Institute and Faculty of Actuaries

Thematic Review report

December 2025

# Thematic Review report

## Actuarial involvement in climate and sustainability work

by Alan Marshall

# Contents

# Foreword

## Sam Younger, Lay Chair of the IFoA Regulatory Board

> **This report provides a valuable and timely overview of the activities of actuaries navigating this high-profile area of risk.**

Barely a day goes by without a reminder of the challenge represented by climate change. So the Board warmly welcomes the latest report of the Actuarial Monitoring Scheme (AMS) focusing on climate and sustainability. The report is an important part of the regulatory work of the Institute and Faculty of Actuaries (IFoA) in independently reviewing areas in which actuaries have significant involvement and influence. I would like to thank all of those IFoA members and organisations that took part.

This report provides a valuable and timely overview of both the activities of actuaries navigating this high-profile area of risk and of the latest developments around the world as firms, regulators and governments seek to mitigate potential harms. At our November meeting, the IFoA Regulatory Board endorsed the report's key findings and conclusions.

The Board recognises that - since actuaries are usually working alongside other experts rather than in isolation - any further specific IFoA actions need to be very carefully considered, especially in relation to mandatory standards. However, not one of the actuaries who contributed to the report felt that there was already too much guidance and other resources, while 60% thought there should be more. The Board is therefore examining how existing guidance and professional skills resources can be enhanced to recognise the ever-changing landscape and further support actuaries. The Board also recognises the power of collaboration on major cross-cutting topics such as this. We will continue to engage with those IFoA members and volunteers who take an active interest in climate and sustainability with a view to amplifying the voice of the profession and encourage ongoing research and thought leadership alongside the global actuarial organisations and other agencies.

**Sam Younger**
Lay Chair of the IFoA Regulatory Board

December 2025

# Introduction

## Alan Marshall, Review Actuary

**It is important that IFoA members are supported to continue work in influencing and leading activity in this area.**

*"Often complementing science, actuaries, alongside risk-analysis experts, have a direct and important contribution to make to the management of climate risks going forward."*
Sir David King, Climate Crisis Advisory Group founder and Chair

Climate and sustainability are defining issues of our time, and the skills of actuaries are making a difference in how we understand and manage associated risks across a range of domains. It is important that IFoA members are supported to continue work in influencing and leading activity in this area, and this review highlights key aspects where this can be enhanced.

Thank you to the individuals and firms who participated in our review, providing fascinating and thoughtful insights from their work on climate and sustainability. We also heard how actuaries can be supported to continue developing as key professionals in this field, both from a thought leadership and client delivery perspective.

The wider context is of consistent and growing scientific evidence, challenged by a changing political landscape. Through this actuaries continue to deliver evidence-based analysis, in a number of ways across this broad topic, to help drive positive social, environmental, and economic outcomes.

**Alan Marshall**
Review Actuary

December 2025

# Executive summary

## A great many actuaries are now thinking about climate and sustainability risks in their work, with some going a lot further to promote the necessary action.

The profession has a significant ongoing role to keep actuarial insight and advice relevant to a rapidly changing world. This report seeks to help actuaries, and those who rely upon actuarial advice, understand more about what tangible activity is taking place, and what support is out there to guide and encourage ongoing learning and development.

### Broadening horizons of actuarial involvement

Actuaries are playing their part across a wide range of domains and territories in tackling the risks and opportunities associated with climate change and sustainability. Across insurance, pensions and investments, actuarial involvement has extended to provide significant and wide-ranging advice to their firms and clients in this topic. This extends to wider fields such as banking, and where climate and sustainability consulting is the main driver. We had submissions from across the globe, also indicating this is a high-profile area of actuarial work. We have seen increased levels of actuaries in senior leadership roles focused on climate and sustainability.

### Actuaries influencing climate and sustainability thought leadership

The IFoA and the wider global actuarial community has recognised the emerging risks associated with climate change for many years. More recently actuaries have increased thought leadership output and played a considerable role in driving this thinking forwards at their firms and through professional volunteer activity. Often this involves working with other disciplines, recognising their expertise, and promoting that of actuaries.

### Supporting actuaries managing climate-related risks

The IFoA has several ways in which it supports actuaries, across Regulatory, Policy, Communities, and Learning. For a fast-moving, evolving topic like this it is critical that the support keeps pace with the requirements of our members and their organisations. Key outputs include:

- Professional and ethical guidance
- Risk alerts
- Climate & Sustainability post-qualification course and certificate
- Series of thought leadership reports
- Numerous ongoing climate and sustainability working parties, across a range of topics
- Dedicated climate investment symposium to complement ongoing focus at the main IFoA conferences

### Importance of collaboration

Actuaries collaborate extensively both within their firms, and through thought leadership activity. This recognises both the skills actuaries can apply in climate and sustainability activity, and also the importance of interacting with other professionals with expertise in this space.

### The developing scientific outlook

The scientific output confirming the impacts of global warming, and the influence on human activity on this, continues unabated. Scenarios that were perhaps deemed as tail risks in the past, are now appearing more firmly in the main body of expected outcomes. The geopolitical background has changed, and this threatens a consensus view on the extent of human influence on climate change, and how to mitigate the harms, putting previously agreed goals under significant pressure. It is critical that actuaries continue to focus on evidence-based analysis and research and use judgement on how to apply this to potential future scenarios, helping to support robust decision-making.

### Main conclusions

- There is increased actuarial involvement and influence across a wide range of domains, with case studies providing significant insight on actuaries' work on the ground. This emphasises the need for ongoing IFoA support for actuaries working in this critical, and fast-developing, risk of our time.
- Climate-related risks continue to evolve with emerging scientific evidence that tail risk and tipping points are crystallising. It is important that actuaries continue to support thought leadership, policy development, and robust decision-making in conjunction with other experts in the field.

