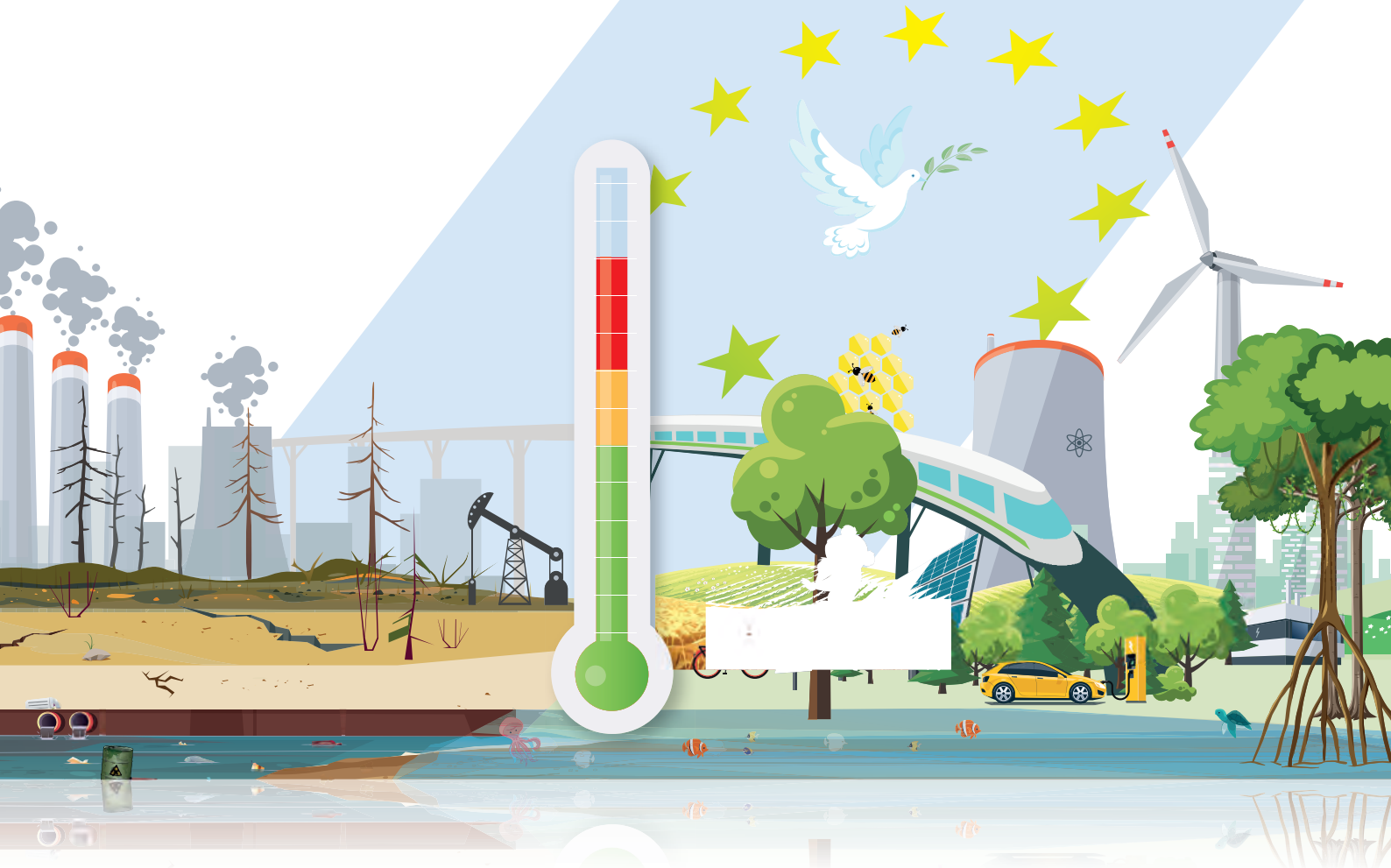
AXA GROUP

2022 Climate and Biodiversity Report

Accelerating Transition



JUNE 2022

In line with France's Article 29 and recommendations from the Task Force on Climate-related Financial Disclosures and the Taskforce on Nature-Related Financial Disclosures (Beta v0.1)

Editorial

The energy transition requires timely and coordinated collective action

Thomas Buberl
AXA Chief Executive Officer

This year's Climate and Biodiversity Report has been prepared in the shadow of the war in the Ukraine. As the cloud of Covid-19 started to lift, Europe was suddenly confronted with a new challenge: a violent conflict, and an associated humanitarian crisis, the largest Europe has experienced since the end of WWII. Subsequently the global economy is experiencing disruptions to supply chains, increases in energy prices and related price increases to primary materials and agricultural commodities.

Covid-19 and the war in the Ukraine are stark reminders that with an interconnected and globalized economy, come interconnected risks. To add to this complex situation is climate change, where climate-related perils can cross political borders and cause complex and compound impacts to human societies and their natural and built environments.

The urgency to act on climate change continues to increase. Since AXA's last Climate Report, the IPCC published its latest report which concludes that there is no time to lose; we must accelerate the energy transition. While there have been some reductions in emissions, globally, they continue to increase, and the physical impacts of climate change are already being observed. The longer mitigation action is delayed, the less feasible some strategies may become. It is also imperative to increase adaptation efforts, to reduce risk and increase resilience.

While short term measures are required to respond to these immediate crises, there is an even more important role for coordinated, long-term action.

The costs of transition

To acknowledge that Europe is experiencing an energy crisis is not to be an apologist for inaction. Rather, it is necessary and responsible observation that the global economy is still heavily dependent on fossil fuels: for energy generation, heating of homes and offices, for mobility, and industrial processes, among other things.

There are costs associated with every energy choice we make, and we are at the beginning of a process whereby immediate transition risks and longer-term physical risks must be balanced carefully. Beyond current price increases, choosing "business as usual" fossil fuels may have less of an immediate impact to consumers and businesses. However, we will incur immediate costs related to energy sovereignty, and longer-term costs associated with GHG emissions and in particular the physical impacts of climate change. Choosing lower carbon energy today means immediate higher costs to invest in necessary infrastructure and retire high-emitting power plants, but over the longer term, less reliance on foreign sources of energy and much-needed reductions in GHG emissions.

We are all conscious of an increasing sense of urgency as the years to net-zero tick away and we realize that our efforts, as important as they are, may not be enough. As the IPCC warns us, even if current commitments from governments are implemented, we are on track to a 3.2 degrees world. We are being called on to collectively transition to a lower carbon economy in time to avoid the worst effects of climate change, while avoiding sudden shocks in energy prices, risking continuity of supply and services to local economies. Accelerated mitigation is only possible if together, we focus on the most high-impact areas: increased efficiency and electrification of buildings, industry, and transport, for example, and rapid decarbonization of the electricity sector. Net-Zero commitments on a 2050 timeline must remain our goal.

Collective action also implies participation from all actors: the right enabling environments set by governments; investment, and real-economy transition with support from private-sector coalitions, and individual action. For institutional investors and insurers like AXA, we must find the right balance to support transitioning sectors which form the backbone of the current global economy, while also financing new and disruptive products and technologies.

Exploring the climate – nature nexus

This year's Climate and Biodiversity Report highlights AXA's ongoing commitments to contribute to fighting climate change and biodiversity loss.

In 2022, AXA continued to explore forward-looking metrics. Applying the "Warming Potential" metric, AXA's investment portfolio revealed a temperature of 2.6°C; an improvement on previous years, but a metric that will remain significantly dependent on the carbon intensity of the global economy. This is why AXA continues to provide funding and insurance to support the transition to new, less carbon intensive models in all sectors, including real estate, utilities, transportation, as well as to innovations supporting greater electrification and the circular economy.

AXA has also made strong progress towards its first intermediate portfolio emissions reduction target. In 2021, AXA reduced the carbon footprint of its investment portfolio by 29% compared to 2019. This result reflects changes in the real economy and select management actions and is a demonstration of what is possible for large institutional investors committed to fighting climate change. It is an encouraging step to continue setting ambitious goals for future intermediate emissions reduction targets.

We are also pleased to publish for the first time an analysis of the impacts of AXA's investments and operations on biodiversity, in line with "Article 29", and building on the Beta version of the Taskforce on Nature-related Financial Disclosures (TNFD). These analyses reveal that progress has been made to help translate nature into a language the financial sector can understand, but that ongoing work is still required. By partnering with Iceberg Data Lab and working with peers, AXA is committed to the development of decision-useful metrics.

We know that nature is our ally, and we must respect and harness it to successfully rise to the dual challenges of climate change and biodiversity loss.

Stronger together

The solidarity that we have witnessed across Europe as the war in the Ukraine has intensified reminds us that we are stronger together. Europe has demonstrated its ability to mobilize, together, for the common good. Collective and sustained efforts are needed to confront future challenges of the energy transition. For AXA, this means continuing to mobilize its teams and experts, work with governments, partnering with our clients, and engaging in coalitions with peers to accelerate transition.

Cross interview: Frédéric de Courtois and George Stansfield

Frédéric de Courtois
Deputy CEO, in charge of Finance, Risk Management, Strategy, Ceded Reinsurance and Operations

George Stansfield
Deputy CEO and Group General Secretary, in charge of Legal, Human Resources, Audit, Compliance and Public Affairs

On the occasion of the publication of AXA's Climate and Biodiversity Report, AXA Group Deputy CEOs Frédéric de Courtois and George Stansfield reflect on progress made to date, and some of the challenges that lie ahead.

AXA has set the standard for insurers seeking to leverage both sides of the balance sheet to act against climate change. How does this work in practice?

Frédéric de Courtois – AXA aims to have a coherent approach to enabling the transition towards a decarbonized economy, both as an investor and an insurer. We believe these two levers place us in a unique position within the financial sector. This is why we have taken strong commitments, notably more restrictive policies when it comes to the energy sector, biodiversity protection and human rights risk. These commitments were reinforced in the lead-up to COP26 at the end of 2021. However, in practice, it is not always possible to replicate these policies to the letter on both sides of the balance sheet due to differences in these business activities. In addition, an investor has the benefit of a broad investable universe, whereas when an insurer chooses not to cover an activity, it is the end of the line. However, where there is a red line AXA is not afraid to act, and we are not afraid to lead by example. It is all about striking the right balance.

George Stansfield – Transparency on actions and progress is important. All our policies are public and can be consulted, and we listen to a range of stakeholders when developing these policies and we review them regularly. Having sound internal governance with the right checks and balances is key when considering issues like this that can impact multiple aspects of our business and multiple stakeholders, both internal and external. So is engaging with our people so they understand why AXA has taken a position, especially for our underwriters who are on the front line.

FdC – While the immediate impact on GHG emissions may be hard to quantify, we are convinced that over the mid- to long-term, such initiatives can contribute to new practices. In this regard, we believe that collective action from investors and insurers can play a role in helping to steer the economy towards a low carbon future. The remaining challenge for AXA, like any investor or insurer which chooses to draw a line under certain activities, is that a competitor may win this lost business. When we say underwriting restrictions are not an easy decision, this is what we mean. To critics of restrictions, we say they can have a substantial impact. This is what we can observe with coal. Today, there are close to 40 insurers and around 60 investors globally that have put in place restrictions on coal.

There is a perceived ambition gap between national commitments and what the science is telling us. What should a large investor or insurer like AXA do in such circumstances?

FdC – We continue to increase our green investment target, which currently sits at €26 billion by 2023, and we continue to actively seek new opportunities. For example, our recently announced commitment to invest €1.5 billion in forests. With this commitment we have demonstrated innovation by investing in nature-based solutions. At the same time, we must finance the real economy as it transitions, but this process will not happen overnight. There is no magic button for transition: we have a responsibility to accompany the real economy as a whole on this journey.

GS – Governments and regulators have a critical role to play in setting legislative frameworks and standards to define what is green, or not. This has been the subject of much debate at an EU level for example, with the Taxonomy Regulation. Governments can also help steer the economy supporting new technologies. This is what we see in France, for instance, with the recent announcement of ecological and energy transition portfolios in the new French government. Public private partnerships are also key to help ensure the efficient allocations of climate finance to where it is most needed.

FdC – The ambition gap is also a reflection of the tensions between the science and the economic and social reality of today. We must be sensitive to the pressures on job and wealth creation during transition. Even if we know that transition entails upfront costs to help the most emitting sectors decarbonize, to provide training for workers, and to finance necessary investments in technology and infrastructure, the cost of "doing nothing" would be higher. Recent research suggests that the most pessimistic estimate of the cost of fighting climate change is lower than the most optimistic estimate of doing nothing. A just and orderly transition isn't nice to have, it is essential for social buy-in. Again, governments must lead the way, setting the rules and providing adequate protection when required.

In 2021 the Net-Zero Insurance Alliance was launched, with AXA as Chair. What has this Alliance been working on? Why is it important for insurers to set net-zero ambitions?

FdC – Insurers are an essential party for all economic transactions and their engagement towards net-zero pathways is required if we are to collectively transition. Therefore, it made sense for AXA to call for the creation of this Alliance and AXA is pleased to act as Chair of the NZIA. 2022 has already been a fruitful year for members.

Members of the NZIA have committed to transition their insurance and reinsurance underwriting portfolios to net-zero greenhouse gas emissions by 2050, consistent with the Paris Agreement. To achieve this goal, the NZIA is collaborating with the Partnership for Carbon Accounting Financials to develop a proposed first global standard to measure insured emissions. Members of the NZIA will be required to publish their first intermediate science-based target within six months of the publication of this standard.

> *"In this regard, we believe that collective action from investors and insurers can play a role in helping to steer the economy towards a low carbon future.*

> ***Even if we know that transition entails upfront costs to help the most emitting sectors decarbonize, to provide training for workers, and to finance necessary investments in technology and infrastructure, the cost of "doing nothing" would be higher.***

To support collective change, it will also be important for insurers to engage with other actors in the insurance ecosystem, including brokers.

GS – AXA also continues to actively participate in the Net-Zero Asset Owner Alliance and has made strong progress towards its first intermediate target, which is detailed in this Report. This Alliance has helped to set the standard for protocol and target setting, and over time we hope that this approach will be adopted by other Net-Zero Alliances. AXA IM, our asset manager, is also engaged in the Net Zero Asset Managers Initiative and reports on progress regularly. In May 2022 AXA IM published its second progress report and announced that 65% of all assets under management are managed in line with Net-Zero pathways, in line with the IPCC 1.5°C pathways report.

In last year's Climate Report, AXA introduced its aim to develop "green business" to support the transition. What has happened since?

GS – In April 2022, AXA announced a green business target to support more sustainable behaviors and business models for both retail and commercial clients. This includes a wide range of activities, from providing insurance coverage for renewable energy plants and equipment to designing and implementing more sustainable claims practices. There is also significant potential for us to help our commercial clients in their transition. Engaging with an existing client to better understand the challenges they face to decarbonize or shift their business model, and helping them manage risks, is a powerful way for us to support the energy transition.

FdC – We are convinced that we must accompany real economy actors to enable the energy transition. To do so, we cannot stand on the sidelines, rather we must stand with our clients and provide the right advice and direction. This work is driven by a long-term view and the knowledge that many of an insurer's key activities are effective adaptation mechanisms: disaster risk management, climate services including early warning systems, social safety nets and risk spreading and sharing, for example This is why, for example, we are expanding our risk consulting offers for commercial clients with AXA XL and AXA Climate. Beyond our products and services, climate risk and opportunities have become key focus areas to the daily work of a broad range of teams: from finance to legal, from strategy to risk management, IT and investments.

The last twelve months have seen increased action from regulators on both sides of the Atlantic – as well as calls for greater convergence. What should be the priority?

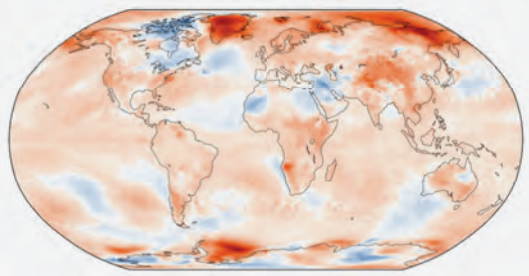
GS – Current efforts to harmonize and improve extra-financial reporting standards are certainly welcome and should be a priority. More broadly, many sustainability practices have been, and are being co-built by the private sector, regulators, scientists, and civil society organizations. We believe in sharing expertise and supporting transparency in reporting activities, which is what drove AXA to release its first Climate Report in 2016 using the TCFD recommendations. Since its creation in 2015, the TCFD has helped drive climate-risk related market transparency measures, which are being adopted by many governments around the world including in the EU, the UK, and potentially the US.

As for nature-related risks and opportunities, the creation of the Taskforce on Nature Related Financial Disclosures in 2021 is also an important milestone. This initiative aims to develop a framework for biodiversity, backed by the science, similar to what the TCFD has done for climate. Like many other financial institutions, AXA is eager to see decision-useful metrics emerge on biodiversity, and as a member of the TNFD, AXA is actively contributing to this effort.

FdC – Consensus on climate scenarios and their variables will be increasingly important as regulators and supervisors continue to explore climate risk-related stress tests. Again, AXA contributes to these exercises to help build collective understanding and consensus between public and private actors on the best approaches to understand climate-related risks.

GS – Finally, we hope that the various regulatory initiatives underway in Europe, in the US and in other markets where we do business can help drive convergence on classification, metrics, and reporting over the coming years. We appreciate the complexity of that task and know, of course, that there will always be local specificities and adaptations. However, there's clearly a large overriding interest to get to the right level of standardization to enable comparability of information across markets for users of this information, and a level playing field for private sector actors to operate and contribute to the transition.

Executive Summary



The Paris Agreement is our roadmap

"Well below 2°C"
and "pursue best efforts to limit warming to 1.5°C by 2100"

We are on track to a **3.2°C** world

4.8°C
expected temperature increase if inaction prevails ("Business As Usual" scenarios)

To stay below 2°C, climate finance for mitigation must be
3 to 6 times higher by 2030

34
members of the TNFD representing
US$19.4 trn
in assets under management

€153bn
estimated annual cost of artificial pollination

AXA views the biodiversity challenge as a natural extension of its climate efforts. Limiting ecosystem loss is a priority to maintain economic stability and mitigate climate change. In parallel, climate change also amplifies ecosystem destruction worldwide.

AXA's climate stategy

1.5°C
investment "warming potential" target by 2050

€26bn
green investments by 2023

0%
Exit from coal by 2040

-20%
Intermediate investment-related carbon footprint target

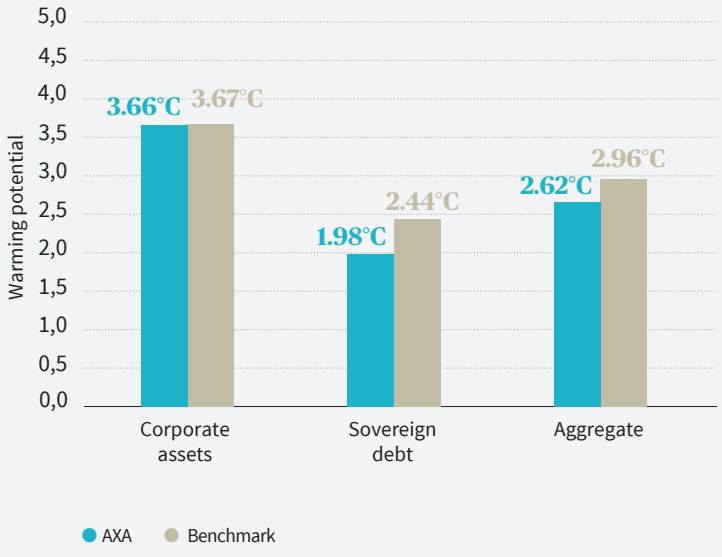
Integrating sustainability factors

85%
of the Group's Credit Portfolio covered by an internal credit rating

8,000+
companies covered by AXA's ESG research

93% corporate equities
87% corporate debt
98% sovereign debt
73% Real Estate
covered by ESG scoring

Aligning investments with the Paris Agreement: the "warming potential" approach - 2021



Net-Zero Asset Owner Alliance*

65 institutional investors representing almost

US$10 trillion

in assets under management collectively committed to achieved climate neutrality by **2050**

* *as of end-2021*

Net-Zero Insurance Alliance*

Chaired by AXA

Over **25** (Re)insurers are members of the NZIA

Over **US$7 trillion** in asset under management

* *as of end-2021*

Net Zero Asset Managers Initiative*

220

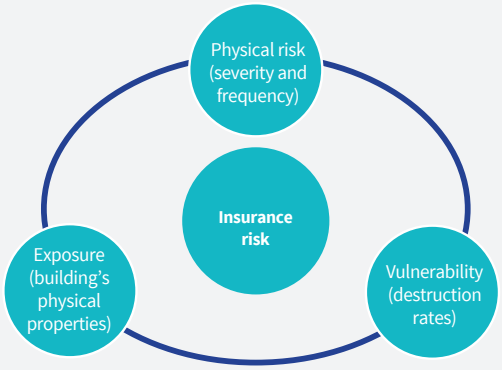
signatories managing

US$57 trillion

of assets under management

* *as of end-2021*

Physical risks on AXA's "Real Assets"



€6.6m

our Real Assets Annual Average Loss to Floods

€2.2m

AXA's Real Assets Annual Average Loss to Windstorms

How climate change may impact our investments

-11%

Portfolio Climate Value at Risk* (under a 1.5°C scenario)

* *As methodology changes occured, these figures may not be compared with those disclosed in our 2021 Climate Report.*

Investment and business exclusions

€7.5bn

total assets impacted by divestment policies

0%

coal in our business by 2030 (EU/OECD) and 2040 (rest of the world)

Direct environmental footprint

-61%

AXA's decrease in absolute CO_2 emissions between 2019 and 2021

Achieve carbon neutrality for own operations by **2025**

Voting & engagement 2021

5,546

General Meetings voted

59%

meetings where AXA did not fully support management proposals

283

issuers engaged

Products & services

€1.3bn

in gross written premiums on Green Business by 2023

12m

of customers on Inclusive Protection by 2023

1,390 ton of CO_2

emissions avoided annually with AXA IM Real assets 22 Bishopsgate skyscraper in London

Our sustainability performance

97th

percentile ranking according to the DJSI

#58/100

AXA's ranking in our industry according to Vigeo

AAA

MSCI

Report structure

Since 2015, AXA has published an annual "Climate Report"[1]. AXA's 2022 Climate and Biodiversity Report (the "Report") describes AXA's responsible investment and insurance initiatives considering two different frameworks[2]:

- the mandatory disclosure requirements applicable in France derived from "Article 29"[3], which considers Environmental, as well as Social and Governance (ESG) matters, and amends and supplements the "Article 173"[4] framework referred to in previous years' reports;
- the voluntary disclosure recommendations of the Task Force on Climate-related Financial Disclosures[5]. In preparing this Report, AXA has considered TCFD's "Guidance for all sectors" and "supplemental guidance" for asset owners and asset managers.

This Report follows the TCFD structure[6]. Key elements of this Report are also described in AXA's 2021 Universal Registration Document[7].This Report also considers the Beta version of the Taskforce on Nature Related Financial Disclosures (TNFD), released in March 2022[8].

Core Elements of Recommended Climate-Related Financial Disclosures

Governance
The organization's governance around climate-related risks and opportunities

Strategy
The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning

Risk Management
The processes used by the organization to identify, assess and manage climate-related risks

Metrics and Targets
The metrics and targets used to assess and manage relevant climate-related risks and opportunities

Source: www.fsb-tcfd.org

There are a number of significant changes between this Report and AXA's 2021 Climate Report. These include:

- a greater focus on biodiversity:
  - an exploration of the Beta release of the Taskforce on Nature-related Financial Disclosures (TNFD),
  - the initial results of a pilot exercise involving the testing of biodiversity metrics, with the aim to measure the impact of AXA's own operations on biodiversity,
  - an exploration of biodiversity metrics for use at investment portfolio level[9];
- information on new policies for Energy and Deforestation and Ecosystem Conversion;
- updates on Net-Zero coalition-building initiatives and related targets. This includes the progress of the Net-Zero Insurance Alliance;
- updates and reporting on the AXA for Progress Index. This includes new targets for Green Business and Inclusive Protection insurance activities;
- further updates on analyses using the ACPR[10] Climate Stress Testing "pilot exercise" and the stress tests from the Prudential Regulation Authority and the Bank of England;
- further detailed analysis of Property-related (re)insurance climate risks; and
- updated methodologies leading to re-baselining of some key "Climate Metrics".

Statutory audit

AXA's external auditors (PwC) have emitted an independent limited assurance report on a selection of information from AXA's 2021 Climate report. This is a voluntary initiative. PwC's limited assurance report can be found at the end of this Report. Its findings confirm the robustness of AXA's processes and underlying assumptions.

(1) Past Climate Reports are available on www.axa.com.
(2) The frameworks partly overlap and are complementary.
(3) Article 29 of Law No. 2019-1147 dated November 8, 2019, on energy and climate and Decree No. 2021-663 dated May 27, 2021.
(4) Article 173-VI of Law No. 2015-992 dated August 17, 2015, on the energy transition for green growth.
(6) Governance, Strategy, Risk Management, Metrics & Targets (see accompanying diagram).
(7) AXA's 2021 "Universal Registration Document" for the year ended December 31, 2021 ("Annual Report") was published in March 2022.
(8) www.tnfd.global
(9) Covering investments in public equities and corporate bonds.
(10) ACPR – Autorité de Contrôle Prudentiel et de Résolution – French banking and insurance supervisory authority.

1. Context

1.1 AXA's key climate & biodiversity commitments put in context

Market/political context/milestones

2013
- 2012-2013 "Food riots"

2015
- COP21 Paris Agreement "well below 2°C" target, enshrines role of investors

2016
- TCFD launch

2017
- TCFD guidelines finalized
- U.S. government pledges to withdraw from Paris Agreement
- First One Planet Summit event

2018

2019
- G7 Summit in France

2020
- COP26 postponed due to COVID-19

2021
- The U.S. rejoins the Paris Agreement
- US-led Climate Leaders Summit
- Glasgow Financial Alliance for Net-Zero (GFANZ) launch
- COP26 (Glasgow)
- CBD COP15 Part (Biodiversity, Kunming)
- TNFD launch
- IPBES-IPCC Report on Biodiversity and Climate change

AXA's Climate and biodiversity strategies

2013
- Palm oil policy

2015
- **First coal divestment**
- First green investment target
- AXA vice-chairs TCFD

2016
- Climate report wins first top award

2017
- Strengthened coal divestment criteria
- **Coal policy extended to insurance underwriting**
- Oil sands investment and underwriting restrictions

2018
- Underwriting restrictions extended to newly acquired AXA XL
- Creation of AXA Climate to address climate resilience
- Act4Nature pledge

2019
- New climate strategy:
  - 1.5°C by 2050
  - €24Bn green investments
  - Transition bonds
  - Coal phase out
- Net-Zero Asset Owner Alliance
- AXA-WWF "**Into the Wild**" Report.
- Impact Investment Fund Climate & Biodiversity
- TCFD membership renewed

2020
- **"Climate leadership" integrated into 2023 strategy plan**
- **Commit to reduce investment carbon footprint by 20% by 2025**
- New €100 million investment in transition bonds issued by BPCE
- Impact Investment Fund Climate & Biodiversity size doubled to US$350 million
- AXA calls for the creation of Net-Zero Insurance Alliance
- 3-year partnership with the WWF dedicated to biodiversity
- Join the "Business for Nature" and "Finance for Biodiversity" initiatives
- Lead "Informal Working Group" Governance workstream to create TNFD

2021
- AXA SA's inaugural Green Bond issuance (€1 billion)
- Green Investment target increased to €25 billion by 2023
- **Net-Zero Insurance Alliance leadership entrusted to AXA**
- Ecosystem protection, Deforestation and Natural World Heritage Sites policy
- Oil and gas exclusions to support the energy transition

Market/political context/milestones

- SEC guidelines on climate-related disclosures for investors
- ISSB launch
- IPCC AR6 report
- CBD COP15 Part II

- Net-Zero macro-targets: carbon sinks must compensate remaining carbon emissions

2022 2023 2024 2025 2030 2035 2040 2050

Operational carbon footprint

Coal phase out EU / OECD — Coal phase out rest of the world

Green Investments

Green Business & Inclusive Protection

Investment carbon footprint

Underwriting carbon footprint (Net-Zero Insurance Alliance)

Investment Warming Potential

2022 2023 2024 2025 2030 2035 2040 2050

- Green Business & Inclusive Protection insurance targets

AXA's Climate and biodiversity strategies

1.2 The science and politics of climate change

Robust scientific consensus on climate change

This section provides an overview of the climate science presented in the International Panel on Climate Change (IPCC) Sixth Assessment Report (AR6).

In its most recent report, the IPCC[1] concluded that it is "unequivocal" that human-induced climate change has warmed atmospheric, terrestrial, fresh, and salt-water systems. The evidence shows that:

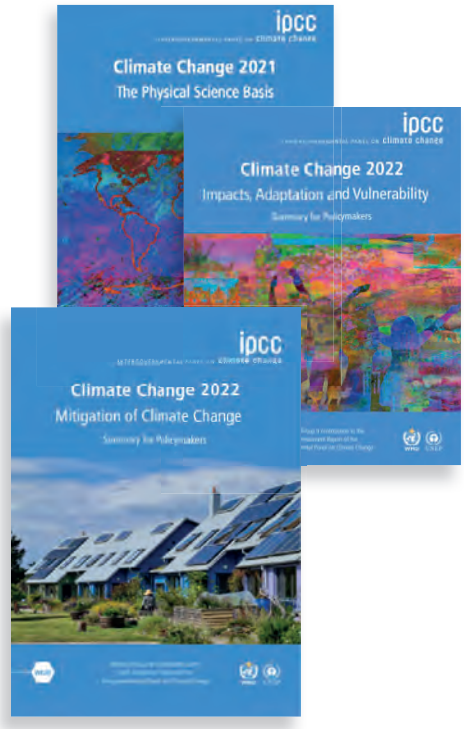
- human-induced climate change has also either caused or increased the likelihood of different weather and climate-related extremes; and that
- the scale of this change is unprecedented.

Without drastic reductions in GHG emissions over the coming decades, global warming will exceed 1.5°C and 2°C during the 21st century.

Climate change is already having a negative impact on human and natural systems. Since 1950, the world has seen:

- more frequent and intense heatwaves;
- heavier precipitation events;
- more droughts;
- more tropical cyclones;
- more fires;
- more flooding.

Finally, local economies may suffer greater property and infrastructure damage. Certain industries most reliant on the environment[2] may see revenues decline. Vulnerable populations will likely be disproportionately affected by future climate change-related events, particularly where local populations heavily depend on the natural environment and have less ability to adapt[3].



The role of mitigation and adaptation

In addition to decarbonization (mitigation), the IPCC states there is an immediate need to reduce climate risks through adaptation. These two actions, mitigation, and adaptation are not mutually exclusive. Both are necessary to address the immediate and long-term impact of climate change. Many adaptation strategies can increase resilience. Protecting and restoring ecosystems can increase ecosystem, human resilience, and also contribute to mitigation.

Separately, human adaptation requires changes to:

- lifestyles (where and how we live, including how we consume);
- mobility (such as low-carbon transport); and
- food production.

There is also an immediate need for climate-proof infrastructure in urban areas to address risks such as heatwaves and water storage needs.

Context Box

Adaptation

According to the IPCC, Adaptation plays a key role in reducing exposure and vulnerability to climate change. Adaptation is the process of adjustment to actual or expected climate and its effects in order to moderate harm or take advantage of beneficial opportunities.

(Source: AR6 Working Group 2)

Climate Finance

The IPCC concludes that while annual public and private finance for climate change mitigation and adaptation rose by up to 60% from 2013 to 2020, more is needed. The IPCC estimates that climate finance for mitigation must be 3 to 6 times higher by 2030 to stay below 2°C[4].

(1) "The Physical Science Basis of Climate Change" WG1: https://www.ipcc.ch/report/ar6/wg1/
(2) For example, agriculture, forestry, energy and tourism.
(3) "Climate Change 2022: Impacts, Adaptation and Vulnerability" WG2: https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/
(4) "Climate Change 2022: Mitigation of Climate Change" WG3: https://www.ipcc.ch/report/ar6/wg3/

1.3 International climate action framework

COP21: the Paris Agreement

COP21 was held in Paris in December 2015. It saw 195 countries negotiate and adopt the Paris Agreement[1]. Countries ratifying it are legally bound to collectively keep warming to "well below 2°C compared to pre-industrial levels" and pursue best efforts to limit warming to 1.5°C by 2100.

These thresholds were chosen based on the "level of destruction" they entail. Indeed, the risks associated with warming are substantially lower at 1.5°C than 2°C[2]. The Paris Agreement also highlighted the role of investors (see box) in the response to the threat of climate change.

The Paris Agreement binds Governments to collectively keep warming within safe levels by reducing greenhouse gas emissions within specific timeframes, which requires rapid and significant reductions. This low carbon transition target will have significant consequences for the real economy, and in turn for investors and insurers. They can choose to develop a long-term risks & opportunities framework derived from the Paris Agreement roadmap. This is the backdrop for AXA's climate action.

Context Box

COP21 Paris Agreement article 2: the key role of investors

"This Agreement (…) aims to strengthen the global response to the threat of climate change (…) by: (a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels (…); (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development (…); and (c) **Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development."**

COP26: "keeping 1.5 alive"

COP26 was held in Glasgow in late 2021. Its main goal was to "keep 1.5 alive": to limit warming to 1.5°C above preindustrial levels. This goal, if achieved, would make the 2020s the "decisive decade" for climate action. Governments are required to produce new Nationally Defined Contributions (NDCs) to decarbonization for the next COP in Sharm El-Sheikh in Egypt at the end of 2022. Before this, the next publication of NDCs had been due in 2025. The agreement also included the first-ever plan to reduce the use of fossil fuels.

Ahead of the final Glasgow pact, over 40 countries agreed to move away from coal as an energy source. This meant committing to phase out coal power in developed economies in the 2030s, and emerging markets in the 2040s. In addition, over 20 countries agreed to halt new direct public financing for coal development by the end of 2022 and invest more in renewable energy.

Alongside the government targets, a coalition of over 450 international financial companies with $130trn in assets has committed to align with the goal of Net-Zero by 2050.
The group, known as the Glasgow Financial Alliance for Net-Zero (GFANZ) and which AXA has joined, will help provide the necessary finance for the carbon transition.

Recognizing the link between climate change and nature, COP26 also included a pledge to end deforestation by 2030. The pledge was signed by countries with around 85% of the world's forests[3].

For investors, supporting efforts to stop and reverse deforestation means addressing those large-scale activities that are driving it[4]. AXA has implemented a policy to limit AXA's investment in companies involved in deforestation and those that potentially damage natural ecosystems, see Section 3.4 "ESG Integration – Exclusions and sensitive ESG restrictions".

Source: AXA

COP27

COP27 will be held in Sharm El-Sheikh in Egypt in 2022. This COP will address the following subjects:

- a greater focus on resilience;
- pushing for increased finance for climate action;
- closer scrutiny of Net-Zero commitments;
- further efforts to strengthen links between climate change mitigation and adaptation and biodiversity[5].

(1) https://unfccc.int/sites/default/files/english_paris_agreement.pdf
(2) https://www.ipcc.ch/report/ar5/syr/
(3) This includes Brazil, home to the critically important Amazon rainforest.
(4) This includes meat production and grazing, palm oil and soya bean cultivation.
(5) For example, through plans to eliminate agricultural commodities-driven deforestation, scale up financing.

