

# Climate risk modelling

Economic consulting





# What is climate risk modelling and why do we need it?

Properly identifying relevant sources of risk is crucial in obtaining accurate market valuations and strategic planning. Climate risk modelling is a toolkit that enables investors, lenders and regulators to assess the climate-related risks to a particular firm. It also allows businesses to better plan for the future and adopt mitigating measures where there are risks.

## Environmental, social and governance (ESG) reporting



**2013**

GHG emissions – mandatory for quoted companies



**April 2022**

Climate-related disclosures – mandatory for companies with over 500 employees and £500m turnover

As of April 2022, UK premium companies and standard listed companies have a regulatory obligation to report climate-related metrics in line with TCFD.

ESG reporting is more than just a regulatory necessity, it can have many benefits for companies:

- ESG factors can reflect risk and are a key part of decision-making for many investors
- better understanding of climate-related risks and opportunities allows companies to more effectively prepare their transition to a low-carbon economy
- consumers are increasingly demanding products from companies with strong ESG credentials
- employees want to work for companies with a strong focus on ESG matters
- accurate and transparent ESG reporting avoids reputational and litigation risk.

**With ESG reporting requirements increasing and starting to reflect climate risks, the importance of climate risk modelling to allow businesses and stakeholders to make informed decisions is clear.**

## TCFD

The Taskforce on Climate-related Financial Disclosures (TCFD) is an environmental reporting framework that was created by the Financial Stability Board (FSB), issuing a list of 11 recommendations, which are widely recognised and applied in industry. These are aimed at the types of information that companies should disclose to support investors, lenders, and insurance underwriters in appropriately assessing climate change risks.

The taskforce assesses climate change risk against two key categories:



### Transition risk

This refers to emerging risks due to regulation, legislation and guidelines to reduce the impact or level of climate change and transition to a lower carbon economy. This may include policy and legal, technology, market and reputational risks.



### Physical risk

This relates to risks around physical changes due to climate change. These have the potential to affect the overall value of an asset and include acute (even-related) and chronic (longer-term) risks. Examples include:

- flooding
- increased storm surges
- heatwaves/cold waves
- wildfires
- sea level rise
- rising mean temperatures.

### Time horizons for considering climate change:

#### Short term

1-2 years

#### Medium Term

3-5 years

#### Longer Term

5-20 years

Risks should be considered over these time horizons through scenario planning and stress testing, especially in the light of potential physical risks that will not only impact business activities, but also firms' infrastructure.

# How can climate risk be modelled for TCFD requirements?

We can work with you to identify the climate-related physical and transitional risks to your business in the medium- to long-term, as well as the opportunities posed by the shift to a low-carbon economy. Based on key focus areas identified, we can model the severity of impacts under different climate scenarios, and test whether your business is sufficiently prepared to mitigate potential threats and harness opportunities.

The table below provides examples of our approach to assessing both physical and transition risks.

	Physical Risks	Transition risks and opportunities	How Grant Thornton can support you
Example inputs	<ul style="list-style-type: none"> <li>• Geolocation mapping national and international location data</li> <li>• Flood risk data</li> <li>• Temperatures - historical data and projections</li> <li>• Water consumption data</li> <li>• Asset type and energy performance ratings</li> <li>• Asset location data</li> <li>• Asset valuation data</li> <li>• Implementation of climate policies</li> <li>• Disclosure of any adaptation/mitigation plans.</li> </ul>	<ul style="list-style-type: none"> <li>• Gross scopes 1, 2 and 3 emissions</li> <li>• Adherence to sustainability targets and reporting</li> <li>• Climate-related regulations and policy</li> <li>• Disclosures of climate change transition plans</li> <li>• Technology advancements</li> <li>• Adverse media reporting</li> <li>• Shifts in consumer preferences</li> <li>• Introduction of climate-related taxes.</li> </ul>	<ul style="list-style-type: none"> <li>• To build a strong foundation for risk assessment, we can assess data availability and support with identifying data gaps</li> <li>• Where necessary, we can support with the creation of proxy data solutions to mitigate data gaps/limitations</li> <li>• We can support you with identifying and sourcing physical risk data from third-parties where required</li> <li>• We can conduct desk-research to collect qualitative information for analysis of risks, where these can't be quantified</li> <li>• We can develop automated capabilities (eg dashboards) for representing the outputs of physical risk assessment.</li> </ul>
Approach	<p><b>Quantitative (where possible)</b></p> <ul style="list-style-type: none"> <li>• Employ our Physical Risk Tool to determine location-based risk level of physical asset bases under current and future scenarios</li> <li>• Undertake scenario analysis using appropriate climate scenarios in line with science-based climate projections such as the IPCC Representative Concentration Pathways: <ul style="list-style-type: none"> <li>– RCP 8.5 “high emissions scenario” – related to ~ 4° C warming</li> <li>– RCP 4.5 baseline scenario – related to ~2° C warming</li> </ul> </li> <li>• Utilising the enhanced assessment of physical risks to design an approach that translates the risk into impacts on your business model under these scenarios.</li> <li>• Assessment of the resilience of current organisational strategy, using stress testing and sensitivity analysis on quantitative modelling outputs where possible.</li> </ul> <p><b>Qualitative</b></p> <ul style="list-style-type: none"> <li>• Qualitative analysis of transition risks identified in the risk identification stage under different climate scenarios, taking consideration of different aspects that affect your business (eg demand impacts, talent retention, reputation).</li> <li>• Undertake scenario analysis using appropriate climate scenarios such as the Network for Greening the Financial System (NGFS) Climate scenarios: <ul style="list-style-type: none"> <li>• Net Zero 2050</li> <li>• Current Policies</li> </ul> </li> <li>• Assessment of the current organisational strategy under these scenarios, using qualitative inputs from our experts and engagement with your stakeholders.</li> </ul>		
Example outputs	<ul style="list-style-type: none"> <li>• Recommendations report on climate-related risks based on the results of the risk evaluation</li> <li>• Assessment of existing mitigation measures against the potential impact of key risks under different scenarios</li> <li>• A high-level roadmap that prioritises recommendations and provides a starting point for improvement.</li> </ul>		

