



Institute
and Faculty
of Actuaries

Climate Change: Managing Risk and Uncertainty

Policy Briefing

The Institute and Faculty of Actuaries (IFoA) is a royal chartered, not-for-profit, professional body. We represent and regulate over 32,000 actuaries worldwide, and oversee their education at all stages of qualification and development throughout their careers.

The IFoA is a signatory of the Green Finance Education Charter and the Professional Bodies Climate Action Charter. It is a supporter of the FSB's Task Force on Climate-Related Financial Disclosures (TCFD), the UN's Principles for Responsible Investment and the UN's Principles for Sustainable Insurance.

January 2022

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Summary

Climate change is one of the greatest risks facing our world today. The climate is changing globally at an unprecedented rate as a result of human activity. This change presents ecological, social, economic and financial risks. The potential impacts of climate change are global and systemic. As well as highly disruptive physical changes, there are significant implications for the entire financial system.

The Institute and Faculty of Actuaries (IFoA) is deeply concerned by these issues and supports efforts to address climate risks.

1. Climate action is urgent - Even if countries meet all their nationally determined contributions (NDCs) and long-term net-zero promises, global warming is estimated to reach 1.8C by 2100.

2. Climate-related risk represents a material financial risk - Firms increasingly face physical, transition and litigation risks from climate change and the move to a net-zero carbon economy. The direct and indirect consequences of climate and environmental changes are likely to impact claims experience and modelling assumptions.

3. The cost of delay is high – Failure to take timely action on emissions is likely to lead to more costly and disruptive remedial action at a later date, as well as earlier and more severe climate impacts. Early action on emissions will improve future options and allow more time for more effective adaptation to future adverse climate impacts.

4. Private finance has a critical role in financing the transition to net zero - Finance should be used as a force for good through active stewardship and products that incentivise behaviour in line with global climate targets. The distinction between financial and non-financial factors in fiduciary duty should be removed to enable investors to factor in not only the impacts of social and environmental issues on their investments, but also the impact their investment decisions on society and the environment.

5. Biodiversity risk must be treated as urgently as climate change - We are currently observing a 6th extinction event. Biodiversity loss represents a systemic risk to the economy, both with regards direct physical risks as well as transition risks. It both amplifies climate change and is amplified by it.

Actuaries are ideally placed to work with governments, business and other stakeholders to help better understand the long term consequences of climate change, and help develop policy options to respond to these risks. These include not only the long-term catastrophic risk to the world, but also the costs and risks to companies of transitioning to a low carbon environment which impact company results and are becoming subject to disclosure requirements.

IFoA Climate Change Statement

Climate change is increasingly being recognised as presenting major risks to everyone living on the planet. In 2021, the IFoA issued a public climate change statement to highlight these risks and drive realistic action for risk mitigation. The statement demonstrates the profession's leadership and highlights how actuaries can apply their skill and expertise to create social impact. It is also international, taking its impetus from the global nature of the risks that climate change presents.

The IFoA recognises that the climate is changing globally at an unprecedented rate as a result of human activity. This change presents ecological, social, economic and financial risks. The potential impacts of climate change are global and systemic. As well as highly disruptive physical changes there are significant implications for the entire financial system.

We are a profession specialising in risk management, and climate change is one of the greatest risks facing our world today. Mitigating this risk is urgent. Future outcomes are uncertain, but the best value insurance premium that society can pay is to reduce our emissions today in order to avoid the irreversible consequences of unmitigated climate change tomorrow.

The IFoA supports the aim of the Paris Agreement to limit climate change to an increase of substantially under 2C from pre-industrial temperatures and recognises that in order for there to be a reasonable probability of achieving this aim there must be a transition to a global economy that has no net greenhouse gas emissions ("net zero") by 2050.

