FINAL

Impact Report

Accelerating the adoption and use of climate and environmental data and analytics by financial institutions internationally

CGFI

UK Centre for Greening Finance & Investment

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Executive Summary

The UK Centre for Greening Finance and Investment (CGFI) was a programme established in 2021 by UK Research & Innovation (UKRI) via the Natural Environment Research Council (NERC) and Innovate UK. The need to establish CGFI was identified in the UK Green Finance Strategy 2019 in order to support the accelerated use of climate and environmental data and analytics by financial institutions and to connect science with finance.

Funding was made available by UKRI to run CGFI for 3 years, under the Climate and Environmental Risk Analytics for Resilient Finance (CERAF) funding call, with this extended by 1.5 years in 2024 and ending in September 2025. The consortium selected to create CGFI was announced on 15 February 2021. The CGFI consortium was led by the University of Oxford in partnership with the University of Bristol, Imperial College London, University of Leeds, University of Reading, Science and Technology Facilities Council, Alan Turing Institute and the Satellite Applications Catapult.

CGFI's research has ranged from climate-related physical and transition risks to spatial finance, with an emphasis on engaging with practitioners on urgent and emerging challenges

CGFI's research has ranged from climate-related physical and transition risks to spatial finance, with an emphasis on engaging with practitioners on urgent and emerging challenges. Our work on physical climate risks has resulted in new tools and approaches to address the financial risks that can arise from compound wind and floods; new models and datasets on tropical cyclone risks; and enduring collaborations on data challenges with insurers, via the CGFI Leeds Innovation Hub.

CGFI's work on climate risks to infrastructure was instrumental in the creation of the Resilient Planet Data Hub, launched at COP28. The platform provides access to global, open risk data for financial use cases, and has supplemented CGFI's capacity building work with central bankers and governments globally.

Our climate transition research has yielded a wide range of working papers addressing transition pathways across various sectors; best practice for scenario analysis and stress testing; and a significant contribution via CGFI's role co-leading the Secretariat of the Transition Plan Taskforce (TPT). The TPT's disclosure specific guidance has subsequently been adopted by the IFRS Foundation, informing best practice for transition planning globally.

CGFI's Spatial Finance Initiative has originated and mainstreamed the practice of spatial finance, producing open asset-level datasets for high-impact industries, covering cement, steel, petrochemicals, pulp & paper, waste management and agriculture sectors. These are now leveraged by financial practitioners, corporates, data providers, consultants and researchers to understand asset-level climate and nature-related risks and impacts and to develop bespoke analytical tools and products.

In parallel, CGFI has helped to nurture an ecosystem of climate and environmental data and analytics providers and played a pivotal role in fostering cross-sector collaboration. For example, CGFI's London and Leeds Innovation Hubs have supported green fintech start-ups in Undaunted's Greenhouse programme and student entrepreneurs with a dedicated Climate Analytics Prize. Additionally, the CGFI Innovation Hubs have advanced industry-academia collaboration through secondments and catalysed new analytical solutions, for example, through a joint 'hackathon' on tropical cyclones with the reinsurance industry.

Our numerous events, including CGFI's flagship Annual Forum, have shared insights and convened expert networks with over 1,000 attendees across research and industry. Our collaborations with the UK Climate Financial Risk Forum and Bank of England have resulted in insights and recommendations for future central bank climate stress testing and provided a platform for connecting research with practice.

In partnership with the Bank of England, CGFI convened over 100 colleagues from financial regulation, academia and industry to help inform the Prudential Regulatory Authority (PRA) consultation on revised supervisory expectations for climate risk. And our successful Associate Fellows programme has established collaborations between industry experts and researchers, with outputs including a Climate Scenario Taxonomy for the financial sector.

While CGFI's 4.5 year programme funded by UKRI draws to a close, CGFI's work continues through programmes it has established or helped to establish, including the Spatial Finance Initiative, the International Transition Plan Network, and the Resilient Planet Data Hub. It will also continue through the ongoing work being taken forward at each of the host institutions. Additionally the Data & Analytics Facility for National Infrastructure (DAFNI), based at the Science and Technology Facilities Council, will continue to support the longer term storage of CGFI assets.

Such a legacy has been made possible by the dedicated work of our team across the CGFI consortium; the contributions of our fellows and partners in industry; and the backing of NERC, Innovate UK and other industry and philanthropic partners.

