefit of our unit-linked customers. For example, we launched an industry-first Carbon Neutral World Equity Fund[1] that combines a low-carbon investment strategy with carbon offsetting. The fund is available in Germany, Italy, Portugal and Switzerland, with rollout to additional markets expected in 2022.

Read more about our unit-linked funds
in our Sustainability Report 2021[2], section Customer

Climate risk solutions

To enhance our customers' ability to manage transition risk, we have strengthened our support for renewable energy through the addition of specialist roles within the organization to help manage and develop risk positions. This will help ensure we maintain a balanced portfolio, keeping in mind the potential for higher risks associated with renewable energy construction projects.

We have expanded our existing natural hazards risk advisory service to address customers' physical climate change risks. As part of our Climate Change Resilience Services (CCRS)[3], a dedicated team of climate risk experts helps businesses better understand how climate change risk may affect their operations, strategy, and financial position and ultimately strengthen their resilience to climate risks.

Read more about our CCRS
in our Sustainability Report 2021[2], section Customer

Measuring sustainable solutions based on an internal definition

In 2021, we established an internal definition of sustainable solutions and measured their associated revenue for the first time. Those stringent criteria have been thoroughly assessed through an internal process to be qualified as sustainable solutions. Meeting those criteria are also a pre-requisite to promoting a product as sustainable.

Read more about our definition and progress
in the metrics and targets section, pages 157 to 158

Fostering internal innovation

To foster innovative thinking internally, we set up a community of practice focusing on knowledge sharing and the development of customer-facing solutions to support the transition (mobility, green consumerism, energy, carbon and sustainable infrastructure). We encourage our workforce to engage in efforts to reduce our operational footprint and in 2021 established an internal carbon fund to support this objective. Governed by the SLC, this fund supports the implementation of initiatives proposed by employees and intended to address operational emissions and ensure our continued carbon neutrality. Our internal carbon price – set at USD 15 per ton in 2021 – is subject to annual increase.

Read more about our carbon fund
in our Sustainability Report 2021[2], section Planet

1 www.zurich.com/media/news-releases/2021/2021-0907-01
2 www.zurich.com/en/sustainability/reporting-and-news/reports-publications
3 www.zurich.com/products-and-services/protect-your-business/risk-engineering/climate-change-resilience-services

4. Our planet: Drive positive impact (continued)

3. Deeply understanding and integrating climate risk into the way we conduct business

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

Natural catastrophe modeling

To manage our climate risks more effectively, we are investing to improve our understanding of them, with modeling the effects of physical risk on our portfolios as a key focus area. While climate change models are constantly improving, they remain less accurate at the smaller spatial resolutions needed for a detailed analysis of the impact of natural catastrophe changes 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 Zurich view framework with a view of climate change, and to integrate this view into our accumulation risk and peril-region modeling.

Read more about natural catastrophe modeling
in the managing risks from climate-related natural catastrophes section, page 155

Portfolio-level climate risk scenario analysis

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 employ scenario analysis at the portfolio level to develop such an understanding. Our first exploratory scenario-based climate risk assessment, performed in 2021, considered outcomes from 2030 onward, with impacts quantified where possible. Outcomes of this analysis are used to determine appropriate responses and ensure the resilience of our strategy.

We view disclosure of the outcomes of these processes in line with the TCFD recommendations as a critical proof point to demonstrate our understanding and management of this risk.

Read more about the outcomes of our first scenario-based climate risk assessment
in the climate risk assessment 2021 section, pages 144 to 152

Read more about how we have integrated scenario analysis into our risk management processes
in the portfolio-level scenario-based climate risk assessment section, pages 153 to 154

4. Our planet: Drive positive impact (continued)

Climate action as part of our broader responsible investment strategy

As the ownership and management of assets carries broad responsibilities, we have established our responsible investment approach which goes beyond climate risk. It integrates environmental and social factors in addition to financial considerations for the assessment of performance. Accordingly, our climate-related strategy must be understood as feeding into a broader sustainable approach to investment management.

Our responsible investment approach as an asset owner and manager

Responsible investment can mean different things to different people. We have primarily chosen to pursue it in three ways:

– ESG integration: Besides examining financial performance, we also assess environmental, social and governance (ESG) factors when analyzing individual investments and investment managers. We consider these sustainability risks and opportunities when we decide whether to buy or sell assets.

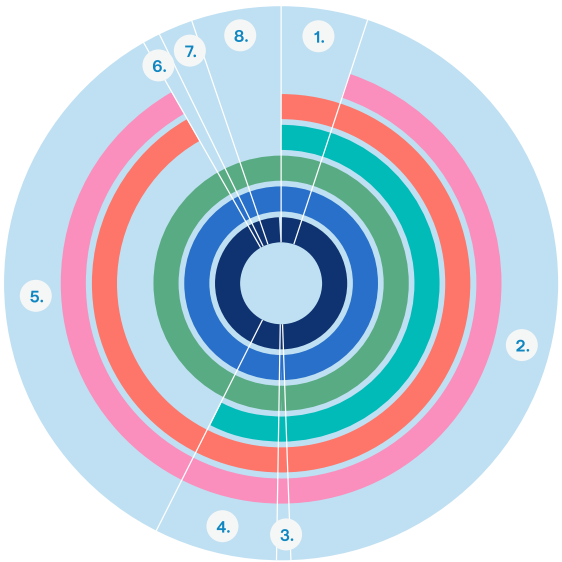
– Impact investing: We fund institutions or projects that, while generating a safe, adequate return on our premiums, also generate targeted and measurable positive environmental or social impacts. More specifically, we are aiming to build an impact investment portfolio that helps avoid 5 million metric tons of CO2 equivalent emissions and benefits 5 million people every year.

– Advancing together: Responsible investing is becoming more sophisticated. We are glad to play a leadership role in developing new and innovative ways to measure impact, scale sustainable investment markets and practices with integrity, and promote climate action – working together with a broad group of stakeholders.

We apply a holistic responsible investment strategy across all our investments. Our three main ways of managing our portfolio responsibly, as described above, are supported by a variety of other technical approaches such as active ownership, selective exclusion screens and a net-zero by 2050 decarbonization target. This enables us to apply the appropriate responsible investment approach to each individual asset class. In 2021, nearly all of our own assets were managed by a signatory to the Principles for Responsible Investment (PRI) or asset managers meeting our requirements for responsible investment, giving us confidence that these assets are managed in line with our strategy. We also believe that we can achieve the best outcomes when we specify the responsible investment management approach used on an asset class level.

As the graph below illustrates, every asset class is covered by at least one element of our responsible investment approach. The graph is a simplified visualization of our holistic responsible investment strategy, comprising a variety of tools we match with the asset classes where they have the most practical influence.

Figure 8:
Our holistic responsible investment approach



Investment approach

- Managed by a responsible investor*
- Net-zero 2050 target
- Exclusion screens
- ESG integration
- Active ownership
- Impact investing

Asset class

1. Equities
2. Credit, private debt
3. Private equity
4. Real estate
5. Government and government-guaranteed
6. Hedge funds
7. Mortgages
8. Cash

* Signatory to the PRI or fulfilling Zurich minimum requirements.

Read more about our holistic approach to responsible investment on our website[1]

1 www.zurich.com/sustainability/responsible-investment

4. Our planet: Drive positive impact (continued)

Climate-related investment approach

As part of our responsible investment strategy, we have designed a proactive and holistic approach to deal with climate change-related risks and opportunities that is based on action in eight strategic areas.

Net-zero portfolio by 2050

We are dedicated to transition our investment portfolios to net-zero greenhouse gas emissions by 2050, consistent with a maximum temperature rise of 1.5°C above pre-industrial temperatures, taking into account the best available scientific knowledge. Science-based interim targets for 2025 have been set for listed equity, corporate debt and real estate. Additional asset classes will be added as methodologies become available.

Read about our progress in the metrics and targets section, pages 162 to 164

Scenarios

It is hard to take action without context. Scenario analysis is conducted using an integrated modeling approach for both investment management and underwriting portfolios to ensure that, to every extent possible, assumptions are used consistently across both portfolios. In addition, our Market Strategy and Macroeconomics team has defined high-level scenarios and is monitoring developments with the help of a scorecard that is updated regularly.

Read more about the outcomes of our first scenario-based climate risk assessment in the climate risk assessment 2021 section, pages 144 to 152

Strengthen ESG integration

Given its complexity and long-term nature, climate change represents a particular challenge for ESG integration. We will constantly evaluate additional data and tools to raise awareness among investment professionals and to support integration in investment strategies.

Read more about ESG integration on our website[1]

Benchmarks

ESG integration practices for passive investment portfolios can only be managed through benchmark adaptations. We launched a first pilot on policyholder money in the UK, where we use a customized benchmark that incorporates a climate risk assessment. We will evaluate the application of such benchmarks for new and existing portfolios on a case-by-case basis.

Finance the transition to a climate-neutral economy

As part of our ongoing commitment to impact investing and our target to help avoid the emission of 5 million tons of CO2e per year, we will evaluate climate solution investments (impact investments and green real estate) across different asset classes on an ongoing basis.

Read about our progress in the metrics and targets section, page 164

Drive change through advocacy

Public and private sectors need to take decisive action. We have defined clear positions on topics such as transparent risk disclosure, carbon pricing, etc.

Read about our progress in the metrics and targets section, page 166

Engagement

As part of engaging with the companies in which we invest, climate change is reflected on the agenda of our bottom-up engagement approach. In addition, we drive a top-down climate engagement campaign for net-zero target setting, and consider climate change in voting actions.

Read about our progress in the metrics and targets section, pages 160 to 161

Selective exclusions

Recognizing the particularly harmful impact of coal on the climate, we have developed a Group approach on selectively excluding from our underwriting and investment activities companies related to the mining of, or electricity generation from, thermal coal, oil sands and oil shale.