1.4 UN Convention on Biological Diversity, (COP15), the COP21 for biodiversity?

As described above, the Paris Agreement at COP21 sent a clear political signal to the private sector that climate action was needed. With respect to biodiversity, AXA can contribute through voluntary initiatives such as the "Business for Nature" and "Finance for Biodiversity" initiatives, see Section 3.3 "Biodiversity". However, against the background of a competitive market environment, adequate rules and guidance from governments are key for cutting-edge issues where the playing field is not yet level.

Government adoption of international science-based biodiversity targets at COP15 is the surest way to provide this much needed clarity. General aspirations will not be sufficient to achieve tangible outcomes. Clear targets will help companies, financial institutions, and civil society to translate these nature conservation objectives into robust long-term business strategies.

Clear steps have already been made in this direction. In October 2021, the first part of COP15 was held in Kunming, China. The Kunming Declaration, agreed at this meeting, identifies the role of finance in addressing biodiversity loss. Like the Paris Agreement, the Kunming Declaration identifies the need to "align all financial flows in support of the conservation and sustainable use of biodiversity" (Article 13)[1].

The second part of COP15 is scheduled to take place in October 2022. It is important that a "science-based" Kunming Agreement is achieved this year. The hope is that it will have the same transformative effect on governments and businesses worldwide as the Paris Agreement had 5 years ago. Such an agreement is needed to achieve the same level of political and business leadership for the preservation of biodiversity as has been seen for climate change.

1.5 EU Sustainability Finance Strategy

The EU has developed a comprehensive sustainability regulatory framework. It aims to:

- support the flow of private finance to sustainable economic activities; and
- facilitate the transition to a carbon neutral economy by 2050.

Key aspects of this framework are already fully or partly in place while other aspects are still under development:

- the **Taxonomy Regulation**[2]: this creates a scientific-based classification system of environmentally sustainable economic activities (the Taxonomy). The aim is to trigger behavioral changes in the financial sector, discouraging greenwashing, and scaling up sustainable investments (for more information about the Taxonomy Regulation, refer to "EU Taxonomy Regulation" in Section 4.3 "Climate Change and ESG Integration" and "Regulation and Supervision—Climate and Sustainable finance-related regulatory initiatives" in Section 7.3 "General Information" in AXA's 2021 Universal Registration Document);
- the **Corporate Sustainability Reporting Directive** (CSRD)[3]: this will more comprehensively amend the existing non-financial reporting requirements under the Accounting Directive[4]. The European Commission's current CSRD proposal intends to, among other things:
  - **(i)** extend the scope of the reporting requirements under the previous Non-Financial Reporting Directive (NFRD) to additional companies,
  - **(ii)** increase the level of assurance for sustainability reporting,
  - **(iii)** create mandatory EU sustainability reporting standards,
  - **(iv)** introduce a double materiality perspective,
  - **(v)** require inclusion of sustainability reporting in corporate management reports, and
  - **(vi)** align the collective responsibility of members of administrative, management, and supervisory bodies of reporting companies under the Accounting Directive with the revised sustainability reporting requirements;

(1) https://www.cbd.int/doc/c/df35/4b94/5e86e1ee09bc8c7d4b35aaf0/kunmingdeclaration-en.pdf

(2) Regulation (EU) 2020/852 of the European Parliament and of the Council of June 18, 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088.

(3) Proposal for a directive of the European Parliament and of the Council amending Directive 2013/34/EU, Directive 2004/109/EC, Directive 2006/43/EC and Regulation (EU) No 537/2014, as regards corporate sustainability reporting, published by the European Commission on April 21, 2021.

(4) As amended by the Non-Financial Reporting Directive (NFRD).

› the **Sustainable Finance Disclosure Regulation** (SFDR)[1]: this governs how financial market participants (FMPs)[2] and financial advisers (FAs)[3] should disclose sustainability information to end-investors[4] from March 2021 (or, for certain information, starting from January 2022 or January 2023);

› the **Corporate Sustainable Due Diligence Directive**[5]: this aims to foster sustainable and responsible corporate behavior throughout global value chains. The European Commission's current CSDD proposal intends to, among others, set common rules with respect to due diligence, due diligence processes and standards, that companies should implement regarding actual and potential adverse effects on human rights and the environment, in connection with their activities, the activities of their subsidiaries and the value chain operations carried out under established business relationships. The CSDD proposal also includes rules on liability in the event of a breach of due diligence processes and standards.

The EU Sustainable Finance Strategy: next key milestones

Patricia Plas,
Group Head of Public Affairs

The European Union's Sustainable Finance Strategy has already led to important regulatory changes at unprecedented speed with the objective to make Europe the first climate neutral continent by 2050 and to support the transition towards a more sustainable economy.

Along the lines set in its renewed sustainable finance strategy, the European Commission has emphasized the need for a supportive framework to recognize transition effort. Among the measures proposed, the extension of the Taxonomy to include the transition would turn the existing Taxonomy into a guiding tool driving transition towards sustainability.

(1) Regulation (EU) 2019/2088 of the European Parliament and of the Council of November 27, 2019 on sustainability-related disclosures in the financial services sector.
(2) Refers to Financial Market Participants (e.g., asset managers, insurers).
(3) Refers to Financial Advisors (e.g., brokers).
(4) This includes customers/clients.
(5) Proposal for a directive of the European Parliament and of the Council on Corporate Sustainability Due Diligence and amending Directive (EU) 2019/1937, published by the European Commission on February 23, 2022.

1.6 "Just Transition" getting very real

"Just Transition" getting very real

Gilles Moëc,
Group Chief Economist

The ongoing decline in real income triggered by the spike in energy prices would be particularly acute for the poorest members of society were it not for the government fiscal response. We may see this as a "dress rehearsal" for a more permanent tension between the necessary fight against climate change, which may well come with a rise in the overall level of consumer prices on trend, and social fairness. The "just transition" issue – i.e. the need to preserve social cohesion as the economy moves towards Net-Zero – is no longer theoretical. Hard choices are ahead.

Fundamentally, climate change is a negative externality. In clear, it means that, if kept unchecked, it will ultimately come with a cost to collective welfare which is not "chargeable" to anyone in particular (and that's precisely why GHGs emissions would continue in an uncontrolled manner). Fighting global warming entails "internalizing the externality" or, translated into less pompous words, it means revealing the future cost in today's prices so that behaviors can change in time. The European Union has taken the lead on this by putting together the largest and most efficient carbon trading system in the world, the Emissions Trading Systems (ETS). The EU sets an overall limit to the carbon issuance of key sectors, and businesses are then free to trade those "carbon credits", generating a market price. Reflecting the policy push towards decarbonization, the price of carbon has increased over the last 2 years and the EU is working on an extension to more sectors of the economy. Still, using the latest academic estimates of the price of carbon consistent with a trajectory to Net-Zero by 2050, the market price needs to rise further, to probably exceed €100 per ton.

If we put a price on carbon someone must pay for it, and there is every chance that the final consumer will be the payer, as carbon prices work their way through producers' input prices. Another way to "internalize the externality" is to directly add a premium on heavily carbonated retail prices to fund the emergence of decarbonized options. The bill can be hefty. In Germany, at the peak of the shift to renewable energy – which is still incomplete given the country's continued reliance on coal – households were paying a premium on their electricity bill equivalent to a full percentage point of their disposable income.

Ultimately, the transition will work if consumption and investment shift from heavily carbonated options to better ones. An issue is that the decarbonized solutions are often more expensive – at least transitorily. To take a concrete example, at the point of purchase, the price of an electric car before tax and subsidy is higher than the price of a traditional combustion engine car. Governments can incentivize consumers to shift to the green option by levelling its price, in practice by levying a tax on the combustion engine cars to fund a subsidy for the electric ones. The problem is that dynamically, this can't be neutral for public finances: as people start buying more green cars, there are fewer traditional cars to tax.

Down the road, a Net-Zero trajectory can work in a way which does not elevate the global price level only if the price of green options before tax subsidy falls quickly enough. In theory, this will be the case, and examples abound – e.g. the steep decline in the price of solar panels as the technology went mainstream and economies of scale kicked in – but bottlenecks may appear. For instance, an acute issue now is that some green solutions are dependent on "rare earth" materials which prices have shot up.

Still, the "Just Transition" issue cannot be ignored since a fair distribution of the cost of the transition is crucial to its success. The conversion of public opinion to the decarbonization of our economies is very new, incomplete in many countries, and fragile everywhere. Sustained political support to the Net-Zero trajectory is needed, and glaring inequalities in how the shock is apportioned could stop the process in its tracks. When it comes to ESG, the "E" pillar cannot leave the "S" one on the sidelines. At the business level, this means a properly integrated strategy mixing environmental and social goals is necessary.

2. Governance

2.1 Board Oversight

AXA has established a solid governance framework to develop and implement its Sustainability Strategy. In accordance with applicable regulations and its Terms of Reference, the Board of Directors exercises its oversight of the Sustainability Strategy mainly through the Board of Directors' Compensation & Governance Committee. Every year, the Board of Directors' Compensation & Governance Committee reviews the Group's Sustainability Strategy and reports to the Board of Directors on this matter. In addition, the Board of Directors' Audit Committee annually reviews the Statement of Non-Financial Performance included in AXA's Universal Registration Document and the Board of Directors' Finance & Risk Committee oversees the climate related risk appetite driven by the climate related stress testing and report to the Board of Directors on these matters.

2.2 "Role in Society Steering Committee" (RISSC)

The Group Management Committee is supported by the RISSC, which is co-chaired by the:

- Group Chief Risk Officer;
- Group Chief Investment Officer; and
- Group Chief Communication, Brand and Sustainability Officer.

The purpose of the RISSC is to steer AXA's Sustainability Strategy and review material sustainability-related issues faced by AXA as well as monitor material sustainability-related initiatives across AXA, including this Report, which is also provided to the Board of Directors' Audit Committee and the Board of Directors for information. The RISSC meets monthly and ensures coordination across all internal stakeholders in formulating AXA's overall Sustainability Strategy, which it submits to the Group Management Committee for review and approval. The RISSC reports back to the Management Committee on a regular basis concerning material decisions taken or to be taken and issues considered on which Management Committee guidance and/or decisions are needed.

- Committee chairs are responsible for escalating material matters related to AXA's Role in Society, i.e., Climate change and Inclusive Insurance, to the RISSC.
- Material matters cover all topics on which the Group will communicate externally, as well as internal decisions with Group-wide operational implications.

2.3 Investments

As far as investment-related matters are concerned, the RISSC is supported by the Responsible Investment Committee (RIC), which is chaired by the Group Chief Investment Officer. Any sensitive and/or strategic climate finance-related decisions debated in the RIC are ultimately submitted to the RISSC for approval. The RIC also reports to the Group Investment Committee (GIC), chaired by the Group Chief Financial Officer. The presence of the Group Chief Investment Officer on the RIC, the GIC, and the RISSC facilitates the alignment of AXA's Responsible Investment strategy with AXA's Sustainability Strategy.

The RIC is supported by the Responsible Investment (RI) Centre of Expertise. This is a cross-functional working group of over 60 experts from AXA's local investment teams interacting with AXA IM. AXA IM has also developed a dedicated RI governance involving all its central management teams and investment platforms.

In addition, the ESG Monitoring & Engagement Working Group advises on issuers and sectors challenged from an ESG or climate perspective and provides investment-related recommendations for approval by the RIC.

2.4 Insurance

Insurance-related ESG risks and opportunities are also subject to specific governance, notably by the Group Underwriting Committee (GUC) chaired by Group Risk Management (GRM). The GUC:

- defines all underwriting restrictions, guidelines, and exemption criteria, including the Sustainability Underwriting Restrictions, and reviews their application in all AXA entities;
- includes representatives from GRM, Group Performance Management, Group Corporate Development, AXA Global Re, and Group Sustainability.

Similar to what happens with investments, sensitive and/or strategic climate-related decisions discussed by the GUC are ultimately submitted to the RISSC for approval.

In addition, a dedicated team within Group Risk Management analyzes emerging risks[1] and monitors their potential impact on AXA's business. These may, for example, relate to long-term ESG issues.

(1) Emerging risks are risks that may develop or that already exist and are continuously evolving. Emerging risks are subject to a high degree of uncertainty, as some of them may never even emerge.

2.5 Remuneration

10% to 30%

weight of Sustainability criteria in AXA Performance Shares

In addition to AXA's governance framework, AXA's compensation policy is designed to align the interests of AXA employees with AXA's Sustainability Strategy. In this context, AXA has progressively integrated ESG criteria in compensation packages of its top executives on the short- and long-term components. For 2022, annual variable compensation of top executives is subject to Group performance (including a criteria on reduction in the Group's carbon footprint in AXA's General Account assets, weighting for 15%) and individual performance (including achievement on diversity and climate related goals). Since 2021, AXA has also increased the weight of Sustainability criteria in AXA Performance Shares from 10% to 30%, including the following metrics for the 2022 grant: AXA's ranking in the DJSI (10%), reduction in Group operations carbon emissions (10%), and increase in the proportion of women in the Group executive population (10%).

Furthermore, approximately 5,000 employees were granted long-term incentives known as Restricted Shares which are subject to a Sustainability underpin i.e. minimum AXA's ranking in the DJSI to be met. Finally, **the weight of environmental and social criteria in profit sharing schemes (20 000+ employees) has been enhanced in 2022**.

For more information, please refer to AXA's 2021 Universal Registration Document ("Annual Report", section "3.2 Executive compensation and share ownership").

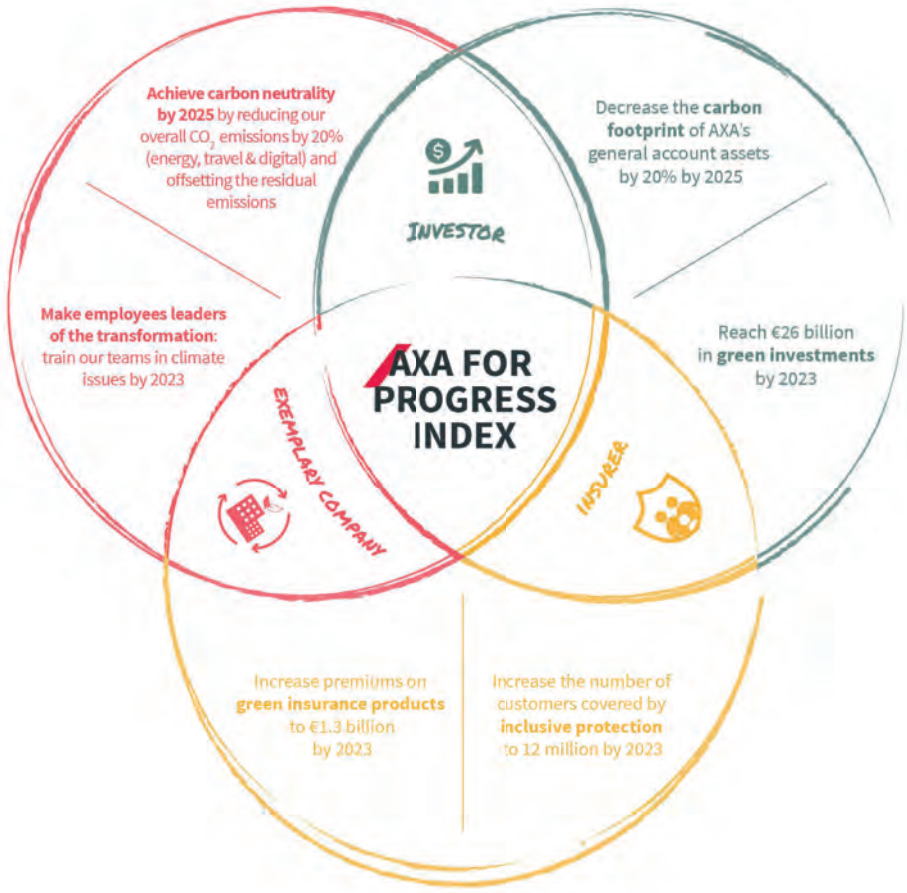
2.6 ESG Acceleration Team

In 2021, a new body was established to ensure the success of AXA's strategic plan *"Driving Progress 2023"*: a dedicated Acceleration Team is now in place for ESG, with members of the Management Committee and representatives of Strategy functions and Markets (Europe, Asia). The ESG Acceleration Team is oriented toward the implementation within the entities and the anticipation of next horizon challenges to tackle.

3. Strategy

This section sets out AXA's overall Sustainability Strategy, with a particular focus on AXA's climate strategy and biodiversity commitments. It combines both investment and underwriting-related initiatives, as well as AXA's broader ESG integration strategy. Following the TCFD recommendations, Metrics and Targets can be found in Section 4.1 "AXA For Progress Index" of this report.

3.1 AXA's Sustainability Strategy



Source: AXA.

AXA Group's overall Sustainability Strategy aims to fulfill two main goals:

- act as a leading force against climate change; and
- expand AXA's health and protection businesses as an inclusive insurer.

AXA created a strong signal by putting its climate commitments at the heart of the new strategic plan *"Driving Progress 2023"*, which was launched in December 2020.

To make AXA's Purpose *"Act for human progress to protect what matters"* tangible for all AXA teams, AXA launched the AXA For Progress Index in April 2021. It is designed to measure and track progress in rolling out AXA's Purpose across all AXA activities.

This tool is based on seven commitments shared across the Group to further embed sustainable development in AXA's activities as an investor, insurer, and exemplary company.

With five of the seven commitments aimed at shaping the energy transition, the AXA for Progress Index is now the Group's primary measurement tool for its climate strategy and biodiversity commitments.

This index allows AXA to identify, measure, and steer actions to fulfill commitments with Key Performance Indicators (KPIs). For further information on the metrics, targets, and progress to date, please see Section 4.1 "AXA For Progress Index" of this report.

3.2 Climate change

Strategic context

Climate change is a medium to long-term risk for which it is difficult to quantify the impact on AXA's activities. AXA's strategy is not only to adapt but also to leverage AXA's expertise to provide solutions. **AXA is well equipped to further the understanding of climate change** through:

- its risk management expertise;
- the vast number of claims data it collects; and
- the research it funds to address climate-related risks.

As an insurer, AXA also has a responsibility to share knowledge about new risks. Through AXA's underwriting decisions, it can also show the risks society is taking and foster prevention actions to mitigate them. Finally, through AXA's significant investments, it is well-positioned to send the right signals to the investment community and to the specific companies in which it invests.

AXA's climate strategy leverages both sides of the balance sheet: investments and insurance. AXA also contributes by reducing its direct environmental footprint. AXA supports academic research, outreach, thought leadership, partnerships, and employee training and volunteering.

AXA was a pioneer in creating an ambitious climate strategy. In 2015, the year the Paris Agreement was signed, **AXA sounded the alarm stating that "a +4°C world is not insurable"**. In other words, runaway climate change will create risks so large that conventional market mechanisms may no longer be suitable.

Starting in 2015, AXA adopted a balanced approach regarding its contribution to the transition to a more sustainable and less carbon-intensive economy. AXA popularized coal divestment in early 2015. Coal is by far the most carbon-intensive form of energy. Phasing it out is key to achieving the goals of the Paris Agreement.

In 2017, AXA pioneered coal and oil sands restrictions in its insurance business. This was a difficult business decision. In 2018, it progressively extended this to AXA's new Commercial Lines entity, AXA XL. AXA has also committed to an ambitious green investment target.

AXA has promoted a strong collective agenda with TCFD, TNFD, and EU initiatives and explored new forward-looking climate alignment metrics since its 2018 Climate Report. In 2019, AXA reframed biodiversity loss as a financial risk. In 2021, it announced a new Energy Policy and Deforestation and Ecosystem Conversion Policy. In this 2022 Report, AXA is presenting the first pilot of an analysis of the impact of its investments and operations on biodiversity.

AXA's climate strategy

AXA's current climate strategy, launched in November 2019, supports the concept of **aligning AXA's business with the Paris Agreement**. To contribute to this overall ambition, AXA has made the following commitments:

- applying the "Warming Potential" methodology for its investments, aligned with a +1.5°C trajectory by 2050. This long-term target is complemented, since December 2020, by an intermediate -20% investment-related carbon footprint target[1] between 2019 and 2025 (part of the "AXA for Progress Index");
- a green investment target of €26bn by 2023, and a new Green Business target for AXA's insurance activities to support the energy transition (part of the "AXA for Progress Index");
- a long-term exit strategy from the coal industry backed by strict investment and underwriting restrictions;
- a target to reduce its direct environmental footprint by 20% between 2019 and 2025 and achieve carbon neutrality for its operations by offsetting remaining emissions (part of the "AXA for Progress Index");
- the launch of the AXA Climate Academy to train employees (part of the "AXA for Progress Index"); and
- an enhanced energy policy and an alignment of climate and biodiversity goals. For further details on AXA's biodiversity actions, please see Section 3.3 "Biodiversity".

Progress against these targets is discussed in Section 4.1 "AXA For Progress Index".

(1) See press release: https://www.axa.com/en/press/press-releases/axa-reveals-its-2023-strategy

Net-Zero Coalition Building

Recognizing the importance of the financial services industry in achieving the goals of the Paris Agreement, multiple "Net-Zero" alliances have been established with the support of the UN Environment Program-Finance Initiative (UNEP-FI). These alliances help coordinate and accelerate efforts towards climate neutrality. The Glasgow Financial Alliance for Net-Zero (GFANZ) is now coordinating these Net-Zero alliances. AXA is a member of the following alliances thereby contributing to the industry's collective efforts.

GFANZ[1]

To achieve the goals of the COP21 Paris Agreement the whole economy will need to transition. To this end, the Glasgow Financial Alliance for Net-Zero (GFANZ) was launched in April 2021, ahead of COP26. This global coalition of leading financial institutions brings together "Net-Zero" finance initiatives as part of the UN-backed "Race to Zero" commitment to accelerating the decarbonization of the economy.

As of November 2021, GFANZ had over 450 members, including AXA, from 45 countries. They manage private assets of over U.S.$130trn committed to achieving "Net-Zero". AXA participates in GFANZ through NZAOA, NZAMI, and NZIA. It is also a member of the GFANZ Real Economy Transition Plan Working Group.

Net-Zero Asset Owner Alliance (NZAOA)[2]

AXA joined the UN-led Net-Zero Asset Owner Alliance (NZAOA) in November 2019. NZAOA is an international group of institutional investors committed to transitioning their investment portfolios to Net-Zero GHG (Greenhouse Gas) emissions by 2050. This involves regular reporting on progress, including establishing intermediate targets every five years.

The metric for reporting on progress is based on GHG emissions and "investment temperature" methodologies. NZAOA's shareholder engagement efforts will be key to achieving the "real-world" transformation driven by its members' climate neutrality commitments. AXA has contributed to the NZAOA "Portfolio Alignment" working group (see Portfolio Alignment section). AXA also launched its -20% carbon footprint (2019-2025) target, in line with NZAOA's "Target Setting Protocol".

In 2021, NZAOA's membership grew from 34 to 65, representing over U.S.$10trn[3] in assets under management (AuM).

NZAOA engages on an ongoing basis with the Science Based Targets Initiative with respect to SBTi's Net-Zero Foundations for Financial Institutions[4]. SBTi is expected to set a standard for Financial Institutions in 2023.

In January 2022, the NZAOA released the second edition of its Target Setting Protocol. This guides members in setting further ambitious climate targets that align with the latest IPCC pathways to keep global warming below +1.5°C. The second protocol includes the following additions:

- a broadening of the scope to bring scope 3 within the targets, as they typically represent the majority of members' emissions;
- revised, more ambitious portfolio emissions reductions targets;
- a set of climate-related considerations that members can use to match emission data and reporting principles.

In 2021, NZAOA members also worked on a target-setting approach for sovereign issuers through two main projects to develop standards:

- the carbon accounting of sovereigns with the Partnership of Carbon Accounting Financials (PCAF);
- assessing Sovereign Climate-related Opportunities and Risks (ASCOR).

Net Zero Asset Managers Initiative (NZAMI)[5]

The Net Zero Asset Managers Initiative (NZAMI) was launched in December 2020[6] to bring together an international group of asset managers committed to supporting global efforts to limit warming to 1.5°C.

As a founding investor of the NZAMI, AXA Investment Managers (AXA IM) is committed to:

- achieving Net-Zero emissions across its portfolios by 2050 at the latest; as well as
- playing a key role in helping to realize AXA's ambitious climate goals.

"We must all play our part in the transition to a low-carbon world, and we were proud to announce key updates to our climate commitments during the World Climate Summit, the Investment COP. As active asset managers, the way we act on our convictions and allocate capital has the power to influence investee companies' behaviors. Our fiduciary duty goes beyond delivering returns to our clients, it's also about investing responsibly and driving climate action. This is how AXA IM plays its part. In our investment decisions, in the products we offer, in the way we engage and vote, and in the way we manage our own business – we act to balance returns with the long-term sustainability of the world we live in."

Marco Morelli, Executive Chairman, AXA Investment Managers

This means that AXA IM will work closely with AXA Group and in partnership with asset-owner clients on analysis, reporting, and changes to investment portfolios.

In April 2022, as part of its second report to the NZAMI, AXA IM revised its Net-Zero Ambition and committed to:

- increasing the scope of Net-Zero aligned assets to 65% of total assets under management (AUM)[7];
- setting interim carbon intensity reduction targets for 2025 (-25% *vs* 2019 baseline) and 2030 (-50%), which are applicable to corporate assets;
- continuing to grow the proportion of Net-Zero aligned AUM over time.

Updates will be provided in the course of 2022.

(1) https://www.gfanzero.com/
(2) https://www.unepfi.org/net-zero-alliance/
(3) https://www.unepfi.org/news/themes/climate-change/the-net-zero-asset-owner-alliance-new-year-countdown-a-review-of-2021-and-a-vision-for-2022/
(4) https://sciencebasedtargets.org/resources/files/AOA-SBTi-comparison-table.pdf
(5) https://www.netzeroassetmanagers.org/
(6) https://www.axa-im.com/who-we-are/our-road-net-zero
(7) This now includes 100% of corporate equity and bonds, 100% of government bonds, 100% of listed real assets, and 100% of real estate assets of AXA Group, for which clear Net-Zero pathways in line with the IPCC 1.5°C pathways report were defined.

Net-Zero Insurance Alliance (NZIA)[1]

As Chair of the NZIA, AXA played an important role in its founding and development in 2021. AXA notably helped the NZIA to:

- lead outreach to educate other insurers and encourage their participation;
- communicate with the insurance regulators; and
- dialogue with the real economy regarding the risks and opportunities of the energy transition.

The NZIA now counts over 25 insurer members plus Lloyd's Corporation with its unique role in the insurance industry as a marketplace and regulator. The NZIA is also working with PCAF[2] in 2021 on the development of the first ever insurance associated carbon emissions attribution factor for property and casualty insurance lines.

The NZIA achieved significant milestones in 2021 with:

- the official launch of the NZIA statement of commitment[3] by signatory members;
- accreditation by the Race to Zero campaign; and
- becoming a member of GFANZ.

AXA was a contributing author to the NZIA white paper "Insuring the Net-Zero Transition" launched in April 2022. AXA also provides resources for the development of the target setting protocol, and the Governance, Engagement, Communications, and Life & Health workstreams.

Insuring the Net-Zero Transition

Renaud Guidée, Group Chief Risk Officer and Chairman of the Net-Zero Insurance Alliance

The insurance industry has been a pioneer ringing the alarm bell about the significant impacts from greenhouse gas emissions and a carbon-reliant growth model. Our leadership in modeling natural events, highlighting emerging risks and advising on risk management options are all relevant to this pivotal challenge.

Historically, discussions have focused on climate change impacts to insurers – not on the impact insurers may have on climate change. The double materiality principle acknowledges that insurance is necessary for economic growth and stability and can drive changes in the global economy.

With the creation of the Net-Zero Insurance Alliance, we have called to action our (re)insurance peers to use underwriting portfolios, i.e. the (re)insurance coverage we provide to our clients, to promote a green transition. In less than a year, the Net-Zero agenda has gained momentum across the whole industry, with more than 25 members.

Together we are building a common ambition, a common framework, a common language. Our end-goal is to support our customers' Net-Zero transitions through GHG mitigation strategies applying the principles of abatement, neutralization, and compensation.

(1) See UN PSI global communications here: https://www.unepfi.org/psi/wp-content/uploads/2021/04/PSI-NZIA-announcement.pdf
(2) Partnership for Carbon Accounting Financials: https://carbonaccountingfinancials.com/
(3) https://www.unepfi.org/psi/wp-content/uploads/2021/07/NZIA-Commitment.pdf

3.3 Biodiversity

One may wonder why is a large insurance company, which is also a large institutional investor, interested in combatting biodiversity loss and protecting nature?

It is quite simple: nature is essential to human activity and survival, from food and shelter to the active ingredients in medicines. Each species makes implicit economic contributions that are far-reaching: their work can be seen as services (ecosystemic services) provided free of charge by nature. An EU funded study estimated that artificial pollination would cost €153bn annually, generating labor and technological costs far beyond what would be economically viable[1].

The potential loss of key ecosystemic services endangers not only humans but also certain businesses that depend on them. This can therefore be of concern for investors and insurers that rely on a well-functioning economy. Indeed, in a recent study, the Banque de France concluded that biodiversity loss could have an impact on financial risks[2]. **Investors' ability to understand and map these potential risks would enable them to identify opportunities and in doing so help support solutions rather than environmentally unsustainable business practices.** This is the theory of change underpinning AXA's support for the creation of the TNFD.

AXA views the biodiversity challenge as a natural extension of its climate efforts. This is important because limiting ecosystem loss is a priority to maintain economic stability and mitigate climate change. In parallel, climate change also amplifies ecosystem destruction. Indeed, the IPBES[3], the IPCC and the TNFD both identify climate change as a key driver of changes to nature and by extension, biodiversity[4].

AXA did not wait for a precise calculation of its biodiversity impacts to start acting. As with AXA's approach to combatting climate change, AXA aims to harness all its expertise as both investor and insurer.

As a result, AXA has announced a series of initiatives, designed to protect ecosystems, and act on the nexus between climate and nature. These include:

- AXA launched the "Into the Wild – Integrating nature into investment strategies" report with the WWF at the G7 Ministerial meetings in 2019. This idea was to raise awareness regarding biodiversity loss and its economic and financial impact. The report contained a series of recommendations, including launching TNFD and creating biodiversity risk metrics for investors;
- AXA was an active member of the "Informal Working Group" (IWG) and led the Governance working group that resulted in TNFD being set up in 2021. AXA is currently a TNFD member and contributes to the TNFD's Metrics and Targets Working Group;
- AXA began a three-year partnership (2020-2023) with the WWF to develop and strengthen its biodiversity strategy;
- AXA IM, with three asset management peers (BNP Paribas AM, Mirova, Sycomore AM), partnered with one of the most promising biodiversity risks data providers. This provider has developed its own metric – the Corporate Biodiversity Footprint (CBF) – based on the concept of Mean Species Abundance (MSA), to calculate the degradation of ecosystems caused by business activities across AXA's investment portfolio[5];
- in October 2021, AXA announced a new policy on Ecosystem protection, Deforestation and Natural World Heritage Sites. This is built on AXA's 2013 Palm Oil Policy. Applied to both AXA's investment and insurance activities, it seeks to:
  - address risks related to deforestation and protected areas of key biodiversity value, and
  - halt support for firms negatively impacting ecosystems that house critical biodiversity;
- in October 2021, AXA also announced a new Energy Policy. This responds to the twin challenge of:
  - climate change (*via* GHG emissions attributable to the energy sector), and
  - biodiversity loss (by reducing exposure to operations that negatively impact local ecosystems);
- at end-2021, AXA called for the adoption of a robust international agreement at COP15 in Kunming, China, see Section 1.4 "UN Convention on Biological Diversity, (COP15), the COP21 for biodiversity?".

Context Box

€1B Regenerative Agriculture Fund to Help Mitigate Climate Change

In May 2022, AXA Climate in partnership with Tikehau Capital and Unilever announced the creation of a new fund dedicated to accelerating and scaling the regenerative agriculture transition[6]. The three partners aim to invest €100m each, and combine a unique set of industry, risk, and financial expertise to drive structural change. The fund will also be open to investors who wish to participate and benefit from this initiative, with a target size of €1bn.

(1) https://cordis.europa.eu/article/id/29867-insect-pollination-worth-eur-153-billion-a-year/fr
(2) https://publications.banque-france.fr/sites/default/files/medias/documents/wp826_0.pdf
(3) Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem. Services: https://ipbes.net/
(4) https://tnfd.global/wp-content/uploads/2022/03/220321-TNFD-framework-beta-v0.1-FINAL.pdf
(5) The first results from AXA's analysis are published this year in Section 4.4 "Biodiversity metrics"
(6) See press release here: https://www.tikehaucapital.com/~/media/Files/T/Tikehau-Capital/pr-2022-en/AXA-Unilever-Tikehau-Capital-PR-11052022.pdf

Context Box

What is nature?

The TNFD defines nature as a construct of four **realms** – Land, Ocean, Freshwater and Atmosphere. These provide an entry point for understanding how organizations and people depend on and impact **natural capital**, which the TNFD defines as natural resources that combine to yield a flow of benefits to people. Just as in the financial world, where assets exist that give rise to flows of revenue, nature consists of stocks of environmental assets that give rise to associated flows of benefits to people and the economy[1].

In addition to the commitments listed above, AXA has also identified specific actions to address biodiversity loss with a particular focus on two of the four realms: land (via AXA's actions on forests), and the ocean.

Forests

- In 2021, AXA committed to a new "Natural Capital" target of €1.5 billion for reforestation to support forestry management projects in developed markets and natured-based solutions through initiatives such as afforestation, restoration and avoided deforestation which outcome can often be measured through the production of carbon credits with the objective is to **sequestrate/avoid 25 mt CO_2 on an annual basis.**
- To better select projects for internal and external clients to offset CO_2 emissions. In 2021, AXA Investment Managers acquired ClimateSeed. This is an innovative marketplace that connects businesses seeking carbon credits with project developers offering carbon offsetting projects. ClimateSeed has a portfolio of 36 projects in 24 countries. **In total, they represent over four million verified carbon credits.**

Context Box

Forests for Good

AXA's forest estate in France is about 15,000 ha. Due to climate change bark beetle outbreaks are increasing in spruce plantations. Some stands have been severely affected and had to be clear cut to avoid the spread of attacks to neighboring forests. AXA will restore harvested forests as requested by French law. It will take this opportunity to test different restoration options, with pilot plantations designed to better cope with the expected consequences of climate change, improve the conservation of biodiversity in forests and raise public awareness of the services provided by forest ecosystems.

AXA Group, AXA IM Alts, and AXA France are partnering with a consortium of scientists, NGOs, and forestry experts (namely INRAE, Agro ParisTech, France Nature Environnement and Reforest'action) in a 3-year project, using salvage harvested spruce forests as an opportunity to experiment new methods of forest restoration and management, including mixed species plantations. Ultimately, **AXA aims to propose a more effective and sustainable way to restore damaged plantations, promoting their multifunctionality (i.e., providing habitat for biodiversity while fostering carbon sink, biomaterial production, water cycle and human well-being).** This initiative is intended to be shared with forest ecosystem stakeholders and the broader public.