# Background and context

## 50 years of developing international collaboration

The 1972 United Nations (UN) Conference on the Human Environment in Stockholm was the first world conference to make the environment a major issue. The participants adopted a series of principles for sound management of the environment.

The Kyoto Protocol, the first international treaty to set legally binding targets to cut greenhouse gas emissions, was adopted on 11 December 1997, in Kyoto, Japan.

The Paris Agreement is a legally binding international treaty on climate change signed at the UN Climate Change Conference (COP21), on 12 December 2015. Its overarching goal is to hold *"the increase in the global average temperature to well below 2°C above pre-industrial levels"* and pursue efforts *"to limit the temperature increase to 1.5°C above pre-industrial levels."*

At COP26 in 2021, nations adopted the Glasgow Climate Pact, targeting a decade of climate action and support. Decisions included strengthened efforts to build resilience to climate change, to curb greenhouse gas emissions and to provide the necessary finance for both. For the first time, nations are called upon to phase down unabated coal power and inefficient subsidies for fossil fuels.

Just prior to the publication of this report, COP30 will have taken place in Brazil. The outcomes from this will provide an important steer on where global actions have reached in tackling climate change, and the extent to which recent changes in the political environment are impacting global co-operation risking the potential pull-back of climate-friendly policies in some jurisdictions.

### The unrelenting science

The international scientific and academic community continues to provide robust and consistent analysis pointing to worsening climatic conditions and its implications.

The **World Meteorological Organisation (WMO) State of the Global Climate 2024 report**[1] highlights the pressure a 1.5 degree warming target is already under:

*"The annually averaged global mean near-surface temperature in 2024 was 1.55 °C ± 0.13 °C above the 1850–1900 average. This is the warmest year in the 175-year observational record, beating the previous record set only the year before. While a single year above 1.5 °C of warming does not indicate that the long-term temperature goals of the Paris Agreement are out of reach, it is a wake-up call that we are increasing the risks to our lives, economies and the planet."*

The **Intergovernmental Panel on Climate Change (IPCC) 2023 Synthesis report**[2] observes environmental changes already taking place:

*"Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. Human-caused climate change is already affecting many weather and climate extremes in every region across the globe. This has led to widespread adverse impacts and related losses and damages to nature and people (high confidence). Vulnerable communities who have historically contributed the least to current climate change are disproportionately affected (high confidence)."*

The **Planetary Health Check 2025**[3] focuses on boundaries being breached:

*"The 2025 PHC report concludes that seven out of nine Planetary Boundaries have been breached, with all of those seven showing trends of increasing pressure – suggesting further deterioration and destabilization of planetary health in the near future"*

The **Global Tipping Points 2025 summary report**[4] further emphasises the points raised above, and highlights emerging positive elements:

*"Positive tipping points are starting to interact and reinforce one another. Policies targeting super-leverage points of interaction can help trigger this cascading positive change. Reinforcing feedback between civil society and policymakers is also critical to amplifying positive change."*

1 | WMO State of the Global Climate 2024 report
2 | IPCC 2023 Synthesis report
3 | Planetary Health Check 2025 - A Scientific Assessment of the State of the Planet
4 | Global Tipping Points 2025 summary report

## Impacts on the financial sector

The financial sector is exposed to the physical and transition risks associated with climate change.

Increasingly views exist that investment markets are placing overly optimistic valuations on carbon-exposed assets. The rapidly closing window for an orderly transition, exacerbates such market risks.

Earlier this year, **Günther Thallinger**[5], on the board of Allianz SE, said that the world is approaching a point where insurers will no longer be able to offer cover for many climate-related risks. He said that without insurance, many other financial services become unviable, from mortgages to investments.

Concerns grow that an already existing insurance gap will only get worse as extreme events become more common and insurers pull back from markets as cover no longer meets an acceptable measure of an unlikely event. The **World Economic Forum**[6] has questioned what this means for the historical role of insurance as a reliable source of risk transfer for corporate assets in relation to climate shocks.

### Finding 1

The scientific output confirming the impacts of global warming, and the influence of human activity, continues unabated. Scenarios that were deemed as tail risks in the past, are now appearing more firmly in the main body of expected outcomes. The geopolitical background has changed, and this threatens a consensus view on the extent of human influence on climate change, how to mitigate the harms and puts previously agreed goals under significant pressure. It is therefore critical that actuaries continue to focus on evidence-based analysis and research and use judgement on how to apply this to potential future scenarios, helping to support robust decision-making.

5 | The Guardian - Climate crisis on track to destroy capitalism, warns top insurer

6 | WEF - Rethinking climate risk and insurance can help boards boost company value and resilience

# Involvement of actuaries

## We gathered evidence showing significant involvement of actuaries in climate and sustainability.

This encompasses a range of domains and territories, with actuaries well placed to carry out analysis and, with the right wider skills to take on senior roles related to this area of work.

Organisational responses included pensions and actuarial consultancies, insurers and representative bodies. Individual responses included those working directly in climate and sustainability, risk management, banking, and insurance.

The most common geographical location for submissions was the UK, with further input from members and organisations based in Asia, Africa, Europe, and beyond, mirroring the international reach of the IFoA.

### Finding 2

Across insurance, pensions and investments, actuaries are involved in providing advice to their firms and clients in this topic, and this extends to wider fields such as banking. We had submissions from across the globe, also indicating this is a high-profile area of actuarial work.

### Types of work, functions, and roles

We asked questions on the types of work actuaries are involved with where climate and sustainability play a part, either as a factor to consider in traditional actuarial work, or where it is the key driver for a given project. We also asked questions during the interviews we carried out to understand the balance of activity between the two.