Read more about our exclusion approach on our website[2]

Read about our progress in the metrics and targets section, page 160

1 www.zurich.com/en/sustainability/responsible-investment
2 www.zurich.com/sustainability/governance-and-policies/exclusion-policies

4. Our planet: Drive positive impact (continued)

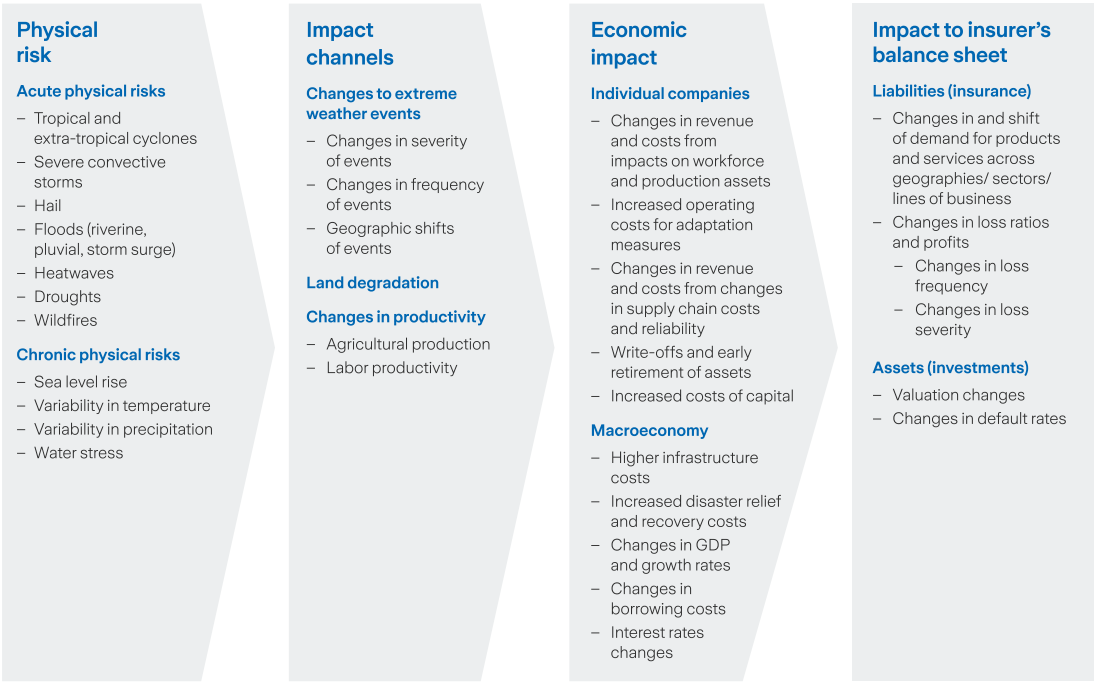
4.1.2 Climate-related risks

In alignment with TCFD recommendations, we broadly categorize climate-related risks as physical and transition risk and outline below potential impacts to our business.

1. Climate-related physical risk

TCFD E

Figure 9:
Climate-related physical risk



There is unequivocal scientific consensus that human greenhouse gas emissions are leading to an increase in global surface temperature and that this is driving changes in climate and weather systems across the globe. The Working Group I contribution to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report, released in August 2021, provided further evidence that changes in climate extremes can already be attributed to the human-induced increase in global surface temperature, and that continuing emission trends will further exacerbate the direction of many of the emerging trends. Overwhelmingly, 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 there is high confidence 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. 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 when extreme heat and drought lead to more wildfires and the combination of sea level rise and changes in hurricane intensity or tracks lead to higher storm surge damage.

Impact to demand and loss profiles

Up to 2030, we expect climate change-driven changes to physical risks to become increasingly relevant, but not yet to become 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.

4. Our planet: Drive positive impact (continued)

Socioeconomic trends such as 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 modelling, such that annual policy renewals provide mitigation against increasing physical risks for short-tail 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. Increases in severity and frequency of natural catastrophes such as tropical cyclones, flood or hail can lead to higher losses by customers that are covered under our property policies. More droughts and extreme precipitation can also impact losses in our agriculture insurance. 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, pages 142 to 144).

Impact through valuation changes

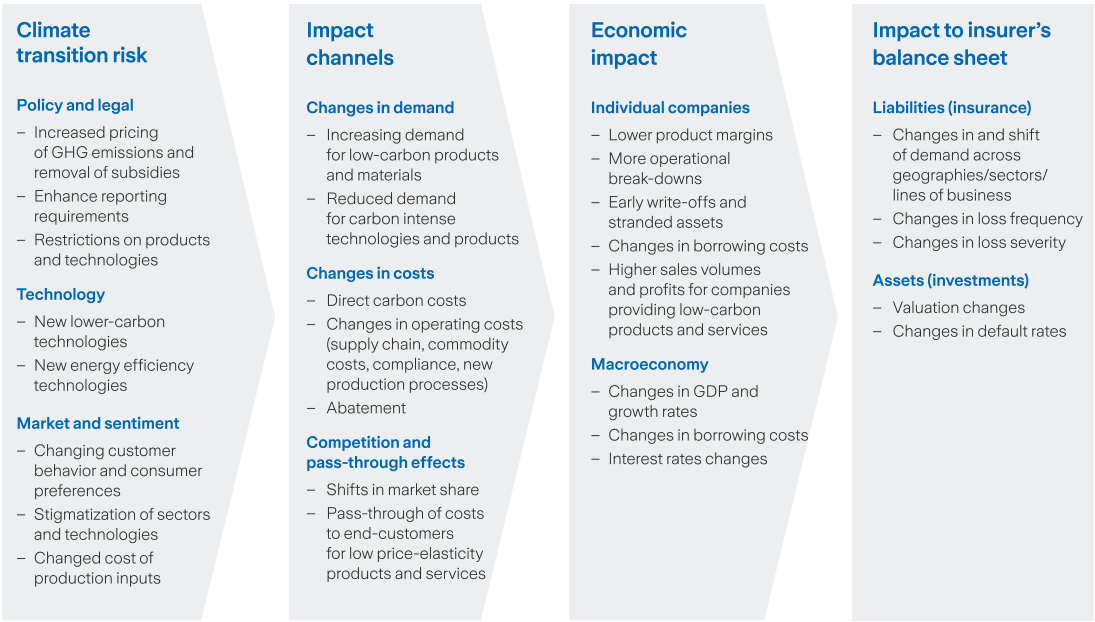
The physical impacts of climate change on the built environment are becoming more significant. With their locations fixed, buildings themselves may be at risk of suffering significant damage costs from climate change impacts. We currently explore possibilities to assess physical risks on property level by using our risk model on catastrophes and integrating data into our central portfolio management system.

The valuation of assets in our investment portfolio can also be affected by direct and indirect exposures to physical risk. Businesses will be directly affected through the impact on their costs and revenues, with a potential for supply chain disruptions and asset write-offs. The vulnerability of nations to physical risk, including through costs associated with infrastructure and adaptation measures, or through disruptions and vulnerability to extreme weather events, can also have an impact on the valuation of sovereign debt.

2. Climate-related transition risk

TCFD E

Figure 10:
Climate-related transition risk



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 as the legal, policy, technological and market changes necessary for the transition will lead to significant shifts in economic activity and asset valuation.

Impact to demand and loss profiles

The steep rise in carbon prices and removal of subsidies on carbon-intensive resources and activities that is expected in this transition can 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. The transition will also shift demand 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 greatly vary across individual actors, depending on their detailed business models, assets, and transition strategy, complicating the assessment of aggregate transition impacts.

4. Our planet: Drive positive impact (continued)

On a portfolio level, for both our proprietary investments and underwriting, there will be winners and losers in any transition scenario. There will also be aggregate macro effects arising in a transitioning scenario, including the impact on economic activity, inflation and potentially also 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 have high dependencies 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.

Impact through valuation changes and other drivers

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 will threaten to 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 impacts 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 that could potentially present 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.

4.1.3 Climate risk assessment 2021

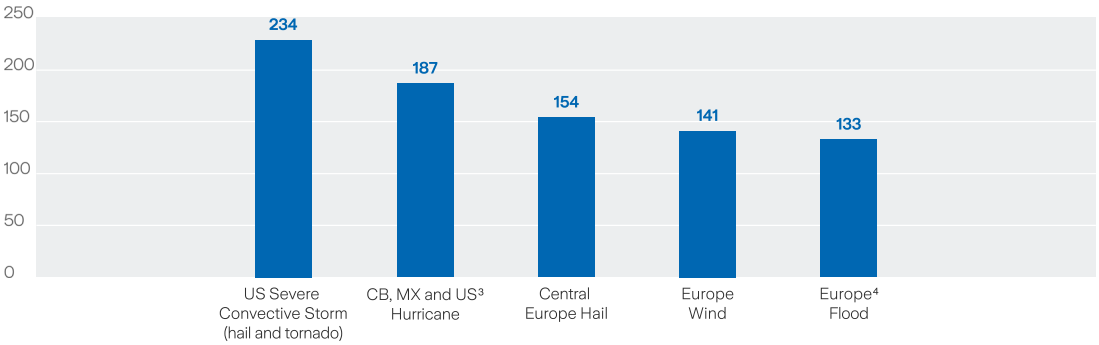
1. Current exposure to physical risk[1]

Current exposures to physical climate risk are expressed through average expected loss (AEL) and probable maximum loss (PML). Note that PML is a tail metric that looks at severe unexpected outcomes as opposed to AEL that provides a view on the expected. The PML is driven by different peril regions compared to the AEL.

Modelled exposures are shown below.[2] Our approach to modelling is discussed further in the managing risks from climate-related natural catastrophes section (page 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 modelling output (e.g., AEL, PML) over time.

TCFD *Average expected loss*

Figure 11:
Average expected losses for top five peril regions in USD millions



Our modelled AEL from climate-related natural catastrophes provide 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.

1 Countries comprising the peril regions referred to here are as follows:
– Central Europe Hail: Austria, Belgium, France, Germany, Italy, Luxemburg, the Netherlands and Switzerland.
– Europe Wind: Austria, Belgium, Czech Republic, Denmark, France, Germany, Guernsey, Ireland, Isle of Man, Jersey, Luxemburg, the Netherlands, Norway, Poland, Sweden, Switzerland and the UK.
– Europe Flood: Austria, Belgium, Germany, Italy, Switzerland and the UK, plus other small nations like Guernsey, Isle of Man, Jersey, San Marino and Vatican.
– CB, MX and US Hurricane: Caribbean, Mexico and the U.S.

2 Results from the Q4 2021 Group Cat Model are presented. There are timing differences in the underlying exposures considered in this analysis (underlying exposures by peril region are generally as at June or September 2021, and in exceptional cases as at September or December 2020).

3 The geographic scope is extended when compared to 2020 TCFD to include correlated exposure in the Caribbean (CB) and Mexico (MX) . The AEL for US hurricane only is USD 169 millions in 2021.

4 The 2020 reporting for flood in Europe included the UK only which on a stand alone basis is not in the top 5.

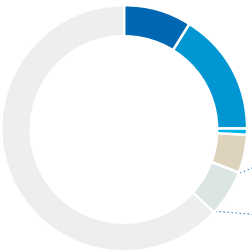
4. Our planet: Drive positive impact (continued)

Probable maximum loss

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.