(1) TNFD v0.1 Beta Release Framework https://tnfd.global/the-tnfd-framework/tnfd-framework-summary/

Oceans

- AXA Climate[1], in partnership with AXA XL, is **providing risk capacity for coral protection against tropical cyclones** at four sites along the Mesoamerican reef in Mexico, Belize, Guatemala, and Honduras. The pay-out[2] will be used by the client to do restoration work such as cleaning debris and attaching corals back to the reef. AXA is scaling up this product in 2022 and broadening the coverage to other types of coastal ecosystems, including mangroves.
- **The Oceana and UN Environment Program Finance Initiative (UNEP FI) Insurance Industry Statement Against Illegal, Unreported, and Unregulated (IUU) Fishing**.

  AXA signed this statement in 2017. It includes best practices about which vessels to insure. AXA's Marine Underwriting Rules and Guidelines now require vessels to be checked against IUU fishing blacklists. This assesses whether fishing vessels have the proper licenses and checks that they don't have periods when their tracking systems are inactive. In addition, AXA XL now requires International Maritime Organization (IMO) numbers for all fishing vessels and refrigerated cargo vessels that it insures. IMO numbers help ensure effective identification of vessels.
- **AXA XL Coastal Risk Index:** At COP26, AXA XL launched the Coastal Risk Index (CRI). This is an innovative tool that maps current and future flood hazards resulting from climate change. For the first time, it integrates the protective benefits of coastal ecosystems into insurance risk models.

  The CRI[3] assesses coastal flooding in the context of climate change by comparing scenarios with and without coastal ecosystems, such as coral reefs and mangroves. This helps build the case for nature-based solutions. The CRI illustrates the:
  - potential benefits ecosystems provide to assets and populations in different flooding scenarios; and
  - estimated value of restoring lost mangroves due to their flood reduction benefits through new global mangrove maps.

  The CRI is designed to be used by communities, policymakers, insurers, investors, and development banks to assess current and future flood risk and calculate the resilience value of ecosystems. This will thus improve how they measure risk and lead to more robust resilience strategies that catalyze the protection of coastal natural assets.

Ulrike Decoene, Group Chief Communications, Brand and Sustainability Officer

One may wonder why we connect our business to biodiversity loss. But ultimately the global economy is so dependent on nature – every good produced and sold – that it is in fact rather surprising the nature-finance nexus has remained a niche topic for so long. Moreover, diverse ecosystems are key to tackling climate change, as flourishing forests and well-preserved oceans absorb carbon emissions. Conversely, climate change accelerates biodiversity loss, creating a vicious circle. We raised this issue in our 2019 "Into the Wild" report, which called for the creation of a Taskforce on Nature-Related Financial Disclosures. AXA is proud to be a founding member of the TNFD to help develop a framework enabling financial institutions to identify economic activities that have a material impact on biodiversity. As a member of the Metrics and Targets Working Group, we collaborate with peers to define decision-useful metrics that will enable investors to further incorporate nature conservation objectives into their asset allocation strategies, helping to reorient financial flows away from "nature-negative" towards "nature-positive" outcomes. Progress has also been made towards the COP15 in October last year, with the "Kunming Declaration" which highlighted the need to align financial flows in support of the conservation and sustainable use of biodiversity. 2022 will also be an important year with the conclusion of the COP15. We hope the outcome of this conference will lay the ground for closer public-private cooperation on nature preservation. We must remember that nature is our ally, and we all have a common interest to preserve it.

(1) An AXA entity that has developed a comprehensive set of business lines around climate change.

(2) The insurance cover is based on a parametric product that triggers a pay-out within days of a cyclone passing through the targeted reefs. The product is structured to pay out based on windspeed measured by satellite data.

(3) The CRI has been developed in partnership with AXA's scientific partners, IHE Delft (Netherlands) and University of California, Santa Cruz (USA) and the Government of Canada through the Ocean Risk and Resilience Action Alliance (ORRAA).

Biodiversity-related memberships

TNFD: AXA is a member of TNFD. Its members include both financial institutions and corporates. It is developing an industry standard to identify and mitigate impacts, dependencies and risks related to nature.

A beta framework was released in March 2022. Testing and refinement will continue until mid-2023 in consultation with key knowledge partners. AXA is a member of the Metrics and Targets Working Group and is actively working with other members to identify the best existing approaches. TNFD membership also provides AXA with access to best practice on identifying and mitigating biodiversity-related risks.

ORRAA: AXA is a co-chair of the Ocean Risk and Resilience Action Alliance (ORRAA). This was formed following the 2018 Ocean Risk Summit. ORRAA brings together the finance and insurance sectors along with governments, non-profits, and stakeholders to:

- drive investment in marine and coastal natural capital;
- reduce ocean and climate risks; and
- build resilience in coastal communities.

AXA supports the ORRAA BackBlue Ocean Finance Commitment.

Sustainable Blue Economy Finance Initiative: AXA became a member in 2021. It has signed up to the Sustainable Blue Economy Finance Principles and endorsed the #BackBlue commitment. This initiative, founded by the European Commission and other institutions, provides key principles to promote the implementation of Sustainable Development Goal 14 (Life Below Water) and set out ocean-specific standards.

Poseidon Principles: AXA became a signatory of the Poseidon Principles for Marine Insurance (PPMI) in 2022[1]. This initiative was developed in an effort spearheaded by global insurance institutions in collaboration with leading industry player and maritime expert support. It recognizes the role of insurers in promoting responsible environmental stewardship throughout the

maritime value chain, hence providing tools to foster collaboration with clients, gain insight to enhance strategic decision-making, and address the impacts of climate change.

AXA has also committed to several public pledges that focus on biodiversity loss since 2018:

- Act4Nature, "Business for Nature" and the "Finance for Biodiversity" initiative; and
- Financial Sector Commitment on Eliminating Agricultural Commodity-Driven Deforestation at COP26 ("DEFRA Pledge");
- AXA also supported the Joint Declaration on the creation of a global coalition for blue carbon at the One Ocean Summit, held in Brest in February 2022.

3.4 ESG Integration

A cornerstone of AXA's investment philosophy

Since 2015, AXA has made ESG a cornerstone of its investment policy by factoring ESG considerations into its qualitative credit assessment and investment processes. AXA's Credit Research Team[2] assigns internal credit ratings (ICRs) and manages issuer eligibility for Fixed Income investments. ICRs cover over 85% of AXA's credit portfolio. When performing a credit review and assigning an ICR, AXA's Credit Research Team assesses several credit factors related to an issuer's business and financial profile (see diagram).

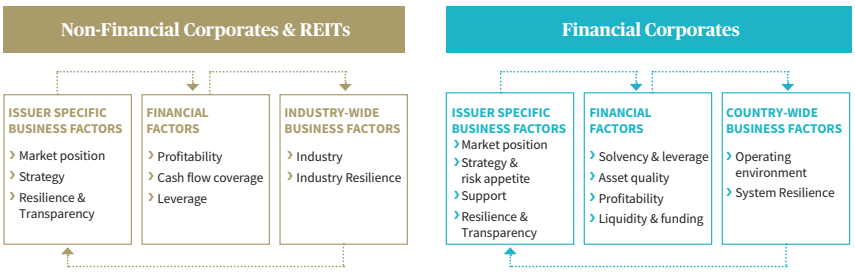
AXA's Credit Research Team focuses on material ESG risks, which it calls "Resilience & Transparency" factors. These may impact the sustainability of an industry's business model by:

- shifting offer and demand dynamics;
- impacting product prices;
- creating substitution risk or opportunities; or
- affecting costs and profitability.

They can also lead to stranded asset risks.

AXA's Credit Research Team identifies industry-specific, material factors, to which most issuers are exposed due to their range of activities or assets in their given sector. Based on an overall assessment of the materiality of E, S and G factors on industry credit risk, industries are classified as subject to high, medium, or low resilience risk.

Internal ESG-integrated credit rating framework



Short-term and long-term considerations

- Resilience & Transparency risk factors may be material within AXA's Credit Research Team's usual rating horizon (approximatively 2 years) and thereby impact the ICR.
- They may, however, also have a longer time horizon. In this case, the ICR may not fully incorporate Resilience & Transparency -related risks/opportunities, but AXA's Credit Research Team may use other levers such as proposing to stop investing or imposing maturity constraints. Those decisions are then implemented by asset managers investing on behalf of AXA in fully controlled mandates.

(1) For more information: https://www.poseidonprinciples.org/insurance/news/poseidon-principles-for-marine-insurance-hold-founding-meeting-and-enter-into-force-with-navium-and-axa-xl-as-latest-signatories/

(2) It oversees AXA's corporate debt investments strategy.

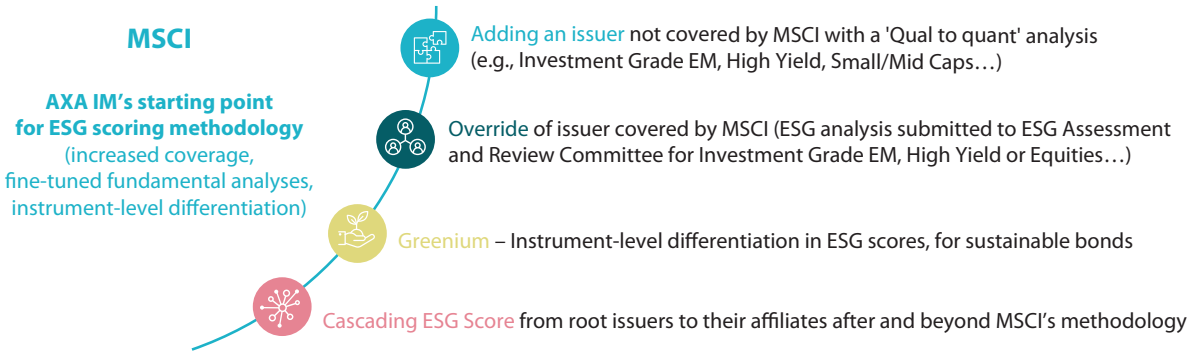
ESG Scoring: description of new methodology

Quantitative ESG-specific tools tailored to each asset class

In addition to the ESG integration done by the AXA's Credit Research Team and AXA IM's Credit Research Team, AXA, through its asset manager AXA IM, also tracks the ESG performance of its investments. AXA IM has had an ESG scoring tool since 2007. This is used to track ESG performance both for AXA's General Account assets and third-party client assets.

In 2021, AXA IM's quantitative ESG-specific tool evolved from a "blended score", which was an aggregation of KPIs from different third-party providers to a score called Q^2. Q^2 stands for "Qualitative and Quantitative". Q^2 uses MSCI ESG scores as primary inputs. It then combines these with qualitative inputs from AXA IM's ESG and fundamental research to generate a quantitative ESG score by issuer. Using MSCI scores for both corporates and sovereigns enables Q^2 to provide consistent ratings across these two asset classes.

AXA IM's scoring methodology



Source: AXA IM as at 02/11/2021, for Illustration Purpose only
ESG Score is a metric that reflects a company's performance across a range of environmental (E), social (S), and governance (G) criteria.
An ESG score may not be available for all of the stocks in the universe.

Q^2 enables AXA IM's asset management teams[1] to further embed ESG considerations in their investment decisions. This tool provides ESG scores and key performance indicators across each of the Environmental, Social and Governance pillars. It is fed by data from leading expert sources in ESG analysis. The tool currently covers over 8,000 companies and governments globally.

ESG Scores: Dashboard

The coverage ratio remains similar to last year's. The overall score increased in 2021 compared to 2020, notably due to the update of the methodology described above. The figures set out in our 2021 Climate Report are not comparable, and should not be compared with the figures included in this report.

	ESG	E	S	G	% Cov ESG
Corporate bonds	6.76	6.83	5.22	5.32	86.6%
ICE BofAML Global Broad Market Corporate	*6.14*	*6.89*	*4.88*	*4.97*	
Equities	6.71	6.77	5.32	5.08	92.5%
MSCI World AC	*6.15*	*6.50*	*5.06*	*4.83*	
Government bonds	6.16	4.52	7.62	6.98	98.1%
JPM GBI Global	*6.10*	*5.01*	*7.97*	*6.72*	
Corp. + Equities	**6.75**	**6.82**	**5.23**	**5.28**	**87.3%**
Corp. + Equities + Gov.	**6.40**	**5.46**	**6.64**	**6.29**	**93.4%**

(1) Portfolio managers, fund managers and analysts.

The ESG tool is tailored to various asset classes by applying a different framework to corporate issuers, sovereign issuers, and real assets, as described below.

Corporate issuers (equity and debt)

ESG-related controversies[1] are also incorporated into the model, with the most material controversies automatically resulting in lower ESG scores. **Issuers with ESG scores of 2/10 or lower are referred to the ESG Engagement & Monitoring Working Group for exclusion (divestment).**

Corporate ESG evaluations are updated every six months. As of 2021, 92.5% of corporate equities and 87% of corporate bonds within AXA's general account assets under management by AXA IM were covered by ESG scoring.

Pillar	Corporate framework factors
E	**Climate Change** (Carbon Emissions, Product Carbon Footprint, Financing Environmental Impact & Climate Change Vulnerability)
E	**Natural Capital** (Water Stress, Raw Material Sourcing & Biodiversity and Land use)
E	**Pollution & Waste** (Toxic Emissions and waste, Packaging Material and Waste & Electronic Waste)
E	**Environmental Opportunities** (Opportunities in Clean Tech, Green Building and Renewable Energy)
S	**Human Capital** (Labor Management, Health & Safety, Human Capital and Development, Supply Chain Labor Standards)
S	**Product Liability** (Product Safety & Quality, Chemical Safety, Financial Product Safety, Privacy & Data Security, Responsible investment, Health & Demographic Risk)
S	**Stakeholder Positions** (Controversial Sourcing, Community Relations)
S	**Social Opportunities** (Access to communications, to Finance, to healthcare, and Opportunities in Nutrition and in Health)
G	**Corporate Governance** (Ownership & Control, Board, Pay and Accounting)
G	**Corporate Behavior** (Business Ethics, Tax transparency)

Sovereign issuers

AXA IM's scoring framework for sovereigns covers over 190 countries. It also applies to supranational institutions, regions, provinces and cantons. The ratings reflect how exposure to and management of environmental social, and governance risk factors may affect the long-term sustainability of their economies. **The Governance Pillar is assigned a higher weighting (50%) than the Environmental and Social pillars (25%) as in AXA's opinion governance is a key way to influence the management of environmental, social and institutional risks.** As of 2021, 98% of government bonds within AXA's general account assets under management by AXA IM were covered by ESG scoring.

Pillar	Sovereign framework factors
E	**Natural Resource Risk** › Risk Exposure: Energy Security Risk, Productive Land and Mineral Resources, Water Resources › Risk Management: Energy Resources Management, Resources Conservation, Water Resource Management
E	**Environmental Externalities and Vulnerability Risk** › Risk Exposure: Vulnerability to Environmental Events, Environmental Externalities › Risk Management: Environmental Performance, Management of Environmental Externalities
S	**Human Capital Risk** › Risk exposure: Basic Human capital, Higher Education and Technology Readiness, Knowledge Capital › Risk Management: Basic Needs, Human Capital Infrastructure, Human Capital Performance, Knowledge Capital Management
S	**Economic Environment Risk** › Risk exposure: Economic Environment › Risk Management: Wellness
G	**Financial Governance Risk** › Risk Exposure: Financial Capital and Trade Vulnerability › Risk Management: Financial Management
G	**Political Governance Risk** › Risk Exposure: Institutions, Judicial and Penal System, Governance effectiveness › Risk Management: Stability and Peace, Corruption Control, Political Rights and Civil Liabilities

Real assets

AXA IM manages over €121bn in real asset investments, covering both real estate and infrastructure investments. AXA IM – Real Assets takes an integrated approach to responsible investment management following three steps specific to this asset class when integrating ESG considerations into investment decisions:

- defining the investible universe by applying sector exclusions and ban lists;
- integrating ESG factors into investment decisions with proprietary ESG scores; and
- integrating ESG targets into active management for annual business plans.

See AXA's investments in real assets in the Section 4.3 "Green Investments - A focus on Real Assets"

(1) For example, environmental damage, human rights violations, corrupt business conduct.

Real estate

AXA IM considers both financial and non-financial criteria in its investment decisions in the direct real estate investment business. Non-financial criteria include environmental, social and governance (ESG) factors as well as sustainability risks that may have a material impact on investment performance. The assessment is linked to the expected performance of a building over a defined period and therefore considers criteria that can be measured at asset level.

The ESG scoring tool used by AXA IM for direct real estate investments is a proprietary tool developed in line with sectoral benchmarks like BREEAM In-Use[1] and GRESB[2].

Since April 2020, the Investment Committee (IC) process[3] includes a review of all direct real estate investment proposals using the following five ESG factors. These provide an initial view on asset-level sustainability risk and form the basis for key actions for the ongoing strategic asset plan for each investment. The five factors are as follows:

- **regulatory risk:** the estimated transitional or regulatory risk associated with the asset;
- **physical risk:** the estimated physical risk associated with natural disasters and climate change;
- **independent certification:** the appropriate level and type of certification for a relevant market, and view as to the relative level of asset quality;
- **counterparty risk:** appropriate counterparty risk governance, including checks against AXA's Anti-money laundering and KYC reviews in addition to AXA IM exclusion policies; and
- **ESG score:** the estimated performance of the asset relative to the AXA IM Real Assets portfolio at sector and country level. This is assessed using AXA IM's proprietary ESG rating tool for sovereigns. It addresses both sustainability risk and principal adverse impacts and forms the basis for active management of the asset.

Using ESG scores to drive positive change

To take AXA IM's proprietary ESG scoring tool even further, 66% of AXA IM's open funds (in Assets Under Management) have binding ESG targets. These range:

- from a target to outperform the ESG score of the investment universe[4];
- to an even more material commitment to remove the 20% bottom performers based on the ESG criteria for its "Label ISR" funds (37 SRI funds), and UN SDG (Sustainable Development Goals) targets for its Impact Investing strategy.

ESG data quality and comparability are clear roadblocks on this path due to:

- the absence of standardized data and mandatory reporting at issuer level; and
- ongoing discussions on forward-looking methodologies.

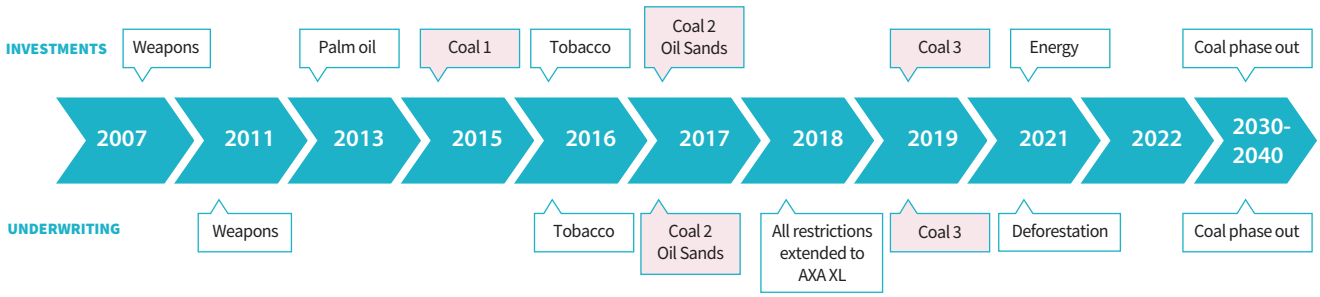
It is hoped that EU and global initiatives[5] will help address these challenges in the medium-term.

(1) https://www.breeam.com/discover/technical-standards/breeam-in-use/
(2) https://gresb.com/nl-en/
(3) The decision-making forum for all real estate investments.
(4) 40% of the open fund's AUM.
(5) Including CSRD and IFRS Foundation projects.

Exclusions and sensitive ESG restrictions

AXA uses various tools to encourage transition strategies. These tools include investment and underwriting guidelines that offer clear criteria.

A history of investments and underwriting restrictions



Certain activities and products are deemed to be inconsistent with AXA's climate strategy and broader sustainability goals. In this context, AXA has developed specific "sector guidelines" that seek to address those issues. They apply to both direct investment and underwriting activities. These currently include the following sectors:

- coal;
- oil & gas (see sub-section "AXA Group Energy Policy" below);
- manufacturers of "controversial weapons" that are banned by international conventions[3];
- tobacco manufacturers, whose products are in conflict with AXA's role as a leading global health insurer;
- ecosystem conversion and deforestation, Natural World Heritage Sites (the latter applicable to underwriting activities only) (see dedicated sections below);
- soft commodity derivatives which may be responsible for inflating the price of basic food commodities (applicable to investments only).

These sector guidelines are published on AXA's website[4].

Since 2007, AXA's investment restrictions represent assets of approximately €7.5bn. They include listed equity assets, with any related corporate bond holdings being left in run off (no new direct investments).

The remaining exposure under applicable policies in AXA's portfolio amounted to less than €400m at end-2021. The release in 2021 of the AXA Group Energy Policy, the AXA Group Ecosystem conversion & Deforestation policy and the AXA Group Natural World Heritage Sites policy will impact these figures.

From 2015, AXA adopted a balanced approach to contribute to the transition towards a more sustainable and less carbon-intensive economy. Carbon emissions require significant reductions to reduce the risk of climate change, which may place business constraints on carbon-intensive industries, leaving some assets "stranded", which in turn may lead to reduced valuations. Current valuation models may not adequately account for such risks.

AXA Group coal policy

Coal is by far the most carbon-intensive form of energy and as such coal-based power generation is seen as the industry the most exposed to stranded asset risk.

AXA acted early in May 2015 with a pioneering coal divestment policy ("coal 1" in above diagram), later strengthened in 2017 with underwriting restrictions ("coal 2") and extended these to its new entity AXA XL in 2018. In November 2019, this approach was amplified and complemented with a long-term perspective[5] ("coal 3").

AXA has used the "Global Coal Exit List" (GCEL)[6] to implement this policy since 2017.

Investments

AXA bans investments, for General Accounts and in Unit-Linked assets in fully controlled mandates, in the following companies:

- power generation companies with coal share of power production (energy mix) over 30% and/or coal "expansion plans" producing more than 300 MW and/or over 10 GW of coal-based power installed capacity;
- mining companies with coal share of revenues over 30% and/or with annual coal production over 20 million tons and/or developing new coal mines;
- certain coal industry partners, defined as manufacturers (*e.g.* equipment suppliers) and infrastructure players (*e.g.* port terminals, dedicated railways) developing significant new coal assets.

€7.5bn

Total assets divested via sector policies

0%

Coal in our business by 2030 (EU / OECD) and 2040 (rest of the world)

(3) Antipersonnel landmines, cluster munitions/cluster bombs, chemical, biological, and depleted uranium weapons, nuclear weapons proliferation.

(4) www.axa.com/en/about-us/responsible-investment

(5) See https://www-axa-com.cdn.axa-contento-118412.eu/www-axa-com/7c51bab4-4266-42b6-aa8a-a6b209ee6e33_2019ClimateStrategy.pdf

(6) https://coalexit.org/

Insurance

AXA also restricts insurance coverage for coal and oil sands-related assets (as well as for the other industries mentioned in the previous section, and arctic drilling). Since 2017, the underwriting restrictions ban Property and Construction covers for coal mines, coal plants, oil sands extraction sites or associated pipeline. In November 2019, AXA significantly strengthened these restrictions by adding the following coal-related restrictions at client-level, mirroring divestment criteria.

- Any new and existing underwriting business, in respect of a Line of Business (see exemptions) is banned if the client:
  - is developing new coal mines or more than 300MW of new coal-based power capacity; or
  - derives more than 30% of its turnover from coal; or
  - is a power company with over 30% of its energy mix based on coal; or
  - is a mining company producing more than 20MT/year of coal.
- A long-term target to achieve a "0%" exposure to coal business by 2030 in the OECD, and 2040 in the rest of the world, has also been set.
- A case-by-case referral process is used to ban or authorize business with coal industry partners (such as equipment suppliers, port terminals, dedicated railways).
- Property and Construction covers are also banned for Oil & Gas extraction in the Arctic region.
- The above rules do not apply to Employee Benefits (health, savings, protection) or to Treaty Reinsurance. The details of these policies are published online[1].
- New business is banned from policy inception date (January 2020).
- For existing business, a two-year grace period is implemented upon policy inception, which is key to enable clients and brokers to reorganize their risk placement, but also to encourage clients to reduce their exposure to coal within this timeframe. In the case of clients breaching our coal development threshold (300MW), this threshold is reduced to one year, in effect allowing for only one renewal.
- More detailed internal rules apply for complex cases such as "mixed risks" packages, etc.

In addition, AXA is committed to a long-term "exit" strategy reducing exposure to the thermal coal industry to zero by 2030 in the European Union and OECD countries, and by 2040 in the rest of the world. This long-term exit strategy applies to both investment and underwriting activities.

AXA Group Energy Policy

Since 2017, AXA has divested from oil sands-related businesses (defined as companies deriving more than 20% of their revenue from oil sands, including pipeline operators) and banned Property and Construction covers for oil sands extraction sites and related transportation (pipelines) as well as drilling in the Arctic Region[2].

In 2021, AXA strengthened its Oil and Gas policy[3] driven by two principles:

- AXA believes it is critical to accelerate the transition of the energy sector towards a more sustainable model, consistent with "Net-Zero" trajectories. This transition can only happen by enabling Oil and Gas companies to implement ambitious transition plans. AXA's role, as a financial and underwriting player, is to focus its support to the Oil and Gas companies with the most far-reaching and credible transition plans;
- despite significant differences between investment and underwriting when it comes to decarbonizing its activities, AXA will continue to strive for progressive alignments between its decisions as an asset owner and as an underwriter.

In addition, AXA has aligned its climate and biodiversity ambitions. Unconventional oil is a larger driver of ecosystem degradation. Oil sands extraction can present heightened spill risk, excessive water use, polluted wastewater, and deforestation. Exposure to the Arctic Region can degrade critical ecosystems, and fracking requires extensive use of water, and chemicals, which can contaminate groundwater and affect the health of residents and ecosystems. In order to reduce the biodiversity impact of investments in and underwriting of energy activities, AXA has aligned its definition of the Arctic Region with the Arctic Monitoring & Assessment Programme (AMAP), based on the respect of critical ecosystems.

The main database used by AXA is the "Global Oil & Gas Exit List" (GOGEL)[4] released in 2021.

Investments

As an asset owner, AXA does not invest in companies that fail to address the transition, while permitting investments in companies showing strong and convincing transition strategies, albeit with stringent credit constraints. AXA excludes all new direct investments in listed equities and corporate bonds in developed markets of Oil and Gas companies operating in upstream and/or oilfield services and/or downstream subsectors, as well as midstream players.

AXA selects integrated Oil and Gas companies for investments based on a restrictive selection process. Less than 5% of the approximately 650 companies identified in the "Global Oil and Gas Exit List" by the NGO Urgewald[5] meet AXA's criteria.

Furthermore, AXA has reduced its investment exposure to unconventional exploration and production, as follows:

- Arctic: AXA has extended its investment restrictions to the Arctic Region (in alignment with the AMAP). Only companies with Norwegian operations in the AMAP Region will be maintained, given their high environmental standards and lower operational carbon footprint. AXA will exclude new direct investments in companies deriving more than 10% of their production from the AMAP Region or producing more than 5% of the worldwide volume of AMAP-based Oil & Gas;
- Oil sands: on top of existing restrictions, AXA will adopt a more stringent policy by ceasing direct investments in companies producing more than 5% of the worldwide volume of oil sands;
- Fracking/shale Oil and Gas: AXA will no longer directly invest in companies deriving more than 30% of their production from fracking/shale Oil and Gas.

(1) https://www-axa-com.cdn.axa-contento-118412.eu/www-axa-com/7c51bab4-4266-42b6-aa8a-a6b209ee6e33_2019ClimateStrategy.pdf

(2) Defined as operations situated above 70°N, excluding Norwegian operations.

(3) https://www.axa.com/en/press/press-releases/axa-extends-its-oil-and-gas-exclusions-to-support-the-energy-transition; https://www-axa-com.cdn.axa-contento-118412.eu/www-axa-com/1acb2cfe-ef11-402c-a269-f2e6c88dd287_axa_oilandgas_policy_2021.pdf

(4) https://gogel.org/

(5) https://urgewald.org/english. As AXA's Oil & Gas policy was released before the final version of the Global Oil and Gas Exit List in November 2021, a provisional version of this list is used.

Insurance

AXA will cease underwriting new upstream oil greenfield exploration projects unless they are carried out by companies with the most far reaching and credible transition plans. AXA's selection of these companies with credible transition plans will be finalized by the end of 2022. Once completed, the cessation of new contracts of new upstream oil greenfield exploration projects will come into force with a 12-month grace period ending on January 1, 2024. In addition, AXA will significantly reduce its insurance exposure to unconventional exploration and production from its business from 2022, as follows:

- AXA extends the scope of its Arctic underwriting restrictions beyond the polar circle and the 70°N zone in alignment with the AMAP. Only Norwegian operations in the AMAP Region will be maintained, given their high environmental standards and lower operational carbon footprint. AXA will strengthen the thresholds applicable to insurance activities in this particularly fragile region, excluding new underwriting coverage for Oil and Gas extraction activities carried out in the AMAP Region by companies deriving more than 10% of their production from the AMAP Region or producing more than 5% of the worldwide volume of AMAP-based Oil & Gas. Exemptions may be granted if the projects are carried out by Oil and Gas companies with the most far-reaching and credible transition plans;
- oil sands: on top of the existing restrictions in place, AXA will adopt a more stringent policy by extending current restrictions to all lines of business for underwriting activities;
- fracking/shale Oil and Gas: AXA will no longer provide any insurance coverage to activities of companies, deriving more than 30% of their production from fracking/shale Oil and Gas.

AXA was the first large insurer to have implemented such restrictions, which represent a significant commercial commitment. AXA uses the "Global Oil and Gas Exit List"[2] which is a publicly available database.

In addition, AXA engages with companies targeted by AXA's sector policies, and separately, brokers (see Sections 3.4 "ESG Integration - Shareholder engagement & voting" and 3.4 "ESG Integration - Underwriting client & broker engagement").

(2) https://gogel.org/

AXA Group Ecosystem conversion & Deforestation policy

In October 2021, AXA announced a new policy on Ecosystem protection, Deforestation and Natural World Heritage Sites. It seeks to address risks related to deforestation and protected areas of key biodiversity value, and to stop supporting firms which have a negative impact on ecosystems that host critical biodiversity. Curbing deforestation conserves water resources, prevents flooding, controls soil erosion, and preserves habitats, in addition to preserving key carbon sinks.

In 2013, AXA divested from "unsustainable" Palm Oil producers and banned illegal logging from its underwriting. AXA's new policy builds on previous work to address other drivers of deforestation, resulting in a more comprehensive approach[1].

Investments

On the investment side, as an asset owner, AXA does not invest in companies in three cases:

- palm oil producers who have not achieved "sustainable palm oil" production certifications and/or have significant unresolved land rights conflicts[2] and/or conducting illegal logging (as per AXA's 2013 palm oil policy, which remains in place);
- companies in any sector facing "high" and "severe" controversies related to land use and biodiversity[3]; and
- companies producing palm oil, soy, cattle and timber that face "significant" land use and biodiversity controversies and that are found to have a "critical" impact on deforestation[4].

In line with other policies, listed equity assets are divested from policy inception and debt assets will be runoff. The exclusion list is updated annually unless a specific event requires earlier revision.

AXA will engage, as a shareholder on its own where necessary and *via* coalitions wherever possible, with a selection of companies of the following type:

- palm oil, soy, cattle, and timber producers;
- traders and buyers of those commodities; and
- other companies on an *ad hoc* basis.

This will be done with a view to improving practices and monitoring progress. Particular attention will be paid regarding controversies, production, and procurement practices.

Insurance

With respect to insurance underwriting, AXA focuses more on activities at risk of causing deforestation. AXA restricts Commercial Lines Property and Construction Insurance Underwriting in four cases:

- illegal logging (pre-dates the policy released in October 2021 and remains in place);
- companies that are excluded by the investment policy screening are to be referred to the Group Risk Management and the critical activity will likely be banned from Construction and Property covers;
- businesses that operate in "high-risk countries"[5] and commodities (soy, beef, palm oil, timber) and facing high or severe deforestation controversies[6] are also to be referred to the Group Risk Management with a view to restrict the critical activity;
- traders of soy, beef, palm oil and timber operating in "high-risk countries" and facing high or severe deforestation controversies are also to be referred to the Group Risk Management and the critical activity will likely be banned from marine cargo covers.

(1) https://www-axa-com.cdn.axa-contento-118412.eu/www-axa-com/f36f7976-ff05-44e2-933c-5328d007fcc0_axa_deforestation_and_worldheritagesites_policy.pdf

(2) According to Sustainalytics Palm oil-related controversies levels 3-4-5 (Land use & biodiversity, human rights, community relations).

(3) According to Sustainalytics' controversies database. "Significant", "High" and "Severe" correspond to levels 3, 4 and 5. According to Sustainalytics Palm oil-related controversies levels 3-4-5 (Land use & biodiversity, human rights, community relations).

(4) According to the "CDP Forest" database.

(5) Determined with support from the WWF experts.
LATAM: Brazil, Bolivia, Peru, Ecuador, Colombia, Venezuela, Guyana, Suriname, French Guiana, Paraguay, Argentina.
Congo Basin: Cameroon, Central African Republic, Democratic Republic of Congo, Republic of the Congo, Equatorial Guinea, Gabon.
South-East Asia: Cambodia, China (Yunnan and Guangxi), Lao PDR, Myanmar, Thailand, Vietnam, Papua New Guinea, Indonesia, Malaysia, Brunei, Australia.

(6) According to Sustainalytics' controversies database.

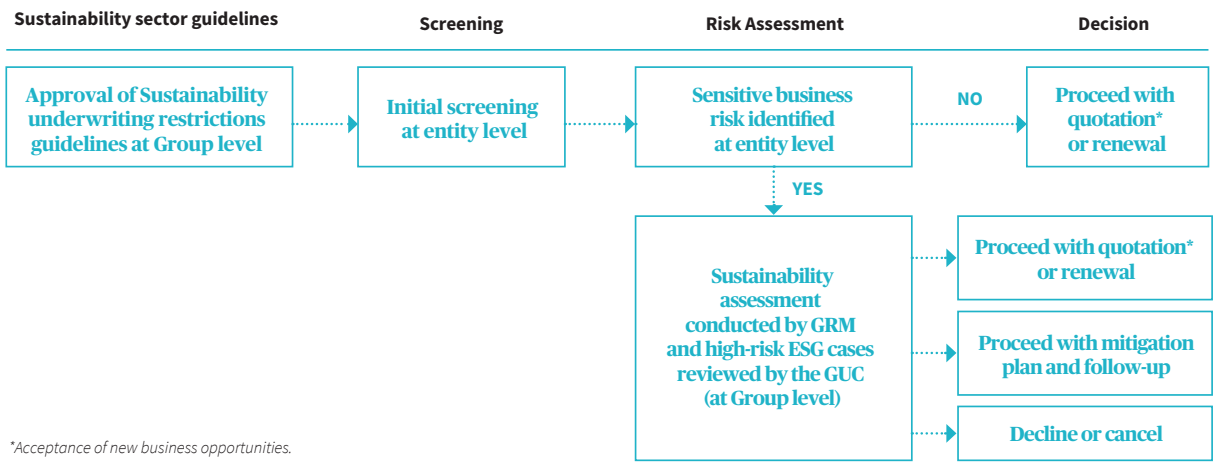
AXA Group Natural World Heritage Sites policy

In line with the UN PSI-UNESCO classification, AXA commits to protect Natural World Heritage Sites (WHS)[1] by ensuring it does not support, through Property and Construction insurance underwriting, businesses in sensitive sectors that are developing activities incompatible with ecosystem preservation in these vital sites. WHS are classified by UNESCO as containing both 'exceptional natural beauty' and 'the most important and significant natural habitats for conservation'. Examples include the Galapagos Islands of Ecuador and the Ivindo National Park in Gabon. They provide both key biodiversity benefits, such as fauna and flora protection, and environmental benefits, including soil stabilization, flood prevention, and carbon capture. They also contribute to economies through jobs, ecotourism, recreation, and exports.