We found that across the responses there is a significant and growing impact on a wide range of actuarial work, and that actuaries are heavily involved in climate-driven projects. Investment related work is perhaps the most developed and prevalent area, across disciplines.

> "Climate and sustainability considerations are embedded across actuarial functions, with a focus on cross-disciplinary collaboration between investment and actuarial teams. Our approach ensures that climate risks, opportunities, and regulatory requirements are systematically integrated into the core investment advisory process, while aligning with key actuarial strategies."

> "Most projects have actuaries from a central team assisting with climate-related work, acting as an actuarial bridge between risk and wider business."

We highlight below some of the detailed areas of actuarial work participants indicated climate and sustainability is having an impact.

**Activities across disciplines**

- Stress and scenario testing
- Broader risk management
- Strategic asset selection
- Financial reporting disclosures
- Business planning
- Asset-liability modelling
- Credit risk analysis

**Insurance specific**

- Own risk and solvency assessment
- Exposure management
- Pricing
- Reserving
- Capital model calibrations
- Propositional design
- Operational risk analysis
- Catastrophe modelling

**Pensions and Investment specific**

- Funding and valuation
- Fiduciary responsibilities
- Investment manager assessment
- Covenant reviews
- Risk transfer activity, including assessment of counterparties
- Environmental Social and Governance (ESG) client training
- Governance advice

## Finding 3

Climate considerations are now part of most core areas of work where actuaries play a significant part. Participants told us that climate-related work involving actuaries is more likely to be most established in investment and risk teams.

We also asked for examples where actuaries were involved with projects and activities where climate and sustainability were the main driver of the work. This provided a range of responses:

| | | |
|---|---|---|
| Climate risk strategy | Specialist climate and disaster team | Sustainability risk appetite statements |
| Managing asset portfolios to net-zero targets | Climate transition planning | Sustainability frameworks |
| Emissions data analysis | Physical and transition risk modelling | Climate regulation compliance |

> "We have a dedicated Climate and Disaster Risk Team leading on work in this area. This has included working with clients to identify and prioritise climate-related risks and opportunities, develop bespoke scenarios and bring it all together through qualitative and quantitative climate scenario analysis."

> "In Sustainable Investment, actuaries lead the development of data-driven climate-risk metrics, integrate physical and transition risk into manager research, and oversee the governance of delegated portfolios (including the assessment of climate performance and progress towards climate goals). This work relies on transparent analytics to separate scientific signal from politically-charged noise and therefore has strategic influence across large asset pools."

In terms of the balance of actuarial activity, one participant mentioned that this would often depend on company structures and use cases, and to the extent that actuaries worked in a risk function or in first-line delivery roles.

> "In my experience actuaries are directly involved either where it cuts across their work or where climate teams or other business areas want help with things like measuring a carbon footprint. I believe actuaries can especially help with this because data isn't perfect, so judgement and approximations are required, which is something actuaries are very familiar with."

> "Climate and sustainability risks should be embedded into decision-making processes across the organisation. As such, they must be integrated into a wide range of use cases from strategy, business planning and solvency capital assessments to risk management, risk appetite frameworks, pricing, and underwriting decisions."

Participants told us of a range of senior climate and sustainability roles with actuaries in post, often at a director or 'Head of' level and included roles with a focus on nature and the environment.

This emphasises the opportunity for actuaries to have broader roles across a range of organisations, and how the profession is seen in a positive light in relation to climate and sustainability roles. Based on the submissions to our review this is weighted towards investment and risk roles (although this may be the case in general across financial services).

One contribution to the review mentioned the importance of the IFoA continuing to support actuaries to be in this space, by emphasising the skills actuaries can bring to bear in tackling climate risk (like pandemic risk, where actuarial expertise in mortality is widely understood).

### Finding 4

We have seen a range of examples of actuaries working on specific climate-related projects, and actuaries in senior leadership roles focused on climate and sustainability.

## How the role of actuaries compares with other professionals, and how they work together

We asked questions about who actuaries interacted with on this type of work, the balance of that interaction and how this may have changed in recent years. Participants told us that climate and sustainability usually involved collaboration with our professionals, and we observed that the balance of work and influence between disciplines depended on the type of work and domain.

**Chart 1**

With respect to climate and sustainability work at your organisations, what is the level of: involvement of actuaries compared to other professionals?

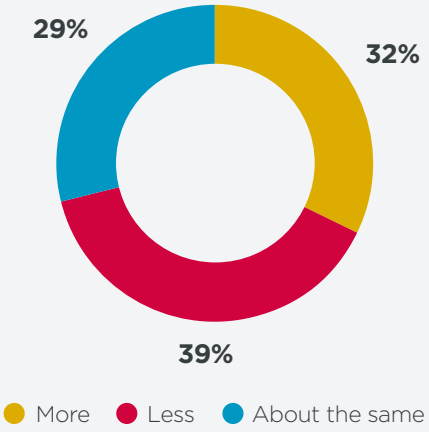
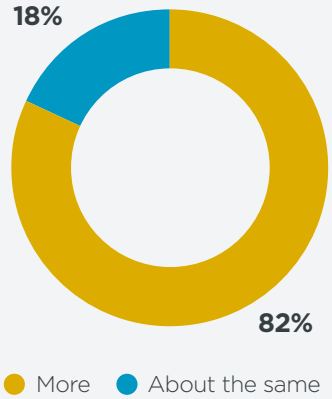



Chart 1 shows a relatively even split in responses on the involvement of actuaries compared to other professionals. Our data is not significant at a lower level; however, as indicated above, it is likely that actuarial involvement will to some extent depend on the domain in question.