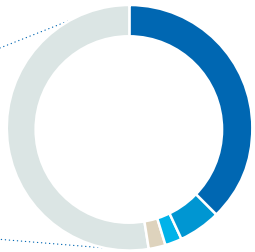
Figure 12:
Swiss Solvency Test (SST) by risk type and climate-related perils as proportion of nat cat total SST

SST total risk capital contribution by risk type



Business risk	9%
Premium & reserve risk	16%
Other credit risk	1%
Life insurance risk	5%
Natural catastrophe risk	6%
Market risk	63%

Climate-related perils as a fraction of nat cat SST total risk capital[1]

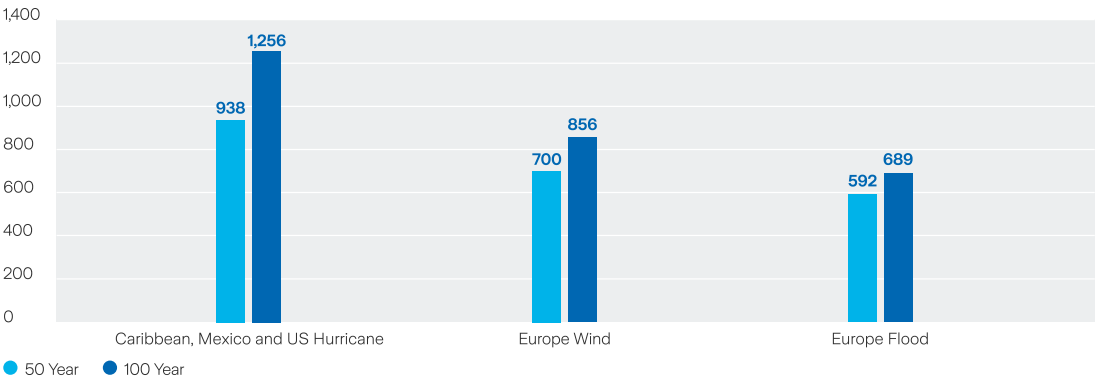


North America Hurricane	37.8%
Europe Wind	5.3%
Europe Flood	2.3%
Other climate-related	2.3%
Non-climate related	52.4%

Our 50 and 100 year PML measured by the net annual aggregate loss are shown below based on our top three peril regions.

Figure 13:
Probable maximum loss by top three peril regions in USD millions

Probable Maximum Loss



Total monetary losses from natural catastrophes

Our loss ratio for the full year 2021 was 63 percent with 5.3 percentage points attributable to the following natural catastrophes experienced throughout 2021: Winter freeze in Texas, Hurricane Ida, European Hail and Central European Floods. These events and figures have been reviewed by the Group's Catastrophe Response Group (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 phenomena that produce unusually large aggregate losses.

1 The nat cat 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).

4. Our planet: Drive positive impact (continued)

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 on climate-related perils in order to reflect trends in the hazard, whereas exposure trends are naturally captured by exposure data updates. 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 focuse substantial time and resource on ensuring risk-adequate underwriting and pricing of the business we assume up-front, including consideration of potential climate change-induced 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.

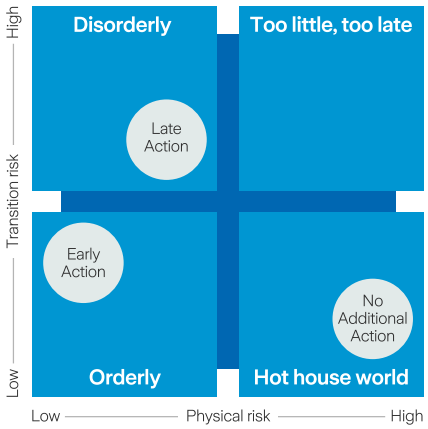
2. Forward-looking scenario analysis

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 improve 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 NGFS suite, with scenarios chosen to cover a relevant set of emissions pathways and modelled to closely incorporate specific attributes required as part of the Bank of England Climate Biennial Exploratory Scenario (CBES) exercise.[2] The emissions pathways of the selected scenarios correspond broadly to representative concentration pathways (RCP) 2.6 and RCP 6.0.[3] The selected scenarios afford a broad analysis of potential risks and opportunities, covering high and low physical and transition risks. As shown below, the no additional action (NAA) scenario primarily explores physical risks from climate change where no new climate policies are introduced, while both early- and late-action scenarios consider alternative routes to net-zero emissions by 2050, and as such are aligned with our strategic objectives. Both scenarios anticipate significant transition risks due to the rapid change in the economy over that period as emissions decrease.

Figure 14:
NGFS scenario framework[4]



As outlined in the risk management section (pages 153 to 155), our scenario analysis leverages a third-party model to assess both our insurance and investment business.

As physical risk is assumed identical for both early- and late-action scenarios (per CBES guidance) and as transition risk is considered materially the same in both late-action and NAA over the quantification window (10 years), analysis of our underwriting portfolio excludes the late-action scenario.

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 RCPs assumed (RCP 2.6 & RCP 8.5).[5]

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 153 to 154).

Scope

The scenario-based assessment of our proprietary investment portfolio considers listed equities, corporate credit and real estate and places a focus on understanding potential risks to the valuation of corporate equities. While equities as an asset class has a low absolute share in our investment portfolio (5 percent), it has a material impact on our investment-related market risk position. The valuation of equity in the scenarios involves discounting future revenues and costs (quantified at 2050) to arrive at a net present value of future cash flows.

1 For details on the Total Risk Profiling™ methodology and scenarios analysis process, see the risk management section (pages 153 to 155).
2 In line with the requirements of the CBES exercise, and to ensure severe physical risks that may crystallise post 2050 are considered, physical risk is stressed in the NAA scenario by calibrating physical risk in the period 2021–2050 based on the level of physical risk that could be prevalent between 2050 and 2080. This is achieved by assuming temperature increases in this scenario are at the 90th percentile of expected temperature increases; a higher level than the expected (mean) temperature increase. Physical risks are therefore modelled based on a temperature trajectory that reaches 3.3°C by 2050. Because the level of physical risk is similar in the early-action and late-action scenarios, it is assumed when modelling physical risk that the early-action scenario has the same temperature trajectory as the late-action scenario in the period 2021–2050.
3 As described by NGFS, "the RCPs are greenhouse gas concentration scenarios that are commonly used in the climate modelling community. [...] They were officially adopted by the IPCC and provide a basis for the projections and predictions of the Fifth Assessment Report of the IPCC". The correspondence between CBES/NGFS scenarios and RCP pathways is based on the emissions trajectory in those scenarios over time. The correspondence is not exact, but NGFS Net-Zero 2050 and Disorderly scenario temperature pathways fall in the range of RCP 2.6, and current policies falls in the range of RCP 6.0. (More details available in the NGFS Technical Documentation).
4 www.ngfs.net/ngfs-scenarios-portal
5 These correspond to SSP1-2.6 and SSP5-8.5 respectively according to the new IPCC designations.

4. Our planet: Drive positive impact (continued)

The analysis of our underwriting portfolio leverages outputs from the same third-party model as inputs to a bespoke modeling of the relationship between key climate drivers, insurance demand, and loss experience. The total book was analyzed by line of business, geographic region and industry/sector to identify a set of nine at risk 'clusters' with potentially high exposure to the impacts of physical and transition risks. Each cluster was then subject to a deep dive analysis to identify and translate key drivers of physical and transition risk into quantitative impacts. The resultant deep dives performed consider 49 percent of the total Property & Casualty (P&C) portfolio (USD 18 billion of USD 37 billion), mostly concentrated in North America (NA) and Europe, reflective of our underwriting footprint. Analysis of our Life book focuses on protection-related products in EMEA and Latin America (LATAM), representing 37 percent of the Life portfolio (USD 5 billion of USD 14 billion).

Quantification is performed to underpin our medium-term assessment (to 2030), an approach considered reasonable for determining strategic management actions in response to risks identified given the prevalence of annual policy renewals across a high proportion of our portfolio. Given the increasing uncertainty inherent in considering longer time periods, impacts to 2050 are analyzed qualitatively.

TCFD Two metrics are chosen to quantify scenario-based impacts of climate risk on our insurance business:

- **percentage change in demand:** estimated impacts on size and composition of demand for insurance products due to physical and transition climate risk drivers in each scenario, compared with a baseline of no further climate action and no further climate change relative to current day levels.
- **percentage change in expected losses:** estimated impacts on claims due to physical and transition climate risk drivers in each scenario, compared with a baseline of no further climate action and no further climate change relative to current day levels.

A scenario-based assessment of the potential impacts of physical climate risk on our business operations was performed, leveraging a separate modelling approach underpinned by third-party data. This assessment focused on employee locations, strategic data centers and critical supplier locations.

4. Our planet: Drive positive impact (continued)

Sierra Signorelli
CEO Commercial Insurance

Underwriting analysis

High-level outcomes

The heatmap below presents a view of potential Group-level climate risk impacts and opportunities across key areas of our underwriting portfolio in 2030 as modeled under the NAA and early-action scenarios. As with all forward-looking analysis, the estimated movements in demand and loss experience presented below and throughout this disclosure are derived through the use of numerous assumptions, including for example the timing and severity of policy responses, the magnitude of temperature rises, future GHG emission trajectories and global energy mix. Analysis outcomes are therefore subject to considerable uncertainty and should not be interpreted as projections of future outcomes.

Figure 15:
Potential climate change-related impacts to our underwriting portfolio under NAA and early-action scenarios with strategically aligned responses[1]

Sector	Line of business	Portfolio weight	Demand impacts		Loss impacts		Responses
			No additional action	Early-action	No additional action	Early-action	
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 modelling, accumulation management and continued development of Zurich Resilience Solutions. Reshape portfolios in case of NAA.
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	–						Continued investment in models developing insights at commodity, product and country level to support adjusting mix. Assess potential growth in private products.
Heavy industry and mining	–						Leverage carbon capture and storage and energy knowledge 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 risk engineering focus on maintenance of 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)

Overall impacts to P&C demand at Group-level in 2030 under the scenarios considered as modelled and with assumptions made are estimated to be of low materiality in both scenarios. Demand impacts related to Life protection products are observed to be higher under the early-action scenario. Impacts to Group-level P&C loss experience are observed to be more pronounced before mitigating actions are considered. In general, the diversification of our P&C business in terms of geographic footprint, industry mix and line of business provides a degree of insulation to potential negative changes in demand at Group-level. Material opportunities for growth are noted in an early-transition scenario, with only minor growth opportunities in areas not aligned with our strategic outlook observed in NAA (e.g., fossil fuel).

Analysis to date does not suggest material impacts to fee income received from Farmers Group Inc. through to 2030.