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The remainder of this report provides further details on scope and impact of CGFI's work, expanding on key themes highlighted above.

Thank you all for your support.

Director and Principal Investigator | **Executive Director**

PHYSICAL CLIMATE RISK DATA AND ANALYTICS

Climate and environmental risks to our economy and financial system are accelerating. These include climate-related physical risks that can arise from increasing severity of floods, storms and heat stress. These physical risks can impact upon pricing, underwriting, and capital allocation across sectors.

To respond to this challenge, there is a pressing need to better integrate the physical risks of climate change into financial decision making. And doing so requires climate and environmental data and analytics relevant to specific financial use cases.

CGFI's research on physical climate risks has resulted in new tools and approaches to address compound wind/flood risks to property; an open, global risk data collaboration and platform; new models and datasets on tropical cyclone risks; and enduring collaborations on data challenges with insurers via our Leeds Innovation Hub.

New tools and insights on the impact of compounding wind and flood risks

CGFI researchers have developed new tools and methods to better understand and manage property-related risks across insurance, reinsurance, mortgage, and credit markets. Although storms can bring wind and flooding simultaneously, wind and flood hazards are often analysed separately, with the potential to put capital at risk from correlated windstorm and flood events. Based at the Universities of Bristol and Reading, a CGFI team led by Professors Paul Bates and Len Shaffrey created a new Flood Severity Index for co-occurring wind and flood risks in the UK and Europe and a demonstrator tool for use by industry.

New approaches and data for global tropical cyclone risks

Limited observation data makes assessing global tropical cyclone risks a challenge. CGFI research led by Ralf Toumi at Imperial College created novel synthetic datasets (later integrated into the Resilient Planet Data Hub) to support financial institutions and the public improve their understanding of the likelihood and severity of tropical cyclones. CGFI's 2025 Hackathon at our Leeds Innovation Hub subsequently brought together researchers and practitioners to produce solutions to real-world tropical cyclone data challenges facing reinsurers.

Our wind/flood demonstrator tool, created by the Institute for Environmental Analytics (IEA) at the University of Reading, has been used by insurance brokers to illustrate co-occurring hazards. The wind/flood model led to novel research insights with insurers and data and analytis providers at CGFI events and in collaboration with the Royal Meteorological Society's Insurance Special Interest Group ensuring latest research can inform insurers risk assessments.

Open, global data on climate risks

CGFI was a founding partner of the Global Resilience Index Initiative, which was relaunched as the Resilient Planet Data Hub at COP28. As key members of a cross-sector partnership with the United Nations Office for Disaster Risk Reduction (UNDRR), insurers and data providers, the CGFI team built a visualisation tool for a wide range of open, global risk datasets – the GRI Risk Viewer.

The tool and approaches have been used to help stakeholders, including governments in East Africa and the Caribbean, to quantify risks to infrastructure and identify adaptation investment opportunities.

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CLIMATE TRANSITION RISK DATA AND ANALYTICS

Meeting the goals of the Paris agreement will require a transition to a net zero and climate resilient economy. To unlock the transition, financial institutions need to price the financial risks and opportunities arising from changes in policy, technology and changes in customer and investor sentiment, engage with transition plans and transition planning, and mobilise transition finance.

Transition risk research and tools

Transition risk and transition finance research at CGFI, based at the University of Oxford, has yielded a wide range of working papers addressing transition pathways across various sectors and tools developed with the IEA and partners for assessing and visualising transition risks. The team has also researched best practice for scenario analysis and stress testing, including collaborating with the UK Climate Financial Risk Forum (CFRF) to evaluate the Climate Biennial Exploratory Scenarios (CBES) climate stress testing exercise.

Transition plans and the TPT

CGFI's work on transition planning includes a significant contribution as co-Secretariat for the Transition Plan Taskforce (TPT). The Transition Plan Taskforce was active from April 2022 – October 2024. The Taskforce engaged with over 600 organizations globally, including financial institutions, corporates, governments, regulators, and civil society. This inclusive approach led to the development of a comprehensive set of materials to guide transition plan disclosures, informed by the latest academic research from the CGFI consortium.

