



TCFD report
playbook

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Overview

Context: the need for consistent and granular climate risk disclosure

Rapidly enhancing the comprehensiveness, consistency and comparability of climate-related disclosures is a critical near-term imperative for financial institutions, corporates, regulators and governments. The recommendations and guidance of the Task force on Climate-related Financial Disclosures (TCFD) provide a globally recognized framework for organizing and delivering climate-related disclosures by corporates and financial institutions. Now the de-facto global standard, the TCFD framework – and the risk assessment, technical analysis and strategic practices the TCFD references, such as scenario analysis – underlies a broad range of policy, regulatory and market-led initiatives designed to align the financial sector with the goals of the low-carbon transition.

However, in the three years since the release of the TCFD, corporates and financial institutions have made limited progress in their efforts to enhance the breadth and depth of their climate-related disclosures. In a 2019 [review of TCFD disclosure practices](#), the TCFD Secretariat found that while disclosure of information has increased, current levels remain insufficient for investors.

Meta-analyses of TCFD disclosures across sectors – including the *2019 EY Global Climate Risk Disclosure Barometer* – suggest that the banking sector scores higher for both quality and coverage of

climate-related risk disclosures when compared with the average across the broader financial industry. However, the financial sector continues to lag compared with leading non-financial sectors, including energy and transport. Furthermore, TCFD disclosure quality remains uneven across different disclosure items, and disclosures on the resilience of firm’s strategies to climate change impacts continue to fall short.

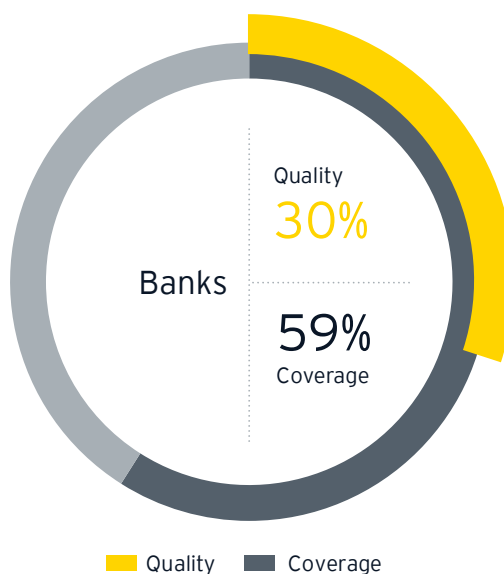


Table 1: TCFD reporting – State of Play	
# of total TCFD Signatories (as of September 2020)	1,440 public and private sector organizations
Share of TCFD signatories that are financial institutions (as of September 2020)	50%
Assets of TCFD supporting firms	\$118 trillion +
# of central banks/supervisors encouraging TCFD reporting	36
Assets under management of investors asking companies to report under TCFD	\$34 trillion (340 investors)
% of companies addressing more than 5 of the 11 recommendations (2019 TCFD Status report)	25%

As noted by [Mark Carney](#), UN Special Envoy on Climate and Finance, achieving a net-zero emissions goal will require a transition of the entire economy – necessitating **climate risks are fully taken into account in all decision-making, including capital allocation by the financial sector**. To reach this point, climate disclosures from financial institutions help in:

- ▶ Core quantitative data monitoring the decarbonization pathway of a firm's businesses, enabling a clear view on the pace of change
- ▶ Comparison between the range of strategies used across the financial sector to address climate-related risks and opportunities, enabling better benchmarking and comparison between firms
- ▶ A comprehensive view on current capital allocation by financial institutions to climate sensitive sectors, and a better understanding of financial institutions' strategies and engagement to facilitate decarbonization

To achieve this, financial institutions will need to use their power as users and producers of disclosure to set clear expectations for disclosures from clients and counterparties – which in turn will enable them to deliver a step-change in their own disclosures. This implies moving from **ambition to action**, and from **experimentation to alignment**.

TCFD in 2020: evolving approaches and expectations

The paradigm shift in climate risk assessment that the TCFD catalyzed has evolved far beyond the boundaries of the TCFD's recommendations and guidance, with notable developments in market practice, granularity, expectations and ambition:

- ▶ **New and emerging metrics**, e.g., the implied "warming potential" of a financial portfolio, are reshaping how climate risks are perceived and communicated.
- ▶ **Links to supervisory expectations and regulatory requirements** are increasing – with the TCFD now specifically referenced in over 30 policy, supervisory and regulatory instruments in over 15 jurisdictions (see Box 1).
- ▶ **Targets** set by financial institutions, often in the context of TCFD disclosures, are shifting from goals on additional green financing to active commitments on the decarbonization of portfolios, in the context of net-zero goals (for instance, the [Collective Commitment on Climate Action](#)).

Rapid innovation has led to a greater range of material information on climate risks and opportunities being disclosed in a quantitative manner, and in certain cases, with a forward-looking perspective. However, this innovation – and the growing range of risk assessment methodologies and tools – could lead to greater divergence in **the technical elements of disclosure**, impeding comparability. Similarly, the growing marketplace of tools for transition and physical risk assessment for different types of financial firms (e.g., banking vs. insurance) has resulted in divergent quality in disclosure of physical vs. transition risks across asset classes.

Consequently, the need for greater consistency – in structures, granularity and metrics used to disclose quantitative information – is increasingly evident. Such consistency is key to improve the usefulness and comparability of disclosures for investors and other stakeholders, as well as to provide boards and senior management of financial services firms a meaningful base from which to set goals and targets.

Box 1: Supervisory and regulatory action on climate risk disclosure

Central banks, supervisors and governments are taking steps to formally encode aspects of the TCFD recommendations into policy and regulatory frameworks affecting financial institutions. Key recent examples include:

UK: The UK Department of Work and Pensions (DWP) has launched a new [consultation](#) seeking views on proposals to require certain pension schemes to put systems of governance, monitoring and risk management associated with climate-related risks and opportunities in place in October 2021. The DWP is also seeking views on whether schemes should be formally required to deliver TCFD disclosures by the end of 2022. In addition, the UK Financial Conduct Authority is currently consulting on [proposals to make TCFD disclosures](#) mandatory for certain listed firms.

EU: The European Commission has introduced several instruments relevant to disclosure of climate-related risks by financial institutions, including the Non-Financial Reporting Directive (NFRD), which is supplemented by specific [guidelines](#) on reporting of climate-related information.

Hong Kong: The Hong Kong Monetary authority has released a [white paper on green and sustainable banking](#) setting out its proposed supervisory approach to climate risks, focusing heavily on the TCFD framework.

Switzerland: Swiss Financial regulator FINMA has publicly announced it is reviewing approaches for [improved disclosure of climate risks by major financial institutions](#), which may lead to mandatory TCFD disclosures.

New Zealand: In September 2020, The New Zealand Government proposed legislation to make climate-related financial disclosures mandatory for financial market participants, making it the first country to formally move toward a comprehensive mandatory reporting regime for TCFD disclosures. The requirements would apply to certain publicly listed companies and large insurers, banks and investment managers, on a 'comply-or-explain' basis. If approved by Parliament, financial entities could be required to make disclosures in 2023 at the earliest.

Recent proposals in the European Union – including the [ECB Guide on climate-related and environmental risks](#) – suggest that specific climate-related metrics associated with TCFD disclosures may be included in regulatory requirements for banks (see Box 3). Under Expectation 13.5 of the draft guidelines, banks are expected to disclose:

- ▶ The institution's Scope 1, 2 and 3 GHG emissions
- ▶ The amount or percentage of carbon-related assets in each portfolio and a forward-looking estimate of this share
- ▶ The weighted average carbon intensity of each portfolio and a forward-looking estimate of this value
- ▶ The volume of exposures by sector of counterparty
- ▶ Credit risk exposures and volumes of collateral by geography/ country of location of the activity, with an indication of physical risk exposures

Responding to the challenge

A first step toward greater consistency is to build industry consensus on common practices for disclosures that complement what the TCFD framework currently provides. Formulating a “shared view” from the financial industry can also influence the quality and consistency of disclosures by corporates, upon which financial institutions must rely to satisfy new risk management and disclosure requirements imposed by regulators and policymakers.

To address this challenge, The Institute of International Finance (IIF) and the United Nations Environment Programme Finance Initiative (UNEP FI), with the support of EY, conducted a joint effort to support banks and other financial institutions in their efforts to strengthen climate risk disclosures. We convened a group of global banks that are members of the IIF’s Sustainable Finance Working Group (SFWG) and UNEP FI’s TCFD pilot program to share their perspectives on leading practices for developing, designing and delivering climate disclosures, and to identify areas where industry consensus needs to develop. On the basis of this engagement, and review of 2019 disclosures, we have developed this **TCFD Playbook** to serve as a resource for firms at different stages on their journey toward fully aligned and comprehensive TCFD reporting. The Playbook provides insight into the 11 disclosures of the TCFD framework in order to help guide firms in their efforts to design and implement TCFD disclosure programs. It contains “Playbook Guidance” tables covering: i) baseline disclosures, ii) advanced considerations, and iii) remaining open questions. These materials are supported by examples from leading 2019 TCFD reports. While focused primarily on the banking sector, this document contains information that is relevant for all financial institutions, including asset managers and insurers.

Three priorities to improve consistency and robustness

Through this engagement, several lessons have emerged for the state of TCFD reporting practices today, and what is necessary for TCFD disclosures to evolve. Three key priorities include:

- 1. Broadening scope from ‘carbon-related’ to ‘climate-sensitive’ exposures.** Industry should come to agreement on a broader view of sensitive sectors, beyond what the TCFD initially defined as carbon-intensive industries (e.g., energy and utilities). This is because: i) it is necessary to include sectors that may be affected by physical risks, ii) it is evident that a broader range of sectors may be at risk from a transition perspective, and iii) shifts toward portfolio alignment – and targets for capital allocation – need to be better and more consistently defined in order to be measurable. Key actions in this area include:
 - ▶ Setting out a framework for climate-sensitive sectors: UNEP FI TCFD program participants have mapped a number of common classification systems (NAICS, ISIC etc.), to identify a preliminary list of climate-impacted sectors and industries. The final heat map is expected to be released in mid-October 2020.
 - ▶ Clarifying links to emerging policy frameworks requiring reporting of portfolio allocations to such sectors – for instance, disclosures under the EU sustainability taxonomy regulation.

2. **Develop a core set of industry standards for metrics and their underlying variables/calculations.** The theory of change behind the TCFD was that markets would address climate risks more effectively if better information were available. The primary complaint from investors and other stakeholders remains that decision-useful quantitative information is not readily available, or comparable. To supply such information requires that the disclosing institution is technically capable of assessing climate impacts on its business – but also that common approaches be taken.

- ▶ A critical near-term priority is for financial institutions to align on a core set of metrics that for quantifying climate-related risks, and measuring alignment with climate objectives. Aspects of this growing body of risk and alignment metrics may require standardization if greater consistency is to be achieved (see Box 2). Considering the trajectory of market practice and supervisory and regulatory expectations with respect to metrics, it is reasonable to assume that the TCFD – or regulators themselves – may develop further guidance on additional metrics to be included in TCFD disclosures.

