

CLIMATE FINANCIAL RISK FORUM GUIDE 2021
RISK MANAGENT USE CASES

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This chapter represents the output from the cross-industry Risk Management Working Group, part of the Climate Financial Risk Forum (CFRF).

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1 Overview

Purpose

The document covers how to further develop risk appetite into the firm's risk management processes, with guidance provided by industry.

This document builds on the principles outlined in the CFRF RAS document, outlining how to develop and embed in specific RAS use cases.

Scope

This guide contains use cases for:

- Section 2: Insurers
- Section 3: Asset Managers
- Section 4: Retail Banking
- Section 5: Corporate Banking (see embedded document)

2 Insurers

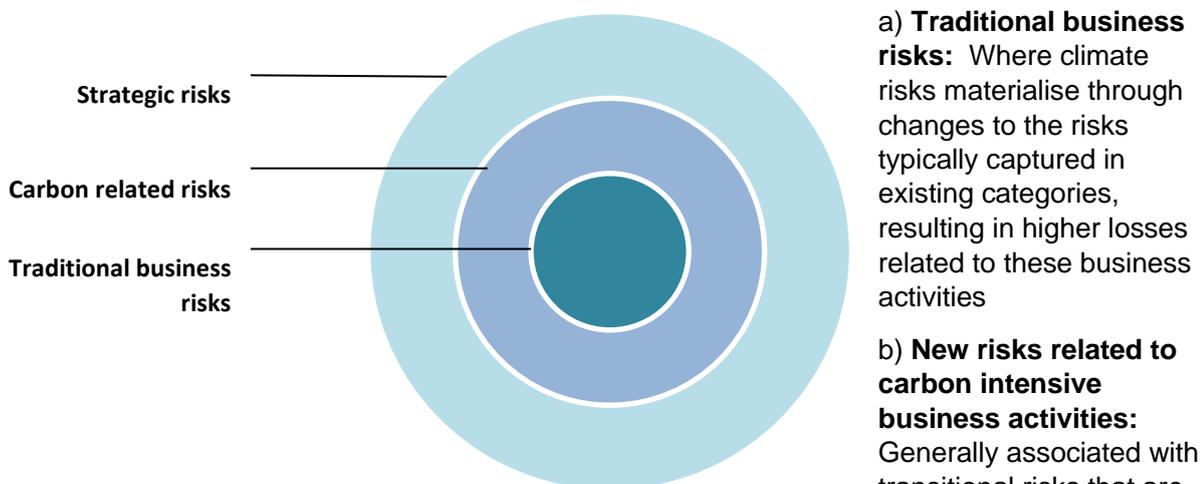
Focus: How to develop risk appetites taking into account the long-term time horizons underlying the emergence of climate related risks.

Introduction

One of the key challenges in incorporating climate considerations into risk appetite statements is the time horizon over which they will emerge. This includes the short, medium, and long term. The most significant physical impacts of climate change are generally expected to emerge outside of business planning time horizons. However, the actions that are needed to avoid these long term risks have to be taken now – this has been referred to as the ‘tragedy of the horizon’. Unless the world takes decisive action, physical risks will emerge gradually over this century. Assessments should also take into account the double materiality of risks; that the actions a company takes over the short term may impact on the medium to long term climate outcomes.

The likelihood of physical risks can be reduced by taking strong co-ordinated action to shift away from a high carbon economy, but this leads to another climate-related risk – transition risk. Given the urgency around addressing climate change we can expect transition risks to emerge sooner than physical risks, but the time horizon for when they may emerge is also very uncertain.

To support the assessment of the different types of climate related risks, it is helpful to distinguish between the impacts of climate risks on:



proportionate to the carbon intensity of the underlying activity. These risks may be in relation to a firm’s own emission footprint or its assets or liabilities. They may require new measurements, be assessed through the existing framework for traditional business risks, or as new strategic risks; and

c) **Strategic risks:** Where climate risks change the risk profile of the long term strategic objectives.

Traditional business risks – Property and Casualty

While many of the physical impacts from climate change are longer term in nature, Property & Casualty (P&C) (re)insurers typically take on short term underwriting risks i.e. one to two years, which allows for future adjustments to the assessment and pricing of the risk at renewal. This process of re-underwriting risks each year is an important risk management

action that separates P&C (re)insurers from other FS sectors firms that may have longer tail exposures. This does not mean that the risks from climate change can be discounted however, for the reasons set out below.

Future uncertainty

It is not yet fully understood how a changing climate impacts the frequency and severity of natural catastrophes, but failure to act may lead to irreversible tipping points in climate systems. Events that may be exacerbated by climate change were manifest in 2019, most notably in losses from so called secondary peril events, e.g. river floods, torrential rainfalls, droughts and wildfires.¹ Many countries in north and eastern Europe are set to see more excess precipitation and flood events.

Notwithstanding that more climate risks are being seen, given that some of the most material, longer term physical impacts from climate change are still unknown, some practitioners may be tempted to postpone their engagement until they have a more certain view of how it will directly impact their exposures. We consider this to be the wrong approach. Climate change can be seen as a systemic risk to the global macro economy, and the climate changes that have already been experienced are a signal to act, not to wait and see. There are also portfolio and reinsurance considerations from changes to the predicted frequency of tail events. For example, a higher number of extreme events may be expected exceeding the cover limits that are currently deemed sufficient or acute physical impacts arising where they haven't been found material before and which are not adequately covered.

Scenario analysis and future management actions

When carrying out scenario analysis, the impact of climate change is typically assessed using the current portfolio as at a specific date. Many practitioners will have noted that while losses may be large they are also unrealistic as that will not be the same portfolio that insurers will be on risk for when the losses occur. There is therefore a tendency to discount longer term risks such as climate change under an assumption that liabilities can be reduced at some point in the future when the risk is more relevant, for example, either by raising premium or reducing exposure.

Actions to reduce future exposures are important steps to manage the future risk profile, and should be logged as 'agreed future management actions'. This will allow the P&C insurer to move away from a broad assumption that a risk is within appetite, towards considering the knock-on implications from their management actions. For example, how quickly can underwriters really change the coverage for long standing customers without damaging relationships and their reputation? What are the conduct risk implications of putting up premiums or refusing coverage? Some P&C insurers may realise that their 'agreed future management actions' cannot be implemented as quickly as they first assumed.

More fundamentally, for some P&C insurers it may trigger conversations around their long term strategy. For example, whether their business plans are heavily reliant on regions or sectors that they are signalling the need to walk away from before the impacts of climate change are felt.

As P&C insurers formalise their future management actions to manage their underwriting risks, it would be reasonable to expect their exposure to climate related underwriting losses to reduce over time. Running the scenario analysis periodically, risk managers should expect

¹ Swiss Re: sigma 2/2020: Natural catastrophes in times of economic accumulation and climate change

to see the reduction in exposures compared to the previous exercise, as opposed to remaining static or even increasing. The monitoring of this exposure trend could be included within the suite of risk appetite metrics.

Customer impacts

Where insurers decide to de-risk or ask for higher prices due to their expectation about increasing physical risk impacts, certain risks may become uninsurable. This will widen existing protection gaps, e.g. for flood, or create new ones, e.g. fire coverage in certain regions, leaving more customers unprotected. Consequently, there could be severe impacts for economies from natural catastrophe (Nat Cat) events and high costs for societies. Where the risk of a rising protection gap is identified, e.g. based on scenario assessment using most recent research, preventive measures should be taken early.

This includes e.g. "Impact underwriting" to provide incentives for a more rapid and far-reaching transition to a low-carbon economy that mitigates the negative impact of climate change. For example, insurers could offer multi-year covers under certain circumstances where protective measures are taken by the policyholder or support the policyholders in the transition. The latter may be achieved in various ways, e.g. by incentivising the use of green technologies, sharing know how, integrating nature based and carbon-offsetting solutions, or repair instead of renew terms. Other preventive measures include public-private partnerships that can help to maintain a workable market for insurance or accelerate investment in green infrastructure projects. Combined policy action is needed to achieve these innovations.

Traditional business risks – Life and health

Life and health insurance contracts are generally of a longer duration than P&C business. This longer-term risk increases the need for a forward looking assessment of how the underwriting risks may change over the duration of the contract.

Future uncertainty

Demographic assumptions change gradually over time with expectations for future changes generally being informed by historic experience. The systemic impacts from climate change or the actions needed to mitigate climate change are of a scale never experienced before. Their impact on these key assumptions are unclear and highly uncertain.

The societal impacts from the risks associated with climate change will have a material impact on these assumptions. For example, could a transition to a low carbon economy result in improved health and life expectancies through reduced levels of pollution and changes to lifestyles? These impacts may be greater than a direct causal link with increased severe weather events. The timing and nature of these wider societal impacts are highly uncertain, and in addition the eventual impact on demographic assumptions may be subject to a wide range of possible outcomes. In addition, these changes are likely to have systemic impacts, which limits the risk management techniques available to (re)insurers to manage these changing risks. The main controls will be based on a forward-looking approach, that is through active monitoring and research on the impacts from climate change. These may be incorporated into existing emerging risk processes or as part of the own risk and solvency assessment (ORSA) of longer-term strategy.

Asset investments backing long term liabilities

Investment risks are impacted by both physical and transition risks. Given the urgency around addressing climate change, we can expect transition risks to emerge sooner than physical risks, but the time horizon for when they may emerge is also very uncertain.

Transition-related market impacts do not always emerge through the actual implementation of regulations – they may arise from changes in consumer sentiment, or just from an increased expectation that these regulations will be put in place, which can, potentially significantly, shorten the time horizon.