Governance on referrals

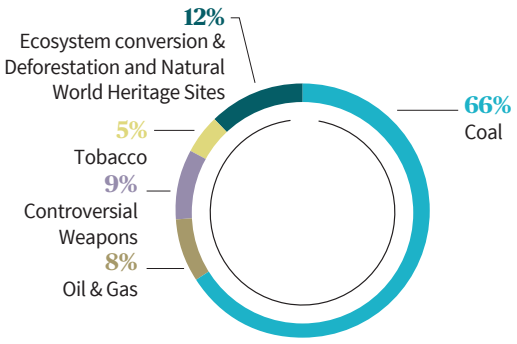
A business referral process is in place to monitor the implementation of AXA's "sector guidelines". This involves any sensitive business risks identified being escalated to Group Risk Management (GRM). Such sensitive business risks are assessed by sustainability Underwriting experts. High-risk ESG cases are escalated to the Group Underwriting Committee (GUC).

Sustainability referrals



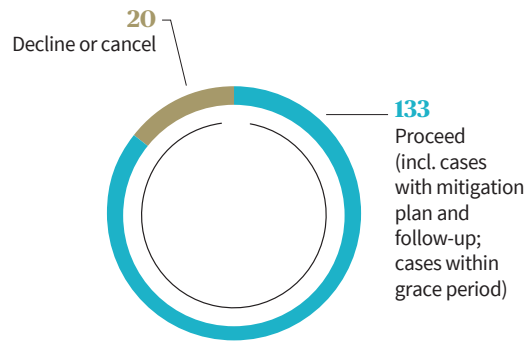
*Acceptance of new business opportunities.

Sensitive business risks referred in 2021 by sector



In 2021, 153 business cases were escalated. These 153 cases referred correspond to 6% of AXA XL's large commercial lines clients

Sensitive business risk referrals and decisions taken



(1) https://whc.unesco.org/en/natural-world-heritage/

Green investments and insurance premiums: making a positive contribution to the energy transition

AXA also aims to support its clients as they transition to more sustainable behavior and business models through green investment and insurance offerings. Details of AXA's offering as an investor and insurer are set out below. See Sections 3.4 "ESG Integration - Shareholder engagement & voting" and 3.4 "ESG Integration - Underwriting client & broker engagement".

Green investments

Green investments include the following asset classes: green bonds, infrastructure debt & equity, impact investments, real estate, and commercial real estate loans. In addition to AXA's intermediate investment carbon footprint reduction target and investment restrictions, green investments encourage sectors to strengthen mitigation and adaptation efforts.

To support AXA's green investment target, AXA has developed an internal framework to define "green" investments based on external labels, certifications, and environmental standards as appropriate. To qualify as a "green" investment, AXA applies the standards to each of the following asset classes. Progress against AXA's green investment target is discussed in Section 4.3 "Green Investments".

- **green bonds:** the green bonds in which AXA invests are independently labelled based on Bloomberg's "Green bond/Loan indicator" (DT607)[1]. This field indicates if the net proceeds of the green bonds go towards "green" projects or activities that promote climate change mitigation or adaptation, or other environmental purposes;
- **infrastructure:** investments in infrastructure equity and debt are classified as "green" assets if the project is categorized in beneficial sectors defined by the Climate Bonds Initiative (CBI)[2];
- **impact investments:** investments in AXA's Impact Funds are classified as "green" whenever:
  - there are targeted climate impacts with clearly defined KPIs, or
  - in the specific case of forests, sustainable management can be demonstrated (FSC or PEFC certification is required). See examples of impact KPIs in sub-section "Impact Investing" below.
- **real estate:** AXA's definition is limited to assets with a very high level of environmental certification[3] and a minimum Energy Performance Certificate (EPC) rating of "B" or equivalent;
- **commercial real estate:** for CRE debt, AXA uses a strict definition of "green" for loans backing an underlying asset with the aforementioned very high level of environmental certification referred to in the "real estate" paragraph above.

Context Box

AXA SA's first Green Bond issuance[4]

The publication of AXA's Sustainability Bond Framework in 2021 helped set new standards for climate finance. AXA SA's inaugural €1bn subordinated green bond issuance under this framework in April 2021 was well received by the market and helped drive the ongoing growth in this asset class.

In accordance with AXA Group's Sustainability Bond Framework, AXA has already allocated €450m to Eligible Green Projects[5] as of April 7, 2022, representing a project refinancing rate of 45%. These projects are an integral part of AXA's overall objective to finance a targeted amount of €26bn of green investments by 2023. The 2022 allocation and impact report on AXA SA's inaugural €1bn subordinated green bond issuance was published in April 2022.

(1) Bloomberg's definition of what constitutes a market-accepted "green bond" is based on the 2021 edition of the Green Bond Principles (GBP), available here: https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/. Bloomberg requires use-of-proceeds to be aligned with GBP to be eligible for green bond designation.

(2) Beneficial sectors include Solar, Wind, Bioenergy, Hydropower, Geothermal, Energy distribution, Energy storage, Transport, Water. For more information see www.climatebonds.net

(3) Minimum level BREEAM "Excellent" or LEED "Gold" or equivalent.

(4) AXA Group's Sustainability Bond Framework and 2021 EUR 1bn Green Bond Allocation and Impact Report dated April 7, 2022 are available at https://www.axa.com/en/investor/sustainable-financing

(5) Eligible Green Projects are eligible Green Projects as defined in AXA Group's Sustainability Bond Framework.

Green Business

In 2021, AXA developed a **Green Business Program** that aims to develop P&C products (insurance coverage or services) that contribute to at least one of the following four objectives:

- Climate Change Mitigation;
- Climate Change Adaptation;
- transition to a circular economy;
- limitation of biodiversity loss and pollution.

Three **shades of Green** have been introduced to provide guidance and transparency on the materiality assessment of a Green Business offer:

- **Shade 1 | encouraging environmentally sustainable behaviors** (*e.g.*, *via* rewards or information sharing);
- **Shade 2 | encouraging environmentally sustainable claims management** (*e.g.*, replacement of accidentally damaged goods - like a refrigerator or washing machine – with more energy-efficient devices or with reconditioned electronic devices);
- **Shade 3 | covering environmentally sustainable assets/activities** (*e.g.*, low-emission vehicles, solar panels) or covering environmentally friendly clients and/or activities.

The combination of the 4 objectives and the 3 shades results in an internal framework that helps entities develop Green Business offerings. It can be found on AXA's website[(1)].

€1.3bn
gross written premiums by 2023

This framework is complemented by a "Green Premium" target to measure progress and encourage product innovation. As part of the AXA For Progress Index, AXA committed to increasing gross written premiums for Green Business offers to €1.3bn by 2023 from €1.1bn in 2020. This target will be achieved by redesigning existing products and developing new solutions.

In 2021, €1.4bn in Green Premiums were collected. This strong performance was mainly driven by the COVID-19 pandemic, which led to a significant increase in PAYD (Pay-as-you-drive) offerings because of remote working. But as the pandemic recedes, it is unclear if this trend will continue. AXA will therefore keep its 2023 target at €1.3bn. See also Section 4.1 "AXA For Progress Index".

Green Business Framework

TAXONOMY	1 Environmentally-sustainable behavior		2 Green claims management		3 Green assets		Green clients / activities
	RETAIL	COMMERCIAL LINES	RETAIL	COMMERCIAL LINES	RETAIL	COMMERCIAL LINES	COMMERCIAL LINES
Mitigation	Transition towards **less energy consumption to reduce GHG emissions**		Damaged goods **repair**, or replacement with a low consumption equipment		**Environmentally friendly assets**		**Environmentally friendly clients and/or activities**
Adaptation	Preventive measures **to limit vulnerability to climate change**						
Circular economy			**Replacement with 2nd hand goods**				
Biodiversity & Pollution prevention	Preventive measures **to limit biodiversity loss**						

(1) https://www.axa.com/en/magazine/Green-Business-and-Inclusive-Protection-2023-targets

Context Box

CO_2 emissions avoided

As the positioning of the Green Business Program is based on positive environmental impact, the next step will be assessing what emissions are prevented thanks to AXA's offering.

As an illustrative example, as a part of green claims management, AXA entities sometimes encourage digital advice calls as it reduces distances traveled and hence the environmental impact (AXA Spain, AXA Germany).

To put this into context, assuming a 30-minute video call (12g CO_2e[1]) can replace a physical client meeting for which the expert will drive 10km with a car emitting 1,930g CO_2e[2], this service prevents 1,218g of CO_2 equivalent per call.

In 2020, AXA Spain handled over 242,000 video calls, corresponding to 465 TCO_2e avoided, *i.e.*, the equivalent of over 200 round-trip flights between Paris and New York[3].

Examples of Green Business offerings

Insurance offerings have been tailored to encourage low-carbon energy solutions.

For example, AXA Germany's standard "Home" product provides basic insurance coverage (fire, mains (tap) water, storm, and hail) for renewable energy plants and equipment (such as photovoltaic systems, solar/geothermal, or other heat pump systems) and customers can add optional additional cover for such installations. The offering also includes the reimbursement of alternative electricity supply (after an insured event) and the reimbursement of the loss of income for photovoltaic systems.

PAYD offerings are a way of encouraging policyholders to use their cars less and adopt more sustainable mobility modes. By offering a discount to clients who drive less than the average mileage per country, clients are incentivized to reduce their CO_2 emissions. For example, AXA Belgium offers discounts for policyholders who drive less than 10,000 km per year (the average kilometers driven in Belgium is 14,800 km).

To support the transition from conventional vehicles[4] to electric (EVs)[5] or hybrid electric vehicles (HEVs), AXA has developed specific offerings. For example, at AXA Switzerland, motor insurance is available for electric or hybrid (plug-in and non-plug-in) vehicles, which notably includes specific roadside assistance (*e.g.*, empty battery) and discounted access to a charging network.

Insurance services have been adapted to better assess environmental liability exposure.

AXA XL has developed an "**Environmental Sensitivity Tool**"[6] enabling companies to identify and mitigate pollution and environmental risks in Europe and in the UK. The tool uses comprehensive datasets and applies machine-learning algorithms to assess individual facilities' environmental liability risks. The outputs include environmental sensitivities scores and high-resolution maps for each location. When combined with customer-specific information like site location, industry type, and occupancy, companies can use this tool to assess their environmental liability exposures at individual facilities or across an entire portfolio of sites.

Focus on Green Claims

As an insurer, AXA has a role to play in the transition to a circular economy, notably *via* responsible claims management. For example, in the motor Line of Business, green claims initiatives encourage the repair of damaged car parts. Where this is not possible, recycled car parts are encouraged as it is beneficial both financially and environmentally:

- recycled car parts are generally cheaper. Using recycled car parts therefore generally reduces the total cost of the repair, may reduce the probability of a write-off as the total cost of repair is lower, and may also lower the insurance premium;
- the environmental benefit can have a greater impact than the part itself, as by using recycled car parts it may be economically viable to repair a car, which would otherwise have been written-off.

Promoting repair over replacement helps prevent CO_2 emissions by extending the lifetime of parts and thereby:

- limiting the use of raw materials; and
- reducing transportation needs.

Various initiatives have been launched within AXA, notably in AXA Spain and AXA Switzerland, which promote "micro repairs" *i.e.*, repairing certain damaged components rather than simply swapping them out. Examples include window screens chips, dented wing panels, or cracks on the rear bumper.

(1) Greenspector report on average carbon impact of one minute of videoconferencing (April 2021).
(2) Calculation based on the methodology defined by ADEME https://monimpacttransport.fr.
(3) Calculation based on the methodology defined by ADEME https://monconvertisseurco2.fr/.
(4) Corresponding to diesel, gasoline, and natural gas.
(5) corresponding to Battery electric vehicles (BEV), plug-in hybrid electric vehicles (PHEV) and fuel cell electric vehicles (FCEV).
(6) For more information: https://axaxl.com/fast-fast-forward/articles/new-tools-for-assessing-and-prioritizing-environmental-liability-risks

Inclusive Protection

In 2021, AXA developed an Inclusive Protection framework to support the development of offerings that better protect underserved populations[1]. A key part of this framework is AXA's capacity to address the specific needs of its clients and beneficiaries. Factors such as financial position, age, gender, sexual orientation, health, geographical location or insurance awareness that can result in significant protection gaps are taken into account.

The framework was developed with AXA entities to robustly define the vulnerabilities to be addressed. This builds on existing initiatives within the Group:

- solutions developed by AXA Emerging Customers, AXA Climate, "Women in Insurance"; and
- local inclusive offers for underserved populations due to income, status, health, or gender.

AXA's goal is to clear any barriers to insurance resulting from such vulnerabilities, by:

- designing or tailoring dedicated offerings that meet the specific needs of underserved groups;
- customizing the marketing and/or distribution model for such offerings through innovative approaches/partnerships to reach the target group.

As part of the AXA for Progress Index, **AXA's 2023 target is to reach 12 million inclusive protection customers versus 7 million in 2020. In 2021, AXA reached 10.6 million inclusive protection customers**[2]. See also Section 4.1 "AXA For Progress Index".

Recognizing the link between human health and climate change, AXA's Inclusive Protection initiative includes innovative insurance products and services that aim to:

- bridge the protection gap; and
- increase resilience by addressing vulnerabilities linked to climate change.

For example, a project incubated in the Business for Inclusive Growth (B4IG) coalition, coordinated by AXA Emerging Customers, AXA Climate and L'Oréal was launched in 2021. Insurance Net for Smallholders (INES) aims to provide a comprehensive risk protection package (Health insurance, Parametric Climate insurance coverage and value-added services) to smallholder farmers/pickers and their families as part of L'Oréal Solidarity Sourcing programs.

12m

of customers on Inclusive Protection by 2023

In 2021, two pilots were launched in Burkina Faso with L'Oréal's suppliers notably OLVEA and AXA's local partner Sonar for shea butter (21,000 women) and India with Solvay for guar (2,000 farmers and their families). This project aims to address the protection gap and directly targets the link between human health and wellbeing, and climate change. Other examples of the broader Inclusive Protection offering are available on AXA's website[3].

Inclusive Protection Framework

	Vulnerability	Description/Marketing segment	Business Maturity
Structural	Monetary / Revenues	Covering the bottom of the pyramid and low-income to mass market	
	Territorial disparities	Providing specific coverage considering customers' location	
	Gender	Covering specificities and needs	
	Age		
	Chronic diseases & conditions	Accompanying our customers all along their chronic diseases and conditions' journey	
	Lack of access to health & protection	Reducing out-of-pocket expenses	
Occupational	Entrepreneurs	Providing tailored solutions to protect the future of work and specific work situations	
	Gig workers		
	Migrant workers		

(1) AXA has developed a tailored-made definition for Inclusive Protection: "An inclusive protection offering is a product or a related service that addresses a vulnerability to meet the needs of the underserved population, to bridge a protection gap".
(2) For more information: https://www-axa-com.cdn.axa-contento-118412.eu/www-axa-com/68b761e1-df44-4765-83f2-bfe75afdbcb6_20220413_Inclusive_Protection_Public_Memorandum.pdf
(3) https://www.axa.com/en/magazine/Green-Business-and-Inclusive-Protection-2023-targets

Transition bonds and sustainability-linked bonds

Green or climate bonds are a recent innovation. Well received in the market, they are intended to fund projects with climate or environmental added value. However, players that are actively reducing their carbon intensity but whose main activities are not yet sufficiently green to be eligible for green bonds require somewhat different instruments.

Since 2019, AXA has explored the concept of "transition bonds". The bonds are used by companies solely to finance transition projects. There is a high level of transparency around the bonds and how they are used to increase investor confidence about how their capital is being used. Transition bonds would help investors overcome the major challenge of providing capital not just to companies that are already green, but to companies working to become so. In November 2019, AXA announced a first €100m "transition bond" in partnership with Crédit Agricole CIB[1]. In 2020, AXA announced a second €100m transition bond in partnership with BPCE[2].

In 2020, AXA IM acted as co-chair of the Climate Transition Finance Working Group of the International Capital Markets Association (ICMA). It published the Climate Transition Finance Handbook, the first global effort to frame the concept of transition finance.[3] This work prompted AXA to carefully monitor the arrival of a new type of fixed income asset class: Sustainability-Linked Bonds (SLBs)[4].

In 2021, AXA set a €300m target to develop public transition bonds and SLBs. The focus is on financing companies with credible plans to transition to Net-Zero. SLBs differ from Green bonds in that, just like conventional debt, they are general purpose bonds. These bonds incorporate targets linked to environmental, social and governance (ESG) factors. As such, they represent a new opportunity to fund the climate transition, while addressing other environmental and social challenges.

Investors like AXA have identified SLBs to incentivize companies to transform their business model as sustainability/ESG objectives are "(i) measured through predefined Key Performance Indicators and (ii) assessed against predefined Sustainability Performance Targets (SPTs)" in line with the SLB principles set out by the ICMA and the Climate Bonds Initiative.

Impact investing

AXA was one of the first institutional investors to proactively engage in impact investing. This is an investment strategy that aims to generate objectively measurable and intentional environmental and social impacts alongside financial returns.

In 2013, AXA committed €200m to its first impact fund focusing on Financial Inclusion, Access to Healthcare and Education. Since 2013, AXA has committed €922m to impact investing, with the value of the invested amount standing at €437m at end-2021. AXA's impact funds focus on both environmental and social impact, with a strong focus on solutions dedicated to climate change and biodiversity loss.

In 2021, **AXA approved a new "Natural Capital" target with €500m dedicated to reforestation, which forms part of AXA's €1.5bn commitment to support sustainable forest management**. At the Women's Forum, AXA also launched a new Fund dedicated to Health and Inclusion. Healthcare access is currently challenged with an increase in chronic diseases, the impact of climate change and migration. As a result, AXA has committed €263.79m to a Health initiative, managed by AXA Investment Managers, and designed to facilitate access to healthcare for underserved populations in emerging and mature markets. This initiative will support, amongst other global health issues, treatment of women-specific health conditions as well as infectious diseases, vision and diabetes and obesity-related conditions.

In their objectives and outcomes, AXA Impact Funds 1 & 2 are "fund of funds" investment vehicles. They demonstrate the tangible role played by AXA and its entities in furthering the UN SDGs[5] through the allocation of much needed capital. A preliminary review of the alignment of AXA's impact funds with the SDGs yielded positive results. This demonstrated that Impact Funds 1 and 2 are providing capital to businesses that directly address the SDGs highlighted below.

Context Box

Deep and credible alignment to the UN SDGs

(1) https://www.axa.com/en/magazine/forming-a-bond-supporting-the-energy-transition
(2) https://www.axa-im.com/media-centre/bpce-issues-e2-82-ac100-million-of-transition-bonds-invested-by-axa-im-to-finance-natixis-assets-contributing-to-the-energy-transition
(3) https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/guidance-handbook-and-q-and-a/
(4) https://www.axa-im.com/document/4451/download
(5) See AXA's annual report for a correlation of UN SDGs with our broader sustainable strategy.

Impact Performance

AXA's impact management and measurement framework covers:

- initial assessment;
- evaluation;
- due diligence;
- investment;
- monitoring; and
- exit.

The objective is to ensure that the generation of impact is intentional, focused and a key driver for investment decisions and managing investments over the investment period. The table below shows the contribution by AXA's platform to key environmental and social challenges aligned with the mission of AXA's funds:

Theme	KPI	2021
Environment	CO_2 emissions avoided *(in tons)*	80.4m
	Avoided waste *(in thousand tons)*	155.8
	Households provided with clean energy	3.7m
	Land under sustainable management *(in thousand hectares)*	69.5
Social	Healthcare Solutions Developed	13
	Healthcare Solutions Distributed	198m
	Healthcare facilities	77
	People reached – financial inclusion	117.9m
	Students reached	4.4m

Context Box

Focus on AXA impact Fund: Climate & Biodiversity

In 2019, AXA launched its Impact Fund: Climate & Biodiversity during the G7 Environment ministerial meetings. The aim was to tackle climate change and protect biodiversity and the ecosystems that will support humanity's future. AXA uses this fund to invest in activities that:

- conserve natural capital;
- protect critical habitats; and
- mitigate climate change globally.

Examples of this fund's investments can be found below.

Investment	Activity description	Expected impact/Illustrated investments
Madecasse	**Madecasse** is a cocoa bean-to-bar chocolate company working with smallholder farmers primarily in Madagscar to implement sustainable agroforestry practices that enables the conservation of habitats to support Madagascar's unique biodiversity, where 85% of the country's plant and animal species are found nowhere in the world.	**Impact targets:** › 528 hectares of critical habitats for biodiversity conserved
Fundaeco	**Fundaeco's** operations focus on the creation, management and conservation of Forest Protected Areas in Guatemala. These Protected Areas are of significant global ecological importance, acting as habitats for critical species and providing a natural carbon sequestration solution, evidenced by the issuance of verified carbon credits.	**Impact targets:** › 60,500 hectares of land under sustainable management › 4.6m tons of carbon emissions avoided › 4.1m verified carbon credits generated
Sistema Bio	**Sistema** works with small-holder farmers in Latin America, India and East Africa to tackle methane emissions from waste within their operations. Sistema's biodigesters provide a sustainable solution to the treatment of organic waste, sequester methane from manure that would otherwise be emitted into the atmosphere; and the resulting biogas and biofertilizers provides low-carbon alternative to fossil-fuel derived products for the farmers.	**Impact targets:** › 5m tons of waste treated › 200m cubic meters of biogas produced › 16m tons of biofertilizer produced › 1.8m tons of carbon emissions avoided

Shareholder engagement and voting

As a shareholder and bondholder, AXA can engage with the management of the companies in which it invests. This can help catalyze positive change on certain issues[1]. Such engagement is either done directly by AXA or by AXA IM on behalf of AXA and third-party clients.

As described in the "Governance" section, AXA's Engagement & Monitoring Working Group reviews issuers from a pure ESG perspective. It can decide on specific follow-up, such as requests for engagement. AXA's Credit Research Team also conducts regular one-on-one interviews with the top management of the issuers in which AXA has its largest investment exposure. These interviews give AXA's Credit Research Team the opportunity to review and discuss issuers' strategy, including in ESG, on a non-public basis.

AXA IM holds constructive and challenging discussions directly with investee companies, and as part of a coalition of investors, engaging with companies in key sectors.

Climate change is one of the most material themes on which AXA IM engages. AXA IM's key climate engagement objectives and indicators are shaped by the TCFD framework, which has established itself as the de facto reporting framework on this issue. Alongside establishing public support for TCFD, AXA IM's engagement approach encourages companies to:

- commit to short-, medium- and long-term carbon emissions reduction targets that are based on climate science. There should be a clear explanation of corresponding capital expenditure plans;
- perform scenario analysis using a scenario where global warming is limited to the Paris Agreement goal of "well below 2 °C";
- align executive remuneration to climate change objectives.

In 2021, AXA IM reinforced its stewardship policy with a focus on "climate laggards"[2]. From 2022, AXA IM will engage with a selection of companies that do not have Net-Zero commitments or that have quantified emissions reduction targets that are not felt to be sufficiently credible or demanding. This engagement policy, with a "three strikes and you're out" principle, aims to apply sufficient pressure to effect timely change, and is applied on behalf of third-party clients.

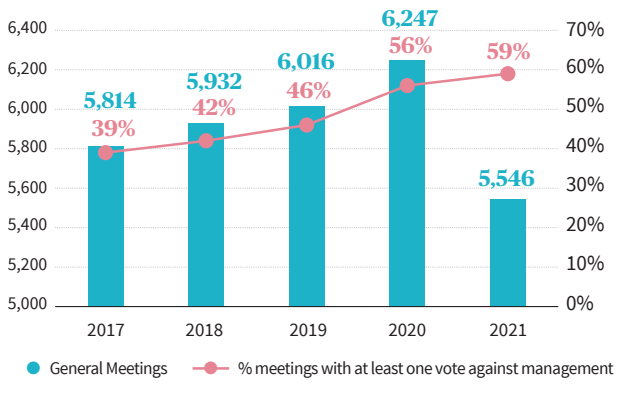
Clear targets are set for each company, tailored to their activities, and communicated to their management. AXA IM will regularly engage with those companies to steer them on those targets, using escalation techniques when necessary (*e.g.*, voting against management). If the targets have not been achieved within three years of engagement, AXA IM will divest from the company.

Asset Manager-level initiatives

AXA IM's voting & engagement initiatives are discussed in its annual "Active Ownership and Stewardship" Report[1]. Below is a snapshot of voting & engagement initiatives undertaken in 2021.

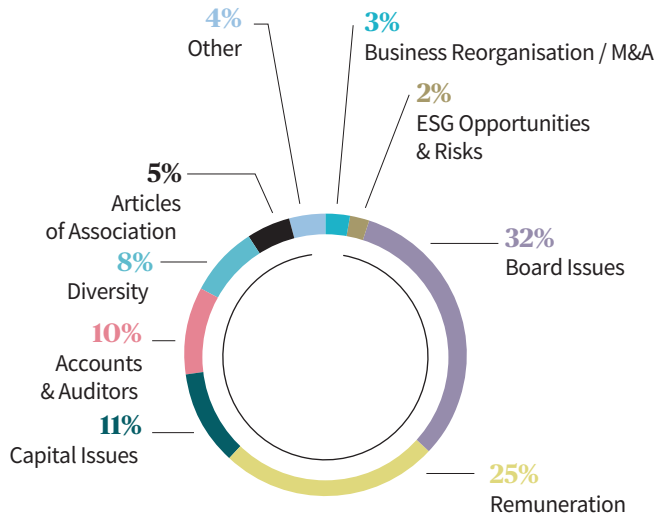
Voting Trend

In 2021, AXA IM voted at 5,546 general meetings and did not fully support management proposals in 59% of these meetings.

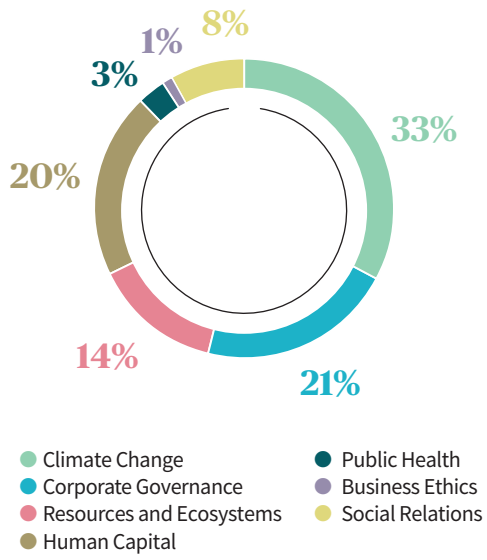


(1) *https://www.axa-im.com/sites/corporate/files/2022-05/axa-im-2021-stewardship-full-report_.pdf*
(2) *https://www.axa-im.com/axa-im-further-strengthens-its-climate-actions-accelerate-its-contribution-low-carbon-world*

Votes against Management Topics



2021 engagement themes



Underwriting client & broker engagement

In 2021, AXA XL France began engaging with clients on their Climate strategies and transition plans to achieve Net-Zero. On a quarterly basis, a series of "Climate Catchup" interviews were held with multinationals across France[2]. Those interviews enabled AXA XL France to share its climate strategy with clients, and also to help AXA XL France determine how it can better support these clients with their transition.

Broker engagement

A specific broker engagement initiative was launched by AXA XL's Environmental team in France, working with the insurance broker Marsh to assess and mitigate biodiversity-related risks. AXA XL France's clients are asked to complete environmental risk prevention audits with measurable criteria. Those clients with industrial sites are encouraged to carry out initial biodiversity diagnostics and incorporate the results into their risk management plan. To support client efforts to be responsible, AXA XL France offers lower client deductibles for environmental risk policies.

33%
Climate-related engagement themes

(2) In industries such as cement, waste and water management and gases, technologies and services for industry and health.

3.5 Training and capacity building

Certifying all AXA employees with the AXA Climate Academy

As part of the AXA for Progress Index, AXA is committed to upskilling all its employees on climate by 2023. To achieve this, AXA has designed the AXA Climate Academy, a digital learning program that helps employees think critically about climate and understand how they can act differently.

The AXA Climate Academy focuses on:

- why climate increasingly matters to customers both in commercial lines and to individual customers;
- the main types of climate change risks (physical risks, transition, and liability risks);
- the impact throughout the value chain for insurance and for investments;
- how employees can help reduce the company's carbon footprint through their professional and personal practices and behavior.

This modular and bite-sized learning program is available in 11+ languages on both Group and local platforms and takes 2 to 3 hours to complete.

AXA launched the AXA Climate Academy during the 2021 AXA Learning Week. This is when employees are encouraged to take advantage of global and local learning initiatives. Over 11,400 participants logged on to the global live event "Real Talk: How climate change reshaped AXA's insurance business" broadcast on LinkedIn.

Karima Silvent, Chief Human Resources Officer

AXA Climate Academy: "We want to engage and upskill all AXA's employees on climate issues by 2023".

"Climate is one of the five pillars of AXA's "Driving Progress 2023" strategic plan. An internal survey carried out in June 2020 highlighted that more than 70% of employees were interested in learning more about climate change. Therefore, we decided to develop the AXA Climate Academy in more than 11 languages to raise climate awareness and build up a shared understanding and capacity for action around climate change risks and opportunities, both from the scientific and business perspectives. This initiative is the starting point of a broader business transformation and for the development of new skills on a topic that is increasingly important for all of AXA's activities."

AXA Climate School: a climate training solution for everyone

In 2021, AXA Climate launched the "AXA Climate School" to enable companies and public institutions to upskill and engage employees.

Employee engagement is a key enabler for companies to lead the climate transition. AXA Climate School offers over 150 microlearning chapters that can be tailored to a specific client's needs.

The AXA Climate School training program is structured along 2 major lines:

- understand: the science behind climate change, natural resources, biodiversity, and the impact it has on all our lives;
- act: sustainable transformation affects everyone. All employees have to understand how and map out their response[1].

AXA Climate also recently partnered with ADEME (the French Agency for Environment and Energy Management) and is offering an online course on the challenges of the low-carbon transition for businesses. This course sets the groundwork for discussions on reducing the carbon intensity of its activities. It is part of the ACT initiative, led by ADEME in partnership with CDP, to accelerate the climate transition in the private sector. It aims to upskill ACT stakeholders (French and international companies) and more generally financial institutions, public authorities, NGOs, students, and the general public.

150

microlearning chapters proposed by AXA's "Climate School"

Climate & ESG training and customer communications

AXA IM plays an active role in promoting the acceptance and implementation of ESG issues within the investment industry. Indeed, AXA IM continuously engages with clients to understand their needs and how they can help them make informed investment decisions for a sustainable future. AXA IM provides thought leadership, market commentary, and educational content to clients[2]. This content is also shared through a variety of channels[3].

AXA IM also regularly organizes workshops for its employees on RI, ESG training and certifications[4]. In 2021, AXA IM delivered over 110 workshops on ESG and climate-related topics[5]. Intermediate level workshops on ESG will be offered to core and support functions in 2022 along with a new CFA Certificate in Climate.

AXA France trains and updates new and existing sales representatives and employees on responsible savings, Group initiatives, SRI news, and customer expectations. In 2021, AXA Prévoyance & Patrimoine ("A2P"), the first professional network for responsible investment and insurance providers, trained 94% of its tied agents (a 1-day-training course) in responsible investment and incorporated responsible investment preferences into the strategy for first sales meetings with prospective clients.

More generally, over 900 advisers from the distribution network completed a 2-hours-digital training about responsible investment last year. ESG investment is also part of the training modules for all three of AXA France's distribution networks (tied agents). There is also specific documentation dedicated to ESG, which is available for advisers in the form of thematic sheets, videos and tutorials. These are useful materials to convey key information to customers in sales meetings.

AXA France updates customers on ESG investment[6] across multiple channels including commercial brochures, magazines, website, email, newsletter, and social networks.

The corporate savings team also:

- conducts dedicated commercial events (morning meetings, supervisory tips, onsite customer presentations); as well as
- customer engagement on ESG (events during Employee savings week, podcasts...).

110

ESG and climate-related workshops organised by AXA IM

94%

tied agents trained by AXA France

(1) Specific courses are available for a range of professions: IT, HR, Purchasing, Finance, Legal.
(2) Through research papers and articles, webinars, events, videos and infographics.
(3) Across AXA IM's website, email, social media and third-party websites.
(4) CFA ESG certificates, CESGA, BREAM.
(5) This included a Masterclass in Net-Zero, ESG fundamentals, ESG for real assets.
(6) Labelled funds, AXA's exclusion policy, ESG criteria, etc.

4. Metrics and Targets

Moving towards international consistency at the regulatory level

Grégoire de Montchalin, Group Senior Vice President Plan, Budgets, Results Central

The second half of 2021 saw significant developments in some regional and international initiatives to standardize sustainability reporting. Concrete advances by the EU led to a faster concentration and better structuring of other international initiatives. This unprecedented dynamic will be a source of considerable change for corporate reporting.

With a very high ambition, the standard-setters want to provide a more robust reporting framework to better cover the needs of a wide range of stakeholders, notably investors, with regard to sustainability-related information. It is of utmost importance that preparers and users actively engage in this endeavor. The insurance industry, with its dual role, its expertise in risk assessment and its ability to raise significant capital over the long term, is ideally positioned to contribute to these discussions. Insurers can support finding the right balance between getting all relevant information on sustainability issues and not creating unnecessary burden for preparers and users of such information.

4.1 AXA For Progress Index

The results of the seven commitments within the AXA For Progress Index presented in Section 3.1 "AXA's Sustainability Strategy" will be published on an annual basis. In the box below is AXA's progress for end of 2021:

AXA for Progress Index Table

		Objectives and Results			
	Means or key performance indicator for monitoring	Unit	Timeline	Target	2021 Result
As an Investor	Carbon footprint reduction of AXA's portfolio (General Account Assets)	% tCO_2/EV €m	2019-2025	-20%	-29%(1)
	AXA's Green Investments	€ Billion	2023	€26 bn	€22.6 bn(2)
As an Insurer	Gross written premiums on Green Business solutions	€ Billion revenues	2023	€1.3 bn	€1.4 bn(3)
	Number of customers covered by AXA's Inclusive Protection initiative	Million customers	2023	12 m	10.6 m(4)
As an Exemplary company	Share of employees certified with the AXA Climate Academy	Share of current permanent employees(5)	2023	100%	13%(6)
	Carbon footprint reduction of AXA's own operations (energy, car fleet, business travel, IT equipment manufacturing and services)	% tCO_2eq	2019-2025	-20%	-61%(7)
Transversal	DJSI / Corporate Sustainability Assessment (CSA) ranking	Percentile ranking in DJSI	Annual	95th – 99th	97th

(1) Performance at end of FY2021 vs FY2019; These results are subject to volatility – for more information see Section 4.2 "Climate Metrics – Carbon footprint – new approaches".
(2) For more information see Section 4.3 "Green Investment".
(3) These results are subject to volatility – for more information see Section 3.4 "ESG Integration – Green Business".
(4) For more information see Section 3.4 "ESG Integration – Inclusive Protection".
(5) According to SDR scope.
(6) For more information see Section 3.5 "Training and capacity building".
(7) Performance at end of FY2021 vs FY2019; These results are subject to volatility – for more information see Section 4.5 "Direct environmental footprint management".