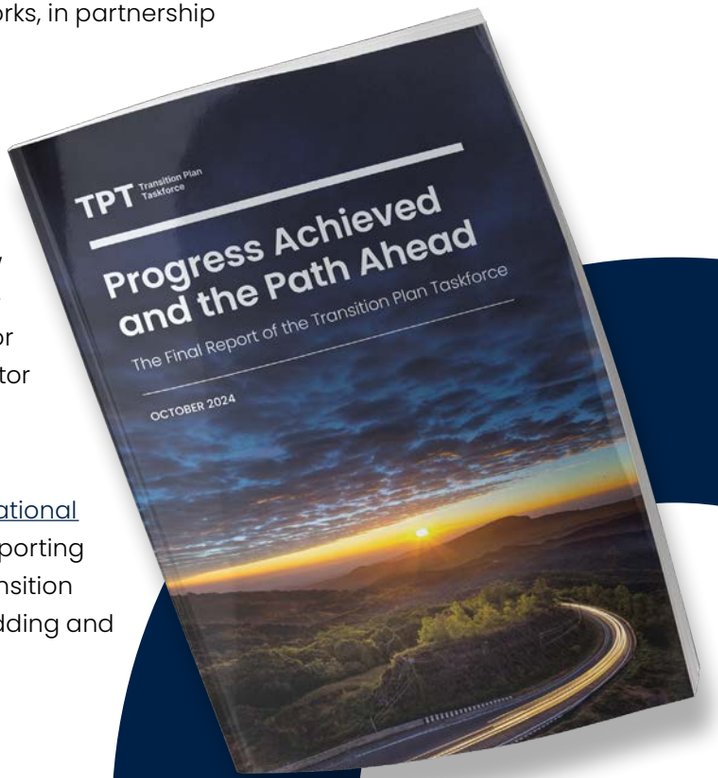
TPT Transition Plan Taskforce

The TPT's successor initiative, the International Transition Planning Network is supporting the development of global norms for transition plans

Our research on the CBES exercise resulted in a report with the CFRF as well as CGFI recommendations for central banks, supervisors and researchers on climate stress testing, which will help refine approaches in future exercises and improve engagement with financial institutions.

CGFI methodologies and frameworks to evaluate the credibility of transition plans in hard to abate sectors help financial institutions assess and support client's net zero transition. Ongoing research on transition risk originating with CGFI will continue to generate insights for financial institutions and corporates on transition planning, as well as on sector-geography-specific transition pathways and trends. CGFI's tool for visualizing and analyzing shocks to financial networks, in partnership with the CFA Institute is freely available.

The TPT's final report identified rapidly growing momentum on transition plan uptake among companies and policy, in the UK and worldwide. The IFRS Foundation is now responsible for the TPT's 13 disclosure-specific documents, including a sector neutral disclosure framework and sector specific guidance, hosted on the IFRS website.



The TPT's successor initiative, the International Transition Planning Network (ITPN) is supporting the development of global norms for transition plans, facilitating dialogue toward embedding and aligning transition planning globally.

SPATIAL FINANCE

Climate and environmental issues are inherently location specific. Geospatial analysis, datasets and tools are indispensable for understanding climate and environmental related financial risks, impacts and opportunities in a meaningful way. However, this requires financial institutions to know exactly where their investees, clients or counterparties are operating, sourcing from or supplying to. Corporate location data, or asset-level data is a fundamental analytical building block but is often perceived to be lacking.

Mainstreaming spatial analysis in green finance

CGFI's Spatial Finance Initiative has originated and mainstreamed the notion of 'spatial finance' and the use of geospatial analysis by the financial system to green finance and to finance green. We have done so by championing the use of geospatial solutions for green finance applications by demonstrating technical feasibility, showcasing operational solutions, awareness raising and capacity building. This includes the publication of two reports on the 'State and Trends of Spatial Finance' in 2021 and 2023. We have also created guidance on where to find asset location data sources for environmental related financial risk analysis, and have published an inventory of asset location databases.

Open asset databases for high impact industries

We have created open asset databases for high impact industries that link individual asset locations to ownership and other operational features such as production capacity, production technology, certification, age, etc. Industries covered include cement, iron & steel, petrochemicals, pulp & paper, waste management, beef slaughtering and agriculture. Additionally, we have developed a framework for assessing environmental impacts at the asset-level, using openly available geospatial datasets. And we continue to develop spatially explicit methods for asset-level analysis, based on open datasets.