Alongside carrying out asset liability assessments (re)insurers should consider the timing and likelihood of investments being impacted by climate related risks over the expected investment period. Drivers of these impacts break down into three aspects: the asset's current exposure to climate risks, how this exposure may change over time, and what actions may be taken to transform the asset's exposure (for example for equity investments the underlying companies' transition and adaptation plans).

An asset's carbon footprint provides an indicator of how much they may be impacted by a transition to a low carbon economy. The larger their current carbon footprint the larger the transformational change that may be needed to how they operate. Here scenario analysis can be used to assess the exposure to transition risk and the underlying timing of these risks, supporting the establishment of monitoring indicators to track both the external landscape and the progress against established transition plans.

A change to the real economy relies upon individual companies making the transition—especially those in high carbon sectors. Assessing the credibility of a firm's transition plans is dependent on understanding the relevant sector and transition pathways. Due to the long duration of liabilities and the regulatory landscape for annuities in particular, investments are expected to be held over the medium to long term. While investment risk may be managed through investing in debt structures rather than equities, assets may be less liquid and the climate considerations over the full duration of the investment should be incorporated into

the initiate investment criteria. For example, does a utilities company that uses coal for power generation have credible phase out plans?

This analysis can be used to inform both setting the risk appetite and managing exposure to the risks. for example, through investment decisions, exclusions and divestment strategies. It may identify potentially increased upside risk under a transition scenario, reducing the riskiness of an investment.

Customer impacts

Similar to the P&C business, the impact from physical risks might lead to protection gaps for Life and Health insurance. This may impact life insurance in general because of the economic impacts of climate change making life insurance less affordable in certain regions. It may also impact mortality causing this risk to become higher in certain regions. Preventive measures that help to mitigate climate change as well as supporting technological solutions that help societies to adapt might act as mitigants.

For life annuities, policyholders may want greater control over defining the investments strategy that supports their pension income. This may be through offering a range of different options around sustainable investments strategies for the underlying assets, for example through fund decarbonisation targets. While making these choices transparent to policyholders will enable customers to participate in supporting the transition, the ability of policyholders to directly influence the investment choices will depend on the product structure. For example, there is limited policyholder ability to ensure that the sustainability considerations are dynamic to reflect evolving preferences against the underlying asset liability management of the firm for products that provide guaranteed income and capital without investment risk.

Where policyholders retain the investment risk a reduction in climate risk may be carried out through allowing or incentivising policyholders to transfer funds into investments with sustainability criteria. Clear disclosures are needed to ensure that customers understand the risks associated with their choices as well as the specific details of the sustainability criteria being offered, to ensure that the products offered meet the underlying customer needs and preferences.

Strategic risks

- Link to the strategic considerations in the RAS document
- Customer and market impacts

(Re)insurers setting specific targets for greenhouse gas (GHG) exposures will ultimately result in a reduction in capacity for covering carbon intensive business activities. Either these covers will no longer be offered or the cost of cover will increase, for example, to including charges for carbon offsetting or carbon reduction activities.

This impact on the market is intended and driven by regulatory initiatives under the Paris Agreement, with a defined time horizon for net GHG neutrality by 2050 in Europe. For example, most countries are expected to exit from thermal coal-based power production by then and no classic combustion engines will be used in new motor vehicles. (Re)insurers supporting this process will need to consider the progress and perspective of their customers in making the transition to becoming GHG neutral. Progress against these objectives may inform the decision on continued offering of (re)insurance cover. At the same time, (re)insurers will build know-how to support their customers, and implement risk-based pricing for alternative (sustainable) technologies as well as for carbon reduction technologies.

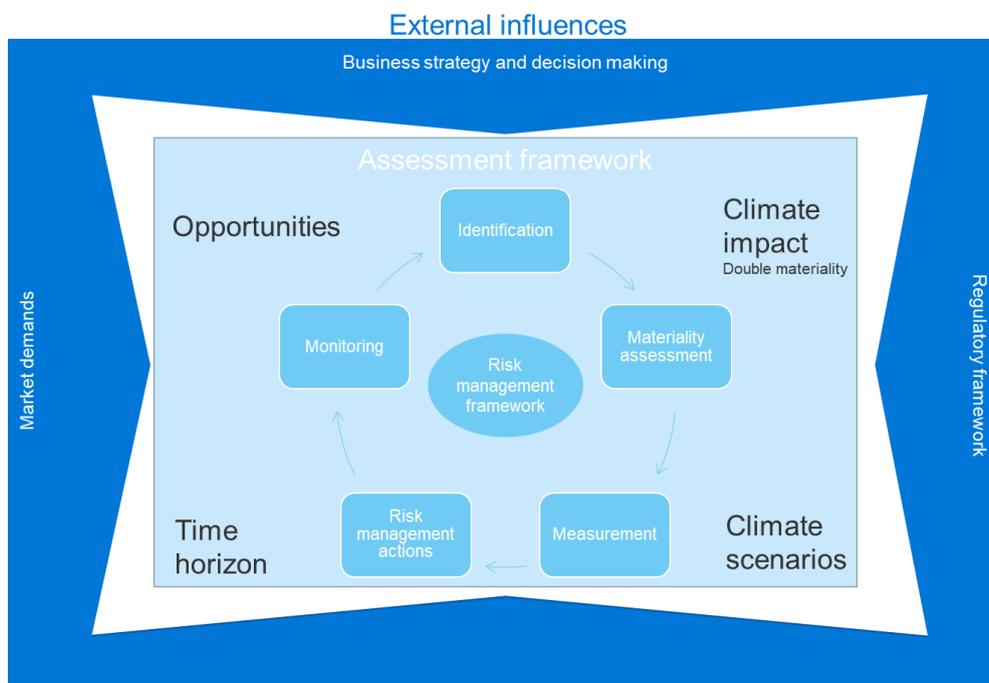
Most carbon intensive commercial sectors could be impacted by lower availability of insurance cover, given that many (re)insurers might take the first steps of GHG reduction.

However, gaps in the availability of insurance cover for major European retail lines is not expected, because its transition will be driven primarily by sectoral regulation, e.g. transition in the automotive industry, which has already started. Insurers might also support the transition in commercial lines by integrating incentives for sustainability into their products, e.g. differentiated pricing for differing customer carbon intensity.

Framework for embedding climate time horizons

As set out in the risk management report, there is no common view of leading practice for factoring long-term climate risk scenario analysis into risk appetite as yet. Below we set out one possible framework for developing an understanding of how the additional time horizon elements can be incorporated into risk appetite statements and tolerances.

Firms can also reference the use cases within the UK Climate Financial Risk Forum: Climate Data & Metrics Report.



1. Establish the assessment framework

While the risk management cycle is core to the assessment of the risks from climate change and the corresponding risk appetites, it is helpful to consider the broader assessment framework that will inform and influence a firm's risk management approach.

The risk management approach should be aligned to both short-term and long-term strategy and corporate plans. To enable practical and effective implementation it will need to be embedded into the business decision making processes. The firm's business and operating model will influence the approach to setting the risk appetites.

The changing market landscape, both through customer preferences and other stakeholders (e.g. shareholders) demands for disclosures, will influence the risk exposures, the rate of adaption and required metrics.

The data available to support decision making and risk management has progressed significantly, however there still remain material data limitations that will influence the design choices within risk management systems. These should be kept under continuous review as the availability and robustness of climate related data evolves.

While the direct regulatory landscape will shape a firm's approach, the risk assessment will also be influenced by the broader policy and regulatory approaches adopted by jurisdictions in response to climate change (for example through carbon taxes).

Throughout the framework the following aspects will inform the approach to setting risk appetites:

Time horizon: The risk categories and how they change over time will be influenced by both the time periods that are being considered and the range of climate outcomes that are being assessed. To ensure that these changes are captured it is important to clearly establish (i) the framework that the assessment will operate under, (ii) the additional climate related elements that will need to be understood in relation to how your organisation defines short, medium and long term time horizons in the context of climate risks, and (iii) to have at least a high level narrative of potential climate scenarios. This will set the parameters for the assessment and ensure that a consistent approach is applied across all risk types.

Climate impact: - how the choices that are made today may impact on the longer-term risks from climate change. An assessment of the risks should seek to capture both the outside-in (how do climate risks and opportunities impact the company) and the inside-out (how does the company impact on climate) perspective of how climate risks may impact on the firm's financial risks. This is sometimes referred to as 'double materiality'. Considerations should be given to how exposures are measured under these two perspectives. Carbon related risks are most likely to have impacts on both perspectives.

Scenario analysis: A mature climate related risk appetite should be informed by the outcomes from scenario analysis, as scenario analysis is used to capture the range of potential outcomes, extended time horizons and high levels of uncertainty associated with climate change. Through describing key potential climate pathways over a short to long term horizon, scenarios support understanding the changing nature of the risks; and how the actions taken today can influence the likely climate pathway and the impact on future risk exposures. Under each scenario the way the risks may emerge will vary, generally speaking exchanging future physical risks for more immediate transitional risks. Due to the scale of the transition and its duration there is benefit from considering alternative pathways that the transitional risks may follow. For example, either an immediate and smooth transition, or one that is delayed and has a sudden disruption.

Opportunities: As firms explore opportunities presented by climate change these may introduce additional risks that lead to changes to the approach to risk management. Opportunities may lead to changes to the firm's risk profile potentially impacting on the materiality of risks and the range of management actions that may be considered.