4.2 Climate Metrics

AXA has tested different approaches to analyze the "climate dynamics" of its investments since 2016.AXA continues to engage with external data providers (MSCI, Beyond Ratings, S&P Trucost), and industry groups, while also using internal "NatCat" risk assessments to cover its Real Assets, to refine these methodologies (notably via the Net-Zero Asset Owner Alliance and the TCFD).

Climate metrics overview table

METRIC TYPE		ASSET CLASS	DATA PROVIDER	WHAT IS MEASURED?
WARMING POTENTIAL		SOVEREIGN DEBT	BEYOND RATINGS	Contribution to global warming, expressed in **°C**.
		CORPORATE BONDS & EQUITY	MSCI CARBON DELTA	Contribution to global warming, expressed in **°C**.
CLIMATE VALUE-AT-RISK	PHYSICAL RISKS COSTS	CORPORATE BONDS & EQUITY	MSCI CARBON DELTA	Impact of extreme weather events (asset damages and business interruption), expressed in **% of Enterprise Value (EV)**.
		REAL ASSETS	AXA GROUP RISK MANAGEMENT	Building-level impacts of extreme weather events, expressed in **€m**.
	TRANSITION RISKS COSTS	CORPORATE BONDS & EQUITY	MSCI CARBON DELTA	Impact of CO_2 emissions reduction, expressed in **% of Enterprise Value (EV)**.
	TECHNOLOGICAL OPPORTUNITIES	CORPORATE BONDS & EQUITY	MSCI CARBON DELTA	Revenues related to technological opportunities (green revenues & patents), expressed in **% of Enterprise Value (EV)**.
GREEN SHARE		SOVEREIGN DEBT	BEYOND RATINGS	Share of low-carbon energy in primary energy use (hydropower, wind, solar, geothermal, tidal, nuclear).
		CORPORATE BONDS & EQUITY	Trucost ESG Analysis S&P Global	Green revenues, expressed in **% of revenues**.
CARBON FOOTPRINT		SOVEREIGN DEBT	THE WORLD BANK	Carbon footprint of AXA's portfolios expressed in **T.eq.CO_2/$m** of revenues (corporates) or **GDP** (sovereigns).
		CORPORATE BONDS & EQUITY	Trucost ESG Analysis S&P Global	
		REAL ASSETS	AXA INVESTMENT MANAGERS	**EV-based** carbon footprint of AXA's portfolio, expressed in **T.eq.CO_2/EV €m (normalized per Enterprise Value)**. **Absolute** carbon emissions pro-rated per AXA's holdings, expressed in **T.eq.CO_2**.
		CORP. BONDS & EQUITY (EXCL.FINANCIALS)	Trucost ESG Analysis S&P Global	
		CORP. BONDS & EQUITY (EXCL.FINANCIALS)	Trucost ESG Analysis S&P Global	

Monitoring progress towards 2050 climate neutrality using forward-looking 'temperature' metrics

As highlighted in the introduction, the goal of the Paris Agreement to keep global warming below +2°C invites all market participants to reorient "finance flows" in line with this target. TCFD guidelines expect "asset owners to describe how they consider the positioning of their total portfolio with respect to the transition to a lower-carbon economy".

In France, "Article 29":

- requires certain institutional investors[1] to explain how they contribute to limiting global warming;
- encourages these investors to set targets; and
- asks them to explain how these targets relate to "international agreements to reduce global warming".

At EU level, a range of measures are being put in place to translate the Paris Agreement into law.

The answers have so far taken the form of carbon footprinting, divestments, green investments, and shareholder engagement. Investors are also turning to new types of analyses and corresponding metrics that seek to complement such efforts. They are also coming up with a more insightful response as to what it means to be a "Paris-aligned" investor – and notably factoring in the COP-related NDCs (Nationally Determined Contributions).

AXA explores the concept of "Warming Potential" in the following pages. It is a promising approach but there continue to be significant methodology challenges.

"Warming Potential" methodology applied to corporate equity and debt

Since 2018, AXA has been using the MSCI "Warming Potential" model[2]. This assesses how a company's projected GHG emissions[3] align with global temperature targets for 2100. AXA only uses this model for corporate equities and debt. It takes a top-down approach combining country-level, sector-agnostic and sector-specific "Warming Potential" functions[4] with company-specific carbon reduction capacities and targets. This model relies on:

- country-level projections to 2030. This matches the horizon for the NDCs presented at COP26;
- gaps between NDCs and carbon emissions budget associated with various temperature scenarios (according to the UNEP Emissions Gap report updated annually[5]);
- company-level business mix structures by sector and country;
- company-level current carbon intensities[6]; and
- R&D in green technologies/products highlighting "transition" opportunities.

Context Box

Carbon emission scopes

Corporate CO_2 emissions are classified into:

- scope 1: "on-site" direct emissions;
- scope 2: emissions related to the purchase of power;
- scope 3: indirect emissions generated by supply chains or product use.

(1) E.g., insurers and reinsurers, management companies of investment funds.

(2) E.g., https://www.msci.com/documents/1296102/19288350/ClimateVaR_RealEstate_Methodology.pdf

(3) Direct (Scope 1) and indirect (Scope 2 and Scope 3) emissions from activities.

(4) Translating tons of GHG emissions into potential global warming.

(5) https://www.unep.org/resources/emissions-gap-report

(6) The company-level carbon intensities used in the model are based on the data used by AXA's provider at the close of AXA's data collection process and as such, may include data from previous years. Similarly, AXA relies on the availability of direct (scope 1) and indirect (scope 2 and scope 3) emissions from activities for them to be included in the modelization process. For more information, please refer to: https://www.msci.com/www/blog-posts/scope-3-carbon-emissions-seeing/02092372761.

"Warming Potential": 2021 AXA Corporate equity and debt results

Based on the methodology described above, AXA updated the "Warming Potential" analysis for its corporate equity and debt investments at end-December 2021.

Between 2020 and 2021:

- AXA's **corporate equity** "Warming Potential" remained flat at +3.3°C, while the equity benchmark[1] fell slightly from +3.4°C to +3.3°C;
- AXA's **corporate debt** "Warming Potential" fell from +4.1°C to +3.7°C, while the corporate debt benchmark[2] remained stable at +3.7°C;
- on aggregate, AXA's **corporate equity & debt "Warming Potential" fell from +3.9°C to +3.7°C** while a broad benchmark on the same universe remained stable at +3.7°C.

This shows that the "Warming Potential" of AXA's corporate investments (equity and debt) has fallen as the global macroeconomy rebounded. It would nevertheless be unwise to draw short-term conclusions from such small variations on long-term metrics. Those metrics also show that these figures are still significantly above +2°C. This confirms that under the "Warming Potential" model, **AXA's operating investment universe is not yet aligned with the +2°C trajectory agreed at COP26**. This should not come as a surprise, but rather serve as a call to action.

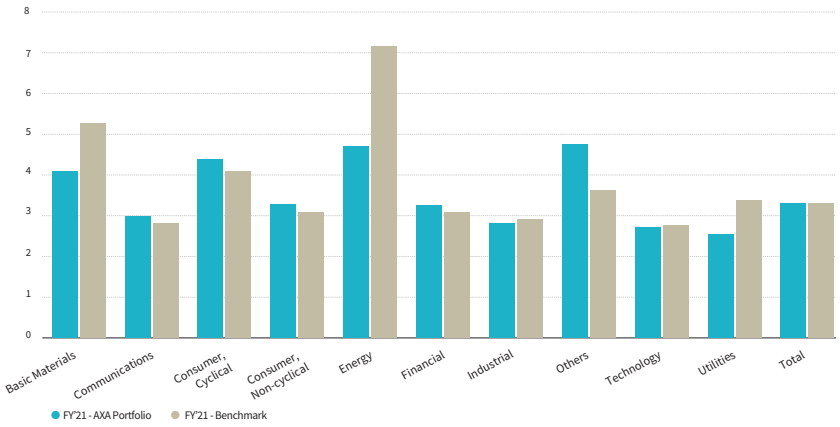
The temperature decrease observed on AXA's corporate debt investments is due to:

- management decisions to steer new investments towards less carbon intense companies or companies with more credible transition plans; and
- the change in asset coverage, with a higher proportion of funds invested in sectors with a lower "Warming Potential".

A sector-level analysis comparing AXA's "Warming Potential" provides further insight:

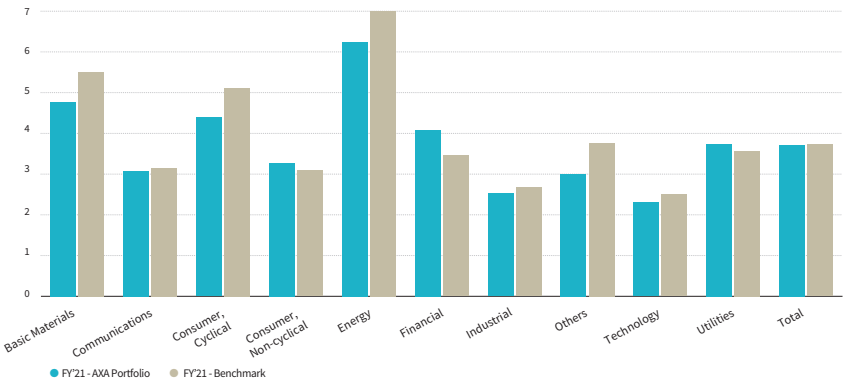
- an equity analysis shows that AXA's investments tend to have a warming potential in line with the benchmark but a lower temperature contribution from carbon-intensive sectors such as Energy, Basic Materials and Utilities. For these sectors, AXA's investments have a lower "Warming Potential" of over +1°C. On the other hand, the "Warming Potential" of Diversified is higher than the benchmark;
- the corporate debt analysis shows that AXA's investments slightly outperformed with a lower warming potential than the benchmark. Although it would be unwise to draw short-term conclusions from such small variations, the slight outperformance is driven by the overweight[3] on Financials combined with an underweight on sectors with high carbon emissions (Energy, Diversified, Utilities).

Corporate Equity Warming Potential (°C)



Source: Carbon Delta MSCI/AXA[1].

Corporate Debt Warming Potential (°C)



Source: Carbon Delta MSCI/AXA[2].

How can a large asset owner like AXA influence its Corporate "Warming Potential"?

In answering this question, it is important to bear in mind the numerous investments, regulatory and fiduciary constraints on an insurer's investments. AXA nevertheless feels there is room for action for investors.

For example, AXA's analysis shows that its climate-related divestments (coal, oil sands), in accordance with AXA's RI Policy, have reduced the "Warming Potential" of its Corporate investments. Conversely, AXA's Green Investment target, set in 2015 (see Section 3.4 "ESG Integration – Green investments") has pushed our investment teams to overweight "green" assets.

However, climate-related divestments and green investments have only slightly reduced AXA's "Warming Potential". Indeed, they only represent a small fraction of AXA's overall corporate investments. Divestment has a gradual impact as coal and oil sands debt assets are run off over a number of years. This is why a single company's decision is insufficient to bring AXA's "Warming Potential" significantly under its benchmark. Broader and more collective action is thus required, for example *via* the Net-Zero Asset Owner Alliance.

(1) Benchmark used in this report: MSCI World ACWI.

(2) Benchmark used in this report: ICE BofAML Global Broad Market corporate.

(3) Overweight means a larger investment in a particular asset or sector within a portfolio as compared to a benchmark. Underweight means the opposite.

"Warming Potential" methodology applied to Sovereign debt

AXA leverages the CLAIM model developed by Beyond Ratings[1] to assess the temperature of AXA's investment portfolios on sovereign assets. Both this model and the MSCI "Warming Potential" (for corporates) detailed above employ a similar approach.

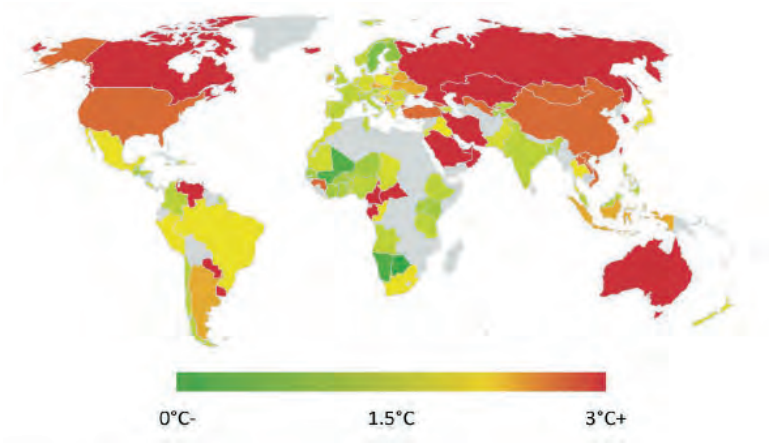
The CLAIM model uses the national carbon pledges by Governments to the Paris Agreement's "carbon budget" to express the theoretical temperature of sovereign assets. Beyond Ratings has developed this approach inferring +2°C compliant national carbon budgets by relying on the so-called "Kaya relationship" between GHG emissions, GDP growth, demography, energy efficiency, and carbon intensity.

The NDCs in the Paris Agreement and updated at COP26 are used to build a homogeneous allocation of GHG emission reduction commitments by country by 2030. Using a theoretical linear relationship between carbon emissions and temperature rise, Beyond Ratings translates 2030 commitments into theorical temperature rises.

NDCs were published and updated at COP26[2]. The CLAIM model takes these new commitments to map the temperatures associated with current NDCs.

$$\frac{\text{GHG Emissions}}{\text{Population}} = \frac{\text{GDP}}{\text{Population}} \times \frac{\text{Energy}}{\text{GDP}} \times \frac{\text{GHG Emissions}}{\text{Energy}}$$

Temperature of NDCs



Source: Beyond Ratings.

"Warming Potential": 2021 sovereign debt results

AXA applied the CLAIM model to its sovereign debt portfolios. As shown in the above table, the results show that countries with new NDCs pledges have a lower warming potential than in 2020. For example, France has a temperature of +1.62°C *versus* +1.9°C in 2020. This relatively low warming potential is mainly due to France's low-carbon energy mix primarily based on nuclear and hydropower.

Based on this model, the "Warming Potential" of **AXA's Sovereign Debt in 2021 was +2°C** (lower than in 2020 and 2019 which were both +2.3°C). AXA's benchmark also fell by +0.6°C to +2.4°C. This was due to:

- the significant exposure to French Government debt[3]; and
- our investments in EU countries, which in general have lower temperatures than the U.S.A. This is shown in the table.

This work reveals that a country's energy mix and high reliance on fossil fuels (such as in Australia, the U.S.A. and Canada) is a key driver of future "financed emissions" for sovereign debt investors. For example, Japan has been phasing out its nuclear energy since 2012 and has gradually substituted this with a combination of coal and natural gas. This has increased its "Warming Potential".

This analysis can serve as a proxy for transition risk & opportunities. Indeed, countries with a "cooler" "Warming Potential" are in principle on the path to successfully:

- decoupling carbon emissions from economic activities;
- reducing the emissions of downstream sectors; and
- minimizing general exposure to regulatory costs related to carbon.

Considering AXA's sovereign geographic exposure to the EU, a reduction in AXA's sovereign "Warming Potential" will heavily depend on coal being phased out and a corresponding rise in renewables and nuclear. This is particularly relevant to AXA's lending to Germany and Italy given their share of AXA's asset allocation. Although neither the largest coal producers in the EU nor the countries with the largest proportion of coal in their primary energy mix, Germany and Italy have some of the largest coal power plants in the EU.

Of note, much attention has been focused on "financed emissions"/"Warming Potential" of corporates because shareholders can more readily engaged with them. This is also where targets have been set[4]. However, sovereign debt is a key asset class for most asset owners. In 2022, the Net-Zero Asset Owner Alliance will develop a framework to address sovereign debt.

(1) CLAIM methodology (Climate Liabilities Assessment Integrated Methodology). Learn more at: https://www.longfinance.net/programmes/sustainable-futures/london-accord/reports/how-measure-temperature-sovereign-assets/

(2) 112 updated NDCs including Australia, Japan, U.S., France, Germany, and China.

(3) 24% of AXA's Government debt holdings versus 7% for the benchmark.

(4) See Section 4.2 "Climate Metrics - Carbon Footprint"

Sovereign allocation breakdown and Warming Potential

2021	AXA Sovereign Debt AUM %	AXA Sovereign Debt Temperature (°C)	AXA Sovereign Debt Cov. Temp %	Benchmark Weight	Benchmark Temperature (°C)
Australia	0.6%	4.09	100.00%	1.8%	4.09
Belgium	7.4%	2.08	100.00%	1.5%	2.08
Canada	0.5%	3.05	100.00%	2.1%	3.05
Denmark	0.0%	1.89	100.00%	0.3%	1.89
France	24.4%	1.62	100.00%	6.6%	1.62
Germany	6.8%	1.86	100.00%	4.5%	1.86
Italy	7.8%	1.76	100.00%	6.0%	1.76
Japan	13.6%	2.25	100.00%	18.4%	2.25
Netherlands	2.5%	2.10	100.00%	1.3%	2.10
Other countries	16.5%	2.05	93.57%		
SNAT	6.7%	1.88	99.96%		
Spain	6.1%	1.79	100.00%	3.9%	1.79
Sweden	0.0%	0.81	100.00%	0.2%	0.81
United Kingdom	1.0%	1.73	100.00%	7.2%	1.73
United States	6.1%	2.89	100.00%	46.3%	2.89
Total	100.0%	1.98	98.93%	100.0%	2.44

Source: AXA, Beyond Ratings/LSEG.

2°C

AXA's Sovereign debt assets warming potential

2.4°C

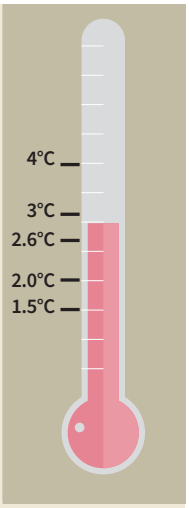
AXA's sovereign debt benchmark warming potential

Portfolio alignment: macroeconomic conclusions

Having regard to the foregoing, AXA's corporate investments (equities and debt) show a "Warming Potential" that is slightly below benchmark and falling as against a benchmark that is also falling slightly.

Our Sovereign debt investments, which are more concentrated, show a more pronounced gap with the benchmark as a result of our high exposure to the EU and France. A weighted average of these two figures[1] produces a combined "Warming Potential" for **AXA's corporate and sovereign holdings of +2.6°C**. This is lower than:

- the broad market reference of +3°C;
- projections derived from the current NDC pledges (+3.2°C); and
- Business As Usual scenarios (*i.e.*, should the NDCs not be implemented) in excess of +4°C.



The "Warming Potential" model has improved significantly since our 2020 Climate Report. For example, it now incorporates Scope 3 emissions[1] as well as self-reported emissions and forward-looking targets. This metric, which requires further testing, is intended to serve as a reference point showing the extent to which today's markets are not on track with the target in the Paris Agreement.

Caution is required when analyzing these figures as the underlying methodologies are evolving. Nevertheless, according to these metrics, given AXA's current asset allocation and issuer selection, its investments point to a global temperature rise of +2.6°C by 2050. This is well above the target in the Paris Agreement and AXA's commitment to climate neutrality by 2050 (expressed as +1.5°C).

This work reflects that global economies are not yet "Paris-aligned". Just implementing the NDCs is not enough to achieve this target. Accelerating the decarbonization of the real economy is key to achieve the Paris Agreement.

All sectors and companies have a responsibility to evolve while factoring in the social and business impact. It is the responsibility of investors to identify and support, for example through engagement, relevant transition strategies while having regard to the risk of financial losses. This is the purpose of the Net-Zero Asset Owner Alliance and the new Net-Zero Insurance Alliance discussed in the opening pages of this Report.

(1) The "Warming Potential" model has improved significantly since our 2020 Climate Report. For example, it incorporates upstream and downstream Scope 3 emissions when available, as well as self-reported emissions and forward-looking targets.

Implied Temperature Rise models

As Net-Zero initiatives get more signatories, Implied Temperature Rise models ("ITR") are gaining traction. This metric estimates the global implied temperature rise (in 2100 or later) were the whole economy to have the same carbon budget over-/undershoot[1] as the company (or portfolio) in question. MSCI is progressively replacing the "Warming Potential" metric with an Implied Temperature Rise model[2] that is more aligned with TCFD recommendations.

ITR models consider:

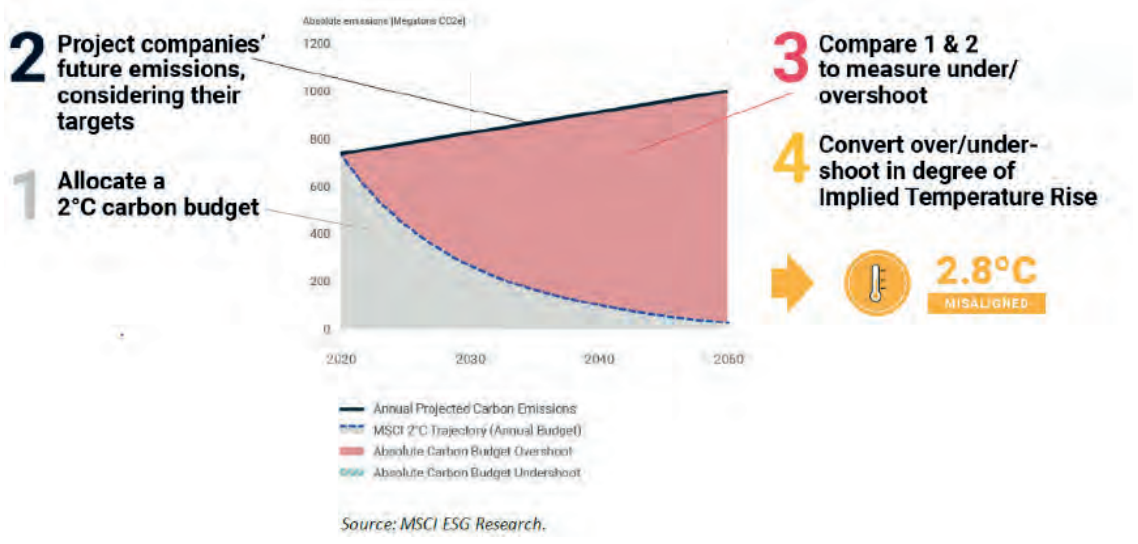
- the remaining carbon budget assuming global warming is to be kept well below +2°C by 2100; and by extension
- how much a company can emit (across Scopes 1, 2 and 3) and stay within the limits.

The ITR of a specific company is computed in 4 steps:

1. **allocate a carbon budget to the company:** the global budget is derived from IPCC scenarios and is attributed to a specific company based on its sector and country revenue mix;
2. **compute projected company emissions:** considering the company's actual or estimated GHG emissions and the reduction targets set, the timeseries of the projected absolute emissions to 2070 are generated for Scopes 1, 2 and 3;
3. **calculate the over/undershoot in the company carbon budget:** the carbon budget over/undershoot is the difference between a company's projected emissions and its allocated +2°C carbon budget. The relative under/overshoot is then computed by dividing their under/overshoot with their respective +2°C carbon budget;
4. **convert the relative over/undershoot to a degree of temperature rise:** this is done using the Transient Climate Response to Cumulative Emissions (TCRE) factor[3].

The TCRE factor was established by the IPCC and provides a relationship that links each additional unit of emissions beyond the available remaining global 2°C carbon budget to degrees of additional warming. The TCRE factor is set at 0.000545°C warming per Gt CO_2.

MSCI ESG research graphic



At portfolio level, the sum of a financed budget overshoot is compared to financed carbon budgets for portfolio holdings. Using the TCRE factor, the total overshoot is converted to a degree of temperature rise.

(1) A company projected to emit carbon below budget can be said to "undershoot" the budget and a company projected to exceed the budget "overshoots" it.

(2) https://www.msci.com/our-solutions/climate-investing/net-zero-solutions/implied-temperature-rise

(3) Temperature Rise = 2°C + company level relative over/undershoot × Global 2°C Budget × TCRE factor. For more information: https://en.wikipedia.org/wiki/Transient_climate_response_to_cumulative_carbon_emissions

Green Share - Contribution to the Energy transition

In addition to "temperature" metrics, portfolio alignment can be measured as the contribution to the energy transition having regard to two angles:

- **project-led green share:** AXA actively invests in green bonds, green buildings and green infrastructure (see Section 3.4 "ESG Integration – Green investments" for definitions);
- **share of green revenue from listed holdings:** the "value-weighted average share of green revenue of issuers in the portfolio" ("Green Share"). This metric aims to measure the "level of greenness" of investments.

In 2021, AXA's "Green Share" across equities, corporate debt and sovereign debt, was 17%, vs a broad benchmark (see dashboard) of 13%. With the implementation of the Taxonomy Regulation in 2022, the calculation methodology for the "Green Share" will evolve. This new metric will be reported in the 2023 Climate Report.

17%
AXA's 2021 "Green Share" investments

13%
AXA's 2021 "Green Share" benchmark

A call for methodology convergence

Rather than disproving the concept of investment temperature, AXA believes that this situation calls for methodology convergence. AXA participates in the NZAOA's "Portfolio Alignment" working group to encourage methodology convergence. The details of these requirements are described on the NZAOA's website(1). In 2022, the working group plans to continue its work to help build market convergence on temperature metrics.

FSB Task Force on Climate-related Financial Disclosures (TCFD)

In addition to this work, AXA has contributed to work by TCFD as a member of the "Implied Temperature Rise Associated with Investments" working group. This working group released a public consultation in 2021 which received feedback from various stakeholders including the NZAOA. TCFD published its recommendations(2) in October 2021.

(1) https://www.unepfi.org/wordpress/wp-content/uploads/2021/02/TCFD-consultation-AOA-response-on-alignment-metrics1-1.pdf

(2) In a report entitled "Guidance on metrics, targets and transition plans", which included an overview of forward-looking "portfolio alignment"-style metrics.

Risk: Climate Value-at-Risk (CVaR)

Besides the "Warming Potential" approach, which reflects the impact that our investments may have on the climate, climate risk analysis can also be done from a business/investment risk perspective to assess how climate change may impact investment returns.

AXA leverages a Climate Value-at-Risk (Climate VaR) model developed by MSCI. This model represents an estimate of how the value of AXA's investment portfolios (corporate bonds and listed equities) might be impacted by climate policy risk, technology transition opportunities and extreme weather events on a 15-year time horizon. This model currently only applies to corporate assets and is under continuous development. Annual updates to this model allow us to expand the range of measured climate-related financial risks of AXA's investments and to assess them more precisely. In 2021, the model was updated to include additional physical risks (river low flow and wildfires) for all scenarios and to adjust the calculation model.

"Policy Risk Climate VaR" (transition costs)

The transition to a low-carbon economy through market and regulation evolutions may negatively impact businesses and their investors. The "Policy Risk Climate VaR" metric assesses how regulations stemming from country NDCs affect a company whose activities directly (Scope 1) and indirectly (Scope 2 and Scope 3) produce GHGs.

This metric evaluates the potential economic losses for companies failing to adapt their activities to a given climate scenario and derived transition pathways.

MSCI uses three Integrated Assessment Models for investment-related analysis:

- "AIM CGE Advance (+1.5°C scenario)";
- "AIM CGE Advance Late Action (+2°C scenario)"; and
- "AIM CGE Advance (+3°C scenario)".

This AIM/CGE model has been developed by the Japanese National Institute for Environmental Studies[1]. It features detailed data regarding technology factors, a key component of MSCI's work. These are close to the International Panel on Climate Change (IPCC) "Shared Socio-Economic Pathways" (SSPs) scenarios. From next year, MSCI will modify the scenarios by incorporating REMIND NGFS prices and cost modeling.

"Technology Opportunity Climate VaR" (green opportunities)

The transition to a low-carbon economy may also generate new opportunities for businesses and investors. The "Technology Opportunity Climate VaR" metric assesses possible future corporate revenue from such green opportunities. While certainly not the only factor when estimating future green revenue, this analysis notably looks at green patents and current low-carbon revenue. This metric thus evaluates the potential economic revenue for companies taking a carbon reduction path in line with a given climate scenario.

(1) For further information, refer to: https://www-iam.nies.go.jp/aim/

"Physical Risk Climate VaR"

Physical climate risk scenarios define possible climatic consequences from increased GHG emission levels, and the ensuing financial burden (or opportunity) for businesses and their investors. The "Physical Risk Climate VaR" metric assesses how much companies are exposed[1] and vulnerable[2] to increasingly frequent and severe extreme weather events.

MSCI has developed a Physical Risk Climate analysis up to 2100 using physical climate scenarios and projections. This combines:

- **chronic climate risks:** this refers to long-term shifts in climate patterns[3]. These risks are based on statistical extrapolation of a historical dataset and projections into the future.
- **acute climate risks:** this refers to event-driven physical risks[4]. Using a scenario is an important component of climate risk analysis, especially for extreme weather modeling. The Representative Concentration Pathway (RCPs) scenarios prescribe specific trajectories of future GHG emissions and diverge slowly over time generating quite similar climate projections. MSCI primarily uses the RCP8.5 scenario and a combination of short-term projections of historical climate data.

This metric thus evaluates potential corporate financial losses in a changing climate environment for a given climate scenario, average and aggressive physical scenarios. The average scenario represents the most likely Physical Risk Climate costs to occur, meaning a scenario of between +1.5°C and +2°C, while the aggressive scenario embodies the tailored risk of the physical risk cost distribution (95% percentile scenario), meaning a scenario over +2°C.

Since 2021, the MSCI Climate VaR model has undergone a series of updates. The main changes are related to the assessment of physical risks as two acute risks have been added to the MSCI model:

- river low flow; and
- wildfires.

This addition enables MSCI's model to better assess the economic impact of respective water scarcity in the energy production sector (especially for thermal and hydro power plants) and of wildfires (driven by droughts, high temperatures, evaporation, and strong winds).

More broadly regarding the assessment of physical risks, there have been updates to incorporate the most recent climate science. Adjustments have also been made to the "Policy Risk Climate VaR" methodology to reflect the latest transition scenarios, carbon pricing and incorporate the up-to-date remaining +2°C carbon budget.

Single Climate VaR metric[5]

To assess future potential costs/benefits for companies in a given climate scenario (+1.5°C, +2°C or +3°C), policy risks, technological opportunities and physical risks are combined into a single Climate Value-at-Risk metric.

AXA applied this Climate Value-at-Risk model to all its investment portfolios (corporate bonds and listed equities) under +1.5°C, +2°C and +3°C scenarios using an average and an aggressive physical scenario. Compared to the average physical scenario, the aggressive scenario explores the most serious downside physical risks. As detailed in the above table, this model shows that aggregated climate-risks represent a potential future risk to the market value of AXA's total investment portfolio (corporate bonds and listed equities) of:

- in the best scenario[6] -11.3%
  - -5.7% for physical risks,
  - -9.5% for transition risks, and
  - +3.9% for green opportunities;
- in the worst scenario[7] -8.04%
  - -7.1% for physical risks,
  - -1.2% for transition risks, and
  - +0.2% for green opportunities.

Nevertheless, this aggregated analysis averages out the impact on market players and some will likely be far more impacted than others. According to the MSCI CVaR model, a +3°C scenario can be less impactful than a +1.5°C scenario.

This is because a rapid reduction in carbon intensity requires a quick and strong response in terms of carbon price increases, negatively impacting transition costs. There will, however, be partial offsets from the bold roll-out of green technology in an environment with lower climate risks.

On the other hand, a +3°C scenario is mainly linked to longer-term impacts on asset valuations with higher discounting costs. The physical risk is modelled as the cost linked to the occurrence of a set of, not exhaustive, extreme weather events likely to result in business interruption and asset damage at company level and don't reflect the impact of such extreme weather events at macro level.

According to the Climate Value-at-Risk methodology, the climate change impact[8] on the valuation of the companies in which AXA invests represents an aggregated risk of 11% of the market value of AXA's investment portfolio under the best scenario (+1.5°C).

AXA does not use this complex and evolving metric in its day-to-day investment. It is useful for providing insight into the assets most at risk from climate change and how AXA manages these risks over time.

11%

AXA's 2021 "Climate Value at Risk"

2100

MSCI Physical Risk Climate analysis

(1) Notably via their geographical location, size and asset value.
(2) Notably via their capacity to adapt.
(3) Extreme heat, extreme cold, heavy precipitation, heavy snowfall and strong winds.
(4) Coastal flooding, fluvial flooding, tropical cyclones, river low flow and wildfires.
(5) The Climate Valure-at-Risk figures for both best and worst-case scenarios, may not be compared with those disclosed in the 2021 Climate Report due to the methodology changes described in the text above.
(6) +1.5°C scenario combined with an average physical scenario.
(7) +3°C scenario combined with an aggressive physical scenario.
(8) Due primarily to regulatory costs and losses from extreme weather events.

Carbon footprint - new approaches

In addition to the forward-looking metrics explored above, AXA has also taken a more static annual year on year snapshot of the carbon footprint of its investments since 2014.

To do so it has employed three different approaches[1]:

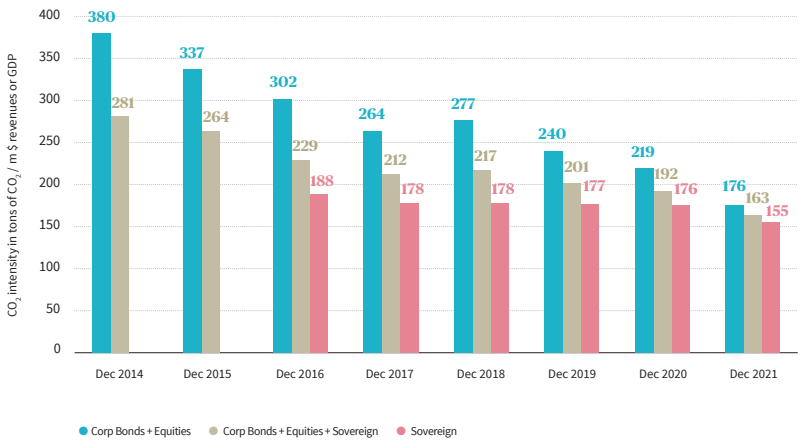
- normalized per revenue;
- normalized per Enterprise Value; and
- in absolute terms.

Carbon footprint: revenue approach

The end-2021 analysis spans AXA's equities, corporate and sovereign debt.