When asked about the overall level of climate and sustainability work at their firm compared to 3-5 years ago, it is encouraging, and not surprising, that 90% of respondents indicated more activity. The same question focused on the activity of actuaries saw 82% say there is more actuarial involvement, with 18% indicating about the same – again an encouraging statistic (Chart 2 below).

**Chart 2**

With respect to climate and sustainability work at your organisations, what is the level of: involvement of actuaries compared to 3 to 5 years ago?




## Finding 5

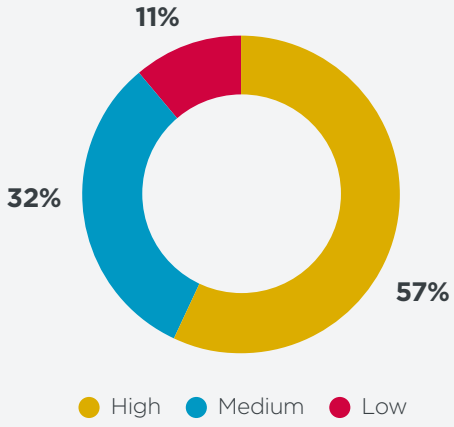
Actuaries collaborate extensively within their firms, emphasising the need to be multidisciplinary in nature. This recognises both the skills actuaries can apply in climate and sustainability activity, and the importance of interacting with other professionals with expertise in this space. The extent of work in this area has increased in the last 3-5 years, both in terms of overall firm activity and that of actuaries.

## Impact of actuarial involvement in climate and sustainability

Chart 3 below shows that over half of review participants indicated that actuarial involvement had a high impact on this work, with a further third indicating a medium impact.

**Chart 3**

Describe the impact actuarial involvement has had on your organisation in terms of approaches and outputs.




We asked about the impact of climate and sustainability work on customers and clients, and this perhaps shows there is still some way to go in ensuring demonstrable benefits can be evidenced more often. Most respondents indicated a medium impact, (see Chart 4 on the following page). This was backed up in interviews with comments that it could be challenging to gain traction for aspects of client work where there was no regulatory imperative.

**Chart 4**

Describe the impact this has had on customers or clients, thinking about aspects such as investments, products, and advice.

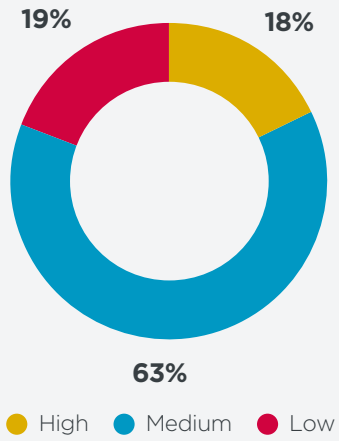
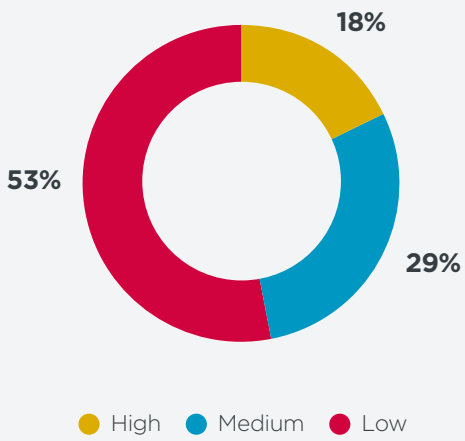



**Chart 5**

Thinking about wider risk – please indicate the level of activity at your organisation which is focused on biodiversity and nature considerations.




## Finding 6

Actuaries have a significant impact on climate and sustainability outputs at their firms. More widely there is some way to go to ensure that the benefits of climate and sustainability focus is consistently translated at a firm-level to customers and clients.

## Work focused on biodiversity

We asked about activity relating to biodiversity and nature considerations and Chart 5 shows that over 80% of respondents indicated this was medium or low at their organisations. This is likely an area where organisations are more likely to be at the start of considerations, both in terms of impact on their business and prioritisation.

We received an interesting case study where a participant is already providing advice to clients in this emerging area of high importance.

## Case Study – Assessing nature exposure in client portfolios

Given the rising importance of biodiversity and nature risk, and its interrelation with climate risk, we have started to support clients in monitoring nature exposure across their portfolios. Our process begins with educating clients on exposure to nature risks and how to engage with managers. Our reporting methodology follows the Taskforce on Nature-related Financial Disclosures (TNFD) guidance to approach monitoring by looking at, and targeting, exposures in key risk sectors. We offer this to clients as part of climate-risk reporting or standalone nature reporting. The priority is to ensure clients are well equipped and ahead of the curve to report against TNFD, should the guidance become mandatory in the future.

# Resources for actuaries

The review questionnaire focused on four key areas where requirements and resources exist to help actuaries with climate and sustainability work:

- Actuarial standards and guidance
- Wider regulatory requirements
- Thought leadership material
- Education and lifelong learning

We asked participants what elements had the greatest impact on their work, and to highlight specific examples that helped them.

## Actuarial standards and guidance

There exists a variety of standards for IFoA members to follow in carrying out actuarial work: the Code, Actuarial Professional Standards (APS), International Standards of Actuarial Practice (ISAP), or equivalent, including UK Technical Actuarial Standards (TAS). The Regulatory Board has also published **non-mandatory guidance**[7] and three Risk Alerts relating to climate risks and associated actuarial work.

Participants said that all aspects of actuarial regulation are relevant to climate and sustainability work, encompassing standards, guidance and risk alerts. 60% of responses indicated that the current level of standards and guidance is too little, with 40% indicating it is just right. No one said it was too much.