2. Risk identification

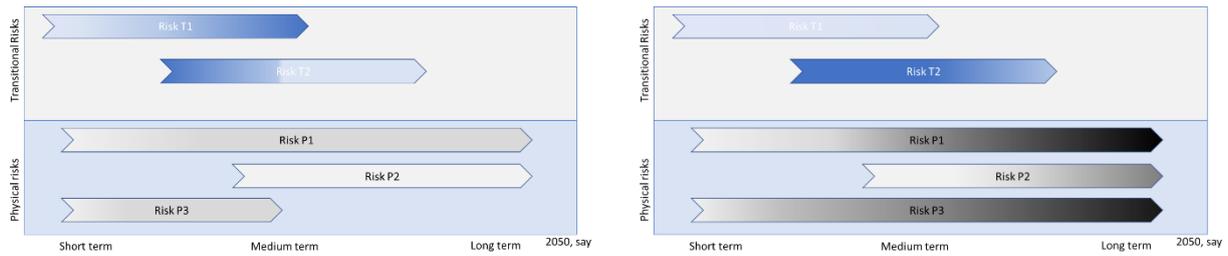
Identify the different types of climate related risks that the (re)insurer is exposed to from their business model and underlying risk profile. This assessment should include consideration of both the traditional business risks where climate risks materialise through changes to the risks typically captured in existing categories; new risks related to carbon intensive business activities; and strategic risks where climate risks change the risk profile of the long term strategic objectives.

3. Materiality assessment

For each scenario and duration assess relative changes to risk exposure assuming no change to the current portfolio, to inform the materiality assessment of the identified risks. Below are illustrations of how a sample of risks may vary over time for a transition and physical risk scenario. Darker colours, in the diagram, indicate an increased risk impact.

'Transitional' scenario

'Physical' scenario



The outputs from this assessment can be used to identify which traditional metrics may be impacted at different time horizons, and where gaps in either the framework or metrics may exist. Where gaps are identified the analysis should support the development of metrics or establishment of a set of additional management actions that can be deployed under the scenario.

4. Measurement

Review whether existing metrics can be used to capture exposure. Where gaps have been identified alternative metrics will need to be developed.

The choice of metric including underlying choice of metric including underlying data and proxy methodologies used to support measurement should be regularly reviewed e.g. for changing level of confidence on the likelihood of the risk; availability of data and pre-defined exposure tolerances.

5. Management actions

It is important to understand the range of actions that may be taken to manage exposures over time, including the timing of when these actions would be most effective (i.e. does the management action need to be taken in the short term to manage medium term risk or can it be deployed in a later period?).

For risks that are expected to emerge in the medium to long term, it is important to consider a range of indicators that will identify the both the timing and the potential impacts, and the scenario where the risks are most prevalent. These should be established to enable additional risk management practices to be deployed at a time when they will provide effective management of the underlying risks and complement the existing risk management framework. Feedback through ongoing monitoring of the changing risk landscape and adjustment to tolerances is a critical aspect of enabling risk management frameworks to adequately capture the extended time horizons associated with climate risks.

6. Monitoring

Regular monitoring should be put in place to capture changes to the risk landscape. These may be from changing stakeholder or regulatory expectations, the firm's development of their strategy, or data availability.

Monitoring and adjusting to tolerances over time, is a critical aspect of enabling risk management frameworks to adequately capture the extended time horizons associated with climate risks.

3 Asset Management

This section provides guidance to asset management firms in the consideration of how their risk appetite statements could be set and implemented, via a case study, focusing on specific sources of climate related risk. It may be of particular relevance to those firms (of any size) at an early stage in their development of risk management systems in relation to climate change.

Climate risk appetites should be set at board level as part of setting an asset manager's climate change strategy. The firm's existing Risk Taxonomy may be used to categorise climate related risks, (e.g. where it is considered that risks in existing categories can be exacerbated by climate risk), but may require enhancement to include any new risks identified.

Firms will need to undertake an assessment of where risk impacts or harm could occur. The TCFD recommendations provide a starting point for considerations of physical and transitional risks, but the same risk may have multiple facets that impact their firm, their clients and the market. For example, physical risks could have material operational impacts on the firm causing financial damage and disruption to their business, while clients could experience financial harm by direct or indirect damage to their assets either by a physical (acute) shock event or prolonged (chronic) shift of climate patterns negatively impacting asset values.

The Financial Conduct Authority ("FCA") has published the Investment Firm Prudential Regime ("IFPR"), highlighting a firm should consider not only risks to the firm itself but also look to manage the potential harm the firm itself could pose to consumers and market.

Developing a firm's Risk Appetite Statement in the context of climate related risks is a balance between the firm's risk appetite and a client's risk appetite. Each client will have differing risk appetites, investment beliefs, objectives and goals. The firm will manage client assets, as with any investment mandate, in the interest of clients and that their fiduciary duties are met.

The investment landscape is changing rapidly and use of data to monitor and manage climate related risks are still evolving. There are a number of providers looking to provide insight into climate risk impacts on certain assets with an array of methodologies and metrics. Firms are also developing their own proprietary data and models.

Climate risks can impact investment performance and the risks arising in the asset manager's operations. An asset manager might offer funds with stated climate related investment objectives alongside funds without such objectives. Climate risks can impact the investment performance for both types of funds through transition and physical risks. Risk appetite statements for climate risks are thus relevant for funds with and without stated climate related investment objectives.

There are several areas within investment decision-making which can benefit from formulated risk appetites. For example, as the economic impact of climate risk is a relatively new area of focus for risk management, there might be different perspectives on whether management of physical risks should be an important part of the investment processes now or in the future. Another example relates to reputational risks of investing in companies with lower ESG rating where a portfolio manager might see opportunities from a return perspective. Explicit climate related investment objectives can make trade-offs clearer and help the organisation manage these risks.

On top of these direct risks to investments, asset managers face the risk of not delivering against stated climate-related aims. It is this risk we will focus on in the remainder of the document.

Whilst the risk that the product outcomes are not aligned with the stated investment objectives apply on every product, climate risk adds an extra dimension. This includes additional data requirements to monitor adherence and compliance risks that makes a compelling case to have distinct risk appetite. Failure to adhere to climate related promises poses significant reputation risk to the firm and may damage the firm's wider propositions or create harm to the industry evoking 'greenwashing' claims.

Risk Appetite Statement

The high-level risk appetite statement for climate-related product risk should address the board's appetite for any issues arising from inconsistencies between the climate commitments made on investment products and the actual product delivery. This could be added to an existing product risk appetite statement or could be a separate standalone statement, depending on the firm's risk taxonomy.

Example

We have minimal appetite for any mismatch between the climate commitments made on investment products and the actual product delivery.

In order to develop measures of exposure against this risk appetite, it is necessary to understand how and where this exposure arises. This process of Risk Identification is a key part of the risk cycle and should be implemented for each firm.

There are many examples of where such risk could arise, and we look at some of the key areas below:

Product Marketing and Corporate Net Zero Commitments

Marketing materials may make promises, commitments or strong suggestions on climate-related investment, either expressly or through implication – for example a commitment that a portfolio (or group of portfolios) will be net zero by a certain deadline – giving rise to 'greenwashing' risk. Failure to meet these promises and commitments could result in serious adverse reputation impacts on the firm, from customers and clients, from regulators or the media. In order to protect against harm to clients, and resultant harm to the firm, asset managers need to have controls to ensure that these commitments are realistic, and that they are, and remain, consistent with the ability of the business to deliver against them.

These controls could include, for example, checklists to ensure that any commitments made in product marketing are backed up by actual processes. Depending on the organisation, this might be included as part of a 2nd Line Compliance review but it is recommended practice that the climate-related marketing is also reviewed by specialists in the ESG / climate product areas. Additionally, product review processes (typically annual) should include review of ongoing delivery against product commitments, based on measurable interim targets.

Product offering and documentation

Prospectuses for funds, Investment Management Agreements (IMAs) for mandates, term sheets, and other product offering documents and related documentation make explicit commitments which need to be honoured. Where these are related to climate risk, they give an exposure to climate-related product risk, which needs to be identified and controlled. As above, controls should ensure that any commitments are realistic

and can be, and are, fulfilled. For example, where commitments are given regarding funds' allocation to climate-friendly assets, it is important that the 1st line is able to clearly articulate what is meant by climate-friendly, any operational bounds around the defined allocation, and the controls that will be put in place to ensure that this commitment is met over time. The 2nd Line would oversee the effective implementation of these controls and ongoing compliance.

Climate-related data and Analytics

Asset managers make use of third party data and analytics on greenhouse gas emissions and climate exposure of issuers, often supplemented with their own internal analysis. Asset managers need to appropriately consider the levels of uncertainty that are inherent in such analytics, and ensure that these uncertainties are properly reflected in the commitments that are given, following the risk identification and mitigation processes and controls above.

Additionally, climate-related data methodologies introduce incremental second-order model risks. Where models are used to assess climate exposure and transition risk and these models are then used as part of honouring client commitments, there is greater exposure to model risk.

This risk should be identified as part of the asset manager's model risk processes and mitigation should be included within the model risk framework – including input and output data verification, model validation, change control and external model review.

Portfolio Management

Portfolio Managers should have the ability to assess performance against climate-related objectives. These may include pre-trade and post-trade compliance with climate-related guidelines. Developing these tools and analytics will rely on internal and external data and models. Investment guidelines will need to be set with data that is available, consistent and measurable for the assets being managed. Controls over investment versus guidelines, which are standard elements of portfolio management practice, should be expanded to include climate-related guidelines and the investment guideline systems will be need to have ability to monitor these guidelines with new data that is being used.

Product performance disclosure

Asset managers should ensure that client updates on product performance include assessment of performance against climate-related commitments. Controls over these updates should include the controls around marketing and product information above, and reflect any model issues.

This is analogous to traditional performance reporting of returns. In the way that standard techniques have been developed for calculation, reporting and presentation of performance, it is to be expected that the industry will develop standard approaches to reporting performance against climate commitments.