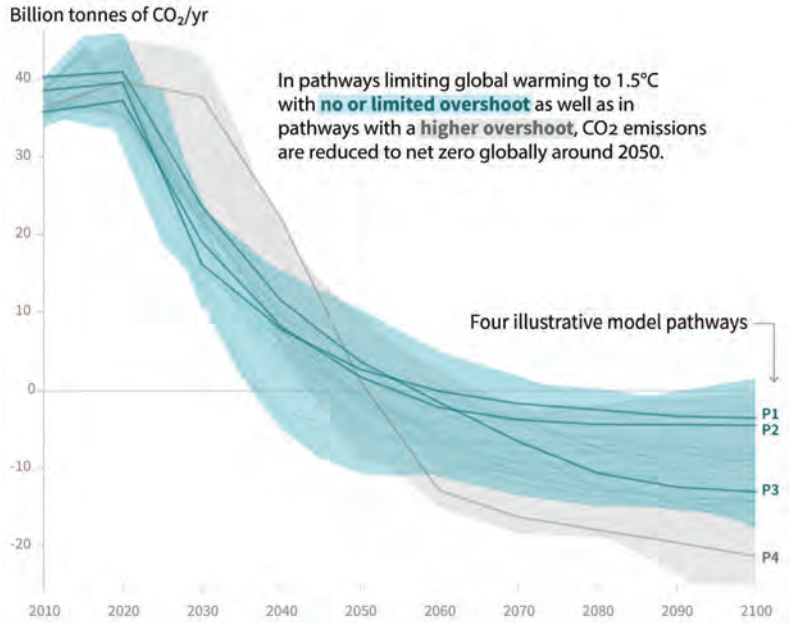
- Since 2014, the carbon footprint of AXA's investments (equities, corporate and sovereign debt) **has fallen sharply by 42%**;
- Looking at an exhaustive scope (corporate and equity investments), it fell 54% between 2014 and 2021.
- Focusing just on AXA's corporate investments, the carbon footprint fell from 246 t.eq.CO_2/m U.S.$ revenue to 179 t.eq.CO_2/m U.S.$ revenue between 2019 and 2021 (-27%)[2].

AXA's investments' CO_2 footprint



Sources: Trucost S&P, Beyond Ratings, AXA IM.

Global total net CO_2 emissions



Source: https://www.ipcc.ch/sr15/chapter/spm/

Carbon footprint: Enterprise Value approach and link to IPCC scenarios and NZAOA target

AXA committed to establishing an investment-related "intermediate target" upon joining the Net-Zero Asset Owner Alliance (NZAOA) in 2019. Together with NZAOA peers, AXA supported the Alliance's "Target-Setting Protocol" which frames minimum requirements in terms of ambition and asset classes. This was published in October 2020.

The Alliance assessed the IPCC Special Report "Global warming of 1.5°C"[3] and identified an asset class-level emissions reduction target range of -16% to -29% by 2025. Indeed, the Alliance analyzed all scenarios in that IPCC report and recommended the use of scenarios with limited "overshoot" of global temperature rise of +1.5°C[4].

(1) AXA's carbon footprint is computed based on the data made available by its providers at the close of AXA's data collection process and as such, may include data from previous years. Similarly, AXA relies on the availability of emissions data from activities for them to be included in the modelization process: (i) normalized per revenue (direct emissions, i.e. greenhouse gas emissions generated from burning fossil fuels and production processes which are owned or controlled by the company and first tier indirect emissions, i.e. greenhouse gas emissions from direct suppliers); (ii) normalized per Enterprise Value (scopes 1 and 2); (iii) in absolute terms (scopes 1 and 2).

(2) 1) This trend is largely due to the fossil fuel divestment program initiated by AXA in 2015 and strengthened between 2017 and 2021 (see Section 3.4 "ESG Integration – Exclusions and sensitive ESG restrictions").

2) The sharp fall in carbon emissions in 2021 was due to the lower carbon emissions in 2020 linked to COVID-19.

3) AXA's data (see aggregate table "Full dashboard") also shows significantly lower carbon intensity compared to our benchmarks across all three asset classes. This is due to less carbon-intensive sector allocations.

(3) https://www.ipcc.ch/sr15/chapter/spm/

(4) I.e., with limited need to remove atmospheric carbon (such as CCS – "Carbon Capture and Storage") to bring the temperature back to below +1.5°C.

These sets of scenarios are usually described by their representative pathways P1, P2 and P3[1].

This is considered "best +1.5°C available science"[2]. Even under the more "permissive" P3 scenario[3]:

- CO_2 emissions must fall by 91% between 2010 and 2050;
- primary energy use from oil must drop by 81%;
- the share of renewables must increase to 63%; and
- nuclear power must grow by 501%.

From 2022, the carbon emissions reduction requirement for new NZAOA members should vary between -22% and -32% due to their more recent baseline.

What does this mean for AXA's investment strategy?

In December 2020, AXA announced a commitment to reduce the carbon footprint of its General Account assets[4] by 20% between 2019 and 2025. This is using the Protocol's preferred approach based on Enterprise Value (EV). While a carbon intensity approach expressed in terms of revenue ties in well with the "physical" processes underlying carbon emissions, NZAOA members believe that the EV approach better represents the role of investors in corporate valuation. This -20% target is in line with the climate scenarios used for the first version of NZAOA's "Target-Setting Protocol" and are compatible with +1.5°C pathways.

Considering the relatively low carbon intensity of AXA's portfolios compared to our investment universe and constraints related to limited debt asset turnover within the 6-year timeframe, it is a significant effort that has started to impact AXA's investment decisions.

Meeting this goal will not only require new, lower-carbon investments but progress by the companies already in the portfolio. Achieving portfolio carbon neutrality requires both:

- reallocation to low carbon activities; and
- continued support for companies in carbon-intensive sectors provided they credibly commit to shifting their business model.

As it engages with them throughout the year (see Section 3.4 "ESG Integration – Shareholder engagement & voting"), AXA encourages companies in its investment portfolios to set increasingly precise targets and use measurable indicators. The effectiveness of AXA's policy will also depend on its ability to help these companies transition through new solutions and innovative financial products, such as sustainability-linked bonds.

AXA's balance sheet carbon intensity per Enterprise Value (tCO_2/EV m€) fell -29% between 2019 and 2021, and -33% in 2021 alone. This reduction was mainly driven by:

- **(i)** carbon emission reduction in 2020 due to the impact of the COVID-19 pandemic;
- **(ii)** investment actions like coal divestments;
- **(iii)** active portfolio construction decisions for new investments; and
- **(iv)** evolution of financial markets due to a strong positive performance for equities and positive impact on fixed income valuations linked to low interest rates in the Eurozone.

This resulting metric will continue to evolve in line with changes to either carbon emissions or asset valuations[5]. A portfolio's carbon intensity could thus deteriorate if no compensating actions were taken for new investments. AXA remains focused on its intermediate objective, -20% carbon intensity by 2025, by pursuing a combination of:

- pertinent investment decisions;
- the ongoing increase in AXA holdings in companies demonstrating credible Net-Zero targets; and
- engaging with companies that have lagging climate strategies.

Carbon footprint: absolute emissions

Because climate change is ultimately not about carbon intensity but rather the absolute level of carbon emissions emitted into the atmosphere each year, AXA also publishes the weighted share of carbon emissions by the companies in its General Account portfolios (Corporate debt, equities, and Real Estate): 6.9 million t.eq.CO_2 (end-2021), distinctly lower than end-2020 (9.6 million t.eq.CO_2).

This figure far exceeds AXA's direct emissions from its energy consumption (buildings), car fleet, business travel and IT activities (85,000 t. eq.CO_2 in 2021)[6], see Section 4.5 "Direct environmental footprint management".

(1) P4 was discarded for betting too heavily on CCS.

(2) Prior to the publication of the IEA "Net-Zero by 2050" report.

(3) Which allows significant emissions to be offset by significant carbon capture.

(4) Corporate debt & equity and Real Estate. In 2021, the coverage of our reporting has evolved: emerging market issuers and entities have been included in data released in this report.

(5) The IEA International Energy Agency) recently warned that global energy-related CO_2 emissions rose to their highest ever level in 2021 as economies recovered from the COVID-19 pandemic and coal use increased.

(6) For further information, please see Section 4.5 "Direct environmental footprint management".

Climate Metrics Full Dashboard [1]

		Total Assets					
		AXA Portfolio			Benchmark		
		FY 2019	FY 2020	FY 2021	FY 2019	FY 2020	FY 2021
Warming Potential (°C)		2.79	2.75	2.62	3.22	3.20	2.96
% Coverage		*77%*	*77%*	*90%*	*85%*	*86%*	*97%*
Green Share (%)		18.5%	18.8%	17.1%	0.13	13.1%	13.3%
% Coverage		*86%*	*85%*	*97%*	*96%*	*96%*	*100%*
Aggregated Climate Risks (CVaR)	Best Scenario	-12.15	-11.47	-11.34	-13.20	-12.02	-13.25
	Worst Scenario	NA	NA	-8.04	NA	NA	-8.81
% Coverage		*48%*	*47%*	*64%*	*76%*	*77%*	*92%*
Physical Risk Cost (CVaR)	Average Scenario	-6.15	-5.96	-5.73	-6.31	-6.02	-5.80
	Aggressive Scenario	-7.72	-7.40	-7.07	-8.23	-7.80	-7.53
Transition Cost (CVaR)	Scenario 1.5°C	-10.33	-9.53	-9.53	-10.78	-9.69	-11.72
	Scenario 2°C	NA	NA	-6.77	NA	NA	-8.58
	Scenario 3°C	NA	NA	-1.17	NA	NA	-1.48
Green Revenues (CVaR)	Scenario 1.5°C	4.34	4.02	3.92	3.88	3.69	4.27
	Scenario 2°C	NA	NA	1.77	NA	NA	1.90
	Scenario 3°C	NA	NA	0.20	NA	NA	0.20
ESG Score		5.89	5.88	6.40	5.50	5.51	6.12
% Coverage		*94%*	*94%*	*93%*	*98%*	*98%*	*98%*
Carbon Intensity (tCO_2 per $mn. revenue)		201	192	163	278.69	265	253
% Coverage		*85%*	*81%*	*88%*	*95%*	*96%*	*97%*
Carbon Intensity (tCO_2 per €mn. EV)		66	70	47	NA	NA	NA
% Coverage		*78%*	*72%*	*78%*	*NA*	*NA*	*NA*
Absolute Carbon Emission (tCO_2)		10,015,565	9,617,567	6,996,315	NA	NA	NA
% Coverage		*78%*	*72%*	*78%*	*NA*	*NA*	*NA*

Benchmark: MSCI World ACWI (equities), ICE BofAML Global Broad Market corporate (corporate debt), JPM GBI Global (sovereign debt).

An investment strategy tailored for climate action

The scientific consensus underpinning the urgency to act on climate change is indisputable. At AXA, we fully endorse this call for action on global warming and reiterate our commitment to reduce our contribution to carbon emissions via our investments to achieve Net-Zero greenhouse gas emissions by 2050 in alignment with the Paris Agreement.

In fact, climate action, in all its forms from mitigation to adaptation, lies at the core of AXA's investment strategy which is motivated by two objectives: 1) to decrease the contribution of AXA's investment portfolio to climate change, and 2) to decrease the exposure of AXA's portfolio to climate risk. This effort requires that our investment strategy continues to build on a best-in-class approach for equity and corporate debt assets and on the acceleration to drive further our investments in green infrastructures, green buildings, while also support and sponsor the emergence of new financial instruments to be added to existing green or transition bonds, such as sustainability-linked bonds.

With our approach, we aim to invest in those companies with a clearly defined path, embedded in ambitious science-based targets, to reduce emissions and limit warming to 1.5°C. We are on track to deliver on our commitments to invest €26bn in green investments by 2023 and to an intermediate -20% investment-related carbon footprint target between 2019 and 2025.

Beyond these targets, AXA acts as an enabler of a more efficient transition notably through the private sector via the financing of renewable energy infrastructures and energy efficiency processes (such as storage or distribution). As of today, AXA has invested close to €1.1bn in energy transition assets.

Pascal Christory,
Group Chief Investment Officer

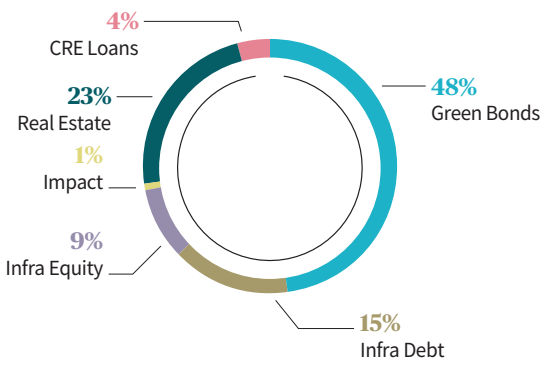
AXA also believes that for the green transition to happen, a major transformation in all sectors of the real economy is of the essence. AXA acts as a companion to those actors in both the public and private markets that wish to fight climate change and leave a positive impact on the environment by supporting them and ensuring that their activities promote inclusive and sustainable targets."

(1) The benchmarks of reference in the "Climate Metrics Full Dashboard" are the indices most representative of AXA's investment portfolio. However, AXA does invest General Account assets outside the scope of these benchmarks of reference. As data providers prioritize the coverage of the benchmarks' scope by default, the coverage rates for AXA's investment portfolio are lower than the benchmarks.

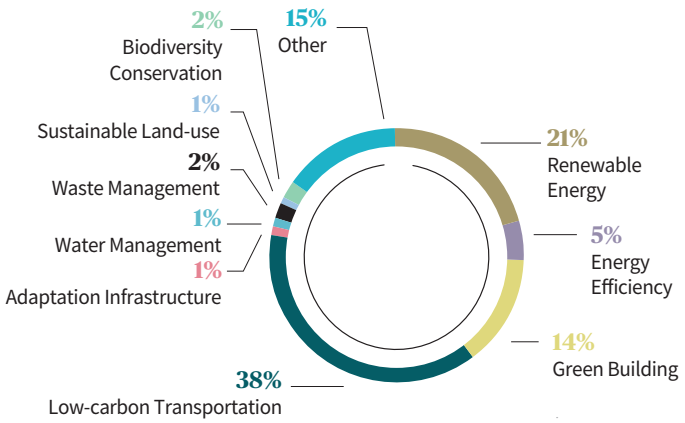
4.3 Green Investments

In November 2019, AXA committed to investing €24bn in green investments by 2023. In 2021, AXA announced this target would rise to €26bn. In December 2021, AXA's green investments totaled €22.6bn, up from €16.1bn at end-2020. This was mainly from new green bonds, infrastructure projects and real estate investments.

Green Assets Allocation pie chart



Green Bond Allocation pie chart



Source AXA 2020.

A focus on Green Bonds

At end-2021, AXA had invested a total of €10.8bn in green bonds, up from €5.90bn at end-2020.

In 2021, AXA invested €3.7bn in green bonds, up from €2.2bn in 2020, channeling the largest share into EU green bonds.

The remaining 2021 green bonds exposure increase was mainly due to the change in methodology in 2021 and financial market evolution. For further information, please see Section 3.4 "ESG Integration - Green investments" .

Examples of Green Bond investments:

- **NextGenerationEU green bond** – The EU is highly committed to combatting climate change and has established ambitious climate-related policies and strategies. To accelerate the green transition, each EU Member State must dedicate at least 37% of expenditure in Recovery and Resilience Plans to measure furthering climate objectives. These measure could then be financed *via* NextGenerationEU green bonds. With the issuance of the EU's first green bond in October 2021, the €12bn proceeds will be allocated to projects involving low carbon transportation, renewable energy, and energy efficiency amongst others:
- **Apple** –Apple has issued U.S.$4.7bn to accelerate progress on the company's goal to become carbon neutral across its supply chain by 2030. Its latest green bond is supporting 50 projects, including the low-carbon aluminum breakthrough. These 50 projects will:
  - mitigate or offset 2,883,000 metric tons of CO_2e,
  - install close to 700 MW of renewable energy capacity worldwide, and
  - promote new recycling research and development.
- **Colbun** – In October 2021, Colbun S.A., a Chilean electric utility, issued its inaugural 10-year U.S.$600m green bond. This is intended to further its ambitious sustainability strategy. The proceeds will almost exclusively finance wind and solar projects. The company's impressive renewables pipeline encompasses five projects totaling close to 2,000 MW in advanced stages of development and another group of 1,100 MW in early stages. Combined, they almost equal Colbun's current capacity.

A focus on Real Assets

Investments in real assets represent a significant portion of AXA's overall €26bn AXA Green Investment commitment (see Section 3.4 "ESG Integration - Green investments"). For an asset to be classed as "Green", specific criteria must be met. In 2021, AXA refinanced the following green real assets with the issuance of its inaugural green bond:

- **Green building | Twenty-two Bishopsgate, London**
  - In 2020, AXA IM Real Assets completed the development of this 62-storey, 278-meter skyscraper in the City of London.
  - It is a 118,637 sqm workplace designed as a high-performance vertical village.
  - The flagship development was completed with an EPC rating of A+ and obtained BREEAM "Excellent" and WiredScore "Platinum" labels.
  - The building was designed to emit 35% less CO_2 than the limit set by the local regulation, avoiding approximately 1,390 tons of CO_2 emissions annually.
  - In addition, the asset runs on 100% certified renewable energy, and 100% carbon offset natural gas runs the combined heat and power system, meeting 60% of hot water demand in the building.
  - Adding to the positive environmental impact of the asset, 98% of construction waste was diverted from landfill.
  - 10% of floor space is dedicated to tenant amenity and wellbeing.
- **Sustainable Forestry**
  - In 2019, AXA IM Real Assets acquired the "Forest Clover 1" forestry portfolio in Ireland.
  - It spans 4,063 hectares comprising fast growing wood types and the main and most valuable commercial conifer species in Ireland(1).
  - In addition to the implementation of sustainable management practices across all Forest Clover 1 forests, the annual level of sequestration of carbon into AXA's forests is estimated through the net growth of arboreal biomass. The net sequestration in 2020 was estimated at 77,851 tons of CO_2.
- **Renewable energy**
  - In 2020, AXA acquired a 20% stake in Acciona Energia Internacional ("AEI"), a dedicated renewable energy generation business operating worldwide.
  - AEI owns and operates three solar parks (two photovoltaic and one concentrated solar) and 49 wind farms representing 2,511 MW of installed capacity(2).

Context Box

AXA IM Alts in partnership with Credit Agricole for a 50% wind farm stake(3)

AXA IM Alts has partnered with Crédit Agricole Assurances to fund part of the world's largest offshore wind farm, Hornsea 2. Based in the UK, the wind farm covers an offshore area of 462 km^2 and is expected to provide enough green electricity to power the equivalent of more than 1.3 million homes annually, the equivalent of all households in Greater Manchester. AXA IM Alts has invested £3bn in this project.

(1) https://realassets.axa-im.com/content/-/asset_publisher/x7LvZDsY05WX/content/acquisition-of-irish-forestry-portfolio-of-circa-4-000-hectares

(2) This portfolio is spread around the globe with the assets mainly in OECD countries including the U.S.A., Mexico, Canada, Italy, Portugal, South Africa and Australia.

(3) See Press Release: https://realassets.axa-im.com/content/-/asset_publisher/x7LvZDsY05WX/content/-c3-b8rsted-partners-with-axa-im-alts-and-cr-c3-a9dit-agricole-assurances-on-hornsea-2-offshore-wind-farm/24669

4.4 Biodiversity Metrics

While biodiversity loss and its main drivers are well documented, the quantification of business impacts on biodiversity is still a relatively new field. The beta version of the TNFD aims to provide guidance for companies and investors to understand biodiversity-related dependencies and impacts that organizations may experience and, biodiversity-related risks and opportunities related to their activities.

AXA has been working with peers to accelerate this work, as a member of the TNFD, and in partnership with other asset managers to develop appropriate metrics.

In order to help build an understanding of the role of appropriate metrics in understanding the role of ecosystemic services to the economy, for the first year AXA is publishing an exploration of the potential biodiversity-related impacts of its operations (AXA as a corporate issuer), and its investment portfolio (AXA as an investor), using different third-party tools currently available.

Context Box

TNFD key terms

Impacts are defined by TNFD as "changes (positive or negative) in the state of nature, which may result in changes to the capacity of nature to provide social and economic functions."

Dependencies are defined by TNFD as "ecosystem services that an organization or other actor relies on to function, such as a clean and regular water supply."

Biodiversity-related risks are defined by TNFD as "the potential threats posed to an organization linked to its and other organizations' dependencies on nature and nature impacts."

Biodiversity-related opportunities are defined by TNFD as "activities that create positive outcomes for organizations and nature by avoiding or reducing the impact on nature or contributing to its restoration."

Impact of AXA's own operations on biodiversity

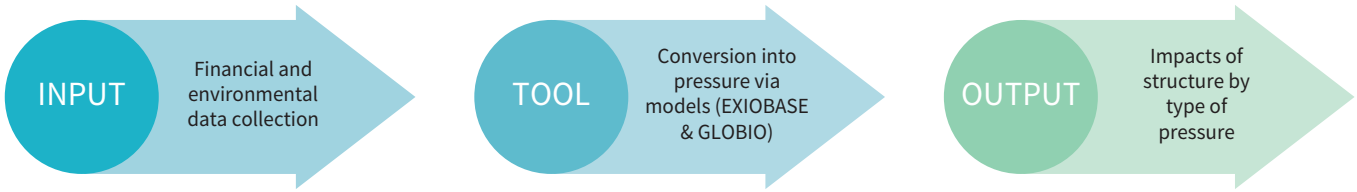
As there are not yet commonly accepted and well-developed tools to measure biodiversity performance, biodiversity impact measures can differ depending on the methodological choices. In the spirit of transparency and to encourage discussion of biodiversity metrics, AXA publishes the following analysis as a demonstration of the possibilities, and limitations, of current metrics relevant to biodiversity for corporate issuers. AXA continues to engage with peers and other key stakeholders in the TNFD Metrics and Targets Working Group to develop further guidance for all key stakeholders.

The pilot test incorporated available financial data and covered AXA's full value chain including scopes 1, 2, and 3. Drawing on AXA's existing environmental reporting and management, AXA was able to use data including the following:

- **scope 1:** direct impact from the company's own on-site operations (fuel consumption, surfaced occupied, water consumed, etc.);
- **scope 2:** indirect impact from the production of non-fuel purchased energy (electricity, steam, heating, and cooling);
- **scope 3:** indirect impacts, not resulting from the company's operations but from sources not owned or controlled by the company, upstream of its activities (purchase of IT equipment, office equipment, car fleet, catering, employee commuting, etc.).

Where data was not available, conservative assumptions were used to not underestimate the pressures of certain activities.

The pilot analysis assesses AXA's impact on biodiversity using scientific models to convert activity flows into measurable biodiversity pressures[1]. This enables various stakeholders to share a common language to express the types of pressures and intensity of biodiversity loss per activity.



(1) Defined by IPBES as the classification of direct drivers of human activities affecting nature.

The tool uses key pressures on land, freshwater, and marine ecosystems identified by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES):

- **land/sea use change:** the artificialization by humans of a piece of land/sea for a certain purpose (land usage, fragmentation, encroachment, wetland conversion);
- **direct resource exploitation:** disturbances due to the direct use of the resource;
- **climate change:** a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer;
- **pollution:** degradation/contamination of natural capital/ecosystems with toxic agents (Atmospheric nitrogen deposition, eutrophication in freshwater, and others).

Note that science-based models applied in this pilot analysis have their limits due to the lack of robust models:

- **drivers of biodiversity loss as invasive species are not yet covered;**
- **direct resource exploitation of water is under-evaluated;**
- this pilot analysis converted AXA's activities into the various pressures on biodiversity listed by IPBES to create a comprehensive grid of its biodiversity footprint by activity and scope.

Most of the impact on biodiversity from AXA's own operations comes from its vehicle fleet (usage and manufacturing) in a year with very little business travel due to the COVID-19 pandemic.

The outcomes of this exercise revealed that of the five key pressures identified by IPBES, AXA's own operations' impact on biodiversity is strongly linked to GHG emissions linked to a range of activities associated with its office buildings[1] as well as energy consumption and electricity production for AXA's buildings.

Based on the activities measured in 2021, this pilot confirmed the nexus between climate change and biodiversity loss and affirmed AXA's commitments to reducing AXA's GHG footprint from its own operations. Some of these actions are detailed below. This exercise provides a valuable insight into the categories of metrics currently available to corporates. It can provide guidance as to a company's main impacts on biodiversity. The same biodiversity relevant metrics, when reported in a transparent and standardized manner, can ultimately be used by an investor such as AXA at an aggregate level.

Context Box

Actions to reduce the GHG footprint of AXA's own operations and address negative impact on biodiversity

AXA has already taken actions to address negative impacts of its operations on biodiversity:

1. **Favor eco-friendly mobility for commuting:**

Since 2021, AXA has been encouraging new modes of transportation. AXA employees can now opt for a company bicycle and, at end-2021, over 70 Zenride partner stores were opened up to employees.

2. **Favor low-carbon intensive buildings:**

AXA entities use local solutions to encourage energy suppliers and building managers to improve building energy consumption and meet AXA's commitments.

3. **Favor reconditioned material to extend their life cycle:**

Since 2020, AXA has opted for the distribution of reconditioned mobile phones with a 2-year guarantee and a 100% biodegradable phone case as resistant as traditional ones. AXA also offers a repair service to all AXA employees to extend the life cycle of their mobile phones. Lastly, if the mobile phone can't be repaired, the usable parts are kept and reused for other mobile phones.

Impact of AXA's investments on biodiversity

To complement the pilot analysis of the potential biodiversity footprint of AXA's own operations, AXA has also published the results of its first exploratory analysis of biodiversity metrics that could assist a large asset owner in understanding the biodiversity-related impacts of an investment portfolio.

To measure the impact of AXA's investments on biodiversity, AXA selected an innovative biodiversity-specific data measurement tool developed by Iceberg Data Lab[2] (IDL) and iCare&Consult[3] called the "**corporate biodiversity footprint**" (CBF). The CBF aims to identify, at a portfolio level, the biodiversity-related impact of an investor's investment activities. The CBF measures impacts by the biodiversity loss associated with the pressures[4] on biodiversity generated by an investee company's economic activities across their value chain. The value chain approach enables an analysis of a company's biodiversity footprint generated by a company's activities across three scopes, using a similar approach to the three GHG scope definitions.

The calculation of the CBF[5] of a company is carried out in several steps:

1. Assess the commodities and products purchased and sold by the company throughout its value chain based on IDL's internal physical Input/Output and allocate the company's product flows by sector (NACE[6] sectorization);
2. Calculate the company's environmental pressures identified by the CBF based on its product flow based on a Life-Cycle Analysis;
3. Translate the pressures through pressure-impact functions (GLOBIO[7]) into one and the same biodiversity impact unit;
4. Aggregate the different impacts into an overall absolute impact at a company level.

(1) This relates to the procurement of vehicles, IT equipment, office equipment and catering services (including full life cycle impact).
(2) Iceberg Datalab.
(3) I Care – Conseil en stratégie et environnement (i-care-consult.com).
(5) Note that CBF is calculated via science-based models (Globio) having their limits: such drivers of biodiversity loss as sea use change, invasive species, natural resources overexploitation identified by IPBES are not yet covered by the IDL CBF solution.
(4) Pressures are defined by the IPBES as land use and sea use change, direct overexploitation of natural resources, climate change, pollution, and spread of invasive species.
(6) The European classification system of economic activities.
(7) Global Biodiversity model for policy support: https://www.globio.info/

In 2021, the CBF methodology covered around 27 industries composed of high- and medium-stake sectors from agri-food, electricity, oil & gas, real estate, to mining & metals. This sectoral model allows IDL to develop a harmonized database of organizations' CBF and enables IDL to calculate a biodiversity footprint (in absolute or relative terms) at a company level, which can then be aggregated at a portfolio level following the same logic and aggregation metrics as for portfolio carbon footprint calculation.

The single unit of biodiversity impact used to calculate CBF is the "Mean Species Abundance" (MSA) which expresses the average relative abundance of native species in an ecosystem compared to their abundance in undisturbed ecosystems.

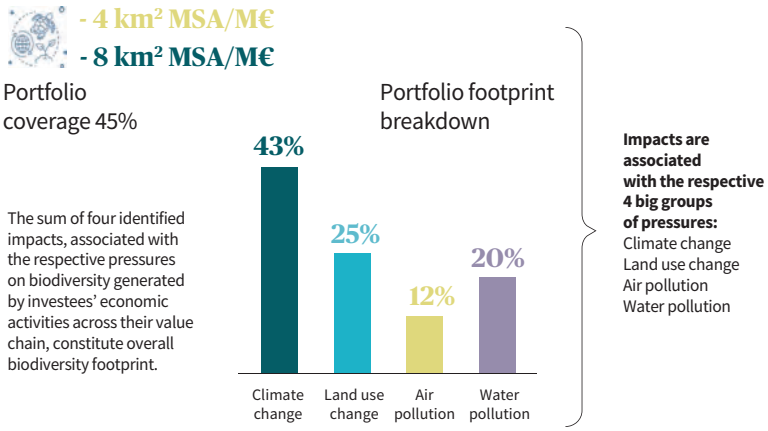
For instance, an area with an MSA of 0% will have completely lost its original biodiversity (i.e., completely artificialized), whereas an MSA of 100% reflects a level of biodiversity, equal to an original, undisturbed ecosystem. The impacts are then renormalized to express the aggregated relative surface in km^2 artificialized.

Aggregated results

This pilot analysis can measure the risk of biodiversity degradation generated by the activities of all the companies invested within a portfolio, expressed in **km^2MSA/M€** invested. The metric shows the surface in km^2 artificialized per million euros invested.

The IDL tool allows investors to calculate the biodiversity footprint at a portfolio level and can provide a breakdown of the four the key pressures on biodiversity as identified by IPBES in relation to the direct drivers of biodiversity loss: climate change, land use change, air pollution, and water pollution. In addition, the IDL enables an analysis at a sectorial level, and an issuer level. At an issuer level, it is possible to explore the impact of the company by pressure, scope, products, or key activities.

Illustrative example of a hypothetical portfolio Biodiversity Footprint



By providing different levels of granularity of information at an issuer, sector, and portfolio level, the IDL tool can help an investor identify the biodiversity impacts of different economic activities. Such information should help investors identify biodiversity-related risks and opportunities in their portfolios.

Conclusion

The pilot exercise carried out by AXA has revealed the relevance of third-party tools to help companies and investors understand the impact of their activities on biodiversity. These analyses, while still experimental in many respects, can help companies and investors identify key first areas of improvement. For AXA's own operations, this exercise confirmed the nexus between climate change and biodiversity loss and supported existing actions in place to reduce the carbon footprint of its own operations. It also affirmed the value of existing environmental reporting and management systems. For AXA's investments, the exercise revealed useful biodiversity-related information that may be used to address biodiversity related risks and opportunities at an issuer level (through, for example, shareholder engagement), at sector level (by identifying sectors with high impacts on biodiversity and engaging with largest players to raise awareness and promote change, whatever in business lines or practices). Metrics displayed will ultimately help inform investment decisions at a portfolio level. However, some further work is required, to understand the limits and strengthen the robustness of the tools, including encouraging increased data availability and the granularity of data at a company level.

4.5 Direct environmental footprint management

AXA's direct environmental footprint, although relatively small in absolute terms, is essential in the sense that it also contributes to leading by example as well as improving our operational eco-efficiency, notably through cost savings. AXA has had an environmental reporting process and related policies since 2002. This reporting is audited yearly and published in Section 4.3 of AXA's 2021 Universal Registration Document.

AXA's targets are based on the approach promoted by the Science Based Targets initiative (SBTi), which AXA joined in 2015. More specifically, AXA has chosen the "Sectoral Approach to Decarbonization" to define its 2019-2025 objectives, aimed at achieving the target in the Paris Agreement. AXA has submitted to the SBTi a target of **-31%** for Scope 1 and 2 perimeters.

This target is part of a broader framework that incorporates new measures relating, for example, to AXA's IT activities and which translates into an overall reduction of 20% in the Group's CO_2 emissions by 2025 compared to 2019[1].

Tables of AXA Group environmental indicators

2021 was marked by an increase in hybrid working schemes within all AXA entities and COVID-19 measures. This shift had an impact on all our environmental indicators.

AXA Group Scope 1,2,3 (own operations market based[1])	Unit	2019	2020	2021	Variation 2021/2019
Scope 1: Energy and car fleet	t. CO_2eq	37,889	26,292	**23,362**	-38%
Scope 2: Energy	t. CO_2eq	62,765	40,894	**31,997**	-49%
Scope 3: Business Travel	t. CO_2eq	90,584	17,460	**3,866**	-96%
Scope 3: IT equipment manufacturing and services	t. CO_2eq	25,298	25,370	**25,720**	2%
Total (energy, car fleet, business travel and IT equipment and services)[2]	**t. CO_2eq**	**216,536**	**110,016**	**84,945**	**-61%**

(1) For location based calculation see AXA's 2021 Universal Registration Document Chapter 4.3 'Climate Change & ESG Integration".
(2) Does not include Scope 2: energy location-based calculation.

Scope 2 - Energy CO_2 emissions	Unit	2019	2020	2021	Variation 2021/2019
Location-based	t. CO_2eq	88,558	63,914	**53,492**	-40%

Carbon neutrality and offsetting

To be consistent with its investment and insurance-related commitments to climate neutrality and the Paris Agreement, AXA also commits to the same target for its operations. In the most recent target to become carbon neutral by 2025, AXA's 20% CO_2 emissions reduction target is supplemented with the offsetting of full year 2021 CO_2 residual emissions (85,000 t.eq.CO_2) by supporting two projects in China and Indonesia:

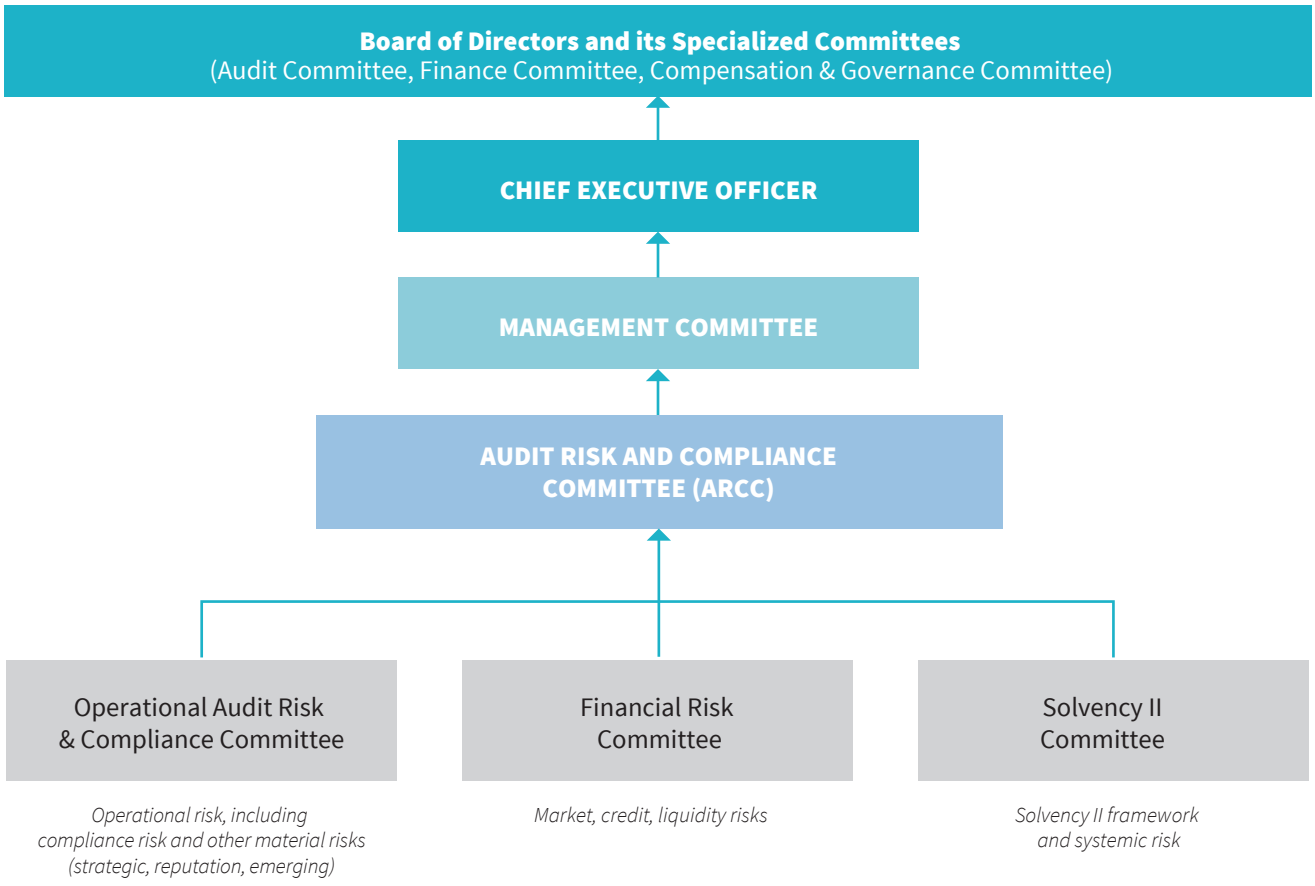
- **rural biogas development in China:**
  - the project will support up to one million low-income rural households in Sichuan with advanced biogas digesters and smoke-free biogas cookstoves, installed and maintained by local technicians,
  - the small-size biogas digesters avoid methane emissions from pig manure as well as carbon dioxide emissions from coal and firewood,
  - they provide families with clean, renewable and free biogas for cooking, heating, and lighting,
  - in supporting this project, AXA is addressing multiple SDGs[2];
- **Peatland Forest Restoration in Indonesia:**
  - this project is a tropical peatland restoration and conservation initiative, covering over 150,000 hectares of critical peat swamp forest in Indonesia,
  - it protects vital habitat for a vibrant mix of flora and fauna, including five critically endangered, eight endangered and 31 vulnerable animal species (orangutan, gibbon),
  - Peatlands are vulnerable ecosystems and highly susceptible to forest fires so protecting them is key to strengthening community and biodiversity resilience to climate change,
  - in supporting this project, AXA is addressing multiple SDGs[3].