This shows a potential appetite for further activity in this space, in order that the actuarial regulatory environment appropriately supports members in this work.

Comments from participants provided helpful additional context, including where this can introduce challenges for actuaries in this field of work.

> "In our view much of the guidance published by the IFoA to date, including the ethical and professional guidance published in 2024 and the risk alerts published in recent years have been helpful in raising awareness and ensuring a common understanding of the general importance of incorporating and communicating climate and sustainability risks into actuarial work, and the professional obligations of actuaries in this areas."

> "We believe that due to the characteristics of climate and sustainability risks it is difficult to apply existing standards to this line of work. Their scope may be too narrow when dealing with these complex risks and their potential impact on all stakeholders."

> "As a profession we have not yet made it adequately clear how existential climate risks are."

> "The specific ethical and professional guidance on climate change is helpful in summarising how existing standards can be interpreted when conducting climate and sustainability work."

7 | IFoA Ethical and professional guidance on climate change

> "The principles-based nature of the actuarial standards means that we can apply them to climate and sustainability work, despite them not explicitly mentioning this topic. However, we do think that many actuaries are uncomfortable in applying the standards to this topic due to the unfamiliar nature of the topic."

> "Guidance can be helpful, but real change comes about when clients are forced to do something more, most notably through wider regulatory activity. If actuarial standards require more from actuaries but clients are not mandated to do anything then there is a disconnect and potentially backs actuaries into a corner."

> "We implemented TAS 100 for climate-related work. Some colleagues thought TAS 100 didn't apply in this context, forgetting that general TAS applies over all work actuaries do (even if specific TASs don't always)."

### Finding 7

Participants said that all aspects of actuarial regulation are relevant to climate and sustainability work, encompassing standards, guidance and risk alerts. A majority of responses indicated that the current level of standards and guidance is too little with no one saying it was too much. Additional comments highlighted some of the challenges actuaries face in applying professional standards in multidisciplinary environments, or to more novel risks.

## Wider regulatory material

Feedback from several participants highlighted that often activity at firms or clients was principally driven by regulatory imperative, with budget constraints impacting the demand for wider consideration. It remains a challenge to encourage activity beyond this, highlighting the importance of communicating the risks and opportunities appropriately.

From a UK perspective, the Prudential Regulatory Authority (PRA) supervisory statement **SS3/19**[8] on the management of climate risks by banks and insurers, was mentioned by participants from relevant firms, along with the recent related consultation paper **CP10/25**[9].

Internationally, Taskforce on Climate-related Disclosures (TCFD), now materially codified in **IFRS S2**[10], has wide applicability across actuarial domains.

Naturally, the territories being operated in had an impact on responses, and there were examples of local applicable regulatory activity.

One submission set out how a local regulator had introduced a climate-related risk directive requiring insurers to regularly share how climate change affects their business. Insurers must disclose their climate policy, explain how they identify and manage climate risks across different areas like reputation, credit, and operations, and share the key measures they use to track climate risk.

### Finding 8

Several participants indicated that climate and sustainability work is often driven by regulatory imperative, and persuading their firms and clients on the importance of wider activity can be a challenge.

## Thought leadership materials

In 2021 the IFoA issued a **climate change statement**[11] supporting the aims of the Paris Agreement and setting out the ways in which it would encourage and support actuaries to research and work in this area. This was followed up in 2022 with a **policy briefing**[12] setting out where the IFoA would seek to influence the debate on climate and sustainability.

8 | PRA SS3/19
9 | PRA CP10/25
10 | IFRS S2
11 | IFoA climate change statement 2021
12 | IFoA policy briefing - Climate Change: Managing Risk and Uncertainty

These publications followed extensive activity over a number of years by the IFoA Sustainability Board, and its predecessor the Resource and Environment Board. This activity continues unabated and, alongside a range of working parties, sets the foundation for the extensive actuarial thought leadership in this area.

Submissions to the review highlighted a range of further thought leadership material which impacted their work, both originating from the IFoA and wider sources. The **Climate Scorpion**[13] series of papers was a popular example, and these papers were also talked about as influencing the approach actuaries take to scenario design.

Other feedback included being clear on the limitations that exist in future predictions used in research work, and also the importance of actuaries proposing alternative approaches, in addition to challenging existing widely used scenarios.

One participant set out how thought leadership material had influenced activity at their firm:

> "We developed a longer-term stress test for my company's ORSA, which runs to 2050. The Climate Scorpion and Planetary Solvency reports influenced the reasonable worst-case outcome in the scenario."

### Finding 9

The IFoA and the wider global actuarial community has recognised the emerging risks associated with climate change for many years. More recently actuaries have increased thought leadership output and played a considerable role in driving this at their firms and through professional volunteer activity.

## Education and Lifelong learning materials

Overall, participants were evenly split on the question of whether current IFoA education and lifelong learning resources met their, or wider IFoA membership, needs on climate and sustainability.

Participants were generally positive about the range of education and lifelong learning resources provided by the IFoA, whilst highlighting areas of potential development and improvement.

There were common threads in the feedback, centred around the assessment syllabus containing sufficient material to prepare actuaries better in this area, and for consideration of additional detail in post-qualification beyond the existing 'entry-level' certification. For the latter, comments included the usefulness of the existing course where climate is peripheral to day-to-day work, with limitations where actuaries are in more specialist climate roles.

> "Several of our actuaries have been on the IFoA climate risk and sustainability course and found it helpful. However, there is a demand for more specialist, in depth training aimed at those more familiar with the topic."

> "Feedback from our employees on the IFoA climate and sustainability course has been overwhelmingly positive. It may be useful to include ESG training within the qualification pathway so we can make sure that all actuaries have a basic level of understanding in relation to climate and sustainability work."