The IFoA will:

- *Advocate for the development of consistent policy frameworks worldwide that aim to achieve the Paris Agreement objectives through a just transition – that is, one that seeks to ensure that the substantial benefits are shared widely while also supporting those who stand to lose economically*
- *Advocate for the development of effective methods of incentivising reductions in greenhouse gas emissions, such as carbon pricing*
- *Use the actuarial skill set and influence to help equip the wider global financial services markets to accelerate a just and sustainable transition to net zero*
- *Support actuaries in their understanding of climate risks and opportunities and encourage their incorporation into actuarial advice*
- *Advocate for better disclosure of consistent and robust information about climate risk by corporates and other market participants*
- *Support collaborations both between its members and with other organisations to help align national and global financial systems with a just, net zero, sustainable economy*
- *Develop and implement a plan to be operationally net zero by 2030*

The IFoA is a signatory of the Green Finance Education Charter and a supporter of the FSB's Task Force on Climate-Related Financial Disclosures (TCFD), the UN's Principles for Responsible Investment and the UN's Principles for Sustainable Insurance. We will continue to work with these and other organisations to better align the finance system with a net zero ambition. We are confident that all actuaries will play their part in leading change in the financial system to serve the public interest in the management of climate-related risk.¹

Since this statement on 11 January 2021, the IFoA has also become a signatory of the Professional Bodies Climate Action Charter.²

¹ <https://www.actuaries.org.uk/news-and-insights/news/ifo-a-climate-change-statement>

² <https://blog.actuaries.org.uk/blog/climate-action-professional-bodies>

Climate change is one of the biggest threats that society faces

In 2021 climate scientists on the UN's Intergovernmental Panel on Climate Change (IPCC) declared a "code red for humanity".³ The 2021 IPCC report revealed unprecedented changes in the earth's climate in every region and across the whole climate system. Some of the changes already set in motion—such as continued sea level rise—are irreversible over hundreds to thousands of years. Global temperature is expected to reach or exceed 1.5°C of warming over the next 20 years. For 1.5°C of global warming, there will be increasing heat waves, longer warm seasons and shorter cold seasons. At 2°C of global warming, heat extremes would more often reach critical tolerance thresholds for agriculture and health.⁴

The UN Climate Change Conference (COP26) in Glasgow saw a number of important pledges on coal⁵, methane⁶, fossil fuel financing⁷ and deforestation⁸. 31 countries made new updated nationally determined contribution (NDC) pledges⁹ – including Saudi Arabia and China – and a new promise by India to reach net-zero emissions by 2070. Carbon Brief estimates that these pledges and NDC updates would – if fully implemented – reduce global temperatures by around 0.1C relative to 2030 commitments in place prior to COP26.

Latest 2100 median warming projections from UNEP¹⁰, CAT¹¹, IEA¹² and CR¹³ as of 9 November 2021 estimate current policies will lead to around 2.6C to 2.7C global warming by 2100 (with an uncertainty range of 2C to 3.6C). If countries meet both conditional and established NDCs for the near-term target of 2030, projected warming by 2100 falls to 2.4C (1.8C to 3.3C).

If countries meet their long-term net-zero promises, global warming could be reduced to around 1.8C (1.4C to 2.6C) by 2100, though temperatures would likely peak around 1.9C in the middle of the century before going down.¹⁴

Net-zero promises from 74 countries now cover at least 76% of global GHG emissions.¹⁵ However, only 12 of these are actually reflected in law today. There remains a large gap between more modest near-term 2030 commitments and ambitious long-term 2050 to 2070 commitments. Carbon Brief estimates that to have a reasonable chance of limiting warming to 1.5C by 2100, global emissions need to fall roughly in half by 2030.¹⁶

Climate change scenario modelling – a high level of model risk

In 2020, the Bank for International Settlements (BIS) called for an 'epistemological break', or

³ <https://www.ipcc.ch/report/ar6/wg1/>

⁴ <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/>

⁵ <https://ukcop26.org/end-of-coal-in-sight-at-cop26/>

⁶ <https://www.carbonbrief.org/guest-post-the-global-methane-pledge-needs-to-go-further-to-help-limit-warming-to-1-5c>

⁷ <https://ukcop26.org/statement-on-international-public-support-for-the-clean-energy-transition/>

⁸ <https://www.nytimes.com/2021/11/02/climate/cop26-deforestation.html>

⁹ <https://wedocs.unep.org/bitstream/handle/20.500.11822/37350/AddEGR21.pdf>

¹⁰ Ibid.