3. **Making the link to targets and commitments.** More and more banks are making overarching commitments to take action on climate-related priorities, including setting goals to align investment portfolios with net-zero emissions goals. These pledges are subject to increasing technical scrutiny from investors and civil society stakeholders. Green financing, green bond issuance, and divestment from emitting sectors are all examples of alignment metrics that can be in this regard. At present, many of these commitments are sufficiently recent that they have just completed the target-setting phase. In the coming years, progress against these targets will need to be disclosed TCFD reports in a consistent and robust manner.

Next steps: developing standardized templates

This document is a first step toward the development of **standardized templates for TCFD disclosures by financial institutions**. Based on the insights we have gathered, it is evident that such templates are urgently needed to guide the alignment of disclosures. Our future work will focus on finding ways to better align disclosures in areas where broad divergence in practices, approaches and metrics persist – with a core aim of harmonizing delivery of quantitative data in a consistent format. By bringing greater transparency on the approaches, data inputs, and variables used to quantify and measure such risks, we hope that financial institutions will be able to collaboratively raise the bar for what good disclosure looks like.

How to use this document

This document was created to assist in the development of a financial institution's TCFD report, and it should be adapted to meet the needs of your firm. This document is primarily focused on the banking sector but is applicable to development of TCFD reports by other types of financial institutions. **We encourage firms to structure their final TCFD report around each of the 11 disclosures. This is how we chose to structure the guidance.**

Adhering to this structure greatly enhances comparability between institutions, while making it explicitly clear which disclosures are being implemented.

Each section of this document relates to one of the 11 recommended TCFD disclosures and includes a description of the key components to cover in each section.

TCFD elements	TCFD recommended disclosures
1. Governance The organization's governance around climate-related risks and opportunities	a. Board oversight
	b. Management's role
2. Strategy The actual and potential impacts of climate-related risks and opportunities for the organization's businesses, strategy and financial planning	a. Climate-related risks and opportunities
	b. Impact on the organization's businesses, strategy and financial planning
	c. Resilience of the organization's strategy
3. Risk management The processes used by the organization to identify, assess and manage climate-related risks	a. Risk identification and assessment processes
	b. Risk management process
	c. Integration into overall risk management
4. Metrics and targets The metrics and targets used by the organization to assess and manage relevant climate-related risks and opportunities	a. Climate-related metrics in line with strategy and risk management process
	b. Scope 1, 2, 3 greenhouse gas (GHG) metrics and the related risks
	c. Climate-related targets and performance against targets

Playbook guidance (in tabular format) includes:

1. **Baseline disclosures.** These are standard disclosures that financial institutions should provide. The choice of baseline disclosures was made on the basis of several factors, including prevalence in a significant share of TCFD disclosures, ease of formulation and degree of consistency.
2. **Advanced considerations.** For more advanced financial institutions, there is a range of more complex, detailed and granular disclosures that can be developed, as well as augmentations to baseline disclosures, to take a TCFD report to the next level. Advanced considerations were selected due to their being referenced by financial institutions, prudential regulators or climate-related framework. Accordingly, emerging consensus is developing, and the rest of the industry should seek to move toward it.
3. **Open questions.** Based on analysis of published TCFD reports and engagement with FIs, we have identified that there are many open questions remaining on how to best formulate more complex TCFD disclosure items. The areas where there is not clear industry consensus will be addressed in Phase 2 of this initiative.

Illustrative examples have been included in the appendix to show how a diverse set of banks have implemented TCFD and includes both baseline and advanced practices.

Financial institutions currently release TCFD disclosures through a range of different reporting modalities, including as an integrated component of annual reports, within sustainability reporting or as a stand-alone TCFD report. We have developed this playbook to be applicable across this range of different modalities, recognizing that such reporting may differ significantly in terms of length, granularity, detail and provision of supporting information and data. In the following sections, we refer to “TCFD Report” as an umbrella for all types of TCFD disclosures, regardless of their modality.

We hope this document is useful to firms as they begin to plan for and develop their 2020 disclosures, and welcome engagement from firms seeking to use the Playbook. Comments and other feedback on this document can be directed to Raymond Aycock at raycock@iif.com.

0. Introduction and report overview

While the TCFD Framework may appear simple, developing a coherent TCFD report can be a challenging exercise, especially as a first effort. The critical priority for any TCFD report should be maximizing “decision-usefulness” – the degree to which information provided is readily accessed, cogent and relevant for the main users of a disclosure. In the case of financial institutions, the main groups of users are often shareholders (including other financial institutions), regulators and other stakeholder groups.

A strong and clear introduction to a TCFD report is key to strengthening decision-usefulness. The introduction and report overview can help to provide insight to the firm’s material climate risk exposures, as well as the governance, strategy and decision-making associated with a firm’s risk management framework.

0.1 Introduction

The introduction should explain to readers why the company has prepared and published this report and how the information within is decision-useful to stakeholders (i.e., the purpose). To achieve this, several aspects should be considered and addressed:

- ▶ Explain why climate change is important to the sector and the company. This may include a description of the company’s overarching commitment and approach to tackling climate change and a summary of the physical and transitional risk it poses to the company and its stakeholders.
- ▶ Explain why the report has been prepared – for example, to transparently communicate to stakeholders, build trust, allow investors to better understand the implications of climate change.
- ▶ Identify the intended stakeholder audience(s) for the report. In addition, identify participation in industry initiatives or agreements, such as the UNEP FI TCFD Pilot, Paris Agreement.

- ▶ Provide a brief summary of the coverage of the report against the recommendations, including any highlights or gaps. Consider describing how long you have been reporting, how this report differs from previous reports and improvements that will be made in future years.

A brief overview of the TCFD framework may be helpful to guide readers through the disclosure.

0.2 Report overview

At the end of the introduction, it can be useful to briefly summarize the specific TCFD disclosures covered by the report (and those which are not addressed). A graphic representation of the disclosures covered – including with reference to the TCFD Framework – can be helpful.

The report overview differs from the introduction in that it summarizes how the institution implemented each of the 11 TCFD recommendations, rather than discussing broad commitments to TCFD or climate change overall.

The following topics should be covered:

- ▶ A brief summary of the firm’s response to each of the 11 TCFD disclosures; ideally, this summary should be presented in an infographic or dashboard where an audience can clearly see how an institution responded to each of the 11 disclosures
- ▶ A high-level summary of the firm’s overall strategy and response to climate-related risks and opportunities, detailing a few choice metrics and targets

1. Governance

Governance is a key component of a firm's climate risk framework. It defines, in the form of a board-approved charter and governing policies, the roles, responsibilities and decision-making mechanisms by which a financial services firm defines and delivers on its climate-related commitments to key stakeholders such as customers, investors and the communities in which the institution operates.

The Governance disclosure should make it clear to all key stakeholders and other interested parties the commitments the institution has made and how they intend to realize them. This should include a discussion of how both the board and management will address climate-related risks and opportunities. This section summarizes key components that should be addressed as part of the governance disclosure.

1.1 Board oversight

Structural overview

This disclosure provides a clear description of the board's structure and experience relating to climate change. This section should include:

- ▶ Clear description of the entity or individual who has primary responsibility for managing climate risks at the board level; this could be, for instance, a specific board committee, subcommittee, an individual board member or delegate

- ▶ Clear description of the roles and responsibilities of the board in defining the enterprise commitments with respect to climate impacts, as well as addressing related risks and opportunities
- ▶ Experience of board members on climate change
- ▶ Specific board committees overseeing climate risks and membership and cadence of meetings
- ▶ Climate-specific structures/committees in place (if any) and related decision-making processes

Oversight

This disclosure details the process by which the board is informed of and manages climate-related risks and opportunities. This section should include:

- ▶ Processes and frequency by which the board and/or board committees are informed of climate-related issues
- ▶ Training received and experience of board members on climate change
- ▶ How the board and/or board committees contextualize climate-related issues (e.g., in the context of risk management policies, strategy, business plans, divestments and acquisitions)
- ▶ How the board monitors and enforces progress toward metrics and targets that are aligned to the enterprise commitments to stakeholders

Incentive structure

This disclosure details the methodology for incentivizing the board's management of climate-related risks. It should disclose the amount of incentives if possible.

Playbook guidance

- Baseline disclosures**
- ▶ Organizational chart that illustrates which board committee(s) are responsible and the frequency (e.g., annually, quarterly, more than quarterly) of those committees
 - ▶ Summary of key issues and initiatives discussed with the board during the current reporting period
 - ▶ ESG experience of board members in a summary of board credentials and experience and/or individual biographies
 - ▶ Acknowledgment of the connection (if any) between management of climate-related risks and board compensation

- Advanced considerations**
- ▶ Separate committee(s) that report to the board of directors for climate-related matters with clear descriptions of their roles and responsibilities
 - ▶ Organizational chart that illustrates how those committee(s) roll up into the board
 - ▶ Details of the board member incentives linked to climate initiatives and a description of the criteria for the incentive compensation, including connection to specific metrics
 - ▶ Description of interaction among steering groups and committees to facilitate knowledge sharing

- Open questions**
1. What are the minimum expectations for governance in respect to climate?
 2. Is there a minimum frequency with which the board should review climate metrics and targets?
 3. What level of detail should be expected when it comes to board level incentives?

- Practical examples**
- [Figure 1.1a UBS](#)
 - [Figure 1.1b Citi](#)
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1.2 Management's role

Structural overview

This disclosure provides a clear description of management's organizational and reporting structure. This section should include:

- ▶ Specific ESG functions or committees and climate-specific functions, relevant committees, or designated individual responsible for management of climate-related risks.
- ▶ A description of the ESG or climate-specific committee's structure
- ▶ Whether these committees report to the board or a committee of the board
- ▶ A description of the interaction across the businesses, finance, risk management and ESG-specific functions

Processes

This disclosure details the process by which management is informed of and manages climate-related risks and opportunities. This section should include:

- ▶ Processes by which management is informed about climate-related issues
- ▶ Scope of management's responsibilities; this includes whether management directly assesses/manages climate-related issues
- ▶ How management monitors and addresses climate-related issues
- ▶ Description of the roles of the first and second lines of defense, which include identifying the responsible individual(s) for the management of risk and the authority of the control functions

Incentive structure

This disclosure should detail the methodology for incentivizing management's role in managing climate-related risks. It should describe the amount of incentives if possible.

Playbook guidance

Baseline disclosures

- ▶ List of management level committees and or functions (e.g., Environmental and Social Risk Management function) related to climate change management
- ▶ Frequency (e.g., annually, quarterly, more than quarterly) of committees or executives reporting to the board to assess and manage climate-related risks and opportunities
- ▶ Acknowledgment of the connection (if any) between management of climate-related risks and management compensation

Advanced considerations

- ▶ Details of the incentive structure linked to climate initiatives and a description of the criteria for the incentive compensation, including the connection to specific metrics

Open questions

1. Are there key responsibilities that every CFO and CRO should have?
2. Should a single dedicated member of senior management (or equivalent) be responsible for the climate change strategy?