> "Climate and sustainability are overarching themes that should be embedded into core training materials across the many areas of actuarial work – pre and post-qualification. It is important to embed climate and sustainability content into existing modules to improve the general levels of knowledge in the profession."

> "The IFoA's sustainability and climate change course is a good introduction to the topic but is likely too foundational to be of use to those currently working in the field."

13 | IFoA Climate Scorpion – the sting is in the tail

> "We should think about lots of use cases and consider climate in a helpful way for these. How many of our qualified actuaries really understand this risk (and nature risk)?"

Some participants mentioned that there are other lifelong learning suppliers that are potentially in a stronger place currently than the IFoA, such as Chartered Financial Analyst (CFA) and Global Association of Risk Professionals (GARP). Feedback included suggestions that actuaries may be better placed to utilise these or similar outlets, or that the IFoA should consider whether improvements to its offering would help bridge current gaps.

The IFoA Learning team is currently developing a competency framework to underpin the qualification pathway. This will include climate and sustainability aspects, alongside other key cross-cutting topics such as artificial intelligence, wider technology developments (including heightened cyber risks), and how the geopolitical environment can influence all of this. How this is weaved into the overall syllabus, and the assessment process, will need careful consideration to ensure it appropriately meets the needs of members and employers.

There is also ongoing consideration of how best to support qualified members seeking to develop further in this space. It is recognised that the current climate and sustainability certificate provides a helpful stepping stone for actuaries to learn the basics, but that there is appetite for deeper learning opportunities to develop more specialised knowledge.

### Finding 10

For post-qualification lifelong learning material there is support for the existing 'entry-level' course, and a desire for material looking in more depth at climate-related aspects.

# Example case studies

## We received a fantastic range of case studies across the submissions.

In our interviews with participants, we discovered more about the climate and sustainability work on the ground that actuaries are carrying out, both where this is led by actuaries, and where there is strong collaboration with other professionals.

In this section we set out examples of the case studies we received.

### Case Study – TCFD-aligned climate scenario analysis project

We helped a large client enhance its climate resilience and better understand the potential impact of climate risks on its strategy, finances and operations.

The programme of work included reviewing existing climate-related work done, updating the climate risk register (including both physical and transition risks, working collaboratively with the client to ensure broad coverage), doing an initial assessment of the risks and opportunities to inform a prioritisation exercise, developing bespoke scenarios and conducting scenario analysis to better understand the potential financial consequence of each risk.

Scenario analysis was conducted for priority risks and opportunities, including risks from extreme heat and precipitation, transition risks and a nature-related risk. Analysis was done qualitatively through desk-based research for each of the risks. For one of the risks further quantitative scenario analysis was carried out.

### Case Study – Setting decarbonisation goals for an underwriting portfolio

This project included:

- development of the framework to use
- baselining the underlying portfolio
- developing targets and implementing these into business functions
- ongoing monitoring and reporting against targets

Next step will be to provide data to expert underwriters to allow them to help in constructing the portfolio and its direction. Long term hope is to have climate metrics alongside traditional metrics, e.g. profitability.

### Case Study – Insurer assessments for bulk annuity transactions

By using an in-depth ESG questionnaire and scorecard (specific for pensions bulk annuity providers), we have produced an overall ESG rating with ratings across five key areas; Investment Approach, Risk Management, Stewardship, Reporting and Collaboration. There is also a separate climate score, which assesses the climate-related issues and considerations across these same five pillars, for each insurer in the market. The questionnaire includes requests for policies and case studies to evidence their approach to integrating sustainability factors and risks in their portfolio as well as their approach to stewardship and transparent reporting. This has been used by a client as part of an insurer pre-selection, where we looked at the ESG credentials of each insurer for the client to consider whether they wanted to rule any out on that basis.

## Case Study – Credit risk modelling secondment

When undertaking recent client work on a secondment basis for a regulated life insurer on credit risk modelling, where substantial long-term credit-risky debt exposures have clear potential for significant exposure to climate change and other sustainability risks, our client asked that we work based on historical data with no allowance for a temporal trend or changes in volatilities or dependencies.

We agreed to do this, on grounds that the work we were being asked to do by the client was firmly exploratory in nature to help build their understanding of the field (and not being developed for direct implementation). After discussion at an early stage in the work, the client accepted the inclusion in our output of a statement that we consider that these aspects are an important part of an overall credit risk measurement and modelling solution for their model purpose.

## Case Study – Net Zero project

Supporting a multinational organisation on a "Net Zero" project, with three main phases:

1. Measuring baseline emissions and capacity building
2. Developing a Net Zero pathway
3. Integrating that pathway into the organisation's governance and decision-making framework

This multi-year project had a team with actuaries particularly on the Sustainable Investment side. However, most of the team are non-actuaries. The actuaries on the team contributed to risk quantification, governance frameworks, and integration of sustainability into decision-making.

## Case Study – Investment principles and decisions

Key investment principles, and investment decisions regarding climate-related factors, are discussed and agreed at various management committees, the membership of which includes actuaries. This includes consideration of own-asset portfolio actions to support delivery of net-zero targets, workplace default fund criteria and life-styling, and the broader investment proposition offering to clients.

## Case Study – Climate change executive briefing

Developing an executive briefing on climate change and net zero as part of a net zero climate strategy review. This included the following sections:

**A.** Context – net zero terminology, the big picture, the transition, Financial Services challenges and physical risk including tipping points

**B.** Response – covered companies, clients, competitors and strategic options

A sustainability risk dashboard is also provided, providing indicators on aspects such as physical, transition, and nature risks.

Different executives have different appetites for level of information, and there is an aim to provide consistent information over time.