1 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.

4. Our planet: Drive positive impact (continued)

NAA: a closer look

No additional climate action leads to an increased need for more sophisticated modelling as weather events increasingly impact portfolio, as well as stronger push on resilience. It also requires the focused reshaping of portfolios away from areas with high risk from physical impact of unabated climate change.

Physical risk is assumed to dominate in the NAA scenario. In line with scenario narratives, increased levels of physical risk modestly suppress economic activity up to 2030 due to impacts on productivity, reducing GDP and consequently demand for insurance. Impacts to demand quantified at the Group level are observed to be pervasive, relatively low and geographically inhomogeneous. The reduction in GDP impacts the motor book by reducing demand in commercial insurance and declining retail purchasing power leading to overall decline in vehicle sales. Retail property and life protection demand is similarly impacted due to suppressed economic activity. Impacts from insuring financial services are mostly second order, being driven by the exposure companies have to climate sensitive sectors.

Potential increase in demand in the agricultural sector is driven by the expansion of the North American biofuel sector and could represent an opportunity in this scenario but is expected to be offset by a decrease in other crop types. Other minor growth opportunities are noted in books to which we have limited exposure and in areas which are not aligned with our strategic objectives as we commit to move our underwriting portfolio toward net-zero.

The impact of climate change on physical losses in property, and to a lesser extent, construction is expected to be the main driver of increased losses under the NAA scenario. Adverse loss trends in property are reflective of expected average annual loss increase due to (extra-)tropical cyclones, floods and severe convective storms. Increase in frequency and severity of claims due to hydrological events such as heavy rain, cyclones and flooding are noted to drive trends for construction.

Early-action: a closer look

The early-action scenario aligns to our commitment to a 1.5°C future, and brings greater opportunities for growth in various sectors. The well-balanced nature of our portfolio limits negative demand impacts even before strategic actions aimed at maximising growth and limiting loss exposure are considered.

The transition to low carbon is observed to have pervasive impacts on our portfolio under the early-action scenario.

Increasing explicit and implicit carbon prices will in particular affect the heavy industry, mining and the fossil fuels sectors and the expected shift away from fossil fuels will in turn benefit the power sector, as end-use sectors move energy demand toward alternate sources of power.

Within the power sector, the transition will yield a shift toward renewables. The resulting impact on demand for insurance from the power sector will be contingent on the price trajectory of renewable assets. Indeed, by 2030 the increase in demand for electricity is expected to be offset by fast decreasing renewable asset prices in some regions, meaning overall sector revenue and insurance demand will stabilize.

Significant investment in the power sector to increase renewable generation capacity and grid infrastructure will have positive spillover impacts on the construction sector, together with the growing need to renovate and rebuild to reduce building emissions.

The increasing importance of biofuels to power the clean-energy transition will potentially drive growth in the agriculture sector (above that observed in the NAA scenario), together with increased yield size due to adoption of more efficient farming practices.

Heavy industry and mining will suffer from increased carbon costs potentially resulting in reduced demand. However, increases in demand for minerals critical to the transition to a low-carbon future, particularly cobalt and copper, which are input into key low-carbon technologies like batteries and photovoltaic panels, represent an opportunity for the mining portfolio.

The cumulative effect of corporate sectoral shifts associated with an early-action scenario contribute to overall decreases in demand for Life protection products.

Increasing carbon costs will drive the uptake of new low-carbon technologies; such emerging technologies represent opportunities for insurers, but they will also come with increased risk. This applies to new technologies in renewables, carbon capture and storage for power and industry, hydrogen for industry, as well as new construction materials and techniques in the construction sector.

The transformation of the motor industry, with increasing uptake of electric or alternatively fueled vehicles, is not expected to significantly impact demand or expected losses, as the behavior of drivers of electric vehicles will align with that of standard vehicles, meaning loss profiles will in turn align.

In the agriculture sector the increased productivity of land serves as an additional loss driver for agriculture as any loss event would potentially have a greater financial impact, however this would potentially be compensated for through the pricing mechanism within the crop business.

4. Our planet: Drive positive impact (continued)

Looking to 2050

In the long term (beyond 2030), the severity and frequency of acute and chronic physical risks are expected to increase, shifting loss profiles across many lines of business including, for example, property, given the expected concentration of acute hazards around high-risk regions (e.g., coastal areas, wildfire zones). The high degree of uncertainty over how electric vehicles and autonomous technology affects the functioning of the transport system (e.g., car sharing, modal shifts, self-driving vehicles) and the resulting demand for cars will likely lead to demand and loss impacts to our motor book. Overall, shifting loss profiles could mean that certain impacts can no longer be compensated through pricing, and that some risks may become uninsurable.[1]

The energy transition continues beyond 2030 and extends to other industrial sectors: this could further increase risks for sectors such as fossil fuels and create opportunities in others such as construction and power. The scale of electrical and mechanical construction projects required to deliver the low-carbon stock necessary for net-zero is a once-in-a-generation opportunity, but it will also come with new risks. Offsite construction, increasing value of materials and components and unknown risk profiles could all contribute to an increase in the number and value of claims in our property and engineering lines book.

Demand for insurance due to the growth in cropland for biofuels will continue to increase in the long term, as biofuel production picks up pace. Improvements in crop yields will remain constant after 2030 due to high initial penetration of new technologies in the sector. Demand profiles for financial services are likely to shift as exposure to climate sensitive holdings by financial institutions becomes a key driver of demand from individual companies. Liability risks are also likely to increase as stricter climate-related accountability and responsibility on financial institutions are introduced.

Proprietary investment portfolio analysis

High-level outcomes

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, even without considering the potentially mitigating effect on liability valuation. This conclusion considers impacts across three major asset classes (listed equities, corporate credit and real estate) covering 36 percent of the investment portfolio, without considering the potential mitigating effect on liability valuation, and is made in accordance with our Total Risk Profiling™ methodology.[2] This methodology considers a major risk to be one that could have a negative impact on the Group's economic capital position in excess of USD 5 billion, either at aggregate portfolio or individual asset class level.

In the NAA scenario, physical risk is limited over the time horizon in 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 the transition risk scenarios, the aggregate impact is also low as transitioning is modelled as being relatively frictionless. Moreover, while some industries and businesses would experience a large negative impact on their market valuations in these scenarios, the aggregate risks stemming from this are limited.

Given the enormous transformation that is required, an orderly and smooth transition, such as the one described by the two 1.5°C scenarios, may be difficult to achieve, with periods of higher volatility likely. There is 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 productivity gains. As the scenarios highlight, there will also be large divergencies across businesses and sectors, with opportunities, as well as risk, associated with the transitioning.

Listed equities: a closer look

Applying the various scenarios and third-party model to our global listed equity portfolio in comparison with a broad market benchmark, transition risk is found 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 approach also sheds light on transition opportunities, including those that stem from the greening of the economy.

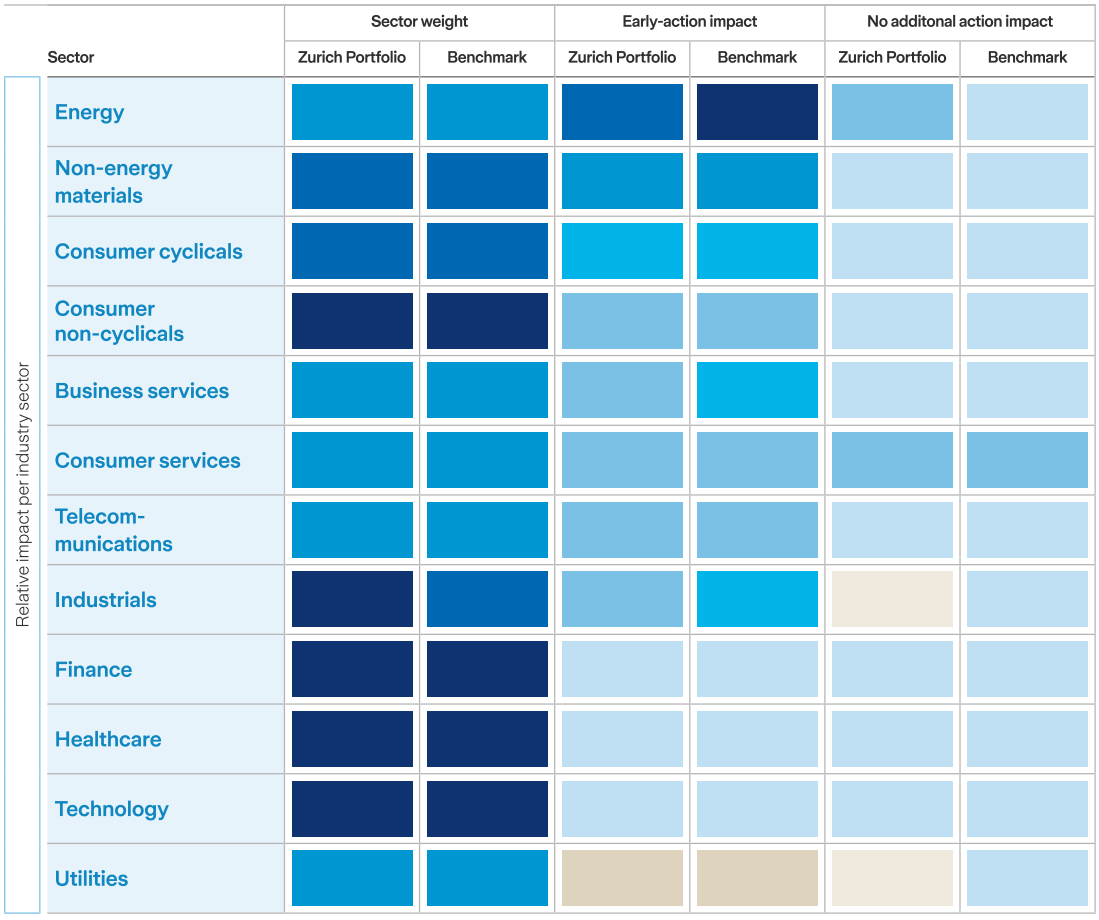
In contrast to transition risk, additional physical risk relative to today's level is estimated to be relatively limited over the time span considered, even in the NAA scenario, as it will take time before more significant additional climate change effects materialize. More severe impact will therefore be restricted to a few regions and sectors such as agriculture and tropical regions, to which we have limited investment exposure.

As shown below, the largest relative valuation effects on our global listed equity portfolio are found in the early-action scenario, where the impact is somewhat higher than in the late-action scenario, due to the discounting of future impact, and a very front-loaded, albeit gradual, rise in the carbon price. From a financial materiality perspective, only minor impacts to our listed equity portfolio are observed.