Practical examples

[Figure 1.2a UBS](#)
[Figure 1.2b Citigroup](#)

2. Strategy

The Strategy pillar of the TCFD disclosures is intended to provide important insight to the type, magnitude and time horizon of climate-related exposures. It is also expected to provide information on the nature and potential impact of the risks and opportunities associated with the exposures. Importantly, disclosures under this pillar should also address how responses to climate risks and opportunities are integrated within the strategy of the firm, as well as how they are incorporated as part of financial planning and analysis. An important element of Strategy disclosures is how a firm's understanding of its climate-related exposures, risk and opportunities is reflected as part of its operational resiliency strategy, planning and decision-making.

While progress has been made by financial services firms with respect to **completeness** of strategy-related disclosures, challenges with respect to methodology and granularity continue to impact the **quality and decision-usefulness** of disclosures. Lack of consistency in the structures of Strategy disclosures, and an insufficient level of analytical granularity, can create major barriers to accurate assessment of the differences in climate risk profiles across financial services institutions. For example, without agreement across banking institutions on a detailed methodology for capturing carbon-related exposures, it is possible for two institutions with similar portfolios and customer profiles to disclose materially different exposures.

Scenario analysis (see section 2.3) continues to be a challenging aspect of TCFD disclosures for most firms, and greater consistency in approaches is urgently needed. The majority of the 2019 financial services disclosures did not include

quantitative estimation of the financial impacts of their climate-related risks and opportunities. Institutions that carried out scenario analysis generally focused more on the transitional risks than the physical risks. Identifying practical steps to harmonize aspects of technical approaches to scenario analysis – including scenario used, key variables and time horizons – is an important priority for industry collaboration.

2.1 Climate-related risks and opportunities over the short, medium and long term

2.1.1 Time horizons

This disclosure details the time horizons used by the organization, as well as their justification. This section should include:

- ▶ A description of relevant short-, medium- and long-term time horizons, listing the specific years when possible
 - ▶ This description must consider the weighted average life of an institution's portfolios as well as time horizons used in internal forecasts (e.g., deferred tax assets).
 - ▶ This description must also consider the fact that certain physical climate impacts may manifest in medium and longer time horizons, while others may manifest over the short term (or are manifesting already).
- ▶ Link between short-, medium- and long-term time horizons and overall business strategy. This contrasts with using these time horizons solely to address climate-related risks and opportunities.

Playbook guidance

Baseline disclosures	<ul style="list-style-type: none">▶ Identification of time horizons used (analysis of TCFD disclosures and CDP reports indicate standardization across the below time horizons):<ul style="list-style-type: none">▶ Short-term (0-1 years)▶ Medium-term (1-5 years)▶ Long-term (5-40 years)▶ Clear connection to time horizons throughout risks and opportunity forecasting and scenario analysis▶ Brief explanation on why an institution has settled on these time frames and context on how they are reasonable in the context of decision-making or risk management
Advanced considerations	<ul style="list-style-type: none">▶ Clear time horizons for management of risks and opportunities, including detailed milestones to show progress and quantify business impact (Section 3.2)▶ Scenario analysis results are reflected in resiliency strategy (Section 3.3)
Open questions	<ol style="list-style-type: none">1. Is there agreement on the with time horizons listed above?2. How should time horizons be influenced by local regulatory reporting definitions and requirements (e.g., EU stress tests, US CCAR)?
Practical examples	<p>Figure 2.1.1a 2019 ING Terra Progress Report Figure 2.1.1b 2019 UBS CDP Report</p>

2.1.2 Climate-related risks and opportunities

This disclosure details the methodology and processes used to identify and assess climate-related risks and opportunities. These risks and opportunities should conform to TCFD typology, contain enough granularity, and be explicitly linked to the organization's time horizons. This section should include:

- ▶ An explicit linkage between time-horizons and specific climate-related events over each time horizon. These risks should have a material impact on the organization. Climate risks can include increased flooding, increased storms and other relevant climate-related disasters.

- ▶ A description of the processes used to determine which risks and opportunities could have a material financial impact on the organization.
- ▶ Risks categorized according to *TCFD typology* and *NGFS guidance*.
 - ▶ Physical risks are categorized as acute or chronic.
 - ▶ Transitional risks categorized as regulatory, market, technology or reputational.
- ▶ Banks should aim to characterize their climate-related risks in the context of traditional banking industry risk categories, such as credit risk, market risk, liquidity risk and operational risk.

- ▶ Opportunities highlight aligned to *United Nations Sustainable Development Goals* (SDGs)
- ▶ Relevant climate-related opportunities, addressed in relationship to risks identified.
- ▶ Both risks and opportunities contain appropriate sectoral and/or geographic granularity.
- ▶ Both risks and opportunities have distinctions between the following areas:
 - ▶ Sustainable financing
 - ▶ Specialized lending products and services
 - ▶ Adaption and mitigation activities
 - ▶ Operating locations (e.g., office space, call centers, branch locations)

Playbook guidance

Baseline disclosures	<ul style="list-style-type: none"> ▶ Use of TCFD Annex to present risk and opportunity identification for the enterprise (i.e., qualitative) ▶ Description of materiality assessment process ▶ Reference of industry recognized frameworks or models for identifying risks and opportunities and a discussion of why the framework(s) is selected
Advanced considerations	<ul style="list-style-type: none"> ▶ Firms describe climate-related risks and opportunities by business segment or geographical region
Open questions	<ol style="list-style-type: none"> 1. Is there a baseline set of risks that all banks should consider? 2. Is there an industry consensus on the frameworks that should be used? 3. At what granularity are banks comfortable with sharing identified risks and opportunities? 4. Are there consistent metrics (absolute or relative) that should be used to assess materiality?
Practical examples	<p>Figure 2.1.2a Citi TCFD Report June 2019 TCFD examples for climate-related risks TCFD examples of climate-related opportunities</p>

2.2 Impact on business, strategy and financial planning

2.2.1 Identifying and quantifying impacts

This disclosure details the process and methodology used to identify impacts of climate-related risks and opportunities. This section should include:

- ▶ A description of the risks and opportunities that could have a material financial impact on the organization
- ▶ Lines of business impacted by climate-related risks or opportunities, including past climate impact on business if relevant
- ▶ Overarching goals and estimated costs and impacts, committed capital expenditure and how investments have evolved
- ▶ Impacts reflect the holistic, interdependent nature among numerous climate-change-related factors that evolve over time
- ▶ Description of why specific financial metrics and underlying calculation methodology were chosen to demonstrate the climate-related impacts

Playbook guidance

Baseline disclosures	<p>Results of materiality assessment for items identified in section 3.1.2, including:</p> <ul style="list-style-type: none">▶ Operational footprint level impact<ul style="list-style-type: none">▶ GHG emissions▶ Renewable energy usage▶ Business segment (or product-level) exposure:<ul style="list-style-type: none">▶ Financing▶ Revenue▶ Balance sheet (e.g., assets – tangible/intangible, liabilities)▶ % of total portfolio, % by sector▶ \$ of capital commitments▶ \$ of carbon-related exposures and methodology
Advanced considerations	<ul style="list-style-type: none">▶ In alignment to the Sectoral Decarbonization Approach, firms perform enhanced financial analysis at the asset level across business segments:<ul style="list-style-type: none">▶ \$ and % of green and brown financing by sector▶ \$ and # amount of green bonds issued and general description linked to firm's strategy▶ \$ of risk weighted assets (RWAs) by sector and/or portfolio▶ \$ and % of financed emissions and methodology by sector and/or portfolio▶ \$ and % of assets under management (AUM) and ESG funds▶ \$ and # of renewable energy transactions reviewed/approved▶ Operational footprint level impact<ul style="list-style-type: none">▶ Employee level impact
Open questions	<ol style="list-style-type: none">1. What external data attributes (e.g., sector unique classifications, zip codes) have banks used to perform segmentation across asset portfolios?2. Is there an overlap with current or in-flight local jurisdictional reporting requirements?

Practical examples

[Figure 2.2.1a National Australia Bank](#)
[Figure 2.2.1b Citi](#)
[Figure 2.2.1c Citi](#)

2.2.2. Managing impact

This disclosure details how the organization manages the impacts of climate-related opportunities and risks. This section should include:

- ▶ Link between how climate impacts financial planning process, with reference to time horizons. Financial planning should ideally include the following areas:
 - ▶ Sustainable financing
 - ▶ Specialized lending products and services
- ▶ Adaptation and mitigation activities
- ▶ Operating locations (e.g., office space, call centers, branch locations)
- ▶ Prioritization of different risks and opportunities
- ▶ Links between climate-related risks and opportunities and business and sustainability strategy
- ▶ Strategic financial planning should correspond to the following areas: 1) business growth, 2) products and services, 3) adaptation and mitigation activities

Playbook guidance

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| Baseline disclosures | <ul style="list-style-type: none">▶ Business segment (and region) projections using time horizons across the following dimensions:<ul style="list-style-type: none">▶ Revenue▶ Net-interest income▶ Non-interest income▶ Alignment of commitments to demonstrate progress to depict execution of firm's strategy |
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| Advanced considerations | <ul style="list-style-type: none">▶ Discussion of prioritization framework for managing climate initiatives▶ Firms perform enhanced outcome-based analysis to quantify environment and social impacts<ul style="list-style-type: none">▶ Avoided GHG emissions▶ Societal impacts (e.g., jobs supported, environmental projects, housing, transit) |
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| Open questions | <ol style="list-style-type: none">1. What current processes or controls have been impacted or will require enhancements to improve analytics and reporting?2. How does your firm measure outcomes related to its environmental impact both at the asset level and enterprise level? |
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| Practical examples | <p>Figure 2.2.2a ING Groep N.V.
Figure 2.2.2b ING Groep N.V.</p> |
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2.3 Scenario analysis and resilience strategy

2.3.1. Scenario analysis

This disclosure briefly details the purpose, assumptions, approach, and results of scenario analysis activities. As described in Box 2, scenario analysis is an evolving area, and that most financial institutions are at an early stage of maturity in conducting such analysis. As such, the information provided here is intended to help stimulate thinking on how information relating to scenario

analysis can be delivered in a clear manner. It is beyond the scope of this document to provide a detailed technical overview of scenario analysis methodologies. However, other resources developed by the IIF and UNEP FI – including those found in Section 6 of this document – may prove useful for institutions seeking to identify the right approach for their circumstances.