## Finding 11:

There is a wide range of implemented actuarial case studies highlighting the contributions of actuaries in helping firms and clients manage climate and sustainability risks. This covers both traditional actuarial work where climate is being considered, and more specific climate-related projects.

# Findings and conclusions

A full list of our findings and conclusions is given in the table below. These are set out in the order they appear in this report.

| | Findings: |
|---|---|
| 1 | The scientific output confirming the impacts of global warming, and the influence of human activity on this, continues unabated. Scenarios that were deemed as tail risks in the past, are now appearing more firmly in the main body of expected outcomes. The geopolitical background has changed, and this threatens a consensus view on the extent of human influence on climate change, how to mitigate the harms and puts previously agreed goals under significant pressure. It is therefore critical that actuaries continue to focus on evidence-based analysis and research and use judgement on how to apply this to potential future scenarios, helping to support robust decision-making. |
| 2 | Across insurance, pensions and investments, actuaries are involved in providing advice to their firms and clients in this topic, and this extends to wider fields such as banking. We had submissions from across the globe, also indicating this is a high-profile area of actuarial work. |
| 3 | Climate considerations are now part of most core areas of work where actuaries play a significant part. Participants told us that climate-related work involving actuaries is more likely to be most established in investment and risk teams. |
| 4 | We have seen a range of examples of actuaries working on specific climate-related projects, and actuaries in senior leadership roles focused on climate and sustainability. |
| 5 | Actuaries collaborate extensively within their firms, emphasising the need to be multidisciplinary in nature. This recognises both the skills actuaries can apply in climate and sustainability activity, and the importance of interacting with other professionals with expertise in this space. The extent of work in this area has increased in the last 3-5 years, both in terms of overall firm activity and that of actuaries. |
| 6 | Actuaries have a significant impact on climate and sustainability outputs at their firms. More widely there is some way to go to ensure that the benefits of climate and sustainability focus is consistently translated at a firm-level to customers and clients. |
| 7 | Participants said that all aspects of actuarial regulation are relevant to climate and sustainability work, encompassing standards, guidance and risk alerts. A majority of responses indicated that the current level of standards and guidance is too little with no one saying it was too much. Additional comments highlighted some of the challenges actuaries face in applying professional standards in multidisciplinary environments, or to more novel risks. |
| 8 | Several participants indicated that climate and sustainability work is often driven by regulatory imperative, and persuading their firms and clients on the importance of wider activity can be a challenge. |

| | Findings: |
|---|---|
| 9 | The IFoA and the wider global actuarial community has recognised the emerging risks associated with climate change for many years. More recently actuaries have increased thought leadership output and played a considerable role in driving this at their firms and through professional volunteer activity. |
| 10 | For post-qualification lifelong learning material there is support for the existing 'entry-level' course, and a desire for material looking in more depth at climate-related aspects. |
| 11 | There is a wide range of implemented actuarial case studies highlighting the contributions of actuaries in helping firms and clients manage climate and sustainability risks. This covers both traditional actuarial work where climate is being considered, and more specific climate-related projects. |

## Conslusions

| | Conclusions: |
|---|---|
| 1 | There is increased actuarial involvement and influence across a wide range of domains, with case studies providing significant insight on actuaries work on the ground. This emphasises the need for ongoing IFoA support for actuaries working in this critical, and fast-developing, risk of our time. |
| 2 | Climate-related risks continue to evolve with emerging scientific evidence that tail risk and tipping points are crystallising. It is important that actuaries continue to support thought leadership, policy development, and robust decision-making in conjunction with other experts in the field. |

# Appendix 1: Scope and approach

This Thematic Review was announced in December 2024 as:

### Climate and Sustainability risk

Actuaries have a crucial role in considering and communicating the financial risks of climate change and sustainability. The IFoA has become a thought leader in this area over recent years, issuing high-profile reports on climate and related topics. The purpose of this thematic review is to build on significant IFoA regulatory and thought leadership resources.

The review will examine the:

- extent and range of climate and sustainability work among the IFoA membership
- organisational context in which actuaries undertake such work
- application of professional and technical standards to such work
- views of members on the existing IFoA offering in this area

Review activity commenced in April 2025 and completed in November 2025.

The IFoA website provides more information on the work of the AMS Team.

## Review methodology

The review was carried out in a number of ways:

- Collecting information from organisations and individuals through a review questionnaire
- Asking for examples of material produced by actuaries
- Researching the business and regulatory environment
- A high-level review of the current actuarial education and lifelong learning material relevant to climate and sustainability
- Follow-up interviews with actuaries at participating organisations to understand the context of the questionnaire responses and any work examples received
- Further interviews with individuals knowledgeable in this field.

## Submissions and participation

We received 29 submissions to our review and carried out several supporting interviews. Thank you to all participants for their invaluable input, they are listed below.

**Organisations**

- Ario Advisory
- Government Actuary's Department
- Aegon
- Isio Group Limited
- Royal London
- Aon
- Willis Towers Watson
- Hymans Robertson LLP
- Association of Consulting Actuaries
- APR LLP
- Singapore Actuarial Society
- Flood Re

**Individuals**

- Pushkar Joshi
- Jérôme Crugnola-Humbert
- Robert Chanon
- Shubham Mehta
- Loubna Benkirane
- Anup Shrestha
- Andrew MacFarlane
- Mary Hall
- Oliver Bettis
- Roelof Coertze
- Matthew Byrne
- Paul J M Klumpes
- Xiao-Xuan (Sherwin) Li
- M Junaid Iqbal
- Doug Baird
- Sandy Trust

## How this report should be read

We have set out in this report the detailed results of our thematic review. The Executive Summary sets out our key findings and conclusions; a full list can be found on **page 19**.