1 This risk was not analysed quantitatively.
2 See the risk management section (pages 153 to 155) for further details on the Total Risk Profiling™ methodology.

4. Our planet: Drive positive impact (continued)

Figure 16:
Estimated impact on listed equity portfolio across early-action and NAA scenarios in comparison to a well-diversified global equity benchmark[1]



Sector weight (% of listed equity portfolio)

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

Impact thresholds

- Very high risk
- High risk
- Moderately high risk
- Moderate risk
- Moderately low risk
- Low risk
- Opportunity – low
- Opportunity – high

1 The sector heatmap is calibrated to highlight relative impact per industry sector. Aggregate scenario level impacts are assessed in relation to Zurich's definition of financial materiality.

4. Our planet: Drive positive impact (continued)

The results demonstrate how relatively higher transition risks to our listed equity portfolio are limited to 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, the services sector, which contributes the largest share to global economy activity, sees little impact. The relative resilience of services appears reasonable, 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, which are arguably more important in a transitioning scenario, are not captured. Additionally, if rapid transitioning were to lead to energy scarcity and 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.

Overall, the impacts on our global equity portfolio are somewhat smaller than those of a broad market benchmark. Reasons contributing to the difference are differing sector weights and geographic exposure; differing 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 mining of or generate more than 30 percent of electricity from thermal coal, oil sands and oil shale.

The applied model assumes that an early-transition scenario can lead to transition opportunities and risks within industry sectors. Within the energy, utilities, and non-energy materials sectors that 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 emissions-intensive rivals, leading to reduced profitability and market share. Other utilities with lower emissions intensity benefit from increased electricity demand, higher electricity prices, and the ability to gain market share at the expense of more emissions-intensive rivals. This variance in individual counterparty impacts also occurs in other sectors, including for example industrials and consumer cyclicals, where median impacts are small.

Overall, the applied model suggests a manageable level of risk across all scenarios and results in a valuation impact of minor materiality. Relatively more material risks are connected to 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. It is also managed to become net-zero by 2050, with the progressing decarbonization successively shielding it from the companies that are lagging behind in the transition.

The analysis supports various hypotheses: earlier-action 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 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. However, sector deep dives show that there are also investment opportunities in these sectors.

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

Own operations

An assessment of potential climate change impacts on our own business operations was performed in collaboration with our CCRS team.

Physical risk assessment scope and approach

A scenario-based assessment of physical risk was performed leveraging a third-party model and data[1] with quantification performed for 2030 and 2050.

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).

An assessment of physical perils was conducted to understand exposure level and criticality under two scenarios: early-action and NAA. 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 upon specific physical parameters for each peril and include flood, wind, temperature, drought, hail, wildfire, precipitation, thunderstorms (lightning), and coastal flooding.

1 Climate data sourced from Jupiter Intelligence, ClimateScore Global v2.3, Oct. 2021.

4. Our planet: Drive positive impact (continued)

The consequences of some of these hazards (hail, lightning, precipitation, wildfire, wind) may affect both property (buildings, equipment, cars, etc.) and employee safety, while others are limited to employees' wellbeing (temperature, drought). There is a potential interdependency (or combined effect) of some hazards. Increased temperature and drought may influence water availability and quality, and increase demand for electricity. Increased thunderstorm and temperature hazard may increase the likelihood of hailstorms. Roof-mounted equipment may be damaged (impact by lightning or hailstones). High wind speeds (intense rainfall may occur concurrently with windstorms) may displace (poorly anchored) roof-mounted equipment, with ensuing damage to the roofing system, resulting in ingress of water to the building interior. Poorly maintained or older roofing systems may also be damaged during a windstorm. Water penetration/ingress into the building may also occur if the roof drainage systems are poorly maintained (blockage of drains or collector pipes).

For data centers, a particular vulnerability is related to lightning strikes (thunderstorm). Loss of power or even data transmission cables may be exposed in thunderstorms if the lightning protection system (internal and external, e.g., power surge protection as well as lightning arrestors) is not effective or reliable.

Key outcomes

– Current exposure levels across offices, strategic data centers and suppliers are effectively managed through existing processes.
– In the early-action scenario, precipitation and drought demonstrated increased exposure (by at least 15 and 10 percent, respectively) between 2030 and 2050 across offices, strategic data centers and supplier locations.
– In the NAA scenario, the increased risk exposure for these perils persisted, most notably leading to an at least 90 percent exposure by 2050 across offices, strategic data centers and supplier locations. In the same scenario, thunderstorm risks are at least high across 70 percent of strategic data center locations already in 2030.
– We did not observe significant variances in risk exposures levels across either of the two scenarios between 2030 and 2050.

Our existing business resilience activities focus on protecting and recovering critical business assets and resources from a wide range of existing and developing risks, including those related to the impacts of climate change. Corporate real estate and security teams are responsible to ensure offices comply with evolving building safety and security codes and requirements. Local teams are aware of risks associated with public infrastructure including risks from aging infrastructure that impact mobility and security of energy supply. To avoid situations where safety, security, and business continuity can no longer be effectively managed, office re-locations would be planned for. These activities are forward looking and iterative, taking into account the changing and evolving risk landscape. The adaptive nature of the resilience program and daily operational planning requirements mean that processes will continue to change in response to the risks resulting from climate change. We note the significant increase in distributed workforces as a result of COVID-19, something which has redefined the operational boundaries to be considered for business continuity. Further analysis is required to identify opportunities to adapt our business continuity planning to a distributed workforce.

Business resilience planning is carried over into supply chain relationship management. We are aware of and manage concentration risks where multiple suppliers are located in a common geographic area. We run annual disaster recovery tests for our strategic data centers. The test assumes complete loss of the primary data center and recovery in the secondary data center which is located out of region or country.

Transition risks

Given the low-carbon intensity of the insurance sector's operations compared to more carbon-intensive manufacturing sectors, our focus on sustainability within our operations, and business-as-usual planning processes, we do not consider transition risk to be material for our own operations considering impacts through to 2050. Regulatory changes related, for example, to the price of carbon, are monitored and can be planned for, with impacts minimized by reducing our carbon footprint in line with our science-based targets.

Risks within our supply chain are mitigated by placing increasing scrutiny on our suppliers' sustainability performance and commitments and setting clear expectations for suppliers in our SCOC. Overall, price increases for products and services are anticipated with carbon pricing schemes and other policy or voluntary requirements to internalize the cost of climate change.

4. Our planet: Drive positive impact (continued)

Other climate risk assessment outcomes

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 deep dive areas, with none presently identified as a material risk driver in the medium term. We closely monitor developments potentially impacting litigation-related risks and drive actions to address them proactively.

Reputational risk: Given our strong 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 against our targets, we employ controls and monitor progress through the governance structures described in the corporate governance report (see pages 38 to 83). We believe strong internal focus on delivery coupled with detailed public disclosure on progress are sufficient to mitigate this risk.

3. Conclusions

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 to adapt to the impacts observed.

From an underwriting perspective, we believe annual repricing will provide mitigation against short-tail business lines and mitigate transition risk in our underwriting portfolio. As the effects of climate change materialize over time, we have the possibility to ensure that our risk appetite for natural catastrophe exposure is maintained or adapted accordingly. We also purchase reinsurance to protect the company's balance sheet from large natural catastrophe impacts and to support earnings volatility management. The reinsurance strategy is regularly reviewed to account for relevant loss trends.

We believe our multi-faceted responsible investment strategy is sufficiently flexible to adapt to the impacts highlighted by this analysis and will continue to demonstrate resilience. Our structured and disciplined investment management approach is carefully crafted to match liabilities, minimize unrewarded risks and remain stable throughout the macroeconomic cycle. The resulting portfolio is highly diversified across asset classes, sectors and geographies. On an issuer level, both transition risks and opportunities are reflected through ESG integration. Our net-zero 2050 strategy is leading to a continuous decarbonization of the portfolio, which also reduces transition risks stemming from highly carbon intensive issuers without adequate transition pathways that could mitigate their risk, while seizing opportunities created by the transition.

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 mean processes will adapt to changing physical risk profiles ensuring operational resilience.

We caveat these conclusions by acknowledging the hypothetical nature of scenarios, the uncertainty inherent in scenario modelling over the timeframes considered and the somewhat conservative modelling 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 provides the flexibility required to maintain our resilience and continue to serve our customers' needs as climate-related risk profiles evolve.

4. Our planet: Drive positive impact (continued)

4.2 Governance

TCFD ❝ The organization's governance around climate-related risks and opportunities.

As outlined in the governance section of the ISD (see pages 132 to 133), 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 2021, as part of regular strategy discussions, the Board requested a discussion of how major global forces stand to shape the future of our industry over a 10- to 15-year period. Considering the relevance of climate change to our underwriting and investing activities and our own operations, this topic was covered as part of the discussion. Outcomes of scenario-based climate risk assessments are considered as part of strategy setting processes.

To accelerate our understanding of climate risk and support consistent management of our aspiration toward a climate-neutral economy, we established a cross-functional 1.5°C taskforce under the sponsorship of the Group Underwriting Officer, reporting into the SLC.

Peter Giger
Group Chief Risk Officer

4.3 Risk management

TCFD ❝ The processes used by the organization to identify, assess and manage climate-related risks.

4.3.1 Integration of climate risk within the overall risk management framework

We consider impacts from climate change as drivers for other risks, such as market or natural catastrophe risks, that 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.

To identify, assess, manage, monitor and report risks that can have an impact on the achievement of our strategic objectives, including climate change, the Group applies a proprietary Total Risk Profiling™ methodology. This short-term 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.

Taking the long-term nature of climate change into account, we complement our Total Risk Profiling™ methodology with portfolio-level climate risk scenario analysis to provide an outlook on medium- and long-term risk developments relevant to our underwriting and investment portfolios, as outlined in the strategy section (see page 137). The details of our risk management framework are outlined in the risk review (see pages 182 to 215).

4.3.2 Portfolio-level scenario-based climate risk assessment

Assessments of the resilience of our business model to potential climate risks over longer time periods are performed using scenario analysis. To ensure a consistent Group view on potential climate change pathways, scenarios selected for this analysis will 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 exercise and 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.