# How can Grant Thornton help you?

Our Economic Consulting team, together with our Financial Accounting Advisory Services and Business Consulting teams, have in-depth knowledge of all climate- and sustainability-related reporting standards and policies, including TCFD reporting requirements. We offer a range of services that can support your business at all stages of your ESG journey, from conducting a gap analysis and identifying key risks to your business, to working with you to develop a transformation roadmap.

## In terms of TCFD support, we can support you with:



Understanding reporting requirements and what is expected of your business.



Developing a set of robust metrics that meet investors' needs and keep your stakeholders informed.



Developing a data collection process that ensures timely and accurate information, and that benefits your business operations.



Securing independent assurance for your climate reporting, so information is quality assured, and it is trusted by stakeholders.



Understanding the evolving regulatory landscape and potential impacts it may have on your business to reduce compliance risks and costs.

## We can also support your understanding of how your business needs to change to achieve your climate targets, and on how you can prepare to operate in a low-carbon economy.



**Identify risks and opportunities:** We can work with you to identify the climate-related physical and transitional risks your business may face in the medium- to long-term, as well as the opportunities posed by the shift to a low-carbon economy.



**Gap analysis:** We can work with you to develop a process for monitoring greenhouse gas emissions of your business and tracking performance against your climate targets. We can produce a quantitative analysis of the gap between your projected emissions and your targets, and help you develop an optimal pathway to achieving your emissions targets.



**Transformation roadmap for growth:** Based on risks and opportunities identified, we can advise you on new products, processes and supply chain operations that can drive operational efficiencies and reduce costs, whilst driving innovation and increasing resilience for your business.

We can assist companies on all stages of their ESG journey whether that includes optimising corporate strategy, assisting in illustrating regulatory compliance, providing litigation support or helping to evaluate ESG metrics.

# Our team



**Schellion Horn** Partner, Economic Consulting  
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Schellion is a post graduate economist with over 20 years' experience providing economic advice, including testimony, to clients and their legal advisors on regulatory and competition matters. This includes in front of High Courts, Competition Appeals Tribunal and Economic Regulators. She has frequently acted in litigious situations including with focus on economic forecasting, risk and valuation. Increasingly she is focussed on ESG matters including risk modelling. Her experience includes:

- Study on techniques for estimating quantum in ESG securities litigation including events studies.
- Appointed by a UK Bank into a FOS investigation as to whether a mortgage product had been sold at fair value.
- Expert report for UK bank in an investigation into mis-selling of SWAPs including estimation of quantum.

Prior to joining GT, Schellion was a Managing Director at Alvarez and Marsal and FTI Consulting and a Director in Deloitte's economic consulting practice



**Dr Tom Middleton** Associate Director, Economic Consulting  
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Tom is a quantitative economist with experience gained through leading technical economic projects in academia, the public sector and the private sector.

This includes experience in competition economics through time spent at the CMA, behavioural science through time spent at the Behavioural Insights Team and on a range of quantitative consulting projects.

Tom is an experienced user of a range of econometric and quantitative techniques and has applied them for a range of clients. Projects include assessing the impact of Covid-19 for the UK government, estimate the impact of prospective mergers on consumers and estimating the impact of prospective tax policy and regulatory changes for multiple governments. Tom recently led on a retrospective fair value assessment for an SVR product issued by a UK Bank focusing on cost modelling.