Conduct risks

All of the above situations represent areas where conduct risk may arise. As part of the identification and management of conduct risk which may pose a risk of harm to the client, the market, or the firm, asset managers should ensure that their conduct risk tools and frameworks recognise the incremental risks that climate-related products introduce.

A simple illustration of a KRI dashboard that could be used by a firm to monitor compliance against its stated risk appetite is shown below.

Key Risk	Key Risk Indicators	Thresholds			How is this risk measured in practice?
		Red	Amber	Green	
Failure to adhere to external climate-related commitments on investment products	Material breaches relating to the climate-related labelling of fund mandates	> X	< = X > = Y	< Y	Breaches could relate to, for example: <ul style="list-style-type: none"> • Marketing materials • Product literature • Client communications • SFDR labelling
	Instances of external challenges on green credentials of funds	> X	< = X > = Y	< Y	There could be several sources for this data: <ul style="list-style-type: none"> • Complaints from clients • Adverse press comment • Assurance reviews • Regulator feedback

Client reporting, metrics and disclosure

Clients are increasingly asking how their assets are exposed to climate related risks. This brings data challenges including availability of data for different asset types and sectors but also how data is interpreted for the relevance of financial impact to client assets. There are a range of climate-related metrics to consider though the metrics alone provide little security of the uncertain outcomes for asset values. This is amplified further due to range of time horizon considered and the sudden nature of climate events, market or economic forces, or government policy changes.

The output from the UK Climate Financial Risk Forum: Climate Data & Metrics Report provides additional guidance in this developing area. It discusses key insights across the industry on potential use of metrics and reporting. A firm will need to determine what their risk appetite is in providing data reporting but should consider the draft guidelines and principles for selection of climate-related metrics and if providing climate-related risk reporting to clients, that they are provided with the appropriate disclosures and operational controls.

4 Retail Banking Mortgages

This section describes key elements that can be used for defining climate risk appetite for a retail banking portfolio.

Background & Context

This case study on risk management for retail mortgages is intended to provide practical guidance on how best to manage the risk of climate change for those organisations operating in the retail banking space. It describes good practice but it is also designed to support those who have yet to fully consider the management of climate change risk. This case study has been produced by the Risk Management Working Group of the Climate Financial Risk Forum.

This document is aimed at retail banking institutions of all sizes and some of the information in this case study may be more or less relevant for different firms depending on the scale and nature of their business and the risk profile they adopt. Also, it is recognised that capabilities do vary greatly across the sector but, notwithstanding this, there should be a common approach to dealing with this particular set of risks. It is for individual firms to determine the best approach for their business based on the information in this guide and other sources of available information.

Whilst this document provides a case study for thinking about how to manage the risks relating to climate change for a mortgage portfolio there will be some links across to other products in the retail banking sector. It should also be noted that this document is not intended to be all encompassing - it is intended to accelerate the thought process of lenders in the retail banking space and help ensure that there is a greater level of consistency in approach and support the forming of best practice.

Risks identified

The table below highlights the key risk areas that are most impacted when considering a retail mortgage book. Whilst there may be some other risks to consider these ones are the most impacted by climate risk:

Traditional Risk Types		Transition Risk	Physical Risk
Credit risk	Focused on the creditworthiness of customers, the value of underlying assets and the probability of default.	<ul style="list-style-type: none"> • What proportion of the mortgage book would be impacted by stricter energy efficiency policies? • How will different segments of the mortgage book (e.g. buy-to-let) be impacted differently by energy efficiency policies? • How would the bank deploying stricter lending criteria, based on energy efficiency, affect collateral? 	<ul style="list-style-type: none"> • What proportion of the mortgage book is geographically located in areas that will be exposed to more frequent and severe weather events under climate change? (e.g. droughts, floods, sea level rise, storms and heatwaves.)
Liquidity and funding risk	Focused on the ability of the bank to meet short term financial obligations.	<ul style="list-style-type: none"> • How could the transition to a low carbon economy affect customer deposits? (e.g. devaluation of underlying assets, job losses in high risk sectors) • What are the bank's investors asking for in terms of climate change strategy and risk mitigation? 	<ul style="list-style-type: none"> • How could physical climate change risks affect customer deposits? (e.g. devaluation of underlying assets, inadequate property damage insurance)
Legal risk	Focused on the risk of litigation against the bank.	<ul style="list-style-type: none"> • Following a climate change event what is the potential for customers to pursue litigation, given the bank understood they were financing an asset exposed to transition risk? 	<ul style="list-style-type: none"> • Following a climate change event what is the potential for customers to pursue litigation, given the bank understood they were financing an asset exposed to physical risk?
Conduct risk	Focused on the action / inaction of the bank causing detriment to customers, to	<ul style="list-style-type: none"> • What proportion of customers would be adversely affected by the industry standard moving towards stricter lending criteria based on energy efficiency? 	<ul style="list-style-type: none"> • What proportion of customers would be adversely affected by the industry standard moving towards stricter lending criteria based on physical risk metrics

	the market and to competition.	<ul style="list-style-type: none"> How will the bank ensure that it is reporting climate change risk in line with regulation? 	such as the probability of flood risk?
Operational risk	Focused on the resilience of the bank's infrastructure, systems, procedures and policies, to events that could affect business continuity.	<ul style="list-style-type: none"> Does the bank's estate (branches, offices etc.) have a high level of energy efficiency? Do the bank's suppliers have a high level of energy efficiency? 	<ul style="list-style-type: none"> Is the bank's estate (branches, offices etc.) geographically located in areas that will be exposed to more frequent and severe weather events under climate change? Are the bank's suppliers geographically located in areas that will be exposed to more frequent and severe weather events under climate change? (e.g. IT suppliers) How will the bank adapt to ensure the health and safety of customers and employees? (e.g. retrofit of air conditioning, planning for future pandemics)
Model risk	Focused on the margin for error in models.	<ul style="list-style-type: none"> Given the long term nature of climate modelling, as well as the increasing quality of climate related transition data, how will the bank ensure that scenario models are adaptable and accurate? 	<ul style="list-style-type: none"> Given the long term nature, as well as the increasing quality of climate related physical data, how will the bank ensure that scenario models are adaptable and accurate?
Business Model risk	Focused on the future viability of the business model.	<ul style="list-style-type: none"> How is the bank planning to adapt its strategy to meet customers' green expectations? What processes or policies are in place to ensure that green products are robust? 	
Reputational risk	Focused on the external	<ul style="list-style-type: none"> How is the bank intending to manage 	<ul style="list-style-type: none"> How is the bank intending to manage

	perception of the firm	external stakeholders and meet expectations? <ul style="list-style-type: none"> • What controls and processes exist to mitigate future reputational risk? 	external stakeholders and meet expectations? <ul style="list-style-type: none"> • What controls and processes exist to mitigate future reputational risk?
General Questions		<ul style="list-style-type: none"> • How do your answers to the above questions differ under various climate scenarios? • How will answers to these questions change over the short, medium and long term? 	

Project deliverables and considerations

Project scope

Delivering effective risk management in relation to climate change is likely to require a project which includes both risk management and governance aspects, as well as a broader set of deliverables linking to scenario modelling, model creation, management information (MI) and disclosures. It may also include workstreams considering product development and innovation. This section therefore covers some linkages to other workstreams of the CFRF but it is intended to describe some of the considerations and outcomes required that will support effective risk management. Therefore, this case study will focus on the project related aspects of:

- Governance
- Risk management
- MI
- Customer considerations

Depending on the organisation there may also be other climate related commitments or other strategic elements that need to be considered within a broader programme of work. For the purposes of this paper we have not considered any of these elements beyond meeting the compliance requirements of SS3/19.

The project outcomes will need to map across to SS3/19 requirements to ensure deliverables meet all the requirements. In order to assess compliance firms will need to think through the specific risks that relate to them and consider proportionality as part of that process. Firms should also consider whether there are specific risks that require risk management activities to go beyond the compliance requirements.

Governance aspects

The governance workstream of the project will need to engage with existing governance frameworks across the organisation. It will decide how best to incorporate climate risk within the existing Risk Management Framework – as opposed to climate risk being viewed simply as a corporate social responsibility issue. As noted in the governance approach section, this will include the setting of accountable executive(s), incorporation within the risk taxonomy, updating committee terms of reference and enabling buy-in to climate risk across the organisation. In particular, consideration to the balance of work between first line and second line is important to ensure climate risk engagement is strong throughout the organisation.

As part of the broader governance aspects the project will need to determine how best to train and engage with all key stakeholders throughout the organisation. It is likely that training will be required for Board and senior leadership to understand the implications of climate risk and it is anticipated that the training would cover several different aspects including:

- Background to climate change risk including broader targets and physical / transition risks.
- Reporting / disclosure requirements.
- Roles & responsibilities.
- Understanding of good practice and regulatory requirements.
- Understanding of metrics and risks once MI and reporting is available to help with

setting risk appetites.

In terms of timing we anticipate that the governance aspects can be set relatively early in the project delivery process as this will ensure accountability is clear and sets expectations of which committees and individuals will be responsible for delivering aspects of the climate risk programme – this will also provide clarity over the likely individuals that should be involved on the programme of work.

Risk management aspects

Risk management aspects of the project will likely be closely linked into the data, modelling and scenario analysis workstreams of the project. The first stage of the project will be to agree which risks will be considered and how they are assessed. Once that is complete it will then be a case of working through qualitative and quantitative processes to understand the risks and how the firm wants to adopt an approach to managing that risk. It is likely that this is an area which will develop over time, starting with a qualitative approach. As quantitative aspects are understood these aspects will likely form part of the risk reporting through the structures identified in the governance workstream.