¹¹ https://climateactiontracker.org/documents/997/CAT_2021-11-09_Briefing_Global-Update_Glasgow2030CredibilityGap.pdf

¹² <https://www.iea.org/commentaries/cop26-climate-pledges-could-help-limit-global-warming-to-1-8-c-but-implementing-them-will-be-the-key>

¹³ https://data.climateresource.com.au/ndc/20211109-ClimateResource-1-9C_to2-7C.pdf

¹⁴ <https://www.carbonbrief.org/analysis-do-cop26-promises-keep-global-warming-below-2c>

¹⁵ <https://wedocs.unep.org/bitstream/handle/20.500.11822/37350/AddEGR21.pdf>

¹⁶ Ibid.

complete rethink, in the approach to climate risks which involve “interacting, nonlinear and fundamentally unpredictable environmental, social, economic and geopolitical dynamics”.¹⁷

More work and research are required to translate these physical and transition risks into climate scenarios. Current scenarios produced by the Network for Greening the Financial System (NGFS)¹⁸ and adapted by member central banks model the physical risks of rising global temperatures, but not rising sea levels and extreme weather events, the rising costs of adaptation investments, nonlinear risks such as tipping points or transition risks such as involuntary mass migration. The NGFS noted in June 2021 that “there are other uncertainties that are not captured due to modelling simplifications such as behavioural change, policy heterogeneity and market allocation of capital.”¹⁹ The level of model risk is high, meaning it is probable that results understate downside risk and so may provide false comfort to users of scenario analysis about the potential severity of climate impacts.^{20, 21}

Carbon budgets too are expressed in percentage likelihood of limiting global warming to a temperature limit. So for IPCC ‘likely’ is over 66%, while the International Energy Agency (IEA) applies a 50% probability.²² The spread of models means that the uncertainty in the remaining carbon budget to achieve 1.5 °C or 2 °C is very large—in fact possibly larger than the remaining budget itself.²³ This emphasises the need to take a cautionary approach and err on the pessimistic side in modelling.

Alignment of private finance

The IFoA supports the aims of the Paris Agreement to strengthen the global response to climate change by accelerating and intensifying the investment needed for a transition to a sustainable economy. The Paris Agreement’s central aim is to limit climate change to an increase of substantially under 2, preferably to 1.5 degrees Celsius, from pre-industrial temperatures.²⁴

Private finance has a critical role in limiting global warming and financing the transition to a net zero economy. Public resources alone will not provide the level of investment needed to reduce emissions, promote adaptation to the impacts that are already occurring and build climate resilience. A major announcement at COP26 was the pledge of the Glasgow Financial Alliance for Net Zero (GFANZ) – a global coalition of more than 450 finance firms across 45 countries with \$130trn under management – to align their financing activities to achieve net-zero emissions by 2050.

The Government set out its long-term ambition to green the financial system in October 2021. ‘Greening Finance: A Roadmap to Sustainable Investing’²⁵ introduces a new Sustainability Disclosure Requirements (SDR) regime, requiring companies and investors to disclose how their climate transition plans align with the UK Government’s Net Zero commitment, initially on a ‘comply or explain’ basis. The report also outlines the Government’s plans to implement a Green Taxonomy, the criteria which specific economic activities must meet to be considered environmentally sustainable. It aims to create clarity and consistency for investors, improve understanding of environmental impact and provide a reference point for companies.

¹⁷ <https://www.bis.org/publ/othp31.pdf>

¹⁸ <https://www.ngfs.net/en/ngfs-climate-scenarios-central-banks-and-supervisors>

¹⁹ https://www.ngfs.net/sites/default/files/media/2021/08/27/ngfs_climate_scenarios_phase2_june2021.pdf

²⁰ <https://www.ortecfinance.com/en/insights/blog/stargazing-or-have-the-ngfs-and-the-bank-of-england-missed-an-opportunity-to-drive-the-race-to-zero>

²¹ <https://markcliffe.files.wordpress.com/2021/10/ea-stressful-test-article-oct-2021-1.pdf>

²² <https://carbontracker.org/carbon-budgets-explained/>

²³ <https://iopscience.iop.org/article/10.1088/1748-9326/ab858a>

²⁴ <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

²⁵ <https://www.gov.uk/government/publications/greening-finance-a-roadmap-to-sustainable-investing>

The IFoA has supported²⁶ the introduction of new mandatory disclosure requirements in line with the TCFD recommendations.²⁷ From 1 January 2022, FCA-regulated asset managers and asset have to disclose how they take climate-related risks and opportunities into account in managing investments. They also have to make disclosures about the climate-related attributes of their products.²⁸ For smaller firms, these rules come into effect from 1 January 2023. The first public disclosures in line with these requirements must be made by 30 June 2023.