Tom has designed and implemented econometric analyses to estimate the impact of adverse ESG events on the share price of listed companies and to estimate the return on investment associated with ESG-related activities.



**Carolina Salvaterra** Manager, Economic Consulting  
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Carolina has over five years' experience working on energy and climate change analysis. Before joining Grant Thornton, Carolina was a Manager in EY's Economic Advisory team, where she advised clients on the review of GB electricity market arrangements, energy regulatory frameworks, network charging reforms, connection reforms, and carbon markets/CBAMs. Prior to this, Carolina spent four years working as a Civil Servant in BEIS, where she provided analytical support and policy advice on key topics related to UK domestic climate targets, international climate finance, and international clean energy transitions.

Her skills and experience in the area include: familiarity with carbon budgets and emissions accounting, experience of analysis of the abatement potential of different policies and monitoring of progress towards carbon budgets, experience working with a range of emissions scenarios from a number of sources (e.g. IEA, IRENA, DESNZ), work on the Oil and Gas sector climate targets for a number of emissions scopes, and familiarity with science-based climate targets.



**Riley Lovegrove** Assistant Manager, Economic Consulting  
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Riley is a postgraduate economist with comprehensive training in econometrics and microeconomics, including economic policy and environmental economics. She has experience in statistical modelling and forecasting in Stata, R and excel.

Riley led the development of a physical risk scenario analysis model, enabling corporate clients to make strategic decisions considering climatic trends and events. She designed and built location-based physical risk and scenario impact model in R and Excel to estimate financial impacts of asset damage.

# Our team



**Laura Gardner** Associate Director, Financial Accounting Advisory Services  
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Laura leads on our climate and sustainability reporting offering within the UK and has extensive experience in helping clients with TCFD/IFRS S2 gap assessment and reporting workstreams, and technical aspects of TCFD and IFRS S2.

Laura assists clients in their application of financial and sustainability reporting standards whilst considering their wider business objectives. Laura's previous experience includes assisting businesses with preparing to report on sustainability reporting standards, such as TCFD, for the first time and the development and delivery of tailored sustainability training for key stakeholders, including Boards.

Laura is actively involved in discussions at a local and international level on new and emerging issues with respect to sustainability reporting, including IFRS Sustainability Disclosure Standards, and will help you with navigating areas of subjectivity and judgement.



**Alasdair Grainger** Director, Net Zero, Public Services Advisory  
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Alasdair is a Director with Grant Thornton and leads firm's Net Zero Practice. His team deliver across sectors to support clients to deliver financial and commercial solutions to Net Zero. He is currently leading several multiyear engagements in sectors as diverse as offshore wind, EV charging infrastructure and energy from waste. He advises clients on their strategic approach, options appraisal and structuring of transactions.

Prior to joining Grant Thornton, Alasdair was a Senior Civil Servant, directly advising the Secretary of State for Energy. Alasdair led Investor Relations for a major Government Department. Alasdair wrote sections of the Green Finance Strategy 2019, led on investor engagement, implemented the Clean Growth Fund, influenced the creation of the UK Infrastructure Bank and proposed the UK Sovereign Green Bond.



**Arti Bareja** Associate Director, Net Zero, Public Services Advisory  
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Arti is a finance and policy professional with over 15 years' experience across government, banks and smaller financial institutions. She joined Grant Thornton in April 2023 from the Department for Business, Energy & Industrial Strategy (BEIS), where she spent over two years as a corporate finance adviser to various teams including the Green Finance team, as well as a policy professional embedded within the Energy & Security division focussed on delivery of low carbon energy infrastructure. She led on the policy development for the UK Government on new nuclear and delivered on an arm's length body to execute this strategy.

Prior to BEIS, Arti worked for several years in the finance industry covering mergers and acquisitions, portfolio management as well as at the smaller end of the spectrum covering ethical lending for SMEs and impact investments for early-stage ventures.



**Carolyn Hicks** Partner and Head of Transformation, Business Consulting  
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Carolyn has worked in the field of Transformation for almost 25 years and has experience in both functional and enterprise-wide transformations, for UK and Global organisations. Specific examples include:

- Advising a global manufacturer/retailer on the People Change Management for their global Finance Transformation, including stakeholder engagement and behaviour change
- Leading the People workstream for a global IT operating model transformation for a global healthcare organisation, creating a single global team.
- Leading the development and execution of the people deployment plan for an enterprise-wide ERP implementation for a UK retailer, incl. associated roadmap for change (leadership alignment, manager buy-in/readiness to lead the change, colleague engagement & adoption, behaviour change & communication), touching 65,000 colleagues
- Advising on the transformation elements of a Finance Transformation for a UK retailer, including shaping the overall deployment approach and plan

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