Our work has contributed to a market-wide shift towards spatially explicit risk analytics and delivered tangible impact through the publication of asset databases. These were made available under a fully open licence model, enabling a wide range of applications by different commercial and non-commercial industry users, intermediaries and researchers. Over half of these users are from the private sector, including financial institutions, real economy corporates and intermediaries.

Applications include screening for nature and biodiversity related risks, impacts and opportunities (e.g. see Storebrand Asset Management 2024 Climate and Nature Report); Physical climate risk assessments (e.g. see UBS and Nest whitepaper on harnesssing climate data); Transition climate risk analysis and identifying decarbonisation opportunities (e.g. see OECD evidence on carbon pricing); Industry specific analysis e.g. for supply chain mapping and risk screening (e.g. see Global Canopy and AP2 guidance on deforestation due diligence); and more.

BUILDING AN INNOVATION ECOSYSTEM AND FOSTERING COLLABORATION

As climate-related considerations have moved from niche to mainstream, the demand from financial institutions for climate and environmental data and analytics has grown rapidly. However, there's more to be done to fully capture the opportunity this creates by translating the UK's world leading capabilities in climate and environmental science into commercial advantage.

Mainstreaming climate and environmental factors into finance also calls for a collaborative approach, one that brings together climate science with finance, research with practice and academics with practitioners, regulators and policymakers.

CGFI has played a pivotal role accelerating an innovation ecosystem for climate and environmental analytics and providing a national platform to translate academic research into practice. This has included fostering early-stage innovation and commercialisation, co-developing practical solutions with industry and convening diverse stakeholders through numerous events, including through CGFI's Annual Forums and our London and Leeds Innovation Hub.

Fostering early-stage innovation and commercialisation

CGFI has actively supported cohorts of early stage green fintech businesses through Undaunted's Greenhouse accelerator programme. We also backed a thematic Innovate UK grant funding call for UK based innovators to develop novel analytics products for the financial services sector and supported successful applicants.

CGFI has also catalysed new ideas for green finance related products, leveraging the latest environmental science, through a dedicated Data Analytics Prize at the annual Climate Investment Challenge, hosted at Imperial College. Also by mapping the evolution of the UK green fintech landscape in a first of its kind analysis, published in CGFI's Green Fintech 2.0 report, CGFI has helped to highlight opportunities for catalytic investment into a rapidly growing sector of the economy.

Co-developing practical solutions with industry

CGFI's internship programme has placed academics within financial institutions and regulators to help bridge the gap between research and practice. This has included partnering with the Bank of England, JBA Risk Management, the Buildings Societies Association and the Nest pension scheme. Alongside numerous networking events to bring together different stakeholder communities we also organised a hackathon for researchers and practitioners from the reinsurance industry to create new data products and insights related to tropical cyclone occurrence and associated financial risks.

CGFI convening and events

Since its launch, CGFI has convened numerous events to connect research with practice and bring together the academic, practitioner and regulator communities working on the intersection of finance and climate.

For example, CGFI's flagship Annual Forum has shared insights with over 1,000 colleagues across research, policy and practice. Our collaborations with the UK's Climate Financial Risk Forum and the Bank of England have provided actionable insights for future system-wide stress tests and connected financial practitioners across multiple sectors with the leading academic research.

"CGFI Annual Forums have been a real highlight in the climate calendar. Bringing together leading climate scientists with practitioners, regulators and policymakers has provided a valuable platform for the interdisciplinary dialogue that is so important for advancing the green finance agenda. At GARP, we particularly enjoyed the research and innovation showcases, which have played an important role in helping to shape our own thinking on climate and nature risk"

Jo Paisley, **President**
Global Association of Risk Professionals (GARP) Risk Institute

Sample of CGFI's knowledge exchange and networking events.