Box 2: Responding to the challenges of scenario analysis

Methodological challenges, data availability and quality, and a lack of transparency on the technical underpinnings of tools remain key barriers to achieving consistency in scenario analysis disclosures. As [recent research](#) comparing scenario analysis tools has indicated, the current divergence in scenarios used, assumptions and output metrics constrains the capacity for scenario analysis results to be robustly compared. For most institutions, scenario analysis is conducted separately for physical and transition risks. Further, most institutions do not disclose comprehensive quantitative risk metrics, but rather qualitative outcomes of their scenario analysis. The institutions that do disclose quantitative risk metrics often do so for a subset of their portfolio, often a set of high-risk sectors.

Beyond the challenges faced by individual firms, there is a relative lack of standardization both in the scenarios used and the risk assessment methodologies applied. As supervisors increasingly recognize climate risks as financial risks, there has been a push for greater comparability. The release of the NGFS reference scenarios in June 2020 provided the industry with a series of specific climate scenarios developed by leading climate modeling research institutions. At the same time, guidance from the NGFS and its members around conducting climate scenario analysis provides further clarity around regulatory expectations, which can help inform firms' preparatory work to undertake scenario analysis activities. National central banks have worked in collaboration with

the private sector to develop supporting materials on scenario analysis – notably the UK's Climate Financial Risk Forum, which released a [detailed guide in June 2020](#).

In recent years, the range of metrics used to communicate the results of scenario analysis has increased (see Box 3). The methodologies applied in some climate scenario analyses may evoke traditional regulatory stress testing, where a portfolio is evaluated using a macroeconomic scenario to assess how losses change. The major development has been the incorporation of a variety of climate variables alongside traditional macroeconomic drivers. While the outputs of climate scenario analyses are often delivered as risk metrics (e.g., climate-adjusted probability of default), certain financial institutions are choosing to apply methodologies that deliver alignment metrics (e.g., implied portfolio warming potential). A notable example is the [Bank of England](#), which in its own TCFD report (released in June 2020), provided a "portfolio warming potential" of 3.5 degrees of warming for its APF corporate portfolio (see chart 4.8).

In parallel to the work of supervisors, industry working groups (including the IIF) have also developed guidance around climate scenario analysis. UNEP FI's TCFD pilot programs have developed tools and methodologies for scenario analysis by banks, investors and insurers, and maps of available tools, which have been used by dozens of industry participants.

This disclosure item should include:

- ▶ An assertion that the scenario analyses were conducted primarily as an opportunity to improve strategic resilience and explore climate vulnerabilities
- ▶ Review of scenarios as well as justification and disclosure of scenarios used, e.g., why the scenarios are applicable to the institution and how they are supported by business judgment
- ▶ Discussion of whether physical and transitional risks are considered separately or jointly, detailing possible interactions if possible

Playbook guidance

- Baseline disclosures**
- ▶ Scenarios:
 - ▶ 3+ types of scenarios (e.g., 1.5°C, 2°C)
 - ▶ Description of scenario (e.g., in-house vs. industry collaboration, vendor)
 - ▶ Source of scenario
 - ▶ High-level outcome by scenario
 - ▶ Variables:
 - ▶ Explanation on alignment with existing or in-flight regulatory initiatives
 - ▶ Assumptions and methodology
 - ▶ Depiction of key scenario assumptions
 - ▶ Depiction of segmentation methodology used across business segments
 - ▶ Results
 - ▶ Firm-specific overlays, limitations or adjustments

- Advanced considerations**
- ▶ Assumptions and methodology
 - ▶ 4°C investment scenario analysis
 - ▶ Disruptive non-linear scenarios and correlation of climate risk variables (i.e., physical and transition risks) to macroeconomic variables
 - ▶ Results
 - ▶ Exposure by sector and/or geography at year-end by defined time horizons (short, medium, long)

- Open questions**
1. Is there an industry-preferred scenario source?
 2. What level of granularity should be included related to scenario analysis (public vs. private)?
 3. What are the most common challenges to performing a scenario analysis (e.g., data, counterparty, assumptions)?
 4. Do you perform a review and challenge on the results?
 5. What is your data strategy to manage internal and external data to perform scenario projections?
 6. How are you integrating into existing models (e.g., capital stress testing, credit rating, pricing, operational risk)?
 7. Which variables are imperative to disclose?
 - a. Use of transition and physical risk variables
 - b. Description of key inputs
 - c. Depiction of price and demand for key variables, specifically transition risks (e.g., carbon price)
 - d. Depiction of energy mix under different scenarios
 - e. Depiction of socioeconomic impacts (e.g., population, income)

Practical examples

[Figure 2.3.1a Barclays](#)
[Figure 2.3.1b UBS](#)

*Table covers transition and physical risks

Transition risks

This disclosure outlines the methodology, assumptions and results of transition risks scenario analysis. It discusses the methodology in detail as well as conducting the analyses on specific sectors. It should include:

- ▶ Disclosure of temperature scenarios (e.g., 1.5°C, 2°C, 4°C, etc.) and time frames
- ▶ Disclosure of economic transition scenarios (e.g., orderly, disorderly, middle-of-the-road)
- ▶ Discussion of the climate model review process, as well as justification for choosing a climate model and provider
- ▶ Disclosure of climate model assumptions. This section includes the following:
 - ▶ Socioeconomic: population peak, migration, GDP growth, employment rate and discount rate
 - ▶ Energy: oil demand, fossil fuel use, reverse emissions, renewable use and projected energy mix by decade when possible
 - ▶ Policy: carbon tax with some form of regional granularity, subsidies for renewable energy sources.
- ▶ Discussion of results of scenario analysis on specific industries, using quantitative variables when possible and relevant time frames
- ▶ Attempt portfolio impact assessment based on analyses of individual industries

Physical risks

This disclosure outlines the methodology, assumptions and results of physical risks scenario analysis. It discusses the methodology in detail as well as conducting the analyses on specific sectors. It should include:

- ▶ Disclosure of temperature scenarios used as well as time frames
- ▶ Discussion of data used, sources of data and relevant tools used to calculate physical risks
- ▶ Analysis of the following:
 - ▶ Extreme weather events. This should include:
 1. Types of extreme weather events analyzed
 2. Tangible impact of extreme weather event (e.g., period of inoperability, asset loss)
 3. Relationship between tangible impact of extreme weather event and revenue
 - ▶ Incremental changes in weather. This should include:
 1. Changes in sector productivity
 2. Relationship between changes in productivity and revenue
- ▶ Discussion of combined revenue/production loss due to physical risks, as well as an evaluation of whether the losses stemmed mainly from incremental or extreme changes in weather

2.3.2. Resilience strategy

This disclosure incorporates results from the scenario analysis into the organization's resilience strategy. It includes:

- ▶ Combined discussion of climate-related physical and transitional risks
- ▶ Plan for how business strategy will change to address climate-related risks and opportunities from scenario analysis, detailing how these indicators are integrated into projects and business discussions

Playbook guidance

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| Baseline disclosures | <ul style="list-style-type: none">▶ Definition of operational resilience strategy▶ Outcomes of climate-based stress test scenarios and high-level details of performance under scenarios▶ Summary of scenario analysis results in the context of financial commitments and recent year progress▶ Description of resiliency of business model and strategic decisions occurred over the past 12 months |
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| Advanced considerations | <ul style="list-style-type: none">▶ Detail of considerations on client/customer resilience through stress test scenarios▶ Detail on communities of operation's performance through stress test scenarios▶ Firm-specific description on sector resilience through stress test scenarios and how the firm is responding▶ Investment/lending portfolio (or asset level) performance under selected scenarios |
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| Open questions | <ol style="list-style-type: none">1. What analysis have firms done related to internal business strategy resilience, counterparties/clients, and vendors/suppliers' resilience? If so, would you share the results directly to these third parties?2. What analysis have firms done to translate scenarios into counterparty/client strategic decision-making?3. What quantitative outputs from scenario analysis should be reported?4. What additional scenario narrative should be included (e.g., why the selected scenario was chosen, why the scenario is applicable to the firm)? |
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Practical examples

[Figure 2.3.1a Barclays](#)
[Figure 2.3.2a NGFS](#)

3. Risk management

The risk management disclosures address how the enterprise identifies, measures, monitors, manages and reports climate-related risks. They provide important insight to how the climate-related risks are integrated within the firmwide risk management framework.

While progress has been made with respect to integrating climate-related risk within risk taxonomies and risk inventories to support risk identification, firms are less mature with respect to quantitative risk estimation, scenario analysis and stress testing.

3.1 Process for identifying and assessing risks

This disclosure briefly summarizes the enterprise's current risk assessment framework and introduces climate-related risks.

It should include:

- ▶ Current risk assessment frameworks and criteria for assessment, with definitions of risk terminology
- ▶ Major issues or categories of issues
- ▶ Process for identifying and assessing climate-related risks (referencing scenario analysis when applicable)

Playbook guidance	
Baseline disclosures	<ul style="list-style-type: none"> ▶ Description of general risk management function and level of integration into business-as-usual capabilities (e.g., risk ID, risk taxonomy, risk inventory, credit rating, underwriting standards, PD/LGD, risk appetite/limits) at a sector level ▶ Description of internal tools and technology and external vendors ▶ Reference to industry recognized frameworks for identifying risks and explanation of why your firm selected them
Advanced considerations	<ul style="list-style-type: none"> ▶ Description of internal taxonomy classification using recognized framework to apply "brown to green" scale by business segment
Open questions	<ol style="list-style-type: none"> 1. What is the minimum level of detail/specificity in the disclosure of climate-related risks/opportunities in the firm's portfolio? 2. How should you connect risk metrics for your firm (e.g., RWA, VaR) to science-based metrics (e.g., GHG emissions)? 3. How are firms prioritizing portfolios (e.g., credit cards, mortgages, auto) that should be analyzed for climate-change risk? 4. For any new models or enhancements, what is the level of governance (e.g., model review, SR 11-7)?
Practical examples	<p>Figure 3.1a UBS</p> <p>Figure 3.1b UBS</p>

3.2 Process for managing risks

This disclosure discusses how climate-related risks are managed and prioritized both independently and relative to other risks.

It should include:

- ▶ Centralized climate-change risk management processes in a single location. This should include how the organization mitigates, transfers, accepts or controls these risks

- ▶ How the risk register is developed from materiality and how climate-change risk is reflected (e.g., combined with other risks, as its own specific risks, broken into different climate-related risks)

Playbook guidance	
Baseline disclosures	<ul style="list-style-type: none">▶ Discussion of the linkage between risk identification processes and the creation of limits and any other methods used to control risk within the portfolio▶ Exposure (\$/%) and quantification of risk types by business segment and jurisdiction▶ Description of impacted risk management process and controls, including a description of improvements planned/completed to enhance capabilities and incorporate climate-change risk into existing risk management framework
Advanced considerations	<ul style="list-style-type: none">▶ Commitments to future state capabilities▶ Carbon measurement methodology and process to evaluate portfolio carbon and portfolio decarbonization pathways▶ Details of training and employee readiness planning and programs
Open questions	<ol style="list-style-type: none">1. What improvements can be made to provide consistency and standardization in data used to assess climate-related risks? What are your sources and why?2. How are you integrating climate-specific metrics into existing risks management routines?3. How are you managing enriched risk and finance data to support your strategy?
Practical examples	Figure 3.2a Barclays

3.3 Integration into overall risk management

This disclosure discusses how climate-related risks are integrated into the enterprise's risk management framework.