Legislation comes into force on 6th April 2022, requiring all UK registered companies with over 500 employees and £500 million in turnover to disclose climate-related financial information. Pension schemes with assets over £1bn are required to describe the extent to which their assets are aligned with the Paris Agreement to scheme members from 1 October 2022.

These changes are in addition to the Government proposals that will require, from 2023, financial institutions and listed companies to publish transition plans that consider the Government's net zero commitment, or to provide an explanation if they have not done so.²⁹

Climate change will fundamentally impact how economies perform as a whole. It will affect macroeconomic variables such as GDP growth, and in turn have a significant influence over the resulting performance of asset classes and industry sectors. Failure to take timely action on emissions is likely to lead to more costly and disruptive remedial action at a later date, as well as earlier and more severe climate impacts.³⁰

The IFoA supports the use of climate scenario analysis as a tool for forward-looking assessment of the risks and opportunities for defined benefit pension schemes and other financial institutions. It has called on BEIS to introduce a scenario analysis requirement for publicly quoted companies, large private companies and Limited Liability Partnerships (LLPs) on a 'comply or explain' basis.³¹ Where an entity does not have the skill or expertise to provide a full scenario analysis, the IFoA proposes simpler scenario stress tests. Small entities are not immune to climate risks and it is important they are encouraged to start thinking about their approach to managing them.

Fiduciary impediments

There is approximately £6 trillion invested in UK pensions. Undertaking reform to remove the perceived barriers which limit the integration and management of climate and environmental, social and governance (ESG) risks within investment decisions will be instrumental in increasing financial flows toward green and sustainable solutions.

Law Commission guidance, DWP regulation and TPR guidance says non-financial factors can be taken into account where pension trustees have good reason to think that scheme members share the concern, and where there is no risk of significant financial detriment to the fund. However, the dichotomy between financial and non-financial factors is a false one. Many issues, including those relating to climate-change will have both financial and non-financial aspects. In addition, some issues that start out as nonfinancial may become financial (e.g. where public criticism translates into reputational damage or reduced customer demand).

²⁶ https://www.actuaries.org.uk/system/files/field/document/05_05-BEIS-mandatory-climate-related-financial-disclosures.pdf

https://www.actuaries.org.uk/system/files/field/document/03_10%20Taking%20action%20on%20climate%20risk.pdf<https://www.actuaries.org.uk/system/files/field/document/Climate%20scenario%20analysis%20for%20pension>

²⁷ <https://www.fsb-tcdf.org/recommendations/>

²⁸ <https://www.fca.org.uk/news/news-stories/new-rules-climate-related-disclosures-help-investors-clients-consumers>

²⁹ <https://www.gov.uk/government/publications/fact-sheet-net-zero-aligned-financial-centre/fact-sheet-net-zero-aligned-financial-centre>

³⁰ <https://www.actuaries.org.uk/system/files/field/document/Climate%20scenario%20analysis%20for%20pension>

³¹ https://www.actuaries.org.uk/system/files/field/document/05_05-BEIS-mandatory-climate-related-financial-disclosures.pdf

This two-step process for non-financial factors creates barriers and complexity, leading fiduciaries to believe they do not need to consider these risks. The IFoA has therefore recommended³² the Law Commission undertake an urgent review into the Fiduciary Duties of Investment Intermediaries to remove the distinction between financial and non-financial factors. Instead, the focus should be on investor purpose. This should incorporate the concept of 'double materiality'; investors should not only factor in the impacts of social and environmental issues on their investments, but should also consider the impact their investment decisions have on the society and the environment.

A clearer definition of fiduciary duty, in line with the recommendation of the UNEP-FI report³³, would be a major enabling factor for sustainable investing within the UK, and the UK could lead the way in harmonising this definition globally.

Finance as a force for good

Divestment

Divestment from fossil fuels has been gaining traction over the last decade. It provides a simple solution to managing public pressure and potential reputational risk. Over half of savers (53%) think asset managers have a responsibility to mitigate climate change (up from 46% in 2017).³⁴ It reduces the risk of litigation, as faced by the ABP pension fund in 2021. ABP was forced to stop investing in fossil fuels after Fossil Free and scheme members threatened legal action over its failure to align its investment policy with its promise to adhere to the Paris climate agreement.³⁵ Divestment also avoids the risk of stranded fossil fuel assets, which are estimated to reach US\$7-11 trillion by 2036.³⁶ As a consequence, over 1500 major investors, pension plans and government institutions have so far divested over US\$ 40 trillion from fossil fuels.³⁷

Policy makers are recognising the urgency of climate change. At the UN Climate Change Conference (COP26) in Glasgow, 197 countries committed to phase down unabated coal. 46 countries pledged to stop all investment in coal power generation, including major consumers such as South Korea and Indonesia. But the pace of change is still too slow.