MI aspects

As noted below, this will have a closely link through to the data and modelling aspects of the programme and therefore will also be an area that builds in capability over time. We anticipate that firm specific MI needs will relate to the risks they identify on their book.

A key aspect of the MI workstream is to enable understanding and support future decision making. Therefore it is important that the MI is built in a collaborative way with decision makers, and its output informs both the qualitative aspects of risk management and also the specific quantitative aspects that are incorporated over time.

Customer considerations

The section below provides some information around customer considerations but the project will also need to consider customers from both the point of view of conduct and reputational risk as well as a much broader aspect thinking through the risk of unintended consequences coming from the programme of work.

This aspect of unintended consequences is something the programme needs to consider carefully as it progresses. Particular areas of concern noted so far include:

- The potential to create mortgage prisoners over time if changes to climate risk underwriting start to impact lending criteria.
- Adverse pricing impacts for specific groups of customers who fall out of 'standard' products.
- Potential impact on demand for housing in specific areas or housing types that results in losses for either the customer or the lender.
- Creation of new sets of vulnerable customers resulting from risks changing over time.

Project structure

In order to create an effective programme structure it is likely that there will need to be clear senior sponsorship of the project as well as engagement with key stakeholders across the firm from both first and second lines of defence. The programme structure is likely to be devolved into a number of specific workstreams covering key aspects of delivery.

It is important that programme assurance is a key part of the structure as that enables confidence that the scope is being met and that the project is on track to meet its delivery timescales. We would anticipate that assurance could be provided through a combination of second line input, third line input and potentially external assurance.

The following table describes a number of the key considerations that the project will need to address in order to meet the requirements of SS3/19 effectively:

Consideration	
1st / 2nd line approach	How best to engage ownership and accountability across the organisation to meet the requirements effectively.
How to apply proportionality	Relevance for firms of different sizes – and also depending on the risk within the lending book.
Obtaining the data required	Seeking out new sources of data to meet requirements and also working out how best to deal with gaps in the data.
Third party partner support	Should third party support from climate experts be gained in order to accelerate delivery, gain expertise and assure the project.
Project set up & governance and recognition that for a number of firms this will be a new topic	For many this will be a new topic with limited existing expertise in place across the organisation – therefore the approach to project setup and senior sponsorship will be key to gaining traction and success in delivery.
Linkage to other climate related commitments	For those organisations who have already made other broader climate related commitments the aspects of SS3/19 may fit well within a subset of those requirements and so the strategic linkage is important.
Internal capability	Assessing current and future capability required will be important and this links to the point above about third party support.
Programme assurance	Assurance will provide stakeholders with confidence that the scope and requirements are being met.
Training	Likely to start with the Board but will also need to expand training to senior leadership and the broader organisation over time.
Transition into BAU	As the project delivers and reaches its end there will need to be consideration for embedding into BAU to ensure the change is sustained on an ongoing basis.

Governance approach

In order to adequately address climate risk on a mortgage portfolio, a strong governance framework should anticipate and assess the mortgage exposures at risk and develop actions to adapt and mitigate.

Key concerns will be how the mortgage portfolio can potentially result in large financial losses, impairing asset values. If damages from physical risks are not insured, the financial burden can increase credit exposures for banks.

Where possible, integrate the oversight and management into existing governance structures as this ensures that climate change is strategically managed and the expertise of the firm is both integrated and leveraged across relevant committees and functions.

There are a number of executive governance committees where climate risk strategy and management should be discussed and each has a purpose in the identification and reporting and the ongoing management of mortgage portfolio risk. These committees may be slightly different or have different names depending on the organisation but the structure noted below is likely to be similar for most banks. These are:

- Board Level governance: which defines the climate ambitions and is responsible for promoting the long-term sustainable success of the Group. This would be covered by the following:
 - Group Risk Committee - financial risk from climate change and focus on risk-related matters such as scenario analysis and stress testing for mortgage portfolios, data and investment challenges in delivery
 - Group Audit and Disclosures Committee considers non-financial disclosures related to the broader environmental, social and governance agenda which may impact the financial statements. It can also focus on external disclosures and metrics related to mortgage portfolio new product offerings in response to climate risk
- Executive Level governance: is defined by strong, knowledgeable executive leadership to get everyone pulling in the same direction to deliver the Board's climate ambition, keeping the Board informed and can be covered by:
 - Executive Committee - setting strategic aims, they provide review and challenge on unexpected climate risk concentrations and the firm's mortgage strategy when considering the climate risk profile
 - Executive Risk and Audit Committee – ensure on behalf of the Board that appropriate policies are implemented to identify and evaluate climate risks and appropriate assurance has been conducted
 - ALCO- monitors and controls structural risks in the balance sheet, liquidity, treasury, funding, recommending policy development and monitoring implementation to ensure that board defined risk limits are adhered to and considered for the impact of climate change risk.
 - **Executive Steering Committee** focuses on the Group's climate ambition and challenges management on current progress across dimensions such as climate risk, measurement, and future opportunities (including product opportunities). It is expected that such a Steering Committee will be temporary in nature and associated with some form of Change Programme Governance; it may fall away as the maturity of BAU governance forums in the climate risk space improves.
 -
- Management Level governance: which defines the climate Risk Appetite, monitors

and manages climate risks, regulatory changes, business performance and reputational risks would be covered by:

- Risk Management Meetings
- Credit Risk Meetings
- Climate Risk Steering Committee
- Sustainability working groups
- Supporting governance: which provides oversight and management of climate risk plans, stress testing and scenario approaches as well as supply of data and risk measurement.

As a result, the Group Chief Executive would be the main sponsor of a climate ambition, regular updates on climate and / or sustainable finance initiatives, and changes to product approaches (e.g. new green mortgage products) that would be provided to the Board or Executive / Management Committees.

The Chief Risk Officer and Senior Management team are responsible for financial and non-financial climate risks. They provide regular verbal and written updates of climate risks and opportunities through a wide range of high level enterprise risk reports, risk appetite reviews and assessment of the risk management approach within the mortgage portfolios.

Management and Supporting governance listed above would be led by the Business leadership teams. These teams are responsible for the execution of the organisation's climate strategy and for mortgages. They can do this through developing new green mortgage products where there is the opportunity to offer lower rates on certain fixed rate mortgages linked to energy ratings, home energy efficiency upgrades, sustainable home improvements etc. Oversight of these new products can be done through the firm's ESG, Sustainability and/or Climate Risk governance forums.

It is important to consider defined terms of reference for each forum to avoid duplication of effort which can happen in large complex organisations. Working groups, decision making forums and escalation routes should be defined to ensure clear definitions of working practices, roles, accountabilities and responsibilities.

Management governance will assess how progress is being made against the climate risk strategy and impact on the mortgage portfolio, review risk reporting metrics (such as risk appetite) and agree any periodic regular climate risk updates to relevant board level committee(s).

Key metrics and reporting across all of these forums would include:

- Risk Appetite statements
- RWA's consumed by 'At Risk' sectors of the mortgage portfolio
- Reputational risk exposures
- Review of 'At Risk' portfolios and physical or transitional risk exposures
- Regulatory developments
- Climate planning progress: issues and actions updates
- Audit or Assurance findings with progress of remediation
- Dashboards outlining progress by business/ functions/ sector

Governance Interactions with Other Forums - covering Data, Modelling and Scenario Analysis and Disclosures.

As climate risk is a relatively new area of focus for risk management, it is important to ensure that the right level of information is captured, understood and reported to support any decision making or changes which may have an impact on climate risk. Below are some other key groups where the mortgage portfolio analysis is key.

To make an adequate climate risk assessment on the mortgage portfolio, there should be a defined and agreed approach to data, models and how scenario analysis is conducted.

Consider developing a climate risk data requirements and sourcing strategy that is supported by the Board and senior management team. This strategy will need to support risk identification, stress testing / scenario analysis, risk appetite and disclosures requirements, which are all key aspects of managing and reporting on climate risk. It will also (i) facilitate an understanding of available climate data and existing gaps; (ii) provide more structured recommendations which may include a data sourcing strategy with potential third party providers.

Examples of data points to consider getting agreement on with various stakeholders / committees are as follows:

Physical Risk Data points (Retail Sector Impacts)

- Property data and attributes – building age, number of floors, cellar/ basement presence of trees nearby, proximity to rivers etc
- Physical risk Data - flood, windstorm, flashfire etc
- Peril damage curves
- Data to enrich climate models e.g. EPC database
- Data from internal models – e.g. LTV's, PD's, LGD's
- Data collected but not used – e.g. mortgage valuation reports in PDF

Governance oversight should work through current data capabilities, gaps and the requirements for any specialist third parties who can provide market intelligence coupled with climate and catastrophe insight models to assess preparedness for any future climate events.

It is also important to ensure that there is understanding and agreement on what will be modelled, the level of scope to consider (products and markets), and what scenarios will be assessed to determine the climate risk on mortgage portfolios. Key forums would include:

- Data and modelling working groups – which act as a sounding board and problem solving group or to make decisions on models, tools and assumptions required or any business considerations. The group can also cover data strategy and data sourcing requirements to support risk appetite and risk management requirements. Some decisions would then go to a Design Authority or to the Climate SteerCo for approval or escalation.
- Design Authority – design decisions made in working groups can be reviewed and challenged in this forum. Final decisions on key areas of scope, modelling approach and appropriate review and challenge are taken. Senior stakeholders from Risk, Finance and, when relevant, the Business teams would attend.

All of these governance layers interact with each other in the management of climate risk. Smaller organisations would adopt a leaner governance structure than above, but would need to ensure demarcation between the management and executive responsibilities within the oversight or governance activities.

Management information

What MI needs to be considered to understand Climate Risk to mortgages?