It should include:

- ▶ How climate is considered in enterprise risk management processes
- ▶ How climate indicators are integrated into projects and business decisions
- ▶ Process for engagement with investors on climate-related risks
- ▶ Description of how climate-related risks have been integrated into credit and investment decision making (e.g., lending policies, underwriting standards, risk ratings, pricing models)

Playbook guidance

- ▶ Description of roles and responsibilities of different risk functions and their role in how they manage risks (systems, processes, reporting)
- ▶ KPIs/KRIs by business segment
- ▶ Business-segment specific description of enhancements to existing processes (e.g., underwriting, no. of transactions approved, attestation)
- ▶ Improvements made to embed physical and transition risks into existing risk management capabilities
- ▶ Description of additional risk mitigation measures (e.g., new exclusion policies, updated risk appetite statements, new lending targets or limits)
- ▶ Management of reputation risk through position statements on climate-related issues, leveraging support of external stakeholders and NGOs

Baseline disclosures

Advanced considerations

- ▶ Policies that restrict or divest from exposures in high-risk sectors, which is in line with the 2° or below scenario
- ▶ Environmental risk assessments conducted for new transactions and newly onboarded borrowers
- ▶ Commitments to supporting clients through mitigation of physical and transition risks, as part of a broader underwriting strategy

Open questions

1. How have you integrated climate-change risk into your firm's risk appetite statement?
2. Does your firm use carbon trading or hedging instruments to offset emissions or exposures?

Practical examples

[Figure 3.3a Barclays](#)
[Figure 3.3b Citi](#)

4. Metrics and targets

Financial services firms' metrics and targets provide investors and other stakeholders important insight on how the capital allocation to carbon intensive sectors is changing. Coalitions aiming to introduce science-based targets for portfolios rely on clear quantification of capital allocation to carbon-intensive sectors. Metrics and targets are the mechanism for measuring and disclosing progress versus the commitments made to stakeholders with respect to managing and mitigating the impact of climate change. To be useful, metrics must be clearly understood, measured and reported internally and externally. Properly defined, financial services firms' metrics and targets provide investors and other stakeholders important insight on how the capital allocation to carbon intensive sectors are changing. Metrics provide a feedback loop to support continuous improvement against targets.

The TCFD Technical Guidance offers three disclosures on the pillar of Metrics and Targets.

- ▶ Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
- ▶ Disclose Scope 1, Scope 2, and if appropriate Scope 3 greenhouse gas emissions, as well as the related risks.
- ▶ Describe the targets used by the organization to manage climate-related risks and opportunities, and performance against targets

These three disclosures can potentially encompass a wide variety of metrics and targets – the universe of which has expanded significantly in recent years. In order to explore these developments more deeply, Box 3 describes the range of risk and alignment metrics that may be used in the context of different TCFD disclosures. It is important to note that while metrics and targets should be described in detail under this disclosure, information may be delivered in reference to other TCFD pillars, particularly Strategy and Risk Management.

In this section, the tables are aligned as follows:

- ▶ **Baseline disclosures:** covers metrics that are specified in the TCFD's original framework, including how to effectively substantiate it with metrics currently available
- ▶ **Advanced considerations:** covers new and emerging disclosures relevant to metrics present in 2019 disclosures
- ▶ **Open questions:** key issues arising from choice of metrics and variables used

Box 3: Focus on Metrics

Metrics for climate-related risks and opportunities can be considered in two groups:

The first set can be termed “risk metrics,” including the core financial metrics for losses, probabilities of default, and risk ratings that have been “adjusted” to reflect climate risks, as well as metrics for exposures to specific sectors. Included in this category are the basic exposure measures suggested by the TCFD (i.e., exposure to carbon-related sectors), as well as those subsequently developed industry groups (e.g., UNEP FI’s efforts to define exposures to climate sensitive sectors). Risk metrics are most directly referred to in the first disclosure guidance (“Metrics and Targets a”).

The second set can be termed “alignment metrics” and generally refers to emissions footprints, sectoral technology alignment, and implied temperature changes. In addition to metrics to quantify alignment with a particular climate outcome (e.g., portfolio warming potential), other forms of alignment metrics can be used to quantify alignment with strategic objectives relating to climate opportunities (e.g., delivery of green financing). Alignment metrics are most directly considered in the second disclosure that covers Scope 1, Scope 2 and Scope 3 emissions (“Metrics and Targets b”), and can also be used to set targets under the third disclosure (“Metrics and Targets c”), and measure progress against them over time. Table 3 provides a summary of the suite of climate disclosure metrics relevant for banks, as well as their key characteristics.

At the time of writing (September 2020), several initiatives are undertaking technical work to further advance climate-related metrics. There have also been notable steps forward on the harmonization of voluntary standards for broader ESG disclosures, which may interact with how financial institutions may seek to implement the TCFD recommendations.

- ▶ **PCAF Global Carbon Accounting Standard:** The Principles for Carbon Accounting Financials (PCAF), a working group of financial institutions, has developed a set of [standardized methodologies to measure and disclose GHG emissions](#) financed by loans and investments provided by financial institutions (e.g., scope III emissions). Based on the GHG Protocol Scope III standard, the PCAF GCAS has been developed in consultation with 70 financial institutions. The Standard is currently under consultation until the end of September 2020.

- ▶ **PACTA for Banks:** Developed by the 2 Degrees Investing Initiative in partnership with a group of banks, the [Paris Capital Transition Assessment for Bank portfolios](#) enables users to measure the alignment of their corporate lending portfolios with climate scenarios across a set of key climate-relevant sectors and technologies. It provides banks with insights into the climate alignment of their corporate clients’ capital stock and expenditure plans.
- ▶ **World Economic Forum Common Metrics Project:** In January 2020, the IBC proposed a set of ESG metrics, including those related to climate risk. The proposal includes both core climate metrics scope 1, 2, and 3 GHG emissions and metrics in line with TCFD guidance. Expanded metrics calls for tracking progress against a science-based target to reduce GHG emissions and reporting financial metrics in line with the TCFD recommendations. In September 2020, [a final set of metrics was published](#).
- ▶ Various private and public-sector entities are offering temperature alignment methodologies. These can be based on carbon footprinting measures, technology measures or other measures (e.g., green technologies) deemed important to meet certain pathways toward achieving the Paris Agreement. The diversity of measures has led to some calling for convergence as evidenced by the [Net Zero Asset Owner Alliance](#).
- ▶ Other relevant efforts in this area include the Science Based Targets Initiative (SBTi) [guidance for financial institutions](#), and the Institutional Investors Group on Climate Change (IIGCC) [Net Zero investment framework](#) (under consultation until 25 Sep).

As technical approaches have advanced, financial institutions are now competing to produce increasingly granular disclosures on risk and alignment metrics across the entire scope of their businesses – especially the scope of information disclosed on “Scope III” impacts, or the climate impacts of financed assets. Disclosures of Scope III emissions associated with financing activities should represent an aggregation of emissions generated by the entire range of a bank’s consumers and commercial customers – such as commercial real estate (CRE), residential mortgages (RM), and personal vehicles. Considering that CRE and RM portfolios can make up a significant share of a bank’s balance sheet, it is critical that climate risks associated with these assets (and impacts of this financing) are accurately portrayed.

Table 3: Climate disclosure metrics relevant for banks

Metric	Type	Units	Status	Description
Exposure to carbon-related assets	Risk	\$m OR %	Established	The amount (\$m) or share (%) of carbon-related assets in a portfolio. Formulated on the basis of the TCFD definition of carbon-related assets, focusing on energy and utilities.
Exposure to climate-sensitive assets	Risk	\$m OR %	New	The amount (\$m) or share (%) of climate-related assets in a portfolio. This explores a broader range of sectors than the TCFD's initial recommendations, focusing on carbon-related assets.
Total expected losses under climate scenarios	Risk	\$m losses	New	Sum of the values of all possible losses under different climate scenarios, each multiplied by the probability of that loss occurring. Calculated on the basis of financial metrics that have been "adjusted" for climate risks, including Probability of Default (Ca-PD) and Loss Given Default (Ca-LGD). Ca-PD or Ca-Ratings may also be reported separately.
Climate-adjusted Loan-to-value ratios	Risk	% (ratio)	New	Adjusted loan-to-value ratios for residential and commercial real estate, formulated on the probability of properties experiencing extreme events over the average remaining mortgage term for the portfolio.
Climate VaR	Risk	\$m VaR	New	Aims to provide a forward-looking return based valuation assessment to measure climate-related risks.
Correlation between asset values and extreme events	Risk	Correlation coefficient (r value)	Developing	This is an emerging conceptual metric relevant to physical risk assessment, aiming to examine how extreme events may affect asset values.
Carbon footprint	Alignment	tCO ₂ e/ \$m invested	Established	The total carbon emissions associated with a portfolio normalized by market value. Metric depends on the scope of assessment employed, and the methods used to calculate emissions at portfolio levels. PCAF is developing a global standard for such emissions accounting practices (see below).
Carbon intensity	Alignment	tCO ₂ e/ \$m revenue	Established	The volume of carbon emissions associated with a portfolio per \$m of revenue.
Weighted Average Carbon Intensity (WACI)	Alignment	tCO ₂ e/ \$m revenue	Established	The exposure of a portfolio to carbon intensive companies. Metric recommended by the TCFD.
Total carbon emissions	Alignment	tCO ₂ e	Established	The absolute GHG emissions associated with a portfolio. Includes Scope I, II, and III emissions.
Portfolio scenario alignment metrics (multiple)	Alignment	Multiple	New	Forward-looking assessments of the convergence between the emissions profile of a portfolio, and the sectoral decarbonization trajectory necessary to achieve climate goals, developed on the basis of sectoral emissions intensity metrics, originating from client-level data.
Portfolio-implied temperature	Alignment	Degrees C by 2050 or 2100	New	Estimate the level of future warming with which a portfolio is currently aligned, on the basis of forecasting emissions intensities to a specific date (e.g., 2030) and then extrapolating future temperature outcomes by 2100.