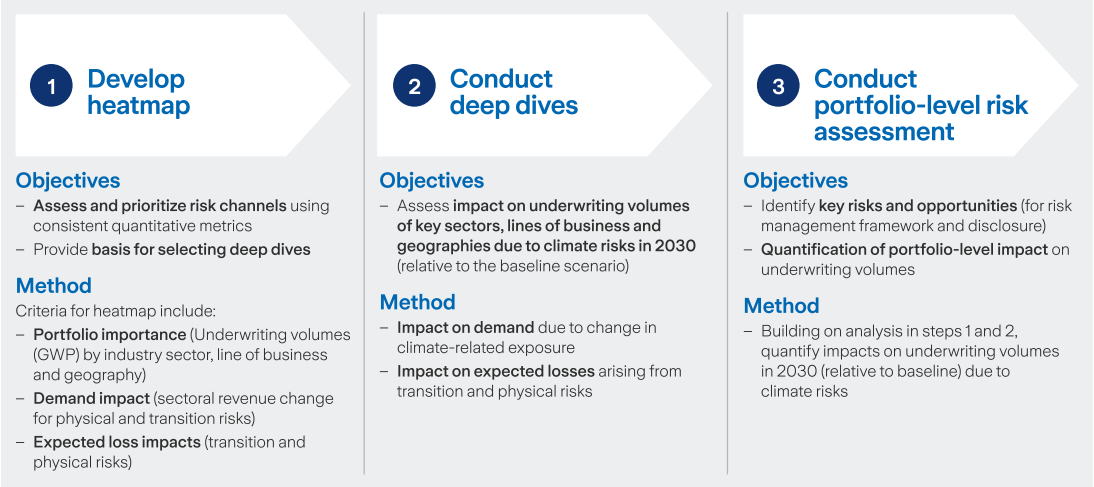
An integrated modeling approach, leveraging a third-party model, is adopted for the analysis of our underwriting and proprietary investment portfolios to ensure, to the extent possible, the consistent use of assumptions.

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.

4. Our planet: Drive positive impact (continued)

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

Figure 17:
Underwriting analysis process



Data sources and assumptions

– A fixed balance sheet approach is adopted to better allow the 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.

– Scenario analysis has been performed using year-end 2020 financial data with latest available emissions data (mostly 2019). Given this difference in data recency, baseline emissions intensities for the modelling were calculated for 2019 and then scaled to reflect 2020 revenues, in order to avoid the risk of emissions intensity numbers being distorted by year-on-year changes in revenue between 2019 and 2020.

– Modelled impacts of acute physical risks on expected losses are, to every extent possible, based on our own natural catastrophe modeling. Coupled with the narrower set of perils captured in the underlying third-party model, this introduces a slight discrepancy with the modelling of acute physical risk impacts on our investment portfolios where such data substitution was not possible. This discrepancy will reduce as the set of perils modelled in the third-party model is expanded.

– While the bottom-up approach adopted by the underlying model facilitates granular analysis of climate change-related risk, the model displays characteristics that serve to 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 ton 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, meaning aggregate estimates of physical risk are somewhat limited.[1]

For further details on our risk management process and supporting committees, see the risk review (pages 182 to 215).

1 Additional hazards, modelled as part of Zurich's natural catastrophe modelling, are reflected in the underwriting analysis.

4. Our planet: Drive positive impact (continued)

4.3.3 Managing risks from climate-related natural catastrophes

As outlined in the strategy section (see pages 140 to 141), changes in physical risks can impact us through the property business via changes in severity and probability of climate-related natural catastrophes. To manage our underwriting selection and ensure accumulations stay within intended exposure limits and assess the capital requirement due to natural catastrophes, we have established sophisticated natural catastrophe modeling capabilities. The resulting view on natural catastrophe risk also underpins profitability assessments and strategic capacity allocation and guides the type and quantity of reinsurance that 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 model validation and developed our proprietary 'Zurich View' of risk since 2005, giving us over a decade 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. We supplement internal know-how with external knowledge (e.g., the Advisory Council for Catastrophes). We are also a shareholder of catastrophe exposure and loss data aggregation and estimation firm PERILS AG, Switzerland and are a member of the open-source initiative Oasis Loss Modeling Framework.

Catastrophe models that are generally based on historical data would not capture potential future climate change-related shifts of extreme weather events. However, when combined with general circulation models (GCMs) they are best positioned to help also understand the risk of future climate conditions. GCMs build representations of the Earth's physical climate systems and therefore can provide model results for climatic scenarios beyond past events. The quality of GCMs continues to evolve as scientific understanding of the earth's climate systems increases and is also driven by progress in computing power and artificial intelligence that extrapolates insights from current modeled regions to future climate scenarios. This science is evolving, and we have strengthened our catastrophe modeling team with dedicated resources to create methodologies to integrate forward-looking aspects such as this into our modeling approach.

4. Our planet: Drive positive impact (continued)

4.4 Metrics and targets

TCFD “The metrics and targets used to assess and manage relevant climate-related risks and opportunities.

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 key performance indicators (KPIs) we track.

4.4.1 Our targets

Outlined below are the principle targets we have set to align our business activities with the outcomes of the Paris Agreement. In line with the efforts of the NZIA, we aim to establish, to the extent permissible by applicable laws and regulations, intermediate, science-based targets for our underwriting portfolios.

Target	Definition	Target year	Base year
Reduction of financed emissions	Our emissions 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 of listed equity and corporate bond investments by 25 percent, in terms of tons of CO2e per USD million invested. – Reduce the intensity of emissions of direct real estate investments by 30 percent, in terms of kilograms of CO2e per square meter.	By 2025 (interim) By 2050 (net-zero)	2019
Engagement targets	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. We will: – Engage with the companies producing 65 percent of portfolio emissions and lacking targets aligned with the Paris Agreement. – Require these companies to set targets aligned with the Paris Agreement. – Collaborate with asset managers in highlighting 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.	By 2025	2019
Financing the transition	Our targets for financing climate solutions enhance the Group’s existing long-term impact investing strategy to provide green financing solutions under its impact investing strategy announced in 2017. We will: – Increase allocation to climate solution investments. – Avoid 5 million 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 over the years.	Ongoing	2019
Reduction in operational carbon emissions	Our 1.5°C journey envisages a reduction of our operational carbon emissions as well. Our targets for our own operations against a 2019 baseline as follows: – Total emissions: absolute reduction in all operational emissions of 50 percent by 2025, and 70 percent by 2029. – Scope 1 + 2: reduction in emissions from the vehicle fleet and onsite heating as well as from purchased electricity, heat and steam (e.g., district heating) of 55 percent by 2025 and 80 percent 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 50 percent by 2025 and 65 percent by 2029.	By 2025 (interim) By 2029	2019

4. Our planet: Drive positive impact (continued)

4.4.2 Our performance metrics

This section highlights our key metrics used 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 own metrics and in line with the guidance on metrics of the TCFD.

Underwriting

Carbon intensity

As a founding member of the NZIA, we have agreed to report the carbon intensity of our underwriting portfolio and to independently set targets as we move toward net-zero within our underwriting book. Ahead of an agreed methodology from the NZIA, we have already started work to understand our weighted average carbon intensity (WACI) at a Group level as well as a country level.

Revenues from sustainable solutions

As an insurer, we aim to support our customers in the transition toward a sustainable future. To succeed, we need to fully understand the changing world around us and respond to these emerging challenges through the lens of an underwriter. Our sustainable insurance and investment solutions enable us to formulate an answer to challenges such as climate change or changing demographics.

In order to measure the revenues from sustainable solutions, we developed an internal definition for sustainable solutions and collected data from business units for the first time in 2021.

The total revenue associated with sustainable solutions

Sustainable solutions refer to insurance products, add-on coverages, investment products and advisory services that are designed or adapted to support activities that generate positive environmental or social impacts and contribute to mitigating climate risks.

In the table, we share our definition of revenues from sustainable solutions of three categories (environmental, social and investment) and provide details for each category.

Table 3:
Internal definition of revenues from sustainable solutions

Revenues from sustainable environmental solutions	Solutions related to technologies and/or activities that have an impact on reducing greenhouse gases, preserve or enhance biodiversity as well as enable the responsible use of natural resources. These solutions aim to mitigate and support resilience against the adverse impact of environmental related risks on our customers.	Examples include: – Insurance coverage for electric vehicles. – Insurance coverage for carbon mitigation solutions. – Risk prevention services that contribute to more customer awareness and resilience to the adverse impacts of climate change e.g., flood resilience.

4. Our planet: Drive positive impact (continued)

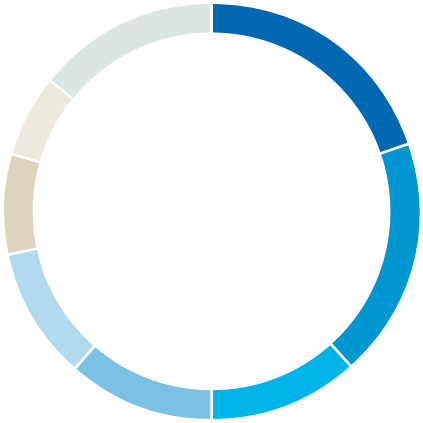
Revenues from sustainable social solutions	Solutions that enhance the social or financial inclusion of socially disadvantaged people, or are designed to incentivize healthy lifestyles and safe behavior.	Examples include: – Life protection for customers with existing chronic diseases such as diabetes or cancer. – Life protection policies sold in a bundle with LiveWell. – Micro-insurance for low-income customers, e.g., insurance for smallholder farmers.
Revenues from sustainable investment solutions	Investment products with a focus on sustainability both specific, and not-specific, to environmental and social aspects.	Examples include: – Unit-linked products investing in funds focused on sustainable environmental and social factors, e.g., ESG funds.

By calculating the Group-wide revenues coming from products that comply with our definition of sustainable solutions, we can quantify how we are supporting our customers with their sustainability strategies. Our first analysis revealed that gross written premiums and policy fees from sustainable solutions based on approved products related to our own definition represent approximately USD 289 million for 2021.

Across business units, a number of different categories were identified, of which insurance for electric vehicles, renewable energy and unit-linked products had the highest number of products fulfilling our internal definition.

The complete overview of all product categories totaling to 156 approved solutions are as follows:

Figure 18:
Breakdown of sustainable solutions by product category



Electric vehicles	31
Renewable energy	29
Investment products	18
Micro-insurance	18
Life protection for customers with existing health conditions	16
Products sold in a bundle with LiveWell propositions	12
Zurich Resilience Solutions (including Climate Change Resilience Services)	10
Other	22

4. Our planet: Drive positive impact (continued)

Revenues related to energy efficiency and carbon technology[1]

More specifically, we also assessed products related to energy efficiency and low-carbon technology, separately priced, which amount to USD 121 million of gross written premiums and policy fees.

Description of product incentivizing sustainable behaviors

Several products incentivize health, safety, and/or environmentally responsible actions and/or behavior. Please find below a set of examples.