Divestment is only part of the solution. In its 2019 report, Schroders found it had little to no impact on companies' cost of financing or operations.³⁸ In some cases, divestment can increase emissions. Bloomberg found when BP sold their dirtiest North Alaskan oil assets, production from the assets increased 4.7% and emissions rose 8.2% since being bought up by a private company in 2019.³⁹

The financial sector should go further and actively engage with the companies they invest in, individually or collectively, to promote more sustainable business practices and ensure that management teams consider their broader impact on society and the environment.⁴⁰

³² <https://www.actuaries.org.uk/system/files/field/document/07-31-Law-Commission-14th-Programme-of-Review.pdf>

³³ <https://www.unepfi.org/publications/investment-publications/fiduciary-duty-in-the-21st-century-final-report/>

³⁴ <https://www.schroders.com/en/insights/economics/how-covid-moved-views-on-sustainability/>

³⁵ <https://www.theguardian.com/environment/2021/oct/26/abp-pension-fund-to-stop-investing-in-fossil-fuels-amid-climate-fears>

³⁶ <https://www.nature.com/articles/s41560-021-00934-2>

³⁷ <https://divestmentdatabase.org/>

³⁸ <https://www.schroders.com/getfunddocument/?oid=1.9.3338808>

³⁹ <https://www.bloomberg.com/graphics/2021-tracking-carbon-emissions-BP-hilcorp/>

⁴⁰ <https://www.actuaries.org.uk/system/files/field/document/07-31-Law-Commission-14th-Programme-of-Review.pdf>

Active stewardship

Active stewardship refers to actions that investors can take to better understand and influence the activities of the companies in which they invest. This includes engaging with an organisation on particular issues, either directly or through a collective of investors who share similar investment principles. Learning how companies are approaching climate risks and opportunities in their business better enables investors to hold these companies to account by influencing their behaviour. While this approach can take time, this can be more effective in delivering real change than divestment.

Stewardship can also take the form of voting on management and shareholder resolutions relating to climate risks and opportunities. Voting for shareholder resolutions relating to climate change can push companies to align their business with global climate targets. The influence of an investor on the board of a company may make a meaningful difference to the speed of which it transitions to a sustainable business model.⁴¹

Expectations and regulation around stewardship have strengthened in recent years. For example, the FRC's 2020 Stewardship Code makes explicit references to ESG factors.⁴² The IFoA notes that the Law Commission 2014 report on the fiduciary duty on investment intermediaries is at odds with subsequent regulation. To rectify this, and to meet the fiduciary and societal need for better stewardship of the financial system, a legal framework is required.

Insurers

In common with investors, many insurers have sought to direct finance away from projects that contribute to global warming and are withdrawing support from the largest carbon-emitting sectors. Public pressure has led to 16 companies refusing to insure the Canadian Trans Mountain tar sands pipeline⁴³, while so far 42 insurers have refused cover for the Adani Carmichael coal project in Australia.⁴⁴ Swiss Re has pledged to cut business support in underwriting and asset management to the world's 10% most carbon-intensive oil and gas production by 2023.⁴⁵

As with investment, the role for insurance in addressing climate change could be reimagined as an active force for good, rather than seeking to do less harm. There is scope for insurers to develop products and services that incentivise behaviour and activities that are aligned with global climate targets. By taking advantage of opportunities, the insurance sector has the potential to be a driver of the change that is needed in order to deliver a more sustainable future.