4.1 Metrics

This disclosure summarizes the climate-related metrics listed earlier in the report and introduces new metrics as relevant. Additionally, this section contextualizes climate-related metrics in relationship to other metrics, linking financial indicators when possible. It should include:

- ▶ Listing and descriptions of key metrics used to measure climate-related risks and opportunities. This should include metrics to measure climate-related risks associated with water, energy, land use and waste management.
 - ▶ Descriptions should include methodology for assessing each metric if not already listed in the report
- ▶ Descriptions should contain an affirmation that the metrics are comparable and consistent across various years and that there were no major methodological or formula changes between years
 - ▶ If there were major methodology or formula changes between years, the report should make this explicit and explain the rationale for the change.
- ▶ Association of financial metrics with climate-related metrics when possible
- ▶ Contextualization of metrics in relationship to a specific project or target
- ▶ Disclosure of internal climate pricing as well as climate-related opportunity metrics that stem from a low-carbon economy

Playbook guidance

Baseline disclosures	<ul style="list-style-type: none">▶ Key risk metrics<ul style="list-style-type: none">▶ Metrics used to assess the impact of (transition and physical) climate-related risks on their lending and other financial intermediary business activities in the short, medium, and long term, including<ul style="list-style-type: none">▶ Balance sheet – credit exposure, equity and debt holdings, trading positions▶ % of total portfolio, % by sector▶ \$ of financing provided and revenue earned over a specified horizon▶ \$ of capital commitments▶ Break down by: industry, geography, credit quality, tenor▶ Amount and percentage of carbon-related (or climate sensitive) assets relative to total assets▶ Additional risk metrics are outlined in sections 2 and 3 of this document.▶ Key alignment metrics<ul style="list-style-type: none">▶ Amount of lending and other financing connected with climate-related opportunities.▶ Common Own Operations metrics<ul style="list-style-type: none">▶ Scope I carbon emissions<ul style="list-style-type: none">▶ Total emissions▶ Air travel per employee▶ Energy use<ul style="list-style-type: none">▶ Total electricity consumption▶ Share of renewable energy▶ Waste, water, and materials consumption▶ Real estate footprint<ul style="list-style-type: none">▶ Share of office space in LEED-certified buildings
Advanced considerations	▶ List of selected metrics and rationale, linked to strategic initiatives tracking progress to-date
Open questions	<ol style="list-style-type: none">1. What is the interval and time series to disclose data to demonstrate comparability (e.g., YoY – three-year time series)?2. How do you integrate metrics reporting for other frameworks?3. What specific TCFD recommended metrics should be consistently disclosed by banks?
Practical examples	Figure 4.1a State Street Figure 4.1b State Street Figure 4.1c UBS

4.2 Scopes I, II and III emissions

This section discloses scope I, II and III GHG emissions. It should include:

- ▶ Disclosure of methodologies used to calculate emissions, along with which gases are factored into GHG emissions (i.e., CO₂, CH₄, N₂O, HFC)
- ▶ Consistent use of absolute/relative intensity metrics to enable understanding against targets, featuring a year-to-year comparison when possible
- ▶ Inclusion of industry-specific GHG efficiency ratios if possible
- ▶ Discussion of risks pertaining to the largest source of GHG emissions

Playbook guidance

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| Baseline disclosures | <ul style="list-style-type: none">▶ Split into Own Operations and External▶ Standards used to calculate Scope 1 and 2 emissions▶ Breakout of Scope 1 emissions by CO₂, CH₄, N₂O and HFCs▶ Breakout of Scope I and II emissions by geography, sector and business activity▶ Scope III emissions metrics by portfolio and/or asset class, including the TCFD identified metrics (link to calculation in the practical examples list below)<ul style="list-style-type: none">▶ Weighted average carbon intensity▶ Total carbon emissions▶ Carbon footprint▶ Carbon intensity▶ Exposure to carbon related assets▶ Explanation of changes in Scope I, II, III emissions over time |
|-----------------------------|--|

Advanced considerations

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| | <ul style="list-style-type: none">▶ Annual assurance of emissions, which includes the scope (e.g., limited or reasonable assurance) and the verification standard used▶ Materiality assessment and methodology to quantify for Scope II emissions▶ Intensity ratios with unit by total revenue and/or full-time employees as the denominator |
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Open questions

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| | <ol style="list-style-type: none">1. Are there certain GHG efficiency ratios that financial services sector would aspire to achieve?2. How should scope III emissions for a financial institution be defined? |
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Practical examples

[Figure 4.2a State Street](#)
[TCFD proposed metrics](#)

4.3 Targets

This disclosure item pertains to targets for climate-related risks and opportunities. Where appropriate, targets should be set relative to metrics described in the preceding disclosures. This section should include:

- ▶ All targets should include certain basic features, including:
 - ▶ Whether the target is absolute or intensity-based
 - ▶ Relevant time frame over which the target applies
 - ▶ Base year from which progress is measured
- ▶ Key performance indicators used to assess progress against target
- ▶ Targets should feature the following areas relating to climate-change: GHG emissions, water usage and energy usage. It can also cover other goals, including environmental financial goals, financial loss tolerance, avoided GHG emissions throughout entire product life cycle, and net revenue goals from products designed for a lower-carbon economy.
- ▶ Alignment to metrics and include most appropriate scope III categories
- ▶ Explicit links between management remuneration and specific targets

Playbook guidance

- ▶ Subset of metrics that management has assigned forward-looking targets, which includes metrics mentioned in section 5.1
 - ▶ Own operations targets
 - ▶ Risks/portfolio targets
 - ▶ Opportunities – commitment to sustainable financing
- ▶ Common “own” operations targets include:
 - ▶ Greenhouse gases
 - ▶ Emissions reduction
 - ▶ Decrease in air travel per employee
 - ▶ Energy use
 - ▶ Increase in amount of renewable energy used
 - ▶ Decrease in electricity consumption
 - ▶ Waste
 - ▶ Decrease in paper consumption
 - ▶ Increase in recycled waste
 - ▶ Increase in waste diversion from landfill
 - ▶ Decrease in water consumption
- ▶ Targets tracked with graphs/tables showing year-over-year progress with accompanying explanation and rationale for use of metrics and targets (including those that are removed and/or added)

Baseline disclosures

Advanced considerations

- ▶ Explanation on the linkage to science-based targets timeline

Open questions

1. What key climate-related performance indicators are material to banks?
2. Do banks have board-level mandates to achieve certain climate-related targets? Are these internally or externally focused?

Practical examples

[Figure 4.3a Barclays](#)

5. Future plans and related climate initiatives (optional)

This section is not part of TCFD framework. It is an optional section where institutions can detail limitations, related reports and next steps. This section can summarize both future climate plans and related climate initiatives that fall outside the standard TCFD disclosures.

5.1 Future plans

Guidance

This section should discuss the organization's plans related to TCFD and climate change. It should include:

- ▶ Data limitations and how future TCFD reports may address these
- ▶ Next steps for advancing the institution's understanding of TCFD. This could include discussions with stakeholders, additional scenario to analyze, employing new data providers, or other related initiatives

Practical example

[Figure 5.1a Citi](#)

5.2 Related climate initiatives

Guidance

This section should discuss other initiatives. It should include:

- ▶ Industry initiatives or pilots that the organization is a part of, such as the UNEP FI TCFD banking pilot
- ▶ Related reports, such as an environment and sustainability report, corporate citizenship report, or ESG report

Practical example

[Figure 5.2a RBS](#)

6. References

This section is not part of the TCFD framework. Instead, it can suggest other resources where readers can learn more about TCFD or climate-related items. This disclosure can summarize the various TCFD-related resources.

6.1 Online resources

This section should summarize the library of TCFD-related resources. It may be helpful to include the following resources:

TCFD materials

- ▶ TCFD core reports and guidance <https://www.fsb-tcfid.org/>
- ▶ TCFD Status reports <https://www.fsb-tcfid.org/publications/tcfid-2019-status-report/>
- ▶ TCFD Knowledge Hub <https://www.tcfidhub.org/>

Guidance materials developed by public authorities and industry entities

- ▶ UK FRC [Financial Reporting Lab Guide](#)
- ▶ EU [EFRAG report and supplementary materials](#)
- ▶ JFSA TCFD Consortium of Japan https://tcfid-consortium.jp/en/news_detail/20081201
- ▶ IIF TCFD best practices https://www.iif.com/Portals/0/Files/content/SFWG%20TCFD%20Practices%20Report_vf.pdf
- ▶ UNEP FI Phase I reports for banking and investors
 - ▶ Part 1: Transition-related risks & opportunities <https://www.unepfi.org/wordpress/wp-content/uploads/2018/04/EXTENDING-OUR-HORIZONS.pdf>
 - ▶ Part 2: Physical risks and opportunities <https://www.unepfi.org/wordpress/wp-content/uploads/2018/07/NAVIGATING-A-NEW-CLIMATE.pdf>
 - ▶ Investor guide to scenario-based methods for climate risk assessment <https://www.unepfi.org/wordpress/wp-content/uploads/2019/05/TCFD-Changing-Course-Oct-19.pdf>
- ▶ UNEP FI Phase II report on physical risks and opportunities
 - ▶ Charting a new climate: <https://www.unepfi.org/wordpress/wp-content/uploads/2020/09/Charting-a-New-Climate-UNEP-FI-TCFD-Banking-Physical-Risk.pdf>
- ▶ IFoA [user guide](#)

Other materials

- ▶ CDSB Application [Guidance](#)
- ▶ Plus the others we already identified as 'Other'

6.2 Climate-related risks and opportunities for inclusion

Climate-related risks

It may be helpful to include the following table of climate-related risks, taken from the 2017 TCFD technical annex:

Type	Climate-Related Risks ⁵⁵	Potential Financial Impacts
Transition Risks	Policy and Legal	
	<ul style="list-style-type: none"> – Increased pricing of GHG emissions – Enhanced emissions-reporting obligations – Mandates on and regulation of existing products and services – Exposure to litigation 	<ul style="list-style-type: none"> – Increased operating costs (e.g., higher compliance costs, increased insurance premiums) – Write-offs, asset impairment, and early retirement of existing assets due to policy changes – Increased costs and/or reduced demand for products and services resulting from fines and judgments
	Technology	
	<ul style="list-style-type: none"> – Substitution of existing products and services with lower emissions options – Unsuccessful investment in new technologies – Costs to transition to lower emissions technology 	<ul style="list-style-type: none"> – Write-offs and early retirement of existing assets – Reduced demand for products and services – Research and development (R&D) expenditures in new and alternative technologies – Capital investments in technology development – Costs to adopt/deploy new practices and processes
Transition Risks	Market	
	<ul style="list-style-type: none"> – Changing customer behavior – Uncertainty in market signals – Increased cost of raw materials 	<ul style="list-style-type: none"> – Reduced demand for goods and services due to shift in consumer preferences – Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment) – Abrupt and unexpected shifts in energy costs – Change in revenue mix and sources, resulting in decreased revenues – Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations)
	Reputation	
Physical Risks	<ul style="list-style-type: none"> – Shifts in consumer preferences – Stigmatization of sector – Increased stakeholder concern or negative stakeholder feedback 	<ul style="list-style-type: none"> – Reduced revenue from decreased demand for goods/services – Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions) – Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention) – Reduction in capital availability
	Acute	
	<ul style="list-style-type: none"> – Increased severity of extreme weather events such as cyclones and floods 	<ul style="list-style-type: none"> – Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions) – Reduced revenue and higher costs from negative impacts on workforce (e.g., health, safety, absenteeism) – Write-offs and early retirement of existing assets (e.g., damage to property and assets in “high-risk” locations)
Physical Risks	Chronic	
	<ul style="list-style-type: none"> – Changes in precipitation patterns and extreme variability in weather patterns – Rising mean temperatures – Rising sea levels 	<ul style="list-style-type: none"> – Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants) – Increased capital costs (e.g., damage to facilities) – Reduced revenues from lower sales/output – Increased insurance premiums and potential for reduced availability of insurance on assets in “high-risk” locations