Both physical and transition risk data is key when considering mortgages and the Climate Risk posed to properties. Given the push for net zero and the emerging government and industry policies, we need to be able to measure, manage and monitor the transition and energy use in the housing stock. For properties in the UK, the most readily available data to measure transition risk and energy usage is energy performance certificate (EPC) data which provides specific information on the energy efficiency and energy usage of a property. The data used to measure transition risk will differ dependent on the data availability, EPC is widely used across Europe but not globally. The requirements to understand physical risk for the portfolio, depend on the geographically relevant risks associated with the portfolio. In the UK, the most prevalent physical risks are flood and subsidence. The CFRF have produced a list of data tools and providers which may be useful when assessing the relevant options.

What specific property data is required?

Strong address matching is required to match mortgages to climate data. This includes geocoded physical risk data to specific addresses, and an accurate understanding of specific assets and physical locations within a portfolio. Understanding the property attributes (number of bedrooms, floor space, heating type etc) aid in estimating emissions data, determining the viability of retrofit and creating recommended actions for customers.

EPC data- availability, challenges, and data quality

EPC data is the most widely available building specific emissions data for properties. EPCs were first introduced in 2008 for rented properties and it has since become mandatory for properties to also obtain an EPC when they are sold or re-mortgaged. The data is available commercially for England and Wales; Scotland has EPC ratings, but this data cannot be used commercially; Northern Ireland has EPC data but it is only available for individual property searches rather than bulk download, and the Republic of Ireland does not have EPC ratings. EPC data for England and Wales can be sourced from the Ministry of Housing; it is updated quarterly. The quarterly updates mean that there can be a delay between ratings being completed and the data uploaded to the Ministry of Housing. In order to ensure up to date EPC data is held, the certificate should be collected at loan origination and each attribute should be stored systematically.

Not all properties have EPCs. In order to fill this data gap, one option is to use an EPC estimated based on year of build of the property. Other options include using machine learning models as well as decision rule methods. One of the main challenges to predict EPC ratings is the inconsistency with which they are assigned - EPC ratings are completed by individuals which mean they can be subjective and hence inconsistent. This leads to difficulties when using existing EPC data to predict ratings for properties without EPC.

Whilst EPC is the best available data currently, there are several challenges with the data. One key data point to note with EPC is that it only provides an estimation of energy usage for the building (which the emissions estimation is calculated from); EPC does not relate to actual energy usage of a property and this could differ significantly from the estimated energy use on the certificate. For example, a well-managed D rated property could have less actual energy usage than a poorly managed A rated property; EPC ratings do not bring out these nuances. As another example, EPC ratings do not take into account the occupancy of a property and hence an A rated property with 4 people residing in it would have a higher energy usage than a D rated property with 2 people living in it. This means there is a limit to

the recommendations we can provide to customers when relying on this underlying data.

EPC data can also be very outdated and not representative of the current property. When utilising EPC data to calculate emissions estimates, the grid composition at the time the EPC was completed, should be taken into account. The composition now has a much higher renewable energy percentage and hence emissions estimates for more recent EPCs will be favourable compared to much older EPC emission estimates. It is also important to consider the type of property when looking at the age of the EPC; houses are much more likely to go through significant retrofit/floor area changes whereas flats cannot change floor area and have much less opportunity for retrofits. Hence older EPCs for flats may be more reliable compared to those for houses.

Where EPC data is not available, the following options should be considered:

1. Actual meter data is preferable to EPC data in terms of estimating emissions impact of property portfolios
2. Property attributes can be used to estimate the energy usage of a property
3. Regional average property emissions data can be used in combination with property address

NWG Case study

(Source: Natwest Group Plc Climate-related disclosures report 2020, page 58):

PCAF data quality score: Our residential mortgages estimate achieves a weighted PCAF data quality score of 4.1. The weighting is based on two scores:

- a) Publicly available data: As at December 2019, EPC data was available for just under half of the residential mortgage portfolio which achieved a PCAF data quality score of 3.
- b) Extrapolated data: To estimate EPC ratings for properties which did not have publicly available EPC data, we used the average emissions profile of properties for which EPC data was available. This is based on the assumption that properties without EPC ratings have the same emissions intensity profile as those with available EPC ratings. This results in a PCAF data quality score of 5.

Flood risk data- Considerations and impact

Physical risk data is much more mature in the market compared to emissions and transition risk data. There are a number of data providers which supply a variety of physical risk data.

For physical risk data, one of the key considerations is the resolution of the data. For example, flood risk data at postcode level may assign high flood risk scores to all properties in that postcode even if only one property is actually exposed to high flood risk, hence property-specific physical risk data is preferable. Another key consideration is projected risk data rather than just current risk, modelled based on climate change scenarios. This data can be used to show the risk to properties over the next e.g.100 years based on severe to mild climate scenarios. Having this projected data will ensure the risk assessment is more thorough and considered.

A prominent physical risk in the UK is flood and subsidence risk. For flood risk, considerations to include with the data are whether flood defences have been taken into account and also the granular split of the flood data by flood data type (coastal, river, surface and groundwater) which can provide further insights to the property and area. For subsidence, again it is worth considering the split of data by type of subsidence (clay, silt, sand, peat and soft) which provides further granularity.

Physical risk data has to be contextualised to understand its significance. The Flood Re scheme ensures most properties (some exclusions exist for example new builds) irrespective of flood risk, can obtain insurance, and this is key to consider when assessing flood risk in the context of mortgages. Without this scheme there would be a much greater impact of flood risk to insurability and hence impact to mortgages. This scheme ends in 2039 and financiers should be mindful of the steps to take after this and consider the impact of physical risks like flood risk on property value.

What's the future state for the data?

More granular information around construction and retrofit activities of properties and specific energy usage of the properties is required to progress. Combining these creates a dataset that can be used to construct tailored measurable actions to truly drive change and drive down emissions impact. Understanding more about the specific attributes of a property gives increased ability to assess individual properties, and provide tailored and appropriate recommendations. Live meter data would ideally be used to understand specific emissions per property and to create insights and actions for customers to reduce impacts. Detail on energy providers per property would also allow us to better understand the emissions impact of the energy usage in homes and creates an opportunity to provide more specific and tailored actions for customers.

Other physical risk data types could be considered to broaden the understanding of physical risks posed. For the UK this could include items such as coastal erosion and sea level rise.

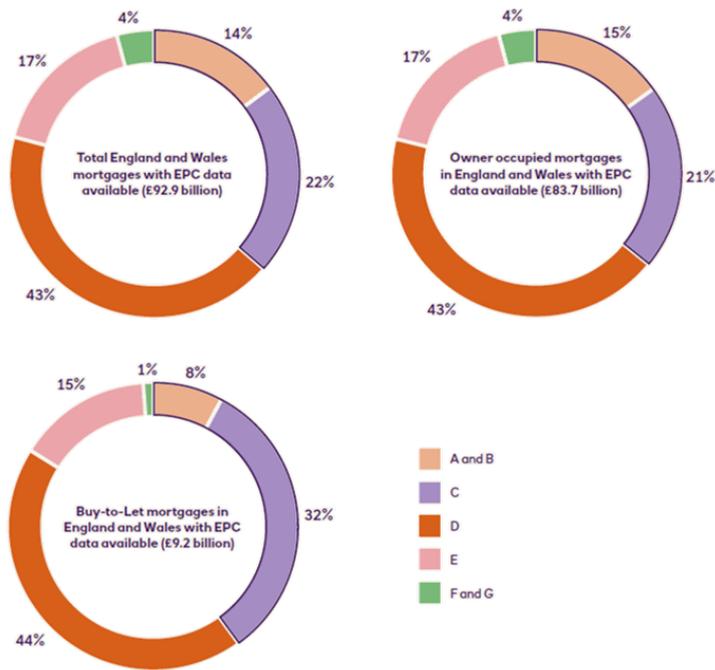
Using Climate data to drive decisions

The industry needs to ensure that pricing is used appropriately and that a just transition is achieved. There are clear risks that poor government or industry policy could create disparity and division in society between those who can afford to make climate positive changes to their properties and those who cannot. We have a responsibility to ensure this does not happen. There is also a clear requirement to ensure customer facing employees understand transition and can support our customers through this by providing nuanced products.