(1) Energy, car fleet, business travel and office automation and IT activities perimeter.
(2) SDGs #1 No Poverty, #8 Decent Work and Economic Growth, #13 Climate Action, #15 Life on Land and #16 Peace, Justice and Strong Institutions.
(3) SDGs #3 Good Health and Wellbeing, #6 Clean Water and Sanitation, #7 Affordable and Clean Energy and #8 Decent Work and Economic Growth.

5. Risk Management

5.1 Introduction

AXA's management of sustainability risks is part of a comprehensive system of internal control and risk management, as described more extensively in AXA's 2021 Universal Registration Document. AXA is engaged in Insurance, Reinsurance, Asset Management and Banking businesses on a global scale. As such, it is exposed to a wide variety of risks, including market risks, credit risk, insurance risks, operational risks, and other material risks.



The mandate of the Audit Risk and Compliance Committee ("ARCC") covers AXA's overall Risk Management governance. The scope of the ARCC covers all of AXA's operations and includes AXA's overall risk appetite (including breaches of risk limits), the Own Risk & Solvency Assessment ("ORSA") and the other Solvency II reports, systemic risk documentation, major findings identified by internal audit, etc.

5.2 Climate risk assessment and stress tests

Adapting risk management techniques to climate change

Assessing risks from climate change is a growing priority across the financial services industry. It has long been an integral part of AXA's risk management framework. AXA endeavors to continuously enhance its overall understanding and assessment of potential climate risk impact and further develop internal climate scenario analyses.

Risk management frameworks need to address to climate risk specificities. Insofar as climate change risks arise over the medium to long-term, their trajectories and impact are uncertain. Moreover, changes in climate dynamics will create structural changes with broad effects on the economic, financial and insurance activities that are not fully reflected in historical data. In this respect, climate scenario analysis based on different trajectories of climate, macro-economic and financial conditions may be helpful in looking ahead at potential vulnerabilities and opportunities relating to climate change.

Supervisory stress tests

The development of climate scenario analysis and stress testing has accelerated in the past two years under the impetus of the supervisory authorities. This is particularly through the climate exercises outlined by ACPR/Banque de France in 2020 and the Prudential Regulation Authority (PRA) / Bank of England in 2021. In 2020, Banque de France and ACPR developed an analytical framework covering physical and transition risks while providing insurance and banking firms with fresh forward-looking data notably based on Network for Greening the Financial System (NGFS) scenarios.

Contrary to traditional stress tests, the ACPR pilot did not focus on the solvency ratio but rather the balance sheet and P&L using forward-looking calibration over several long-term horizons to 2050 with the possibility to include management actions. ACPR provided 3 climate transition scenarios ("orderly", "sudden" and "delayed") which are based on the scenarios developed by the NGFS, and one physical scenario (RCP 8.5 scenario[1]). Several research projects are underway to integrate the impact of climate change in AXA's internal Natural Hazard risk models for several warming levels (covering all main IPCC scenarios, RCP 2.6, RCP 4.5, RCP 8.5).

Similarly, the Bank of England and PRA ran their "Climate Biennial Exploratory Scenario" (CBES) exercise in 2021. The goal was to test the resilience of current business models at leading UK banks and insurers to the physical and transition risks from different climate pathways also specified in NGFS climate scenarios.

It is expected that such climate stress test exercises will be performed under EIOPA leadership on a regular basis and involve more European countries[2].

AXA actively contributed to these exploratory exercises by ACPR/Banque de France and PRA/Bank of England. It sees the use of climate scenario analysis as an opportunity to further understand the long-term implications of climate change on its investment portfolios and insurance business. Cooperation with supervisory authorities and industry peers makes it possible to improve the methodological framework and internal expertise to better assess climate change risks.

Stress tests and internal analyses

As part of **AXA's Own Risk and Solvency Assessment (ORSA)**, AXA has drawn upon the ACPR scenarios to better reflect AXA's risk profile, particularly physical risks:

- **P&C Natural Catastrophe (NatCat)** risks have been assessed through modular approaches (from simple to sophisticated modeling) making it possible to encompass the 3 drivers of Nat Cat risks (changes in hazard, exposure and vulnerability) and assess worldwide potential impact (more regions, more perils) of forward-looking scenarios in a range of uncertainty (pessimistic *vs*. optimistic views); (see section 5.4 "Climate-related impact on AXA's own operations").

Regarding **Health & Protection** related risks, AXA leveraged the scenarios developed in 2020 by ACPR and AON France to do a 2021 study on mortality increases from urban pollution and to define a methodology to derive mortality shocks under the most unfavorable scenario (see AXA's Health & Protection business below).

Based on representative selected risks, AXA has estimated the quantitative impact using supervisory stress tests and the ORSA risk assessment.

Physical risks to AXA's Property & Casualty business

- **Property & Casualty:** the physical risks of climate change that would most affect this business by 2050, under a pessimistic scenario (RCP 8.5 scenario), are rising temperatures, sea-level rise and extreme precipitation perils.
- **Flood:** risks linked to extreme rainfall are likely to become more severe and more common by 2050 in some regions, including North America, Northern and Eastern Europe, where risks increase could be up to 2.5 times current risks using a pessimistic projection scenario.

(1) Representative Concentration Pathways (RCPs) have been defined by Intergovernmental Panel on Climate Change (IPCC) experts and used as climate model inputs to evaluate the impact of different mitigation policies (from no mitigation actions to the complete stop of high-carbon activities). RCP 8.5 is a scenario of long-term global emissions of GHGs which stabilizes radiative forcing at 8.5 W m−2 in 2100, without ever exceeding that value. It delivers a temperature increase of between 1.4°C and 2.6°C (resp. 2.6°C and 4.8°C) by 2050 (resp. 2100), relative to pre-industrial temperatures. This scenario is a high RCP assuming constant emissions after 2100.

(2) EIOPA might launch its own climate stress test exercise involving the participation of EU insurers from 2024 (to be confirmed at the date of issue).

- **Tropical cyclones:** precipitation rates are expected to increase and coastal flooding from storm surges due to rising sea levels will also become more frequent.
- **Droughts:** as the Earth warms, the spatial extent and length of droughts is expected to increase by 2050, notably in the Mediterranean, Southern Africa, Australia, and Central and South America regions (see following Section 5.6 "Climate-related physical property (re)insurance impacts").

Due to AXA's worldwide exposures, which afford a high level of intrinsic diversification, the possible evolution of future P&C NatCat claims remains mainly driven by changes in future **exposures** (demographic changes, wealth growth) rather than an increase in the climate **hazard** itself.

AXA's current studies show that, in France, flood risk would increase by 1.5% p.a. up to 2050 (80% due to evolving exposure and 20% due to changing physical flood characteristics) under a pessimistic climate scenario in which GHG emissions continue to rise up to the end of the century. Such a change could be managed in a timely manner with no significant impact on AXA by adapting AXA's underwriting, pricing, reserving, or reinsurance strategy and fostering prevention initiatives[1].

In 2021, various AXA entities participated in other stress test exercises covering their P&C businesses[2]. This led to an acceleration in AXA's internal research on the impact of climate change on the key regions within AXA's portfolios[3]. The UK stress test exercises included looking at scenarios involving the litigation risk associated with climate change. Given the large study scope, both in terms of perils and geographically, the frequency-severity method[4] was chosen as model outputs are available for current climate conditions. Changing exposure was not factored into these exercises.

In 2022, AXA took steps to build on the stress test exercises and expand the methodologies and processes developed to consider climate change scenarios, notably across the AXA XL division. One key conclusion of the 2021 stress test exercises is the need to have a multi-model view when assessing future climate risk trends. There was also a focus on illustrating and communicating the uncertainty, limitations and challenges associated with these approaches. **The goal is to ensure that business decision-making properly incorporates the quantification of risk.** The key conclusion from these exercises was similar to the ACPR exercise. This is that the changes expected in terms of hazards are much smaller in the near-term than those from exposure, such as rebuild cost inflation.

Stress tests and transition risks: AXA's investments

The impact of financial market scenarios on AXA's investments is low. This is notably due to AXA's low exposure to carbon-intensive sectors likely to be the most affected by the climate transition. Indeed, the quantitative exercise done as part of the ACPR stress test exercise highlighted AXA's responsible investment strategy and the significant divestment from carbon-intensive sectors.

Furthermore, AXA can further decrease this exposure through active investment decisions around the reorientation of fixed income maturities to best in class by sector with:

- a preference for corporates with formal low-carbon commitments;
- a limitation on investment maturities; and
- engagement actions encouraging corporates to engage a low carbon economy strategy.

AXA's Health & Protection business

AXA used the ACPR stress test approach focusing on two physical scenarios:

Scenario 1: Vector-borne diseases (for example, dengue, malaria): this scenario considers an increase in the probability of pathogen transmission by vectors such as mosquitoes, ticks, or fleas. This is mainly due to rising temperatures resulting in a shift in hospitable land to those vectors. This probability varies depending on the place of residence of the insured population and on their vulnerability to vector-borne diseases. The timing of the impact depends on the pace of temperature increase, which remains highly uncertain.

Scenario 2: Pollution in urban areas: this scenario considers a deterioration in air quality resulting in a higher rate of respiratory related diseases and deaths. This would impact the following insurance cover: death, health (consultation and hospitalization) and disability (work stoppage).

In 2020, AXA estimated that AXA's Health & Protection business would be rather resilient to climate change impact over a thirty-year period. The main financial impact came from the pollution scenario and, in particular, the impact on life insurance. Nevertheless, the impact was expected to be limited because, even using a very conservative approach[5], the assessed impact would be absorbed through management actions such as realistic repricing.

Conclusions

- **AXA continues to actively participate in supervisory stress test exercises.**
- **In addition, work by AXA Group Risk Management experts in 2021 enabled AXA to better evaluate the effects of climate change on its business.**
- **Concerning Health & Protection, AXA's own shocks calibration has confirmed that such impact on AXA's insurance portfolio looks like being moderate.**
- **Concerning P&C insurance, the proprietary in-house climate risk framework has been further developed around 3-fold climate risk modeling.**
- **AXA will continue to work to improve climate risk assessment, primarily by further considering the vulnerability and prevention aspects.**

(1) This adaptation may, however, impact the insurability of some assets and increase the "protection gap".

(2) This included the Prudential Regulatory Authority (PRA) (AXA XL and AXA UK) in the UK and the Bermuda Monetary Authority (BMA) (AXA XL).

(3) This included North Atlantic Hurricanes, Japanese Typhoons, Australian Cyclones, European Windstorms, North America Severe Convective Storms and Winter storms, European Inland Floods and U.S. Wildfires.

(4) https://www.investopedia.com/terms/f/frequencyseverity-method.asp

(5) I.e., no diversification between the two sub-scenarios, shocks as if the whole population were in urban areas.

5.3 Climate-related health insurance impact

In 2021, AXA did a 6-month study on the impact of climate change on Health & Protection by deriving AXA's own air pollution mortality shocks.

AXA's study showed that three pollutants (PM2.5, PM10, NOx) out of the four in the ACPR pilot exercise have been trending down over the past 20 years, both in terms of emissions and concentrations.

As AXA's objective was to measure the impact of possible additional pollution from climate change, these 3 pollutants did not appear to pose an increased risk. AXA thus only focused on the 4th pollutant: **Ozone**.

Two sub-questions emerged, namely:

- What impact might climate change have on Ozone concentration levels?
- What impact might an increase in Ozone concentration levels have on the mortality of the French population?

Drawing on the literature(1), AXA established a hypothesis for translating temperature increases in Celsius into increases in Ozone (O_3) concentrations in µg/m³.

The answer to the second part of the question is based on studies on Quantitative Health Impact Assessments (QHIA), done primarily by the WHO (World Health Organisation) and other health organizations. **They estimate a relative risk for the main pollutants.** For a given population with a given overall mortality rate, it is thus possible to calculate the number of premature deaths for a given concentration of the pollutant.

This allows the number of premature deaths with the current Ozone concentration to be calculated and compared with the number of premature deaths for a given temperature increase and hence a given Ozone concentration increase. In this way, an additional number of deaths due to climate change is calculated as the difference between the premature deaths currently due to pollution and those following a temperature increase. This can be expressed as additional mortality rates.

Based on the most pessimistic IPCC scenario (RCP 8.5), the overall cumulative deviation in pollution deaths claims over 30 years was estimated to be approx. 18 times lower with AXA's methodology on AXA's insured portfolio (1.5%) than with the ACPR one (28%). This is for two main reasons:

1. AXA considered that three out of the four pollutants in the ACPR pilot exercise did not represent an additional risk compared to the current situation;
2. Shocks were only provided for the national population, but AXA's portfolio is much less exposed to the 65+ age group, which is the most impacted by pollution.

Without applying any reactive management actions such as repricing, AXA's internal study confirmed the relative resilience of the AXA Health & Protection business to climate change in general (and the air pollution scenario in particular). This had already been demonstrated during the climate pilot exercise.

(1) Using both prospective meteorological models and retrospective models based on past evolution of ozone concentrations.

5.4 Climate-related impact on AXA's own operations

Climate change may impact AXA's own operations. This would mostly be via the physical risks incurred by its buildings and the disruption in activities they can cause(1). Climate hazards may impact the health and safety of AXA employees. Climate regulation may also impact AXA's own operations with liability risks related to conduct and reputation(2). Climate transition risks would involve societal disruption and workforce transformation.

Business adaptation and mitigation action

AXA leverages its operational risk framework through risk assessment and scenarios quantification on a one-year horizon. These scenarios, which are designed on an annual basis with AXA's business and modeling experts, include a climate focus(3). They consider the geographic location of AXA's premises as well as business continuity plans for business-critical processes and dependencies (internal and external).

AXA also leverages its internal control framework so that entities can ensure they have implemented effective controls in response to key risks, including climate risks. Detailed initiatives and policies to ensure AXA has an appropriate level of readiness to respond to crises events, including climate hazards, can be found in the section entitled "Climate change impact on AXA's own operations" in the 2021 Universal Registration Document.

(1) *E.g., inaccessible offices, commuting to the office and business travel interrupted, etc.*
(2) *E.g., new climate-related claims and litigation from clients.*
(3) *E.g., Flood, Windstorm/Storm surge event, Cyclones, etc.*

5.5 Climate-related physical risks' impact on the real estate investment portfolio

Extreme weather events may also impact "Real Assets", which are subject to both physical and transition risks in TCFD terminology. In addition to the "Climate Value-at-Risk" (CVaR) analysis of its corporate credit investment portfolio, AXA has a significant amount of claims-related data to conduct a "physical risks" analysis of its real estate portfolio.

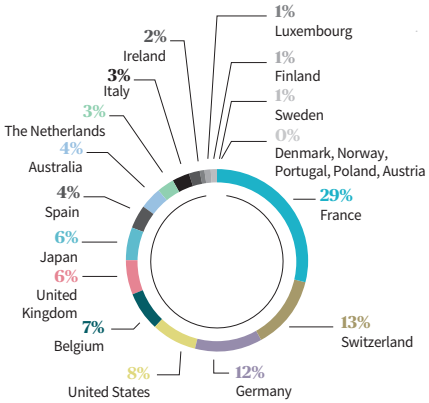
The underlying climate mechanisms overlap with Property (re)insurance but impacts differ significantly when looking at such assets from an investor's perspective.

In-house risk analysis for Real Estate assets

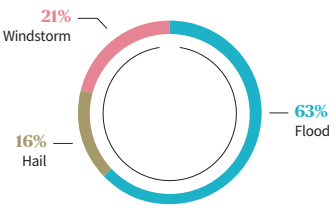
Since its first Climate Report in 2016, AXA has done annual analyses of a selection of real estate assets. In 2021, this analysis covered over €43bn[1] of direct property investments. AXA's Investment and Risk Management teams evaluated the financial impact of floods, windstorms and hail on these properties in some 20 countries representing almost 100% of the direct investment portfolio. Like with previous studies and based upon an analysis of climate risk, both average annual losses (AALs) and losses from a 'one-in-a-fifty-year' flood, windstorm and hail events remain limited compared to the total asset value. The resulting AALs are broken down by country below.

AXA's real estate portfolio by country

More than €43bn of assets worldwide

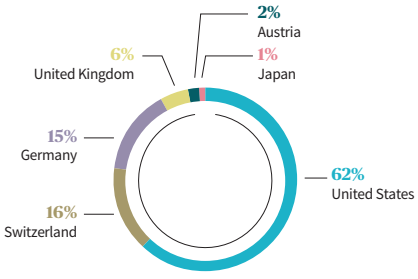


Annual Average loss: €9.7m

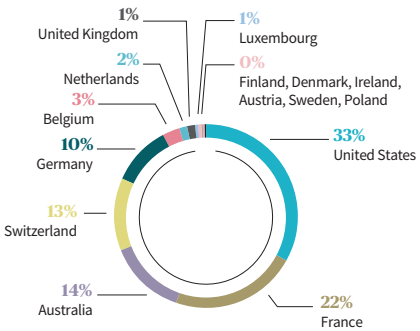


Breakdown of AAL by peril and country

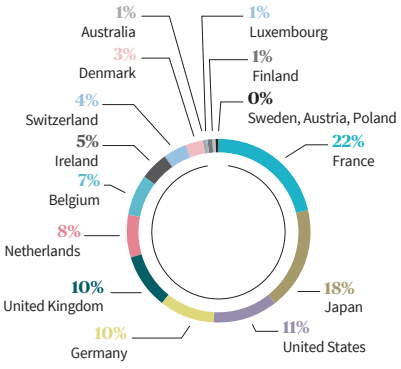
Flood AAL: €6.6 M



Hail AAL: €1.7 M



Windstorm AAL: €2.2 M



AXA's real estate exposure is global with most of the portfolio in Europe (82%). The portfolio's highest risk exposure is to flooding (63% of AALs), followed by windstorm and hail.

Asset-level data used to run the analysis currently relies on the geolocation of buildings and their main occupancy. However, models used to assess risk exposure to natural hazards can incorporate more granular information regarding the physical components of a building[2]. This can generate more refined and asset-specific results. Such detailed information is currently not systematically available in real estate portfolios. Work is on-going to collect this data.

Based on the internal risk assessment, the U.S.A. is driving AAL for both flooding (62%) and hail (33%) perils.

- **Windstorm peril:** the U.S.A., France, the UK, Japan and Germany account for 62% of the AAL.
- **Flood peril:** Germany and Switzerland account for 30% of the AAL.
- **Hail peril:** France, Australia, Switzerland and Germany account for 59% of the AAL.

The AAL increased compared to 2021 analysis due to the addition of new assets within the real estate portfolio.

(1) Representing AXA's ownership in real estate assets managed by AXA IM Alts as at 31/12/2021.
(2) Such as the structure, the year of construction, the height of the building.

Incorporating Physical Risk Analyses into Investment Decisions

AXA IM Real Assets further strengthens the analysis of physical risks during the acquisition process. Using internal tools, AXA IM's team has been able to identify buildings with higher levels of historical physical risk. This has subsequently been addressed by the asset management teams through the development of adaptation responses. Two specific projects were run in 2020 as proofs of concept to assess portfolio-wide analysis of future scenarios. This included models from MSCI and AXA Climate:

- the first project was run on a pan-European real estate portfolio. MSCI modelled resilience to transitional and physical risks from climate change. This holistic approach enabled the investment team to identify the potential value-at-risk of assets in the fund and the tail-risk buildings that may need additional work to develop an asset- specific adaptation strategy;
- in a more detailed project, the investment teams engaged with AXA Climate to focus on physical risk using the RCP 4.5 and 8.5 scenarios. This made it possible to capture the normalized risk score of a representative global portfolio of 90 assets, with a deep dive into 3 assets for which a detailed adaptation report was drawn up to guide asset management teams.

In addition, AXA IM Real Assets is increasingly using an internal underwriting tool to strengthen the analysis of physical resilience to climate change during the acquisition process. The responsible investment team supports local acquisition teams by underwriting a climate physical risk analysis of the buildings in question and incorporating the results into the technical due diligence phase. This has enabled acquisition teams to engage with their technical partners to reinforce their climate-related ambitions and include a specific adaptation strategy for those assets where required.

In conclusion, according to according to AXA's risk modeling, the financial impact of climate-related "physical risks" on real estate assets appears limited.

The teams at AXA IM Real Assets continue to collaborate with AXA's Nat Cat teams to better understand physical risk levels and determine appropriate adaptation efforts to limit such exposure to climatic events.

Transition Risk - A Holistic Approach to Resilience

To minimize exposure to the transitional liquidity risk of its buildings, AXA's investment teams use EPC ratings to measure broad portfolio efficiency. The goal is for at least 75% of its European portfolio to have an EPC of C or better by 2025, up from 45% in 2021;

- **CRREM** is another tool available to benchmark a building's energy performance against Paris Agreement targets. It provides the real estate industry with consistent, science-based intensity targets for different building types, in different countries, relative to local grid emission levels.

These consistent asset level performance targets include both energy efficiency (kWh/sqm) and GHG emission (kg CO_2e/sqm) metrics that need to be met for the underlying asset to align with global targets. This tool provides critical insight into measuring the performance of AXA's goal of achieving Net-Zero investment portfolios by 2050 at the latest. As at 2021, 25% of AXA's building stock was aligned with the 1.5°C warming scenario. This percentage is set to rise with the new carbon reduction targets set by the organization.

Transition risks can also impact Real Estate investments. AXA's investment teams rely on different market standards and tools, such as the Energy Performance Certificate (EU EPC)[(1)] and the Carbon Risk Real Estate Monitor (CRREM) models to understand transition risks:

- **EU EPC** – Aligned with the Taxonomy Regulation and with the MEES (Minimum Energy Efficiency Standard) regulation in the UK, the EU EPC is becoming a useful tool to determine the buildings on which to concentrate energy efficiency efforts and thereby reduce an asset's carbon footprint.

  In addition to an EU EPC being required to sell or trade an asset, AXA's conviction is that this regulatory standard will continue to be used to define minimum legal thresholds for energy performance standards, as it currently is in the UK and Netherlands.

Ultimately, using these various tools provide AXA with new insights into some of the physical and transitional risks and climate change impact on its portfolios. AXA remains engaged with other institutional investors and managers in using the tools to better protect and enhance the value of its assets and portfolios over time.

(1) https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-performance-certificates_en

5.6 Climate-related physical property (re)insurance impact

Climate Risk

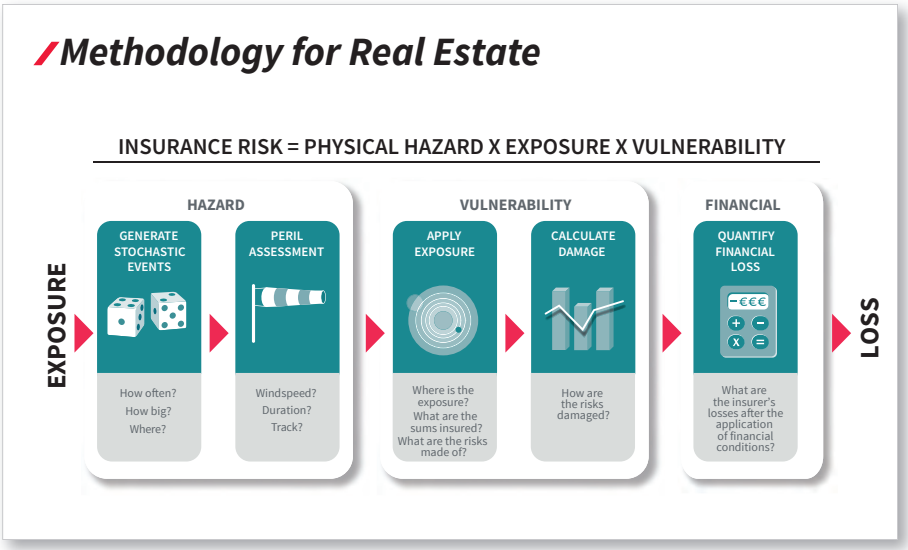
Changes in year-on-year losses from climate-change related hazards are a function of three components:

- hazard;
- vulnerability; and
- exposure.

There is scientific consensus that the hazard is changing for different climate-related perils due to anthropogenic climate change. However, scientific evidence suggests that over the long-term[(1)], the direction and order of magnitude of such change may be slow and, in many instances, highly uncertain.

In fact, there are instances where climate risk may decrease due to complex interactions between hazard, exposure and vulnerability over space and time. Understanding when and where these changes are likely to occur presents opportunities for AXA as a (re) insurer:

- to either take risk where others might not wish to; or
- de-risk where it is thought prices may not reflect the risk taken.



Where AXA does have projections of the expected change in hazard, these are mostly at time scales that are too far into the future (*e.g.*, 2050 or 2100) and at too coarse a spatial resolution to provide valuable insights on how to manage its business.

These projections are certainly useful in understanding how the climate will change in the distant future at continental scales and above. However, from an annual underwriting, business and capital planning perspective, AXA requires high-resolution climate and weather results at time horizons in the order of a number of years.

AXA's internal analyses suggest that by far the biggest driver of changes in losses over the past 10 years has been from changes in exposure. These changes have been generated by rising property values, economic growth and population dynamics, among other things. **AXA expects exposure factors to continue to change at faster rates than hazard and vulnerability over the coming decade. From a (re)insurance perspective, it is therefore prudent to shift its focus to explore how near-term changes in AXA's exposure are likely to impact AXA's risk profile.**

Hazard

When discussing the impact of climate change on (re)insurers, it is important to distinguish between weather and climate:

- climate refers to average weather over longer time horizons (typically 30+ years) and low resolutions;
- weather instead refers to short-term, relatively regional events.

While climate change is global, its impact will manifest through extreme localized weather events. There continues to be significant uncertainty around our current understanding of how climate change will influence the frequency and severity of many of these atmospheric climate-linked hazards.

Despite this uncertainty, AXA should continue to endeavor to understand the impact that a changing hazard will have on the risk AXA faces as a (re)insurer. To identify perils and areas that will most likely be impacted by climate change, AXA has developed maps using data from the IPCC and other scientific reports.

AXA analysed the IPCC's Sixth Assessment Report and identified in the table below:

- **(i)** increases in red;
- **(ii)** decreases in blue; and
- **(iii)** left in black conclusions without a clear or certain trend.

(1) 50 to 100 years.

This table shows, purely for the purposes of illustration, whether the past climate change trend of the hazard is reflected in current NatCat models. It should be noted that these comments are general and generic. A much more detailed analysis is required to identify perils and areas that will most likely be impacted by climate change and affect AXA's portfolio.

Hazard	Past Observed Change	In Cat-Models	Future Projected Change in Warmer Climate
Tropical Cyclones (TCs): Basin-wide Activity	› *[Likely]* that the proportion of major TC intensities (CAT4&5) and the frequency of rapid intensification events have increased over past 40 years **(Globally)**	Generally YES – Note that past changes refer to basin-wide, while no detectable trends at landfall	› *[Likely]* that the global frequency of TCs over all categories will decrease or remain unchanged ***(Globally)***
			› *[Very likely]* that average peak TC wind speeds and the proportion of Cat4-5 TCs will increase (Globally)
			› *[Very likely]* that TC rain-rates will increase (Globally)
Coastal Flood/ Sea Level Rise/ Storm Surge	› *[High confidence]* Heating of the climate system has caused global mean sea level rise through ice loss on land and thermal expansion from ocean warming **(Globally)**	Depending on model vintage as well as lags between model release and model use	› *[Very likely to virtually certain]* that regional mean relative sea level rise will continue throughout the 21st century. Approximately two-thirds of global coastline has a projected regional relative SLR within ±20% of the global mean increase (medium confidence).
Extratropical Cyclones (ETCs)	› ***[Low confidence]*** in any recent changes in the total number of ETCs over both hemispheres **(Globally)**	N/A(1)	› ***[Medium confidence]*** that future changes in the intensity of ETCs will be small, although changes in the location of storm tracks could lead to substantial changes in local extreme wind speeds **(Globally)**
	› ***[Medium confidence]*** in a poleward shift of the ETCs storm tracks over both hemisphere since the 1980s **(Globally)**	YES – considering the historical data used to built the models	› *[High confidence]* that average and max. ETCs precipitation-rates will increase **(Globally)**
Severe Convective Storms (SCSs)	› ***[Medium confidence]*** that the mean annual number of tornadoes in the United States has remained relatively constant since 1970 **(U.S.)**	N/A(1)	› *[High confidence]* that average and max. SCSs rain rates in the U.S. will increase **(U.S.)**
	› ***[Low confidence]*** in changes in the number of SCSs due to insufficient data records and varying definitions between regions **(Globally)**	N/A(1)	› *[High confidence]* that environments will become more favourable for SCSs development in the Tropics and sub-tropics, potentially increasing SCS frequency **(Globally)**
	› *[Medium confidence]* in an increased number of detected tornadoes in Europe **(Europe)**	N/A(1)	› *[Medium confidence]* that the frequency of springtime SCSs in the USA will increase, lengthening the SCS season **(U.S.)**
Heavy Precipitation Over Land	› *[Medium confidence]* in an increase in globally average precipitation over land since 1950 **(Globally)**	Generally YES - considering the historical data used to built the models	› *[Virtually certain]* that heavy precipitation will become more frequent and more intense **(Globally)**
Flood	› ***[Low confidence]*** in observed changes in the magnitude or frequency of floods globally **(Globally)**	N/A(1)	› *[Medium confidence]* that flood frequency and magnitude in SE and N. Asia and India, E. and tropical Africa, and northern North America will increase **(Regionally)**
	› Some regions have experienced increases and some decreases in flood magnitude and frequency	Generally YES – considering the historical data used to built the models	› *[High confidence]* that flood frequency and magnitude in central and E. Europe and the Mediterranean, parts of South America, S. and central North America, and SW Africa will decrease **(Regionally)**
Wildfire	› *[Medium confidence]* that weather conditions promoting wildfires have become more probable in southern Europe, northern Eurasia, the USA, and Australia over the last century **(Globally)**	YES (U.S.) – we believe the influence of climate change on near-term wildfire activity exists within the natural variability of models.	› *[Medium confidence]* in projected increases in the frequency and duration of fire weather (hot, dry, windy conditions), making extreme wildfires more likely for some regions, dependent on fuel availability and ignition sources **(Globally)**

* *By the end of the century.*

(1) N/A = Not applicable due to no observable or a highly uncertain historical climate trend

Concerning the Future Projected Change in Warmer Climate in the above table, these projections are provided to the end of the century. They nevertheless remain highly uncertain for some of the perils. For example, in the case of tropical cyclones, AXA expects their overall frequency to decrease but the intensity of the storms and the induced precipitation to increase, with differences across basins.

Hazard - Understanding Uncertainties

There is a great deal of inherent uncertainty in the risk assessment process. Uncertainty cannot be eliminated from such work, and it is appropriate to acknowledge it and, where possible, assess it. To complicate matters further, uncertainty is greatly increased when introducing climate change into risk assessments.

There are different types of hazard uncertainty to consider:

- uncertainty in system response (for example, future global temperature scenarios, time horizon of focus);
- uncertainty in assessment tools (for example, uncertainty in catastrophe models, uncertainty in the current view of risk); and
- uncertainty in Climate Change attribution (natural variability versus climate change).

This uncertainty does not mean that AXA should not attempt to understand, implement, and model the impact of a changing hazard on the risk it faces as a (re) insurer. This is an ongoing effort.

Exposure

Internal analysis using U.S. and European data suggests that industry-wide insured exposure in these regions has increased by approximately 4-5% *per annum* on average. These year-on-year increases have been driven by socio-economic factors such as population growth, urbanization, urban sprawl, wealth inflation and land use. This trend is unlikely to subside in the near-term. AXA is thus proactively exploring the potential impact of increasing exposure to regions of high hazard in order to better understand the change to AXA's risk profile over the coming years and beyond. This includes research underway by AXA XL in collaboration with the University of Colorado Boulder using a machine-learning approach to forecast settlement evolution.