- "Insurance and Climate Science - Research, Analytics and Grand Challenges" event with the Royal Meteorological Society at the CGFI London Innovation Hub.
- "Collaborating for Impact: Bridging the gap between climate science and insurance industry practice" event with the Lighthill Risk Network, Oasis LMF and Journal of Catastrophe Risk and Resilience at the CGFI Leeds Innovation Hub.
- "From research to application in the insurance industry" workshop for researchers and insurers to collaborate on key challenges, in collaboration with the Lighthill Risk Network, Oasis LMF, Journal of Catastrophe Risk and Resilience, and Maximum Information at the CGFI Leeds Innovation Hub.
- "Climate risk and mortgages" discussions and working sessions in partnership with the Buildings Societies Association at their 2024 and 2025 annual events.
- "Net zero transition plans: Credibility and action" event to discuss the latest trends, case studies and best practice for transition planning with TPT at the CGFI Leeds Innovation Hub.
- "Green fintech trends and opportunities" webinar series to unpack green fintech implications post COP16 and CCOP29 in collaboration with NatureTech Collective and Innovate UK Business Connect.
- "Green fintech 2.0 report launch and networking" event at the CGFI London Innovation Hub.
- "Enhancing banks' and insurers' approaches to managing climate-related risks consultation paper" event in partnership with the Bank of England to discuss potential interpretation and application of the proposed updated supervisory expectations.
- Sessions at the 2024 and 2025 Building Society Association annual conference, focusing on engaging building society practitioners with the potential of climate and environmental risk analytics.

Working with the Leeds Innovation Hub through the UK CGFI internship programme has been invaluable for JBA Risk Management. The collaboration enabled us to tackle a live scientific and commercial challenge on estimating present-day flood risk in a non-stationary climate with rigour and creativity. Our intern, Bailey Andrew, brought fresh expertise from medical statistics and, with support from Leeds colleagues, worked with us to develop a sophisticated spatial extremes model that is now informing the next generation of JBA's flood risk products. The work has strengthened our internal capability, contributed to external engagement with clients and regulators, and laid the groundwork for further academic collaborations and outputs. It's a great example of how academic–industry partnerships can drive innovation with real-world impact.

Dr Paul Young
Head of Science and Research Partnerships
JBA Risk Management

The engagement with the Leeds Innovation Hub has been instrumental in pushing forwards Aon's engagement with the wider academic network on topics important to the (re)insurance industry. We have extremely valued our ongoing relationship with the Leeds Innovation Hub, providing the opportunity but also the physical space to hold events we wouldn't otherwise be able to. The benefit to us has been able to promote our engagement and work to our clients, increasing the confidence our clients have in our work, as well as having access to a much wider consortium of academics. It has also given us the opportunity to be involved in a wider range of topics.

Dr Adrian Champion
Head of Climate Analytics UK & EMEA
Aon

CGFI Associate Fellows Programme

A key element of CGFI's work to foster collaboration has centred around its Associate Fellows Programme, bringing together over 20 business and research fellows from industry and academic partners to publish working papers and share perspectives on integrating climate-related considerations into the finance sector.

Establishing a strong industry-academia network has provided a platform for practical knowledge exchange and collaboration across multiple actors in the financial system from pension funds and investors through to the insurance and re-insurance industry and banks and building societies. This was evidenced, for example, by CGFI's recent partnership with the Bank of England, rapidly convening leading academics, regulators, policymakers and financial practitioners to support the Prudential Regulation Authority (PRA's) consultation, and, in so doing, providing much needed institutional infrastructure to support the Greening of Finance and Investment.

Working with the Leeds Innovation Hub has been an enormously valuable experience both personally and for the organisation. Collaborating with Leeds colleagues has enhanced relations with the academic sector both in Leeds and beyond, by introducing us to a range of multi-disciplinary work in the climate space and facilitating a joint internship project which is driving insights for use across the financial sector. The internship project has not only helped to advance our own knowledge but also enabled greater translation of the latest academic thinking into policy development and informing regulatory engagement with the banking and insurance industries. This close connection between the Leeds Innovation Hub and the Bank of England's growing office in Leeds has therefore been instrumental in forging new partnerships that support the Bank's strategic objectives across the UK.

Emily Estcourt, **Climate Risk Specialist**
Bank of England

LEGACY AND FORWARD LOOK

CGFI has played a central role in accelerating the use and adoption of climate and environmental data and analytics in the financial sector. We have demonstrated the value of a national platform for connecting environmental science with finance in support of the UK's global leadership in green finance.

CGFI's legacy will provide an enduring contribution through the provision of open source datasets and tools, research publications and ongoing work of each of its host institutions. Datasets and tools from across CGFI have been integrated into the DAFNI platform, where they will be maintained as legacy assets and accessible to stakeholders including non-academic users. Finally, CGFI's publications and resources not published elsewhere, will continue to be accessible at the Oxford Sustainable Finance Group's website and Zenodo.

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