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Climate-related opportunities

It may be helpful to include the following table of climate-related opportunities, taken from the 2017 TCFD technical annex:

Type	Climate-Related Opportunities ⁵⁶	Potential Financial Impacts
Resource Efficiency	<ul style="list-style-type: none"> – Use of more efficient modes of transport – Use of more efficient production and distribution processes – Use of recycling – Move to more efficient buildings – Reduced water usage and consumption 	<ul style="list-style-type: none"> – Reduced operating costs (e.g., through efficiency gains and cost reductions) – Increased production capacity, resulting in increased revenues – Increased value of fixed assets (e.g., highly rated energy-efficient buildings) – Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs
Energy Source	<ul style="list-style-type: none"> – Use of lower-emission sources of energy – Use of supportive policy incentives – Use of new technologies – Participation in carbon market – Shift toward decentralized energy generation 	<ul style="list-style-type: none"> – Reduced operational costs (e.g., through use of lowest cost abatement) – Reduced exposure to future fossil fuel price increases – Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon – Returns on investment in low-emission technology – Increased capital availability (e.g., as more investors favor lower-emissions producers) – Reputational benefits resulting in increased demand for goods/services
Products and Services	<ul style="list-style-type: none"> – Development and/or expansion of low emission goods and services – Development of climate adaptation and insurance risk solutions – Development of new products or services through R&D and innovation – Ability to diversify business activities – Shift in consumer preferences 	<ul style="list-style-type: none"> – Increased revenue through demand for lower emissions products and services – Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services) – Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
Markets	<ul style="list-style-type: none"> – Access to new markets – Use of public-sector incentives – Access to new assets and locations needing insurance coverage 	<ul style="list-style-type: none"> – Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks) – Increased diversification of financial assets (e.g., green bonds and infrastructure)
Resilience	<ul style="list-style-type: none"> – Participation in renewable energy programs and adoption of energy-efficiency measures – Resource substitutes/diversification 	<ul style="list-style-type: none"> – Increased market valuation through resilience planning (e.g., infrastructure, land, buildings) – Increased reliability of supply chain and ability to operate under various conditions – Increased revenue through new products and services related to ensuring resiliency

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6.3 TCFD climate metrics

It may be helpful to include the following table of all the TCFD-suggested carbon exposure metrics:

Metric	Supporting Information	
Weighted Average Carbon Intensity	<i>Description</i>	Portfolio's exposure to carbon-intensive companies, expressed in tons CO ₂ e / \$M revenue. <i>Metric recommended by the Task Force.</i>
	<i>Formula</i>	$\sum_n^i \left(\frac{\text{current value of investment}_i * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i}{\text{current portfolio value} \quad \text{issuer's \$M revenue}_i} \right)$
	<i>Methodology</i>	Unlike the next three metrics, Scope 1 and Scope 2 GHG emissions are allocated based on portfolio weights (the current value of the investment relative to the current portfolio value), rather than the equity ownership approach (as described under methodology for Total Carbon Emissions). Gross values should be used.
	<i>Key Points</i> + / -	<ul style="list-style-type: none"> + Metric can be more easily applied across asset classes since it does not rely on equity ownership approach. + The calculation of this metric is fairly simple and easy to communicate to investors. + Metric allows for portfolio decomposition and attribution analysis. - Metric is sensitive to outliers. - Using revenue (instead of physical or other metrics) to normalize the data tends to favor companies with higher pricing levels relative to their peers.
Total Carbon Emissions	<i>Description</i>	The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO ₂ e.
	<i>Formula</i>	$\sum_n^i \left(\frac{\text{current value of investment}_i * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i}{\text{issuer's market capitalization}_i} \right)$
	<i>Methodology</i>	Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach. Under this approach, if an investor owns 5 percent of a company's total market capitalization, then the investor owns 5 percent of the company as well as 5 percent of the company's GHG (or carbon) emissions. While this metric is generally used for public equities, it can be used for other asset classes by allocating GHG emissions across the total capital structure of the investee (debt and equity).
	<i>Key Points</i>	<ul style="list-style-type: none"> + Metric may be used to communicate the carbon footprint of a portfolio consistent with the GHG protocol. + Metric may be used to track changes in GHG emissions in a portfolio. + Metric allows for portfolio decomposition and attribution analysis. - Metric is generally not used to compare portfolios because the data are not normalized. - Changes in underlying companies' market capitalization can be misinterpreted.
Carbon Footprint	<i>Description</i>	Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tons CO ₂ e / \$M invested.
	<i>Formula</i>	$\frac{\sum_n^i \left(\frac{\text{current value of investment}_i * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i}{\text{issuer's market capitalization}_i} \right)}{\text{current portfolio value (\$M)}}$

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Metric	Supporting Information	
Carbon Footprint (continued)	Methodology	Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach as described under methodology for Total Carbon Emissions. The current portfolio value is used to normalize the data.
	Key Points + / -	<ul style="list-style-type: none"> + Metric may be used to compare portfolios to one another and/or to a benchmark. + Using the portfolio market value to normalize data is fairly intuitive to investors. + Metric allows for portfolio decomposition and attribution analysis. - Metric does not take into account differences in the size of companies (e.g., does not consider the carbon efficiency of companies). - Changes in underlying companies' market capitalization can be misinterpreted.
Carbon Intensity	Description	Volume of carbon emissions per million dollars of revenue (carbon efficiency of a portfolio), expressed in tons CO ₂ e / \$M revenue.
	Formula	$\frac{\sum_n^i \left(\frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i \right)}{\sum_n^i \left(\frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} * \text{issuer's \$M revenue}_i \right)}$
	Methodology	Scope 1 and Scope 2 GHG emissions are allocated to investors based on an equity ownership approach as described under methodology for Total Carbon Emissions. The company's (or issuer's) revenue is used to adjust for company size to provide a measurement of the efficiency of output.
	Key Points + / -	<ul style="list-style-type: none"> + Metric may be used to compare portfolios to one another and/or to a benchmark. + Metric takes into account differences in the size of companies (e.g., considers the carbon efficiency of companies). + Metric allows for portfolio decomposition and attribution analysis. - The calculation of this metric is somewhat complex and may be difficult to communicate. - Changes in underlying companies' market capitalization can be misinterpreted.
Exposure to Carbon-Related Assets	Description	The amount or percentage of carbon-related assets ³⁴ in the portfolio, expressed in \$M or percentage of the current portfolio value.
	Formula for Amount	$\sum \$M \text{ current value of investments in carbon-related assets}$
	Formula for Percentage	$\frac{\sum \text{current value of investments in carbon-related assets}}{\text{current portfolio value}} * 100$
	Methodology	This metric focuses on a portfolio's exposure to sectors and industries considered the most GHG emissions intensive. Gross values should be used.
Key Points + / -	<ul style="list-style-type: none"> + Metric can be applied across asset classes and does not rely on underlying companies' Scope 1 and Scope 2 GHG emissions. - Metric does not provide information on sectors or industries other than those included in the definition of carbon-related assets (i.e., energy and utilities sectors under the Global Industry Classification Standard excluding water utilities and independent power and renewable electricity producer industries). 	

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7. Supplemental appendix

List of sources

Firm name	#	Reference title	Source (Click on the below for the external link)	Section alignment
Barclays	1	Barclays, Climate-Related Financial Disclosures	Barclays 2019 ESG Report	Risk management, Metrics and Targets
	2	Barclays – 2019 Annual Report	Barclays 2019 Annual Report	Governance
	3	Group-wide Exploratory Climate Stress Test 2019	Barclays 2019 ESG Report	Strategy
Citi	4	Citi, 2018 Global Citizenship Report	2018 Global Citizenship Report	Governance, Strategy
	5	Citi, 2019 ESG report	2019 ESG Report	Risk management, Future plans and related climate initiatives
	6	Citi, Finance for a Climate-Resilient Future	TCFD Report (2018)	Governance, Strategy
ING	7	ING Terra Progress Report 2019	ING 2019 Terra Report	Strategy
NAB	8	National Australia Bank, Sustainability Report 2019	NAB 2019 Report	Strategy
State Street	9	State Street – Climate Change 2019	State Street 2019 CDP	Metrics and Targets
UBS	10	UBS 2019 Annual Report	UBS 2019 Annual Report	Governance
	11	UBS – Climate Change 2019	UBS 2019 CDP	Strategy
	12	UBS, Sustainability Report 2019 – Based on GRI Standards	UBS 2019 Sustainability	Governance, Strategy, Risk management, Metrics and Targets
NGFS	13	Network for Greening the Financial System	GFS May 2020 Status	Strategy
RBS	14	Royal Bank of Scotland	RBS 2019 Annual Report	Future plans and related climate initiatives

1. Governance

1.2 Board oversight

Figure 1.1a Credentials of the Board of Directors, [UBS 2019 Annual Report](#)

The examples below explicitly highlight the experience/competency of the board related to climate, specifically ESG.



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Figure 1.1b Citi 2018 Global Citizenship Report

The excerpts below provide a flowchart and detailed descriptions that clearly define the governance structure to a reader.