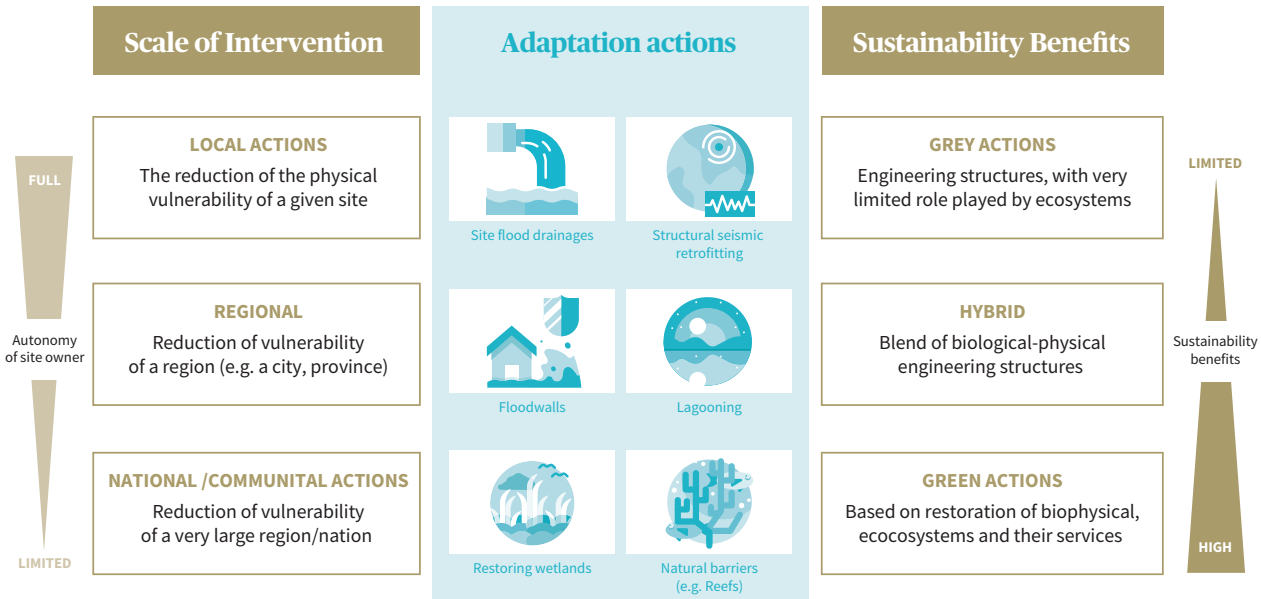
Vulnerability

Vulnerability refers to the susceptibility of an asset to a given hazard intensity and its adaptive capacity. In the context of this Report, this can be considered the extent to which an asset is sensitive to a changing climate. From a risk modeling and pricing perspective, it is critical for AXA to have detailed information on the susceptibility or damageability of the insured asset(s) to a given hazard intensity to have an accurate representation of the risk.

Until recently, the focus has been on identifying mitigation measures to limit the climate risk. When it comes to a changing climate, adaptation and resilience measures will complement this approach. How this resilience will emerge within communities and develop over time will contribute to the risk uncertainty AXA faces as a (re)insurer and to the development of the emissions pathways that AXA works towards.

The adaptive capacity of a particular asset will depend on the extent the vulnerability will evolve in a changing climate. Resilience and adaptation can take a number of forms, as set out in the table below:

Impact of adaptation actions



Modeling: Uncertainties & Limitations

A variety of models touch on climate change. All have been built to address different issues and provide different perspectives. This section aims to:
› briefly describe some of them and their strengths and limitations as regards Natural Catastrophe risk assessment for (re)insurance business; and
› provide input on AXA's contribution.

Models considering Climate Change

	SCIENCE FOCUSED MODELS		BUSINESS FOCUSED MODELS	
	NUMERICAL WEATHER PREDICTION	GLOBAL / REGIONAL CLIMATE MODELS	CATASTROPHE MODELS	PRICING MODELS
				
Purpose	Predict Weather	Predict Climate	Model Risk from Catastrophes	Price Risk
Timescale	Days to weeks in advance	Years to decades, past and future	Based on policy length , typically 1 yr	Based on policy length, typically 1yr
Resolution	High-resolution (5-10km)	Low-resolution (25-100km)	High-resolution (geocoding)	High-resolution (geocoding)
Description Use at AXA	– Initialized based on current conditions – Models run to estimate multiple meteorological elements to forecast future conditions for near future	– Developed to globally reproduce medium to large scale atmospheric features, useful for global trends – Downscaling to high-res required to model localized weather features	– Financial module combines Hazard, Exposure, Vulnerability to generate 1,000s of yrs of possible history and provide "confidence" in tail – By design, they include current climate in their modelling based on timing of parameterization	– Analyzes all risks impacting a policy, to arrive at a tech premium (incl allowance for expense &capital cost) – Requires estimate of expected loss over contract length using cat models, past experience pricing, benchmarking
	› Due to their very short-term nature, not explicitly used for AXA purposes	**› Within AXA, used to formulate view on future impacts on hazards exposed, based on scenarios**	**› Within AXA, used to estimate loss cost and aggregations to particular perils and regions**	**› Within AXA, used to estimate technical price for a (re)insurance contract**

Integrating Global and Regional Climate Model outputs into Catastrophe Models and Financial Models, and subsequently financial decision-making and disclosures, is a complex task for insurers. This is particularly the case given the uncertainties around natural climate variability, climate model uncertainty and system/emission scenario uncertainty (i.e., RCPs).

Time horizon and spatial scale are two key attributes to understanding the risk AXA faces as a (re)insurer. The impact of uncertainty on these factors will be discussed below.

(Re)Insurance Business Application: Time Horizons and Spatial Resolution

From a (re)insurance perspective, AXA thinks about time horizon and spatial resolution in terms of:

› **Risk pricing:**
- when AXA prices risk, the pricing aims to reflect the current view of the risk (hazard, exposure and vulnerability),
- AXA has the ability to adjust pricing on (re) insurance contracts annually,
- when considering exposure to natural perils, as AXA's modeling of extreme weather on a local scale is only accurate a few days in advance, AXA must consider the time horizon over which AXA has available data to estimate the risk it is pricing,
- when pricing risk, AXA tries to address the challenge of either relying on:
  - smaller datasets from recent years that may contain well known short-term climate influences, or
  - the long- term benefits of a more complete dataset with potential inaccuracies and the fact that the past may not reflect more recent climate conditions that may be driving the risk;

› **Business planning/capital management:**
- from a business planning/capital management perspective the time horizon in which AXA typically operates is 3 to 5 years (10 years at most),
- AXA must consider the impact and extent to which natural hazards may vary over this time horizon,
- business planning considers how these risks might be changing and how it should respond to these changes from an appetite/profitability perspective,
- the way that AXA chooses to shape its insurance portfolio in the future also drives its capital management strategy. It is thus important to have a view as to how the climate may evolve at a macro and more granular/regional scale.

The above demonstrates the need for information at a time horizon and resolution that aligns with projections and information from Global or Regional Climate Models[1]. Long-term projections, driven by RCP scenarios, are important to get a comprehensive view of climate change impact and to call attention to the need for large-scale societal changes. However, projections at these timescales and coarse resolutions are not well-aligned with the needs of the (re)insurance community.

Insurers need extreme weather projections up to at most 10 years (preferably in the 3-5 year range) at high resolution to allow them to consider how hazards creating exposure are evolving. Knowing this will allow insurers to effectively mitigate some of the risks associated with a changing climate and potentially take advantage of opportunities, from a pricing, business planning and capital management perspective.

In conclusion, a Cat model combines all 3 components of the risk equation to arrive at a view of risk. When discussing time horizon and resolution it is necessary for AXA to consider:

- all three components and the relative impact they might have over competing time horizons and resolution;
- and how their interactions might change in the future.

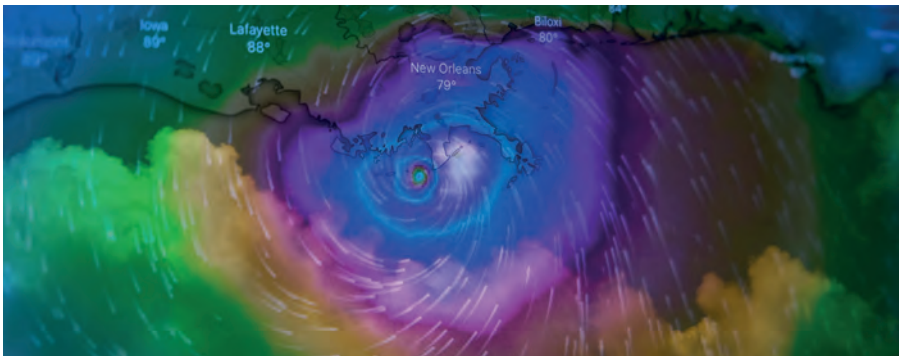
Advances have been made and continue to be made around climate modeling. It is nevertheless clear that this modeling needs to be adapted for risk pricing, business planning and capital management for a (re)insurer. Climate model results are important inputs for societal actions but needs to be refined to understand the risk AXA is likely to face.

AXA's framework for assessing future Nat Cat risk

Despite the discrepancy between the information needed to perform an assessment of forward-looking scenarios for NatCat risk and what is currently readily available, AXA has explored how to assess the impact of future climate-related perils on (re)insurance risk. As a first step, AXA has identified complementary approaches within the company to cover the perils in combination with the geographic factors. This is based on the availability and quality of data for the three drivers of climate risk.

AXA considers three types of approaches:

- **"Toy model":**
  - this approach is simple and relies on available literature or datasets that provide a percentage of impact on hazard, exposure and/or vulnerability,
  - it is possible to combine various sources of information (*e.g.*, different CMIP6 models[2]) and scenarios (*e.g.*, RCP 2.6, 4.5 and 8.5) to assess impact at different time intervals,
  - it can also be performed at various scales, from city to country-level,
  - this approach assumes a proportional and direct effect between the evolution of the drivers and the evolution of the risk,
  - this does not allow flexibility, namely with regard to terms and conditions of the policies that AXA covers,
  - however, such an approach provides insight on where the risk may evolve significantly along with the associated uncertainties. This enables AXA to identify areas requiring further study,
  - AXA implemented this approach for the AXA Group ORSA exercise and this has provided a worldwide view of the future of Natural Catastrophe risks;
- **severity/frequency adjustment:**
  - AXA's NatCat modeling can produce a list of hazard events associated with:
    - **i.** the frequency of each event, and
    - **ii.** the amount of loss caused by each event on a considered exposure;
  - it is therefore possible to adjust the frequency and/or the severity of events, based on literature or climatic datasets analysis,
  - whilst such an approach requires the availability of modeling results based on past climate, it is applicable to any model's outputs and doesn't require access to the core of the model or the input datasets. Examples can be found in the next section on stress testing;
- **integrated view:**
  - this is the most sophisticated approach as it consists in integrating a modified view of hazard/exposure/vulnerability in the NatCat models themselves capturing forward-looking scenarios,
  - to capture the impact of climate change, this approach requires access to the core of the model. Climate simulations are used as inputs instead of past datasets,
  - several research projects are underway to incorporate the impact of climate change into AXA's internal Natural Hazard risk models for several warming levels[3].
  - the focus is currently on droughts, tropical cyclones, floods and storm surge.



As a global (re)insurer, a challenge for AXA is the scalability of such methods. AXA is in fact looking to expand the above-mentioned analyses, focused on one country and one hazard, to other geographical scopes where data is not always available. To get to a level that will enable decision making, it is necessary to have a global scale view[4].

(1) They tend to focus on longer-term projections, typically out to 2030, 2050 and 2100.

(2) https://www.wcrp-climate.org/wgcm-cmip/wgcm-cmip6

(3) Covering all main IPCC scenarios, incl. RCP 2.6, RCP 4.5 and RCP 8.5.

(4) Assessment of the hazard component in current and future climate for all perils along with their potential changes, exposure data today and future projections, and information on planned evolution of codes of construction and other adaptation measures in the coming years.

5.7 Climate-related liability risks

Helen Browne, Group General Counsel

The 2015 Paris Agreement and the increasing urgency of the climate crisis are having a profound impact on the regulatory environment in which we operate. We are seeing a rapidly developing body of climate-related laws and regulations as well as increased scrutiny by regulators of the management of the financial risks of climate change. According to the Grantham Research Institute on Climate Change and the Environment, by May 2021, over 2,200 laws and policies at both national and international levels have been put in place to help prevent climate change[(1)]. Many of these laws have created new legal duties and this in turn has led to an increase in climate-related litigation by different parties, including individuals and NGOs, against governments and companies to do more to prevent global climate change.

In recent years, a rapidly increasing number of legal challenges have been brought to impose consequences for climate inaction. Administrative cases brought against governments and public bodies remain the most predominant type of climate litigation, centering on alleged failures to enforce climate laws/regulations or mitigate climate harms. Cases are also now targeting a wider variety of private sector and financial sector actors and there is more diversity in the arguments being used incorporating, for example, tortious claims and claims against corporations for failing to account for or disclose possible risks, greenwashing claims for misleading investors or the public about their climate harms or climate change mitigation measures and claims based on fiduciary duties. The number of "strategic" cases, that aim to bring about a broader societal shift, is also on the rise.

As with all litigation risks, certain territories in which such lawsuits are filed are more likely to be sources of exposure for insurance companies and potentially related or "copy-cat" cases (*e.g.*, historically litigation prone environments including the U.S.A., Germany and Australia). The political landscape in these regions should be closely monitored to understand the exposure of insurance companies. However, the geographic scope of climate litigation cases is rapidly expanding, including cases in Global South jurisdictions.

Climate litigation cases may be brought by plaintiffs on a variety of grounds and increasingly with strategic intent centered directly on climate change, including:

- ***claims for causal contribution to climate change:*** liability cases, predominantly in the U.S.A., to hold governments and companies accountable for their past and ongoing contributions to climate change;
- ***claims that companies have defrauded shareholders and misrepresented the impacts of climate change on their business:*** cases against private parties continue to be brought, some challenge insufficient or inappropriate communication of climate change, others challenge corporate action, inaction, and responsibility;
- ***corporate greenwashing claims:*** cases against companies for alleged greenwashing, conveying a false impression or providing misleading information about how a company's products or actions are environmentally sound, are increasing rapidly. For example, in April 2021, New York City sued three major oil companies for allegedly misrepresenting themselves by selling fuels as "cleaner" and advertising themselves as leaders in fighting climate change[(2)];
- ***claims related to professional negligence for failure to manage or adapt to climate change risk:*** these claims look at not only the physical risk but also the transition risk of climate change and some cases have targeted the potential failure of directors, officers, and fiduciaries to adapt investment strategies in line with climate risks;
- ***litigation to accelerate climate policy action:*** cases aimed at contributing to efforts to ensure a climate-compatible shift in financial market decision-making. For example, recent cases against pension funds and investment funds for failing to incorporate climate risk into their decision-making and for failing to disclose climate risk to their beneficiaries;
- ***claims dealing with the violation of human rights obligations:*** the use of human rights arguments in climate cases continues to rise, *i.e.*, the Grantham Report accounted for more than 100 (112) human rights cases in U.S.A. and non-U.S.A. databases, with 29 of them filed in 2020 and a further five in 2021. These latest cases include, for the first time, three cases before the European Court of Human Rights.

In May 2021, in a landmark first instance ruling[(3)] that may set a global precedent for legal action against energy companies elsewhere, a Dutch court found that Royal Dutch Shell owed a duty of care to the plaintiffs and ordered Shell to deepen planned greenhouse gas emissions cuts (by 45% between 2019 and 2030, *vs* Shell's commitment of -20%). The environmental group which won the court case also demanded in January 2022 that 30 corporations publish their greenhouse gas emissions reduction plans. In a post COVID-19 crisis context, litigants could also be driven to file new lawsuits, including by linking the global health crisis to the climate emergency[(4)].

(1) https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2021/07/Global-trends-in-climate-change-litigation_2021-snapshot.pdf
(2) https://www.reuters.com/business/energy/new-york-city-sues-exxon-bp-shell-state-court-over-climate-change-2021-04-22/
(3) https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBDHA:2021:5339&showbutton=true&keyword=shell
(4) https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2020/07/Global-trends-in-climate-change-litigation_2020-snapshot.pdf

Potential impacts

The insurance business could be impacted in several ways by the growth of climate change directed litigation. AXA have identified four potential areas of impact: (i) underwriting, (ii) investments, (iii) corporate governance, and (iv) reputation.

- ***underwriting:*** certain P&C coverages (*e.g.* general liability, professional indemnity, D&O) could be particularly impacted by climate change litigation. The sectors that have been identified as most at risk include carbon intensive sectors, sectors exposed to climate change physical risks (includes utilities – wildfire and flooding (dams), agricultural) and the financial sector;
- ***investments:*** strategic climate change litigation against corporates could jeopardize insurers' existing investments, impair businesses' corporate strategies, expose investee companies to financial risks (including defense costs and damages claims), impact insurers' investment portfolios and devalue carbon intense assets;
- ***governance:*** insurers increasingly have regulatory and legal obligations with regards to climate risk governance, scenario analysis and stress testing as well as climate related disclosure requirements. Businesses are under increasing scrutiny from stakeholders to consider and disclose the impact of climate related risks on company investments and operations. If and when climate litigation risk is seen as a financial risk, institutions may be required by law to quantify and disclose the risk and the potential impact that climate change litigation can have on their income statements and balance sheets.

Companies will need to adapt as litigation is increasingly seen as an important tool for change, and regulatory action to mitigate climate change is on the rise. The current regulatory context will likely reinforce the litigious environment in the U.S.A., and further generate an increasingly litigious environment in Europe and further afield. Consequently, companies that fail to acknowledge and respond sufficiently to this evolving risk landscape could potentially witness repercussions to both their reputation and their profitability. In order to mitigate the risks presented by climate change litigation, AXA is closely monitoring the potential impacts on underwriting, investment and shareholder engagement, and corporate governance, as well as the company's reputation.

6. Other information

6.1 Sustainability Ratings

UN Principles for Responsible Investment

AXA answers the detailed annual UN PRI assessment. This seeks to measure the breadth and impact of the Responsible Investment Strategies of its signatories. AXA's scores per "module" are listed on www.axa.com.
AXA's social, societal, environmental and governance performance is rated by several specialists[(1)]. AXA generally ranks amongst the top performers in its industry and is also included in the main international sustainability indices:

- DJSI World and DJSI Europe (based on Standard & Poor's research);
- Euronext Vigeo, World 120, Eurozone 120 and France 20 (based on Vigeo Eiris research);
- FTSE4GOOD (based on FTSE Russell research).

97th
AXA's percentile ranking (DJSI)

AAA
MSCI ESG Ratings

AXA's main SRI ratings are listed below (not all ratings are updated annually):

Agency/Organisation	Scores & ratings
Dow Jones Sustainability Indices	Score: 87/100 - Sector average : 40/100 Percentile ranking: 97th
MSCI ESG RATINGS	Rating: AAA (since 2015)
V.E	Score 68/100 - Sector leader
SUSTAINALYTICS	Ranking: 6/295 in sector
FTSE4Good	Present in the index since 2012 FTSE ESG Score: 4/5

Note: The Dow Jones Sustainability Index is a reference performance indicator for AXA, its methodology serves as the basis for the AXA Entities Sustainability Index since 2010, and is one of the performance metrics used to calculate long term incentives (Performance Shares) since 2016.

6.2 Sustainability-related memberships

AXA has supported many investors and insurance-led coalitions in the field of ESG and is an active member of the following organizations:

- **UNEP-FI:** since 2012. AXA serves on the Global Steering Committee of the UNEP Finance Initiative which works with several banks, insurers, investors and institutions to accelerate sustainable finance. In 2021, AXA joined the UNEP FI leadership council to provide feedback on the main agenda;
- **UN PRI:** AXA has been a signatory of the UN Principles for Responsible Investment since 2012. The initiative was launched under the sponsorship of the UN in 2006. Signatories are invited to follow a set of 6 principles to better incorporate ESG into their investment decisions and ownership practices and publicly report on them each year;
- **UN PSI:** AXA is a signatory to the UN Principles for Sustainable Insurance;
- AXA is also a member of or has supported many other coalitions in the fields of climate change, ESG, RI and CSR, such as the UN Global Compact, CDP, ORSE, EpE, Finance for Tomorrow, etc. AXA's local entities also support numerous local initiatives.

6.3 Academic Research

AXA supports climate risk mitigation efforts by funding top-tier scientific research through the AXA Research Fund (the Fund). A scientific philanthropy initiative launched in 2008, the Fund supports academic research in health, climate and environment and socio-economic issues. The strategic focus is determined by an Advisory Board, and the selection of research projects is overseen by an independent Scientific Board.

As of 2021, the Fund had committed €250m to fund science. It has funded over 670 research projects in 38 countries, including over 230 projects focusing on climate and environment.

In 2021, the Fund selected a new AXA Chair on high-latitude fires[1] supported with €1m over 5 years. The AXA Chair in Wildfires and Climate is hosted at the School of Chemical and Environmental Engineering at the Technical University of Crete. It is led by Dr. Apostolos Voulgarakis, who uses fire and Earth system modeling, satellite observations and Machine Learning to inform prevention and preparedness strategies. Dr. Voulgarakis thus aims to:

- pursue cutting-edge research on the link between wildfires and climate; and
- significantly advance AXA's understanding of how fires may shape the future of climate.

In 2021, the Fund highlighted its support for climate and nature's resilience. With climate change and infrastructure development undeniably adding to the degradation of coastal ecosystem such as mangroves and coral reefs[2], the Fund held a Coastal Resilience and the Role of Nature Based Solutions webinar[3] attended by leading academic, government and industry experts to discuss:

- the challenges of coastal risk; and
- the opportunities to accelerate investment in nature-based solutions.

The Fund also selected four outstanding climate researchers for its AXA Awards for Climate Science[4] in recognition of their contribution to the understanding of climate change and related adaptation strategies. The four awardees are respectively working on:

- advancing the understanding of climate change;
- informing the predictability of occurrence and impact of extreme weather events such as heat waves and storms;
- describing and mitigating the effects of climate change on inequality; and
- promoting more resilient and fairer societies that are better prepared to face future global changes.

€250m

AXA Research Fund commitment to scientific research

The complete list of projects supported by the AXA Research Fund is available on www.axa-research.org

Context Box

Community – designed interventions to regenerate rainforest and prevent disease

At the 9th Geneva Health Forum (GHF), AXA Research Fund in partnership with the GHF launched the ***Grand Jet d'Or de Genève* prize 2022**[5].

The theme was "The COVID-19 Pandemic and Environmental Emergency: Reinventing Global Health in Times of Global Changes".

The forum brings together all those concerned with major global health issues.

Following a competitive selection process, the *Grand Jet d'Or de Genève* 2022 chose this research group: **"Healthy Forests, Healthy People: Health In Harmony, Harvard T. H. Chan School of Public Health, Zoo New England and Partners"**.

This multidisciplinary and dynamic research team brings together members from:

- the international Planetary Health NGO Health In Harmony (HIH);
- Harvard T. H. Chan School of Public Health;
- Zoo New England; and
- the Madagascar Health and Environmental Research (MAHERY).

The team is led by Dr. Sakib Burza, Medical Director of Health In Harmony and Honorary Associate Professor of Tropical and Infectious Diseases at the London School of Hygiene & Tropical Medicine.

This 10-year research program will study Community-Designed Interventions to Regenerate Rainforest and Prevent Disease in Madagascar. It will assess their impact on forest integrity, biodiversity, wildlife health and human health.

(1) These have been identified as a particularly threatening aspect for the balance of the Earth system.
(2) Thereby increasing the exposure of coastal communities to sea level rise, flooding, erosion and more.
(3) https://www.axa-research.org/en/events/coastal-resilience-and-the-role-of-nature-based-solutions
(4) https://www.axa-research.org/en/news/the-axa-research-fund-announces-the-four-winners-of-an-axa-award-for-their-contributions-to-climate-science
(5) https://www.axa-research.org/en/news/axa-geneva-health-forum-grand-jet-dor-de-geneve

6.4 Independent limited assurance report (PwC)

Independent limited assurance report on the Identified Information presented in the AXA 's 2022 Climate & Biodiversity Report

To the Board of Directors of AXA SA,

In our capacity as statutory auditor of AXA SA (the "Company" or "AXA") and upon your request, we have undertaken a limited assurance engagement in respect of the following selected sustainability indicators for the year ended December 31, 2021:

- Aggregate Corporate Securities (Equity and Debt) Warming Potential (section 4.2 Climate metrics - subsections "Warming Potential" methodology applied to corporate equity and debt and "Warming Potential": 2021 Corporate equity and debt results)
- Climate Value at Risk for Corporate Securities (section 4.2 Climate metrics – subsection "Risk: Climate Value-at-Risk (CvaR)")
- Carbon footprint of Corporate Securities and Sovereign Debt (section 4.2 Climate metrics – subsection "Carbon footprint – new approaches")
- Amount of Green Bonds (section 4.3 Green Investments - subsection "A focus on Green Bonds")
- Carbon footprint of group's operations (section 4.5 Direct Environmental footprint management)
- Qualitative information relating to the pilot on the biodiversity footprint of group's operations (section 4.4 Biodiversity metrics – subsection "Impacts of AXA's own operations on biodiversity")

the "Identified Information" which is disclosed in the Company's 2022 Climate & Biodiversity Report at the section indicated.

Our assurance does not extend to information in respect of earlier periods or to any other information included in the 2022 Climate & Biodiversity Report (either linked or not to the Identified Information), including any images, audio files or embedded videos.

Our Limited Assurance Conclusion

Based on the procedures we have performed as described under the section "Summary of the work we performed as the basis for our assurance conclusion" and the evidence we have obtained, nothing has come to our attention that causes us to believe that the Identified Information for the year ended December 31, 2021 presented in the Company's 2022 Climate & Biodiversity Report as at June 24, 2022 is not prepared, in all material respects, in accordance with the Criteria (see below under "Understanding how AXA has prepared the Identified Information").

We do not express an assurance conclusion on information in respect of earlier periods not covered by the 2022 Climate & Biodiversity Report. We have not reviewed and do not provide any assurance over other individual project information reported.

Understanding how AXA has prepared the Identified Information

The absence of a commonly used generally accepted reporting framework or a significant body of established practice on which to draw to evaluate and measure the Identified Information allows for different, but acceptable, measurement techniques that can affect comparability between entities and over time. In addition, greenhouse gas quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

- Consequently, the Identified Information needs to be read and understood together with the following procedures:
- MSCI Climate Value-at-Risk and Warming Potential: Model Update Notes, 2021;
- MSCI - Carbon-Delta Methodology, January 2020 and Scope 3 Carbon Emissions Estimation Methodology, July 2020;
- S&P Global - Trucost Data Methodology Guide - Corporate Environmental Performance, July 2019;
- Guide to Green Bonds on the Terminal - Understanding the Bloomberg Green Bond Universe, June 2021;
- Environmental Reporting Protocol, 2021;

the "Criteria", which AXA has used to prepare the Identified Information, and significant elements of which are disclosed in the 2022 Climate & Biodiversity report and available upon request from the Company's headquarters.

AXA's Responsibilities

Management of AXA are responsible for:

- selecting or establishing suitable Criteria for preparing the Identified Information;
- the preparation of the Identified Information in accordance with the Criteria;
- designing, implementing, and maintaining internal controls over information relevant to the preparation of the Identified Information that is free from material misstatement, whether due to fraud or error.

Our Responsibilities

We are responsible for:

- planning and performing the engagement to obtain limited assurance about whether the Identified Information is free from material misstatement, whether due to fraud or error;
- forming an independent conclusion, based on the procedures we have performed and the evidence we have obtained; and
- reporting our conclusion to the Directors of the Company.

As we are engaged to form an independent conclusion on the Identified Information as prepared by management, we are not permitted to be involved in the preparation of the Identified Information as doing so may compromise our independence.

Professional Standards Applied

We performed our limited assurance engagement in accordance with International Standard on Assurance Engagements (ISAE) 3000 (Revised), "Assurance Engagements other than Audits or Reviews of Historical Financial Information" issued by the International Auditing and Assurance Standards Board.

Our Independence and Quality Control

We have complied with the independence and other ethical requirements of the French Code of Ethics for statutory auditors (code de déontologie) and the International Code of Ethics for Professional Accountants (including International Independence Standards) issued by the International Ethics Standards Board for Accountants (IESBA Code), which are founded on fundamental principles of integrity,

objectivity, professional competence and due care, confidentiality, and professional behavior. We have also complied with the provisions set forth in Article L. 822-11-3 of the French commercial code (code de commerce).

Our firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

Our work was carried out by an independent and multidisciplinary team including assurance practitioners, engineers, and environmental scientists.

Summary of the Work we Performed as the Basis for our Assurance Conclusion

The procedures we performed were based on our professional judgment and included inquiries, observation of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records.

Given the circumstances of the engagement, in performing the procedures listed above we:

- made inquiries of the persons responsible for the Identified Information;
- obtained an understanding of the process for collecting and reporting the Identified Information;
- performed limited testing of relevant documents and records on a sample basis;
- performed limited testing and reviewing on a sample basis of quantitative information related to the Identified Information to check that the data had been appropriately measured, recorded, collected, and reported; and
- considered the disclosure and presentation of the Identified Information.

For Warming Potential and Climate Value at Risk information, calculated by the external provider MSCI, our procedures did not include the review of MSCI's databases, computation, and information systems nor quality management procedures. For Carbon footprint and Green Bonds information, our procedures did not include the review of the preparation of S&P Trucost's and Bloomberg's databases.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement.

Neuilly-sur-Seine, France
June 29, 2022

PricewaterhouseCoopers Audit

Bénédicte Vignon
Partner

Sylvain Lambert
Partner, Sustainability

6.5 Disclaimer

Cautionary statement regarding forward looking statements and important legal information

This Climate and Biodiversity Report may include statements with respect to future events, trends, plans, expectations or objectives and other forward-looking statements relating to the AXA Group's future business, financial condition, results of operations, performance and strategy as they relate to the climate objectives and other goals set forth herein. Forward-looking statements are not statements of historical fact and may contain the terms "may", "will", "should", "continue", "aims", "estimates", "projects", "believes", "intends", "expects", "plans", "seeks" or "anticipates" or words of similar meaning. Such statements are based on Management's current views and assumptions and, by nature, involve known and unknown risks and uncertainties; therefore, undue reliance should not be placed on them. In particular, the actual achievement of the climate-related and other goals set forth in this Climate and Biodiversity Report may differ materially from those expressed or implied in such forward-looking statements. Furthermore, many of the factors impacting the achievement of our climate goals may be more likely to occur, or more pronounced, as a result of catastrophic events, such as weather-related and other catastrophic events, including pandemic events. Please refer to Part 5 – "Risk Factors and Risk Management" of AXA's Universal Registration Document for the year ended December 31, 2021 (the "2021 Universal Registration Document"), available on AXA's website (www.axa.com), for a description of certain important factors, risks and uncertainties that may affect AXA's business and/or results of operations, particularly in respect of the COVID-19 crisis. AXA assumes no obligation to update or revise any of these forward-looking statements, whether to reflect new information, future events or circumstances or otherwise, except as required by applicable laws and regulations.

This Climate and Biodiversity Report and the information included herein were prepared on the basis of data made available to the AXA Group as of the date of this Climate and Biodiversity Report. Unless stated otherwise in this Climate and Biodiversity Report, thisClimate and Biodiversity Report and the information included herein are current only as of such date.

This Climate and Biodiversity Report refers to certain non-financial metrics, such as ESG scores, key performance indicators, controversy scores, climate or sustainability-related metrics and benchmarks, as well as other non-financial data, all of which are subject to measurement uncertainties resulting from limitations inherent in the nature and the methods used to determine them. Non-financial metrics used herein generally have no standardized meaning and may not be comparable to similarly labelled measures used by other companies. In addition, the AXA Group reserves the right to amend, adjust and/or restate the data presented in this Climate and Biodiversity Report, from time to time, without notice and without explanation. The data presented or included in this Climate and Biodiversity Report may also be further updated, amended, revised or discontinued in subsequent publications of the AXA Group depending on, among other things, the availability, fairness, adequacy, accuracy, reasonableness or completeness of the information, or changes in applicable circumstances, including changes in applicable laws and regulations.

The measurement techniques used for determining non-financial metrics and data may involve complex modelling processes and research.

The use of different measurement techniques can also result in materially different measurements, while the precision of these techniques may vary. In addition, the determination and use of non-financial metrics and data, in particular when integrating sustainability risks or the impact of investment decisions on sustainability factors in investment processes, remains subject to the limited availability of relevant data: such data is not yet systematically disclosed by issuers, or, when disclosed by issuers or collected from third-party data providers, it may be incorrect, incomplete or follow various reporting methodologies. Furthermore, most of the information used to determine non-financial metrics or factors is based on historical data, which may not be complete or accurate or may not fully reflect the future non-financial performance or risks of the underlying investments.

Although a rigorous selection process is applied to data providers with a view to provide appropriate levels of oversight, AXA's ESG and other processes, including AXA's proprietary ESG scoring tool, may not necessarily capture all non-financial risks and, as a result, AXA's assessment of the impact of its investment decisions on sustainability factors may not be accurate, or unforeseen sustainability events could adversely affect the performance of the investment portfolio. While the methodologies for non-financial scoring applied by AXA are regularly updated to take into account changes in the availability of data or methodologies used by issuers to disclose non-financial information, there is no assurance that such methodologies are or will be successful at capturing all non-financial factors.

This Climate and Biodiversity Report may include or refer to information obtained from, or established on the basis of, various third-party sources, including, but not limited to, third-party benchmarks and indexes. Such information may not have been reviewed by AXA, and AXA does not approve or endorse such information by inclusion thereof or reference thereto. In addition, such third-party information may not have been independently verified. Accordingly, AXA does not guarantee the fairness, adequacy, accuracy, reasonableness or completeness of such information, and no representation, warranty or undertaking, express or implied, is made or responsibility or liability is accepted by AXA as to the fairness, adequacy, accuracy, reasonableness or completeness of such information, and AXA shall not be obliged to update or revise such information.

In accordance with applicable laws and regulations, AXA's 2021 Universal Registration Document includes, in particular, (i) all the components of the Annual Financial Report (rapport financier annuel) referred to in Article L. 451-1-2(I) of the French Monetary and Financial Code (Code monétaire et financier) as well as in Article 222-3 of the AMF General Regulation (Règlement Général); (ii) all disclosure matters required to be included in the Board of Directors' report to AXA's Shareholders' Meeting held on April 28, 2022, established pursuant to Articles L. 225-100 et seq. and L. 22-10-35 et seq. of the French Commercial Code (Code de commerce); and (iii) all the elements required to be included in the corporate governance report established pursuant to Articles L. 225-37 et seq. and L. 22-10-8 et seq. of the French Commercial Code.

This Climate and Biodiversity Report does not form part of AXA's 2021 Universal Registration Document and is not intended to address or provide information in respect of, nor should it be relied upon as addressing, or should any reference herein to AXA's 2021 Universal Registration Document be construed as addressing, any of the abovementioned requirements of (i) the Annual Financial Report, (ii) the Board of Directors' report to AXA's Shareholders' Meeting or (iii) the corporate governance report. For the avoidance of doubt, any reference in this Climate and Biodiversity Report to Article 173 of Law No. 2015- 992 of August 17, 2015, should be construed solely as a reference to paragraph VI thereof and related implementing measures.

Where reference is made to a website in this Climate and Biodiversity Report, the contents of such website do not form part of this Climate and Biodiversity Report.

This Climate and Biodiversity Report does not purport, nor intend, to comply with the requirements set forth in Article 29 of Law No. 2019-1147 of November 8, 2019, Decree No. 2021-663 of May 27, 2021, Regulation (EU) 2020/852 of the European Parliament and of the Council of June 18, 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (the "Taxonomy Regulation") or Regulation (EU) 2019/2088 of the European Parliament and of the Council of November 27, 2019 on sustainability-related disclosures in the financial services sector (the "SFDR Regulation"), including their respective commission delegated regulations, or with the voluntary disclosure recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

Photo credits: AXA - UN Climate Change (top of page 9) - Shutterstock - Climate Visuals - Unsplash - Stocknap - Flaticon - Freepik

Report development and coordination: AXA Group Sustainability - Céline Soubranne, Roslyn Stein, Marika Rueter, Estelle Zhang

Designed & published by LABRADOR INFORMATION DESIGN +33 (0)1 53 06 30 80

www.axa.com