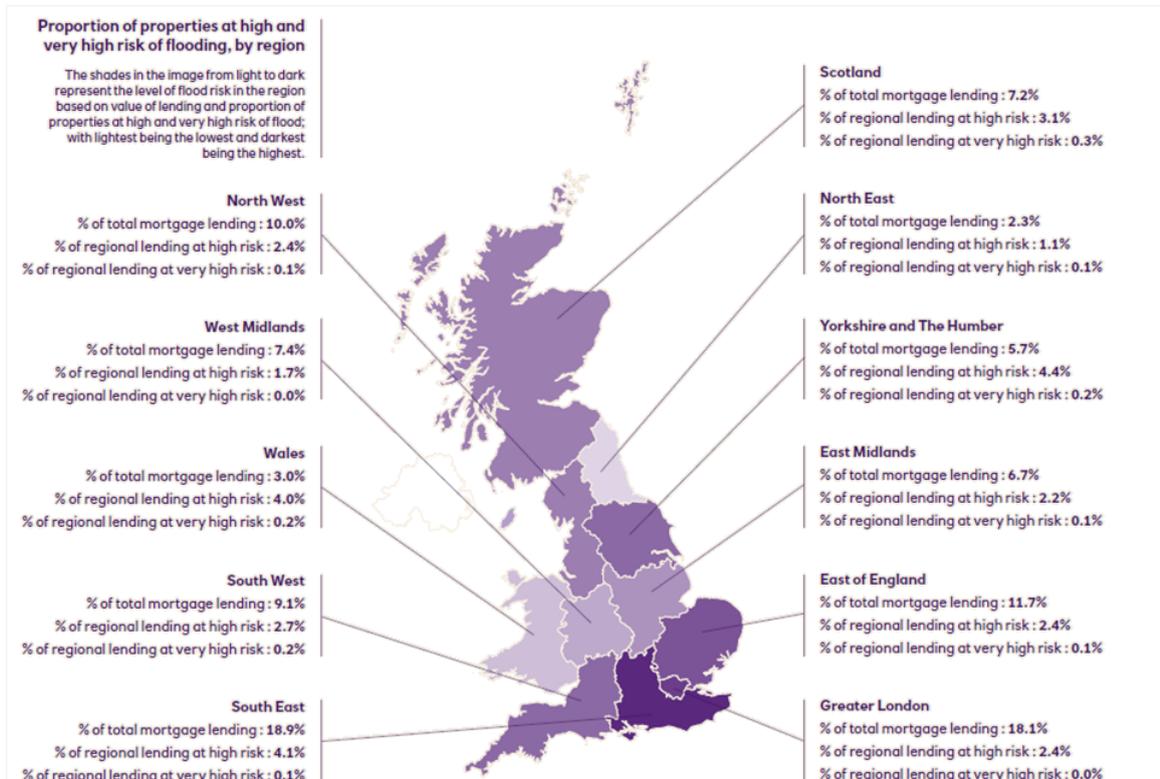
We should use data to drive decisions being mindful that data can sometimes be a blunt tool, and we need to see the full picture to make informed decisions. The development of climate data dashboards will assist in providing a rounded, contextualised view of the climate risks posed and ensure that appropriate actions are taken to reduce the exposure to climate risk, whilst keeping customers safe. We need granular, current and forward-looking MI aligned with scientific reduction pathways to drive emissions down and create opportunities for customers.

NWG EPC ratings for Retail banking residential mortgages in England and Wales

(Source Natwest Group Plc Climate-related disclosures report 2020, page 42):



NWG Flood Risk for residential mortgages in Retail Banking portfolio (Source: Natwest Group Plc Climate-related disclosures report 2020, page 43):



Customer considerations

There are some key themes arising in 'green' mortgage lending, which are amplifying existing conduct risks in this space: asset quality, product design, location, affordability, suitability of advice provided, pricing and impact on potential customer vulnerability. Equally, reputational risks to the lender are also amplified. These are discussed in more detail below.

Asset Quality - New v Old Housing Stock

New build housing since 2008 has had to achieve an EPC rating of C or above, which aligns to many Green Mortgage offerings on the market.

Delivering mortgage lending to new builds/ more efficient properties is more straightforward, but the majority of UK housing stock will require investment to retro-fit energy efficient technology to improve the EPC rating. To meet this demand, the market has started to introduce 'green' additional borrowing for their existing client base. The additional borrowing brings some new challenges to the mortgage lending market:

- How to track the benefit achieved from the additional lending? Is a change in EPC rating sufficient evidence for the lender? Is EPC a sufficient measure? – as described in the MI section.
- What happens if the desired rating is not attained within a certain timeframe - is the preferential pricing removed?
- What happens if the customer uses the funds for different purposes?
- Impact on asset value – it is still not clear whether there will be a direct increase in house values from the investment spend.
- From a recent industry survey², there are 15 lenders currently offering green mortgage type products (house purchase and/or retrofit), with the expectation that more will follow shortly.

Product Design

From a retail mortgage provider's perspective, greenwashing and product mis-selling concerns need to be understood and mitigated. How products are designed and what makes a product green or otherwise needs to be considered and product managers need to be trained to understand this. This will help reduce the potential for products being developed which do not meet customer needs or address a lender's climate ambition.

In terms of the sales journey, clear product disclosures, which are readily understood by the customer, are required. Where incentives or discounted pricing is applied or where there are conditions to be met need to be clearly articulated.

There is the need to integrate into product design, additional data captured as required by EU product taxonomy requirements. It is expected that a UK version will be developed. A

² <https://www.greenfinanceinstitute.co.uk/wp-content/uploads/2021/05/GREEN-FINANCE-GREEN-MORTGAGES.pdf>

recent UNEP FI article³ highlighted the challenges in capturing appropriate data, particularly where the (retail) market tends not to track the output of any additional mortgage spend. There is the opportunity to use existing processes to capture the additional data points, but this will require development.

Location

Green mortgage lending helps to address the transition risks, but does not address the physical risks of increased flooding, coastal erosion, subsidence, etc. With the benefit of flood risk data and projections, lenders can assess their appetite to regions which are more exposed to these risks going forward. However, there needs to be a cognisance of not only managing appetite for new lending in these areas but also how we support existing customers and how we manage exposure, particularly if asset values decrease as a result of these physical risks.

There is an inherent risk of creating mortgage prisoners, whereby the location of the asset means there is reduced appetite for lending and/or costs increase to reflect the increased risk. Likewise, lenders may be left with assets with reducing values or geographic areas which are 'unmortgageable.'

Affordability

Affordability remains key for all mortgage lending, to ensure fair customer outcomes. Payback periods for the investment in energy efficiency may exceed the lifetime of the asset ownership, and indeed, this may deter customers from making the capital investment if there is less realisable benefit to the spend. It is difficult to expect energy savings (£ terms) to offset the additional borrowing costs, which means that affordability will still be driven from net free income. Consideration should be given to whether lenders need to factor in property transition costs when assessing affordability; properties may not need retro-fitting now, but perhaps in the future.

Not all customers will be able to make and afford such investments, and government support may be required. The Green Homes Grant which was announced to address fuel poverty in September 2020 was cancelled in March 2021.

Suitability of Advice & Product Disclosures

The core product offering of mortgage lending is relatively unchanged, it is a mature market with established advice & execution only customer journeys, across multiple channels, including third parties, such as brokers. However, providing 'advice' on climate risk, and steps to improve energy efficiency and physical risk mitigation is new and banks need to carefully consider how customer conversations are structured and managed.

Conduct risks increase significantly, when a bank is seen to be recommending action, which leads to customers borrowing or spending money to retro-fit their homes, which do not deliver the benefits intended. Similar issues have arisen in other product areas, across the industry, when future or planned performance is not achieved.

³ <https://www.unepfi.org/wordpress/wp-content/uploads/2021/01/Testing-the-application-of-the-EU-Taxonomy-to-core-banking-products-Final-v2.pdf> P.58

Ultimately, the customer needs to make an informed choice, which will also be based on their own beliefs around climate change. This informed choice may also include reviewing flood risk data - but should this come from the lender or the valuer?

Pricing Considerations

When there are pricing discounts offered for green mortgages/ additional borrowing, these are offered with the intended benefit of energy efficiency being achieved. EPC Ratings are snapshots in time and have a finite life span. Lenders need to consider the appetite for EPC ratings to be refreshed or checked in order that customers can continue to benefit from the price advantage. An alternative may be for the lender to accept that the customer can benefit for the lifetime of the mortgage. Furthermore, it is recognised that EPC is a first generational measurement tool for energy efficiency; please refer to the MI section for further details on the challenges and suggested maturity evolution.

Customer Vulnerability

Lenders will have to develop strategies to deal with customers who are unable to effect change to their homes. This could be due to (i) affordability (fuel poverty), (ii) where the costs to retro-fit are excessive/ property type does not support improvements or (iii) where the physical risks (location) present higher costs to remediate or remediation is not feasible. Lenders need to consider how best to support these customers whilst managing down the lending risk and exposure.

Reputational Considerations

The following are recommended for consideration:

- Data Usage - lenders will be utilising a variety of sources (EPC, flood risk, etc) and lenders will need to be transparent about how this data is being used in the mortgage assessment process.
- Change in lending appetite/ location restrictions – building on the location and customer vulnerability aspects, lenders will have to develop strategies to support customers who may be impacted by their decisions such as restricted appetite to EPC ratings, locations, property types. This may link into public sector support, particularly for areas subject to higher physical risk impacts. Third party considerations – where lenders seek to utilise third parties to support climate improvement initiatives, appropriate due diligence is required. Energy efficient technologies are still relatively new and lenders run the risk of ‘recommending’ providers where the benefits are still being proven. Similarly, lenders need to consider any reputational impacts where technology implemented fails or requires additional investment to repair. This aligns to the risks arising from an advised sales journey.

Other considerations

There are several other considerations that might need to be made in assessing climate risk in the context of mortgages. There have been several consultations and changes around regulation in recent years and firms should maintain a view over the changing legal and regulatory environment as this may change the level of risk in the forward looking environment, and may change the actions required by firms.

It will be important to ensure that the importance of financial institutions in driving forward

climate risk considerations in the retail banking mortgage market is positioned appropriately. As well as the role of financial institutions, other stakeholders also have a key role to play and need to work together and coordinate to enact change. For example, customer action will be driven by education, incentives and policy; Government can play a critical role through legislation and subsidisation; while housebuilders, energy suppliers and retrofitters can provide direct influence on structural change.

Proportionality will also be another factor that is important for firms to consider. The level of risk in the book, the types of products being sold, geographical concentration, the level of capital held and the capability of risk management will all be factors to consider in thinking through a proportionate response to SS3/19.

Firms own broader strategy in relation to climate and the environment as well as other ESG matters will also be a factor that impacts the work required in this area.

5 Corporate Banking

Overall framework

With changing government policies and tightening regulation, it is more important for banks to assess the impacts of climate risk on their portfolios. For corporate portfolios, it brings additional challenges due to variability in terms of industry, size and geography. Depending on the materiality attached to the clients, banks might wish to undertake the assessment at client level.