Supporting climate informed practices

Our 'Build Back Better' program is one of the responsible initiatives that can be found in a range of policy clauses. For example, we offer retail customers in Europe a 20 percent payback above the cost of a property restoration after damage when environmentally friendly materials are used. In North America, we cover additional costs that might occur when choosing environmentally friendly alternatives to rebuild property, thereby helping customers rebuild their property after damage in compliance with existing or emerging green standards.

We have also launched several initiatives for our commercial customers. For example, as part of our CCRS, we help businesses to identify, assess, mitigate and adapt to current and future climate change risks.

As well as incentivizing green building and resource-efficient investment, we encourage green travel. For example, we provide retail customers in Italy with a 50 percent discount on their third party liability car insurance if the vehicle is fully electric. In Switzerland, customers receive a discount on their insurance if the vehicle uses alternative fuels. In addition, we developed a product called 'AutoSense' that incentivizes safe and ecological driving and allows customers to compensate for their CO2 emissions.

Incentivizing healthy behavior

In 2020, we developed our LiveWell program with a mission to inspire positive change and provide services and solutions that encourage our customers to make positive lifestyle choices. In 2021, LiveWell added capabilities around lifestyle tracking, challenges, screenings and telemedicine. To date, we are supporting **one million contracted lives** (lives in scope as per the customer contracts) on a daily basis to live a healthy lifestyle. LiveWell has achieved a strong NPS score in its first year. We will continue to measure our progress to understand how to best serve our customers and improve their daily experiences.

1 Revenues capture gross written premiums and policy fees.

4. Our planet: Drive positive impact (continued)

Underwriting and investment management

Exclusion screens

In line with our thermal coal and oil sands policy[1], all initial engagements with affected investee and customer companies were concluded in 2021. All companies covered by the thresholds have either been cleared, excluded or are under continued engagement, contingent on the presentation of credible transition plans. Progress on these targets is monitored and can be revoked if companies fail to meet their transition targets.

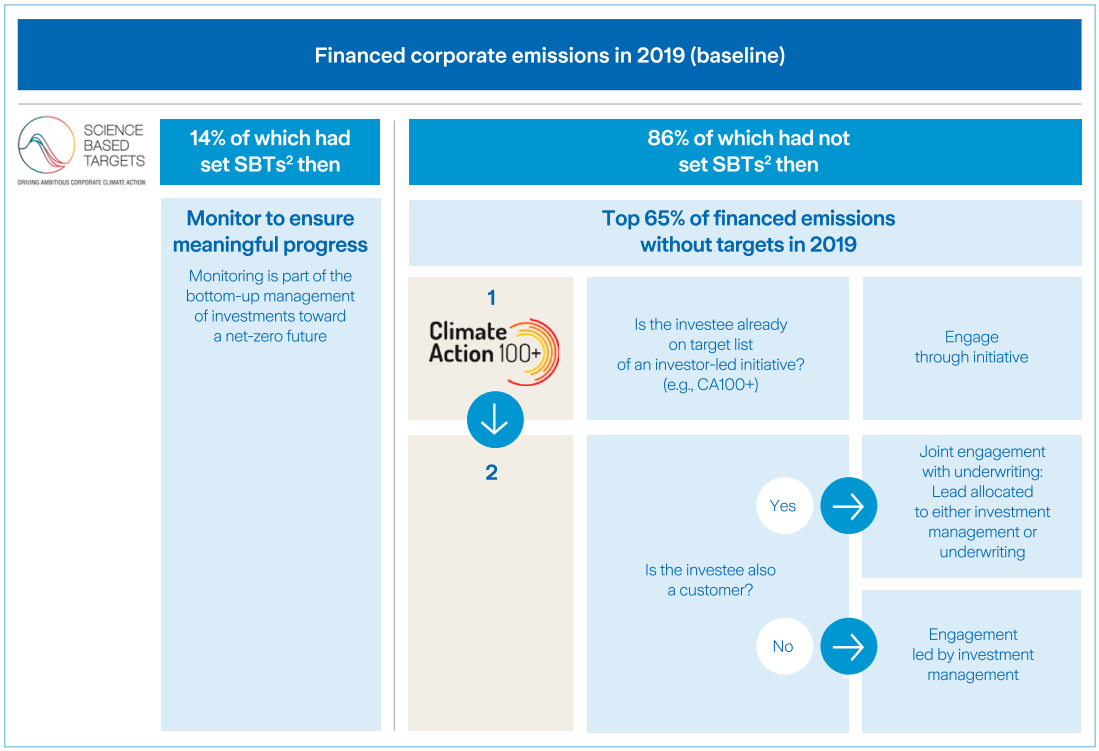
To measure the progress of the implementation of our coal policy, we are monitoring the number of companies affected by its thresholds and actions taken on both the insurance and investment side. Since the introduction of our first coal policy in 2017, our actions resulted in the divestment of USD 573 million in assets (equity and fixed income already disposed) and the phaseout of insurance relationships covering USD 38 million of gross written premiums. These figures represent less than half a percent of our respective investment or insurance portfolios, as our exposure to the thermal coal and oil sands industry was already limited before policy inception, reflecting our ESG integration approach.

Number of companies subject to our coal and oil sands policy since November 2017:

113	124	55
Excluded	Cleared	Engagement ongoing

Engagement for the transition

Figure 19:
Our engagement approach



1 www.zurich.com/en/sustainability/governance-and-policies/exclusion-policies
2 Science-based targets.

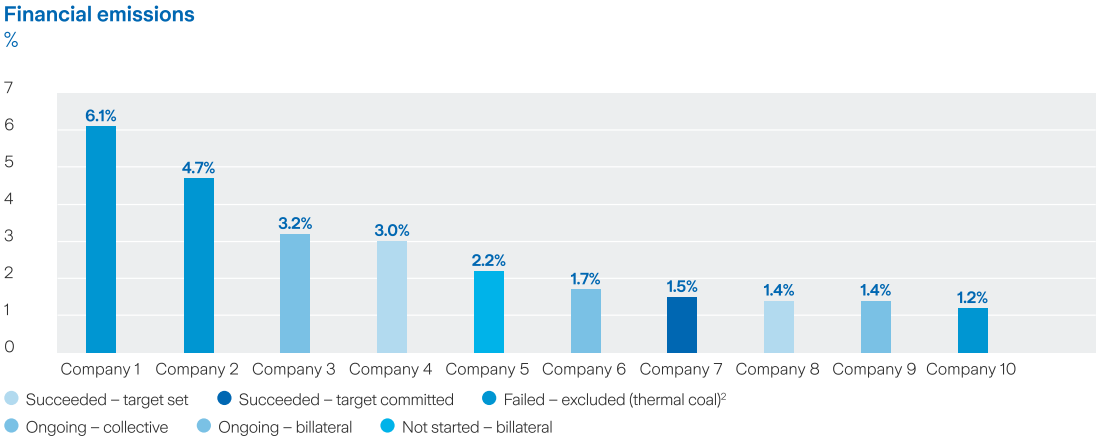
4. Our planet: Drive positive impact (continued)

Table 4:
Engagement progress in 2021

Engagement started	46%
Engagement not started	19%
= Target	**65%**
...of which	
Engagement as part of thermal coal/oil sands policy	17%
Engagement as part of net-zero journey	48%
Started engagements undertaken...	
Collectively	25%
Bilaterally	21%
...with outcome	
Failed[1]	16%
Ongoing	18%
Succeeded[2]	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 coal and oil sands 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 20:
Engagement progress for top 10 emitters without science-based targets (SBTs)[1]



1 Corresponding to financed emissions in 2019 (baseline data).
2 Failed engagement under thermal coal program means that company was added to restricted list and hence equity exposure divested and credit exposure put in run-off.

In addition to direct company engagements (as illustrated above in figure 19), we also participated in roundtables supporting sector engagements and engaged with asset managers, bilaterally and as part of the NZAOA asset manager workstream. We contributed to an NZAOA paper that outlines how asset owners can engage their asset managers on climate-change topics. This can include: asking asset managers to set their own science-based targets; joining the Net-Zero Asset Manager Initiative; becoming a signatory to CA100+; and making sure their active ownership policies (proxy voting and engagement) are fit to manage climate transition risks and are conducive to climate change mitigation and the transition to a climate-neutral economy.

4. Our planet: Drive positive impact (continued)

Investment management

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

Emission reduction targets

Table 5:
Emission reduction targets

Emission profile 2021

		In scope AuM 2021 (USDbn)	In scope AuM 2020 (USDbn)	In scope AuM 2019 (baseline) (USDbn)	Diff (2021 to baseline)
Zurich Corporate Portfolio		63.1	64.3	58.5	8%
By region	Asia Pacific (APAC)	6.0	5.1	4.5	35%
	Europe, Middle East and Africa (EMEA)	40.7	42.5	38.2	7%
	Americas	16.3	16.7	15.9	3%
By sector	Utilities	4.8	4.7	4.4	10%
	Government Owned Company	2.2	2.6	2.7	(18%)
	Energy	2.5	2.7	2.1	16%

1 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.
2 Committed or set targets under SBTi.

	In scope AuM 2020 (USDbn)	In scope AuM 2019 (baseline) (USDbn)	Diff (2020 to baseline)
Zurich Global Real Estate Portfolio[7]	12.5	11.7	7%
Asia Pacific (APAC)[8]			
Europe, Middle East and Africa (EMEA)	10.8	10.0	8%
Americas	1.7	1.7	1%

3 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.
4 The emission factors are retrieved from the International Energy Agency (2020) with the exception of Switzerland for which KBOB (2016) is used.
5 The relative emission intensity is calculated based on the gross floor area (GFA) of the buildings.
6 Market-value weighted and based on balance sheet investments, incl. buildings used by Zurich.
7 Real estate emissions are only available with a four-quarter lag. 2021 emissions will be reported in the 2022 report. Includes investment portfolio buildings only, as own-use buildings are part of Zurich's own operations net-zero boundary and report.
8 Zurich does currently not directly hold real estate investments in the APAC region. Given that direct holdings form the base for the emission reduction targets, there are no applicable figures for this region.