## Findings and conclusions

The main output of this review is a series of findings based on the questionnaires and case studies submitted, conversations with actuaries in this field, and analysis of other relevant sources and material.

We have also set out conclusions highlighting where actuaries, regulators and other stakeholders might consider further work to follow-up one or more of the findings.

## References and abbreviations

Referenced documents or webpages are shown by footnotes on the relevant page. A full list of documents is set out in **Appendix 2**. Although abbreviations are defined when they first appear in this report, a full list is set out in **Appendix 3**.

## Case studies

We have highlighted several case studies in this report. These are based on the submissions made by organisations and individuals to this thematic review. In some cases, we have edited or supplemented the case studies to aid clarity or to reflect comments made in follow-up discussions.

## Status of report

This report has been prepared by the IFoA Review Team and is issued by the Regulatory Board of the IFoA. Its purpose is to report on findings of the thematic review on the involvement of actuaries in managing climate and sustainability risk.

This report imposes no obligation upon members over and above those embodied in **the Actuaries' Code**[14] (Code) or **the IFoA Standards Framework**,[15] which includes compliance with the Technical Actuarial Standards (TASs) set by the Financial Reporting Council (FRC). It is intended to be helpful to the IFoA and other regulators when considering developments in regulation. It is also intended to help actuaries in their work.

This report does not constitute legal advice. While care has been taken to ensure that it is accurate, up to date and useful, the IFoA does not accept any legal liability in relation to its content.

## Review of this report

An earlier draft of the report has been subject to review by an individual with significant experience in this topic, who did not otherwise take part in the review.

This, along with additional editorial review, is considered by the author to meet the Work Review requirements of **Actuarial Profession Standard (APS) X2.**[16]

We wish to thank the above individuals for their review comments, although the contents of this report, in particular the findings and observations within, remain the responsibility of the IFoA Review Team.

## Conflicts of interest

We are not aware of any conflicts of interest arising from the contents of this report in relation to the Review Team that carried out the work or the Regulatory Board that has commissioned the review work.

## Questions about this report

We welcome questions about this report which should be sent to **reviews@actuaries.org.uk**.

14 | The Actuaries' Code is the ethical Code of Conduct that all members of the IFoA must follow

15 | Standard Setting at the IFoA (2020)

16 | APS X2 – review of actuarial work

# Appendix 2: References


| No. | Title | Author |
|---|---|---|
| 1 | State of the Global Climate 2024 report | WMO |
| 2 | 2023 Synthesis report | IPCC |
| 3 | Planetary Health Check 2025 | Potsdam Institute for Climate Impact Research |
| 4 | Global Tipping Points 2025 summary | University of Exeter's Global Systems Institute |
| 5 | Climate crisis on track to destroy capitalism, warns top insurer | The Guardian |
| 6 | Rethinking climate risk and insurance can help boards boost company value and resilience | WEF |
| 7 | Ethical and professional guidance on climate change | IFoA |
| 8 | SS3/19 | PRA |
| 9 | CP10/25 | PRA |
| 10 | IFRS S2 | IFRS |
| 11 | IFoA Climate change statement | IFoA |
| 12 | IFoA Policy Briefing - Climate Change: Managing Risk and Uncertainty | IFoA |
| 13 | Climate Scorpion | IFoA (Sandy Trust, Oliver Bettis, Lucy Saye, Georgina Bedenham, Timothy M Lenton, Jesse F Abrams, Luke Kemp) |
| 14 | The Actuaries' Code | IFoA |
| 15 | Standard Setting at the IFoA (2020) | IFoA |
| 16 | APS X2 – review of actuarial work | IFoA |

# Appendix 3: Abbreviations

List of abbreviations used in this report

| Abbreviation | Full term |
|---|---|
| APS | Actuarial Profession Standard |
| CFA | Chartered Financial Analyst |
| ESG | Environmental Social and Governance |
| FCA | Financial Conduct Authority |
| FRC | Financial Reporting Council |
| GARP | Global Association of Risk Professionals |
| IFoA | Institute and Faculty of Actuaries |
| IPCC | Intergovernmental Panel on Climate Change |
| ISAP | International Standard of Actuarial Practice |
| PRA | Prudential Regulatory Authority |
| TAS | Technical Actuarial Standard |
| TCFD | Taskforce on Climate-related Disclosures |
| TNFD | Taskforce on Nature-related Financial Disclosures |
| UN | United Nations |
| WMO | World Meteorological Organisation |

Institute and Faculty of Actuaries

**Thematic Review report** **December 2025**


**Beijing**
Room 512 · 5/F Block A · Landgentbldg Center · No. 20 East Middle 3rd Ring Road
Chaoyang District · Beijing 100022 · People's Republic of China
**Tel:** +86 10 6611 6828
**Email:** China@actuaries.org.uk

**Edinburgh**
Spaces · One Lochrin Square · 92 Fountainbridge · Edinburgh · EH3 9QA
**Tel:** +44 (0) 207 632 2100

**London (registered office)**
1-3 Staple Inn Hall · High Holborn · London · WC1V 7QJ
**Tel:** +44 (0) 207 632 2100

**Malaysia**
Arcc Spaces · Level 30 · Vancouver Suite · The Gardens North Tower
Lingkaran Syed Putra · 59200 · Kuala Lumpur
**Tel:** +60 12 591 3032

**Oxford**
Belsyre Court · 1st Floor · 57 Woodstock Road · Oxford · OX2 6HJ
**Tel:** +44 (0) 207 632 2100

**Singapore**
Spaces · One Raffles Place Mall · #02-01 · Singapore 048616
**Tel:** +65 8778 1784

**actuaries.org.uk**