It is ideal that the assessment, even when done at client level, follows a certain structure and covers all sub-types of climate risks. Given the nascency of climate risk considerations by the corporates, it is also critical to understand the acceptance of climate risk by the client and its intent to take actions to mitigate the risks. While some of the gross risks can be quantified, risk mitigation might have to be largely qualitative in nature.

The banks can consider dividing their client level assessments in to three broad categories. For each category, there can be a number of questions which can be scored depending on the response. A weighted scoring approach can be adopted to evaluate the category score. The category scores themselves can be aggregated in a weighted manner to reach a client-level climate assessment score.

Questions are provided as examples – closed questions have the benefit of facilitating data collection and analysis; open questions can provide more insight in responses but consolidation of these responses will be more challenging.



Strategy, disclosures and commitments

This category aims to assess the intent of the client to transition by evaluating their level of public disclosures and commitments to reduce emission levels.



Transition risk and mitigation

Gross transition risk should be evaluated by assessing the client's reliance on high carbon products for its business model and its possible financial impacts resulting from governments and regulators policies. It is also critical to understand what actions the client is taking to mitigate those risks.



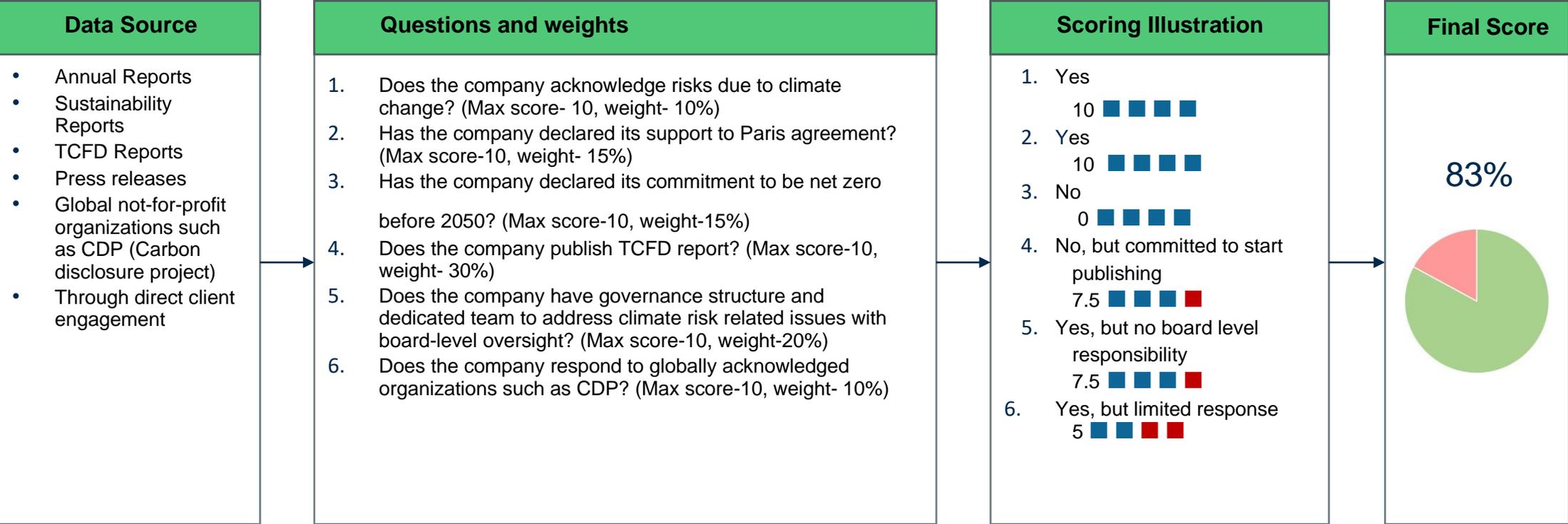
Physical risk and adaptation

Based on the location of the client's offices, operating locations and other assets, the clients can face physical risks due to climate, both as of today and in future. The assessment should also include the adaptation plans that the client may have to mitigate those risks.



Strategy, disclosures and commitments

This category aims to assess the intent of the client to transition by evaluating their level of public disclosures and commitments to reduce emission levels. Most of the information required can be gathered from the public declarations made by the company, however, the efforts should be made to also approach the client for the verification of the information.





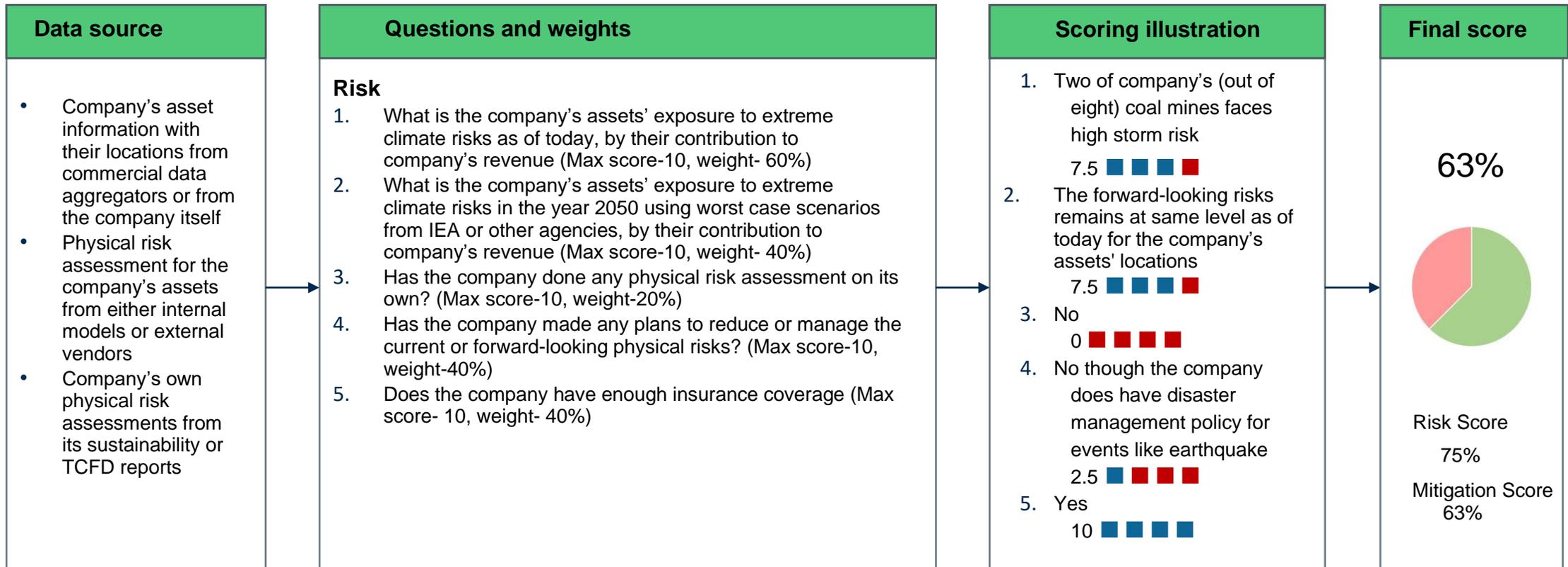
The aim of this category is to assess the gross transition risk for the company along with assess the transition mitigation plans capability. Reliance of fossil fuels is a key discriminator. The banks can also consider assessing the financial impact on clients due to carbon tax and other government policies by deploying advanced climate risk models.

Data source	Questions and weights	Scoring illustration	Final Score
<ul style="list-style-type: none"> Financial information from annual reports Emission data and emission reduction targets and plans from Sustainability or TCFD Reports Alternate sources may include Global not-for-profit organizations such as CDP or other commercial data aggregators Through direct client engagement 	<p>Risk</p> <ol style="list-style-type: none"> What is the reliance of the company on fossil fuels byproduction or revenue? (Max score- 10, weight-50%) How the company’s emission intensity compares to its regional peers? (Max score-10, weight- 30%) Does the company face any challenges due to government policies or NDCs? (Max score- 10, weight-20%) <p>Mitigation</p> <ol style="list-style-type: none"> Has the company declared its plans for emissionreductions? (Max score-10, weight-30%) Has the company declared its plans to decarbonise itsproduct offerings? (Max score-10, weight-20%) Does the company disclose its scope 1, 2 and 3 emission levels. (Max score- 10, weight- 20%) Was the company able to reduce its emissions in last fiveyears? (Max score-10, weight-20%) Has the company done any scenario analysis to adjust itsbusiness strategy? (Max score-10, weight- 10%) 	<ol style="list-style-type: none"> 93% of EBITDA is from coal mining activities · 0 ■■■■ Aligned to peers · 5 ■■■■ Yes, their main buyer countries have announced a cut down on coal-based energy · 2.5 ■■■■ Yes, but the reduction plans are weak · 2.5 ■■■■ Yes, but they are also energy intensive non-coal mining activities · 2.5 ■■■■ Yes 10 ■■■■ Yes, but against the weak targets 5 ■■■■ No 0 ■■■■ 	<p style="text-align: center; font-size: 24px;">31%</p> <p>Risk Score 20%</p> <p>Mitigation Score 43%</p>



Physical Risk and Adaptation

The aim of this category is to assess the gross physical risk for the company along with the assessment of the adaptation plans. This could be further developed to consider the impact of physical risk in the supply chain.



Portfolio level assessments and risk appetite

Based on the alignment with the strategy, the bank can devise the risk metric considering the framework described earlier. The bank will need to assess how much weight it should give on both types of risks individually. The bank will also need to decide whether it wants to have separate risk appetite threshold for different sectors or geography. Below are some of the risk metrics that bank can consider based on exposure concentration.