Biodiversity: Beyond climate change

Biodiversity loss poses serious, systemic risks for societies, economies and the health of the planet. It is both amplified by and amplifies climate change impacts.⁴⁶ The Dasgupta Review estimates that resources are being depleted at 1.7 times the sustainable rate.⁴⁷ Rich country levels of GDP consumption are five times the sustainable level.⁴⁸

⁴¹ <https://www.schroders.com/getfunddocument/?oid=1.9.3338808>

⁴² https://www.frc.org.uk/getattachment/5aae591d-d9d3-4cf4-814a-d14e156a1d87/Stewardship-Code_Final2.pdf

⁴³ <https://www.eenews.net/articles/coal-oil-sands-companies-feel-growing-insurance-squeeze/>

⁴⁴ <https://www.insurancebusinessmag.com/au/news/breaking-news/adani-insists-insurance-is-in-place-and-coal-weeks-away-from-exporting-316966.aspx>

⁴⁵ <https://www.reinsurancene.ws/swiss-re-extends-climate-policy-to-exclude-oil-gas/>

⁴⁶ <https://www.actuaries.org.uk/system/files/field/document/EAC-Biodiversity-and-Ecosystem-loss.pdf>

⁴⁷ <https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review>

⁴⁸ IFoA response to EAC consultation Jan 2022

At the Group of Seven (G7) Summit held in June 2021, the UK and other G7 countries agreed commitments to halt and reverse biodiversity loss by 2030 and tackle deforestation, marine litter and illegal wildlife trade. Included within the G7 Nature Compact is a commitment to work to dramatically increase investment in nature from all sources, and to ensure nature is accounted for in economic and financial decision-making.⁴⁹

The IFoA supports the Dasgupta Review and its framework of produced capital, human capital and natural capital as a foundation for broader, sustainable measures. Whilst a move to a three capitals framework would require seismic shifts, there are interim steps that could be undertaken to improve our current financial and economic approach.⁵⁰

Given the long term nature of biodiversity risks, there is a need for regulation to shape action so that everyone is playing by the same rules. The IFoA supports market-based disclosures, comparable to TCFD disclosures for climate-related risks, and a capital-based regime that helps capital flow to areas of the economy that are compliant with biodiversity preservation (e.g. higher capital requirements for assets related to areas that are disruptive to biodiversity). Consideration could be given to the direct prohibition of financing and underwriting for business activities that hasten biodiversity loss where inadequate transition plans are in place.

Transparency is required and this means a need for disclosures that focus on not only risks to a business from biodiversity loss but *also* the impact the business has on biodiversity loss. A challenge here is scope – we need to develop something akin to scope 1, 2 & 3 carbon emissions but for biodiversity loss. Regulation should consider which stakeholder voices get heard and should reflect differences in terms of valuation from different points of view.

GDP growth is an appealing metric because it is familiar and quantifiable. However, a wider portfolio of metrics is needed in order to maximise societal wellbeing and ensure it is achieved in a way that can be sustained over the long term. Research has shown a deep-set ‘economism’⁵¹ present across institutional investment professionals, reducing risk assessment to mere financials and narrower investment performance. A changing mind-set is needed to incorporate also qualitative measures of progress.

⁴⁹ <https://www.gov.uk/government/publications/g7-2030-nature-compact/g7-2030-nature-compact>

⁵⁰ <https://www.actuaries.org.uk/system/files/field/document/EAC%20-%20Aligning%20the%20UK%27s%20economic%20goals%20with%20environmental%20sustainability.pdf>

⁵¹ Christophers, B. (2019). Environmental Beta or How Institutional Investors Think about Climate Change and Fossil Fuel Risk, *Annals of the American Association of Geographers*, 109(3), 754-774



Institute and Faculty of Actuaries

Contact us

If you would like to know more about the IFoA's work please contact us at: policy@actuaries.org.uk

Beijing

14F China World Office 1 · 1 Jianwai Avenue · Beijing · China 100004
Tel: +86 (10) 6535 0248

Edinburgh

Level 2 · Exchange Crescent · 7 Conference Square · Edinburgh · EH3 8RA
Tel: +44 (0) 131 240 1300 · Fax: +44 (0) 131 240 1313

Hong Kong

1803 Tower One · Lippo Centre · 89 Queensway · Hong Kong
Tel: +852 2147 9418

London (registered office)

7th Floor · Holborn Gate · 326-330 High Holborn · London · WC1V 7PP
Tel: +44 (0) 20 7632 2100 · Fax: +44 (0) 20 7632 2111

Oxford

1st Floor · Park Central · 40/41 Park End Street · Oxford · OX1 1JD
Tel: +44 (0) 1865 268 200 · Fax: +44 (0) 1865 268 211

Singapore

163 Tras Street · #07-05 Lian Huat Building · Singapore 079024
Tel: +65 6717 2955

www.actuaries.org.uk

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