Absolute emissions

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

Relative emissions (intensity)

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

* Carbon emissions = scope 1 and scope 2 emissions

I: Current value of investment on issuer i

EV: Enterprise value of issuer i

C: Carbon emissions of issuer i

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 target boundary – listed equity, listed corporate debt and direct real estate – covers 36 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, based on enterprise value (EV), 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 that

4. Our planet: Drive positive impact (continued)

Absolute financed emissions 2021 (m t CO2e)[1]	Absolute financed emissions 2020 (m t CO2e)	Absolute financed emissions 2019 (baseline) (m t CO2e)	Diff (2021 to baseline)	Relative emission intensity 2021 (tCO2e/1m MV)	Relative emission intensity 2020 (tCO2e/1m MV)	Relative emission intensity 2019 (tCO2e/1m MV) (baseline)	Diff (2021 to baseline)	Target	% of financed emissions with SBT 2021[2]	% of financed emissions with SBT 2020	% of financed emissions with SBT 2019 (baseline)	Diff (2021 to baseline)	% of financed emissions in run-off under coal/ oil sands policy 2021
6.8	8.3	7.9	(15%)	108	128	136	(21%)	(25%)	19.9	19.5	14.3	39%	12.7
1.8	1.8	1.8	(2%)	292	355	400	(27%)		1.2	1.6	1.2	6%	44.7
3.9	4.8	4.5	(13%)	95	113	118	(19%)		32.4	31.3	22.9	41%	0.8
1.1	1.6	1.7	(32%)	70	98	105	(34%)		6.1	4.3	5.3	16%	3.8
2.9	2.7	2.7	7%	600	565	616	(2%)		16.7	17.9	14.4	16%	28.5
0.8	1.3	1.4	(42%)	375	498	529	(29%)		26.5	24.3	5.4	388%	2.1
0.8	1.0	0.7	18%	310	384	305	2%		–	–	–	–	1.1

Absolute emissions 2020 (tCO2e)[3,4]	Absolute Emissions 2019 (baseline) (tCO2e)	Diff (2020 to baseline)	Relative emission intensity 2020 (kg CO2e/ sqm)[5]	Relative emission intensity 2019 (kg CO2e/sqm) (baseline)	Diff (2020 to baseline)	Target	% of green certified buildings 2021[6]
50,669	53,181	(5%)	20.4	21.6	(6%)	(30%)	19
37,244	41,153	(9%)	21.3	22.9	(7%)		20
13,425	12,028	12%	18.1	18.0	1%		19

the EV approach is a better measure to convert a corporation's operational emissions (scope 1+2) into the 'financed emissions' attributed to its underlying equity and 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.
- EV 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 EV is not available (for example for financial companies) it is substituted with market capitalization. EV data is provided by S&P Trucost.
- Market value (MV) is defined as the market value of listed equities and listed corporate debt at fiscal year end.
- While all financial data (EV and MV) is calculated as of 31.12.xx, we use the latest available corporate emission data available as of January, when portfolio-level financed emissions are calculated on an annual basis. This means that emissions data is systematically lagging. For example, financed emissions for 2021 will be largely based on FY2020 emissions data, as FY 2021 emissions data will only be made available by investees in H1 2021, and tends to flow to data providers via Carbon Disclosure Project (CDP) submissions in Q4 of a given year.

4. Our planet: Drive positive impact (continued)

Coverage tends to be almost universal for our listed equity universe, where data gaps were almost exclusively due to missing look-through to single holdings for comingled funds and ETFs. In the listed debt portfolio, data gaps were largely due to missing reported or estimated emission data for smaller or emerging market-based companies. To close these data gaps, we have worked on creating proprietary industry-based estimates that are based on the sector emission intensities.

In addition, to address issues with emissions data in the wider portfolio, work is ongoing: to match ETFs and mutual funds with the financed emission intensities provided by their respective fund managers or benchmark provider; engage with data providers to increase coverage of modeled emissions to small-cap and emerging market issuer; and engage with companies directly, encouraging them to report their operational emissions.

We have already made substantial progress in reducing the emission intensity of our corporate portfolio, based on latest available emission data – which is predominantly from 2020. With the COVID-19 pandemic resulting in the largest-ever decline in global emissions, undoubtedly Zurich's emission reduction benefited from this effect. As primary energy demand dropped nearly 4 percent in 2020, global energy-related CO2e emissions fell by 5.8 percent according to the latest statistical data.[1] Unfortunately, we already know that global CO2e emissions have rebounded in 2021. In addition, the divestments of restricted names based on our thermal coal, oil sand and oil shale policy contributed to the financed emission reduction. These two effects positively impacted the reduction of financed emissions, which might not continue at the same pace in forthcoming years.

In real estate, the entire Swiss portfolio has been optimized and monitored since 2014. The target set to reduce 20 percent of total operational carbon emissions (scope 1 and scope 2 emissions) against the baseline of 2010 was achieved by the end of 2019. The target to reduce 80 percent by 2050 has been reviewed as it was not in line with our net-zero strategy and current science-based target setting methodology. Energy and carbon reduction data have been audited and published in our sustainability report since 2016. As agreed in the NZAOA's target setting protocol, we calculated a baseline 2019 for scope 1 and scope 2 emissions for our global real estate investments and communicated a 30 percent reduction by 2025. As a science-based scenario is required, the use of Carbon Risk Real Estate Monitor (CRREM) 1.5°C pathways was analyzed and piloted in the Swiss real estate portfolio, then applied globally. Over the course of 2021, a carbon management platform was implemented in order to evaluate and report the progress of the global real estate carbon reduction performance. According to the methodological framework of CRREM, the reference area for the calculation of carbon intensity (kgCO2e/m²) and energy intensity (kWh/m²) figures is the Gross Internal Area (GIA: Gross floor area minus area of external walls).

Given the importance of sovereign debt for institutional investors, we are currently working with the NZAOA to develop a methodology that allows the target-setting protocol to be expanded to sovereign debt.

TCFD E Financing the transition 2021

Table 6:
Financing the transition 2021

	2021	2020	2019 (baseline)	Diff (to baseline)	Target
Climate solution investments (USDm)	8,203	8,054	7,408	11.0%	**upward trend**
of which green impact investments[1]	5,115	4,424	3,662	39.7%	
of which green certified buildings[2,3]	3,088	3,631	3,747	(18.0%)	
Milllion tCO2e avoided through climate-related impact investments[4]	4.6	2.9	2.8	64.0%	**5**

1 Values refer to the environmental share of Zurich's impact investments displayed in table 8: 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 5: Emission reduction targets.
4 Impact numbers for 2021 include methodology upgrade from previous years, as explained in Zurich's impact measurement methodology paper: www.zurich.com/-/media/project/zurich/dotcom/sustainability/docs/zurich-impact-measurement-framework.pdf

1 www.iea.org/articles/global-energy-review-co2-emissions-in-2020

4. Our planet: Drive positive impact (continued)

Other Responsible Investment KPIs

The following section shows the progress we have made with our responsible investment strategy the last five years and 2021, specifically.

For more in-depth information please consult the latest Sustainability Report[1].

Responsible Investment strategy KPIs

Table 7:
Investment portfolio managed by responsible investors

	2021	2020	Change	2019	2018	2017
Assets managed by responsible investor[1]	99.6%	99.6%	–	98.2%	97.5%	97.5%
Total amount of impact investments (USD millions)	7,037	5,770	22.0%	4,555	3,790	2,830
Investment portfolio (USD millions)[2]	211,334	226,389	(6.6%)	204,803	195,472	207,261

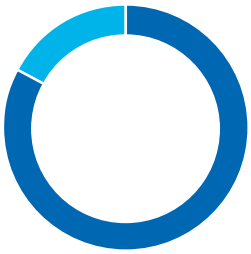
1 A United Nations supported PRI signatory or asset manager that fulfills our minimum requirements for ESG integration.
2 Investment portfolio is calculated on a market basis, and is different from the total Group investments reported in the consolidated financial statements, which is calculated on an accounting basis and doesn't include cash and cash equivalents.

Proxy voting

As part of our active ownership strategy, we require all our managers for listed equities to exercise their voting rights on directly held equities. We measure the votes we cast based on assets under management. Reasons for votes not cast are a combination of portfolio turnover and voting restrictions (such as demands to vote in person, share blocking or requirements that increase the cost of voting).

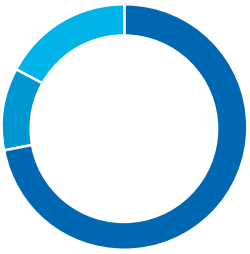
Figure 21:
Proxy voting 2021

Our voting activities in 2021



Votes cast	83%
No votes cast	17%

Our voting behavior in 2021



Voted with management	72%
Voted against management	11%
No votes cast	17%

1 www.zurich.com/en/sustainability/reporting-and-news/reports-publications

4. Our planet: Drive positive impact (continued)

Impact investing

In 2021, our impact investing portfolio of USD 7.0 billion helped avoid a total of 4.6 million tons of CO2e emissions and benefited 3.6 million people.[1]

Table 8:
Impact investing portfolio

	2021	2020	Change	2019	2018	2017
Total amount of impact investments(USD millions)	7,037	5,770	22%	4,555	3,790	2,830
Total amount of impact investments – environmental share	73%	77%	–	–	–	–
Total amount of impact investments – social share	27%	23%	–	–	–	–
Green, social & sustainability bonds (USD millions)	5,846	4,677	25%	3,645	3,104	2,714
Impact private equity (USD millions)	211	189	12%	163	145	116
Impact infrastructure private debt (USD millions)	980	904	8%	747	540	–

1 Impact numbers for 2021 include methodology upgrade from previous years, as explained in Zurich's impact measurement methodology paper: www.zurich.com/-/media/project/zurich/dotcom/sustainability/docs/zurich-impact-measurement-framework.pdf

Advancing together

We believe that 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 a number of industry initiatives and research bodies. Most notably we are a founding member of the NZAOA, as well as Investor's Leaders Group at the University of Cambridge, have 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 2021, we participated actively in 23 membership organizations. Our colleagues spoke about responsible investment at 48 conferences and other industry events around the globe.

Own operations

Progress in the achievements of Group targets for its operations against a 2019 baseline is presented below. Please note that parentheses around percentages or points indicate a reduction.

TCFD E

Sustainable operations

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

Table 9:
Absolute carbon emissions coming from our own operations[1]

Key performance indicator	Unit of measurement	2019 (base year)[1]	WORLD ECONOMIC FORUM 2020	2020 change relative to base year	Target reduction 2025	Target reduction 2029
Absolute carbon emissions Absolute reduction in all operational emissions	CO2e (metric tons)	164,346	66,708	(59%)	50%	70%
Scope 1 + 2 emissions Reduction in emissions from the vehicle fleet and onsite heating as well as from purchased electricity, heat and steam (e.g., district heating)	CO2e (metric tons)	49,042	27,714	(43%)	55%	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 impacts	CO2e (metric tons)	115,304	38,994	(66%)	50%	65%

1 Operational emissions include extrapolations to ensure 100 percent data coverage while details by categories are explained here: www.zurich.com/sustainability/sustainable-operations/our-environmental-kpis