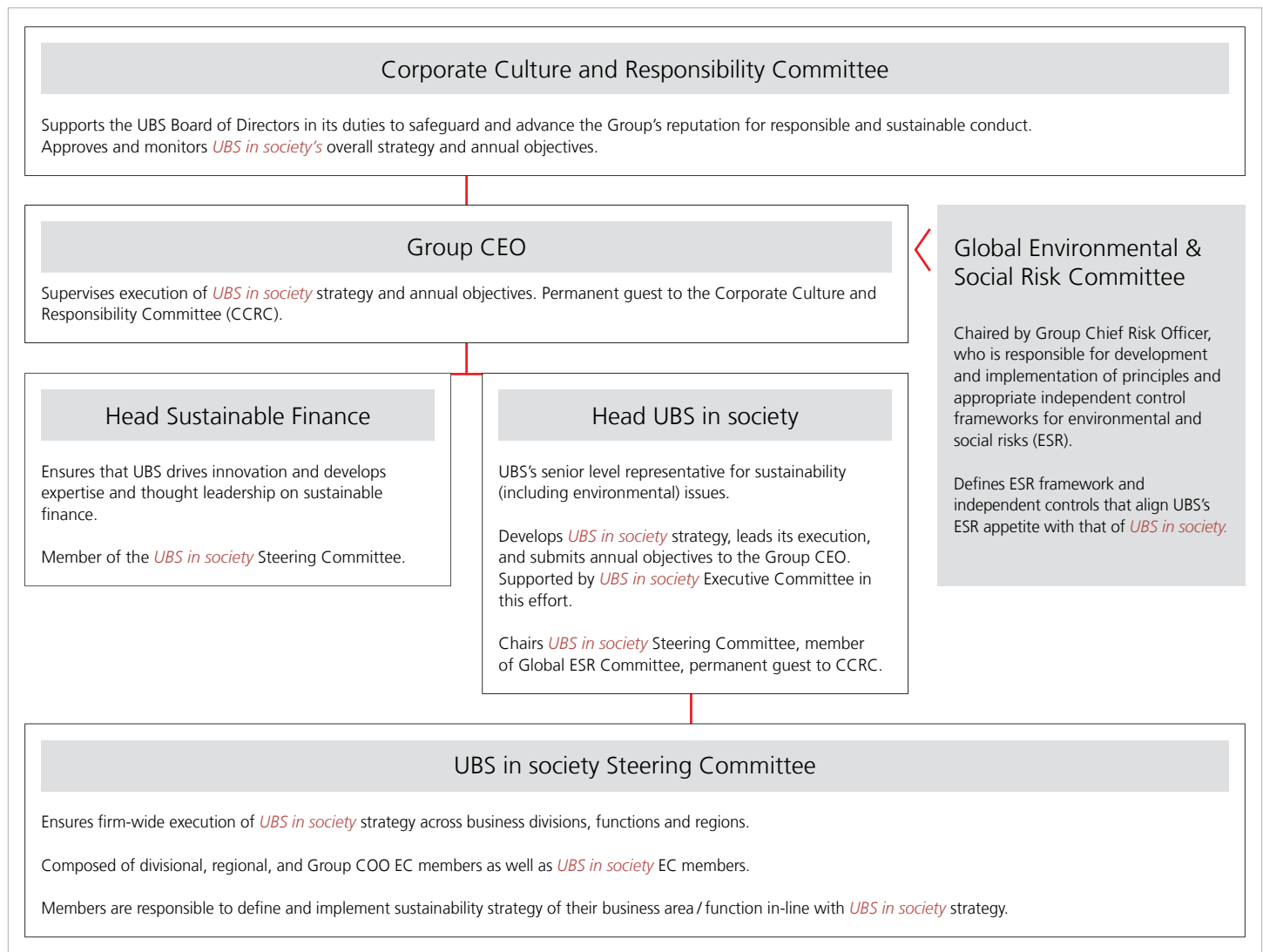


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1.2 Management's role

Figure 1.2a Sustainability Governance, [UBS 2019 Sustainability Report](#)

The illustrations below clearly show governance structure for sustainability, specifically how subcommittees flow up to senior management and the board level committee.



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Figure 1.2b Description of Roles and Responsibilities, Citi [TCFD Report \(2018\)](#)

The excerpts are detailed descriptions of the roles and responsibilities throughout the organization as it relates to climate.

issues, and our global and regional sustainability initiatives.

The Global Head of Sustainability oversees Citi's [Sustainable Progress Strategy](#) and also collaborates with a range of senior leaders to enable the development and implementation of climate-related metrics and targets, as well as other goals and programs that generate a positive impact on society.

The Environmental and Social Advisory Council (ESAC), a senior executive level advisory council, provides guidance on environmental and social issues related to global business activities, including advising on the Sustainable Progress Strategy. The Council is chaired by a senior executive in our Institutional Clients Group and includes executives from our Banking, Risk, Public Affairs, Operations, Corporate Sustainability and Environmental and Social Risk Management (ESRM) groups. Our ESAC holds meetings approximately three times per year. Citi also has a cross-functional Climate and Sustainability Council, based in London, focused specifically on our sustainability performance in Europe, the Middle East and Africa.

Business Unit Responsibilities

Citi's Corporate Sustainability team is responsible for managing Citi's overarching Sustainable Progress Strategy in partnership with business units across the bank. Our ESRM team manages our [ESRM Policy](#), which governs our review and approval of client transactions in environmentally and/or socially sensitive sectors, and guides client engagement on environmental and social risks and mitigation measures. Our Corporate Realty Services group also has a specialized sustainability team that manages our environmental footprint and green building goals, and our Enterprise Supply Chain team oversees supply chain sustainability. These specialized teams sit within their respective business units, ensuring ownership of sustainability goals throughout the company. Citi's banking and financing teams also work with clients to address climate change issues and to facilitate contributions to our \$100 Billion Environmental Finance Goal.

Strategy

Regarding climate-related strategy, the TCFD recommends that companies disclose the results of scenario analysis and

how companies integrate climate risks and opportunities into their decisions over different time horizons. The results of Citi's most recent climate scenario analysis are provided in Section 2 of this report.

As referenced previously, Citi's comprehensive, firm-wide [Sustainable Progress Strategy](#) includes climate change as a priority thematic area. Our Sustainable Progress Strategy is aligned with Citi's mission to serve as a trusted partner to our clients by responsibly providing financial services that enable growth and economic progress and guides our work to conduct business in a way that creates value for our company and for future generations. On the financing side, we partner with clients to finance and facilitate environmental solutions that reduce the impacts of climate change and manage the environmental and social risks and impacts associated with our products and services. On the operational side, we actively manage our global facilities and supply chain to reduce our emissions and minimize our climate impacts. Stakeholder engagement and reporting are central to our sustainability efforts, and we emphasize transparency and open engagement with clients, investors, suppliers, employees and other stakeholders.

As a financial institution, Citi's ability to adapt to the changing environment – with respect to the climate, our company's business and the context in which we operate – is one of our greatest strengths. Citi has historically focused our resources on assessing potential risks and opportunities related to many different aspects of our business in the short- and medium-term, including climate-related risks and opportunities. Citi's definition for the short- and medium-term is consistent with the accepted definition of credit horizons for term lending, which ranges from 1 to 5 years. Citi does consider longer time horizons as well, sometimes up to 100 years, which is very different than the time horizon for Citi's loans, when assessing climate change impacts and potential future risks. Even though these longer time horizon analyses may not have immediate impacts on decision making, they could influence long term strategic planning. For a more complete discussion of these aspects and others of Citi's current sustainability activities, including those to address climate change, refer to Citi's latest [Global Citizenship Report](#).

Citi will continue to contribute to the conversation on climate disclosures. We will both improve our internal

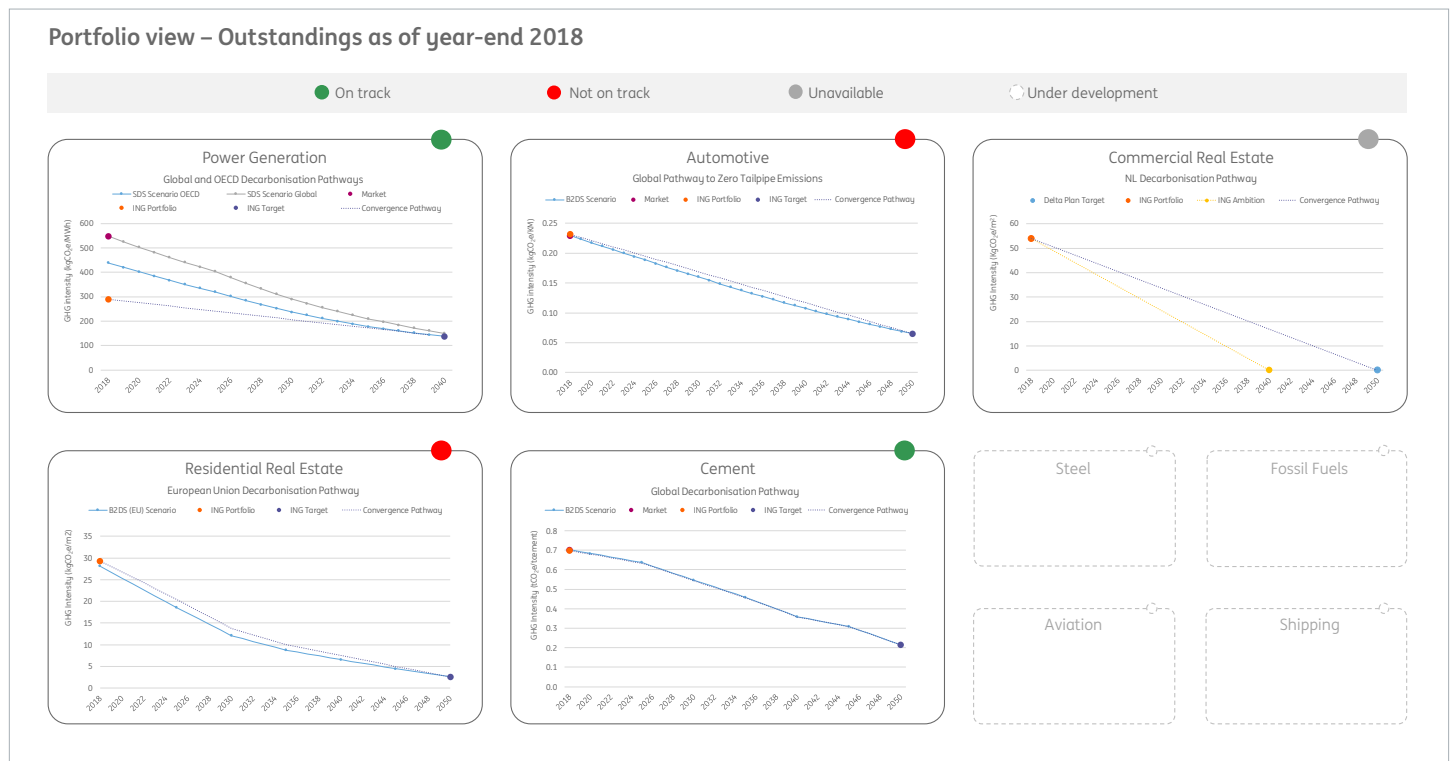
2. Strategy

2.1 Climate-related risks and opportunities (S, M, L)

2.1.1 Time horizons

Figure 2.1.1a ING Groep N.V., 2019 ING Terra Progress Report

Includes RAG status detail and extensive time horizons for aligning sector portfolios with climate scenarios.



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Figure 2.1.1b 2019 UBS 2019 CDP

Simplified table from standardized CDP report; clearly defines timelines.

	From (years)	To (years)	Comment
Short-term	0	3	To align with our Risk and Opportunities disclosure in 2.3a and 2.4a we included "Current" in the short-term here.
Medium-term	3	6	
Long-term	6	40	We also analyze longer timelines over 40 years in our scenario analyses that look at risks at and past the year 2060, and till 2100 (= Paris Agreement objective year).

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2.1.2 Climate-related risks and opportunities

Figure 2.1.2a Citi, TCFD Report (2018)

Clear identification of risks and discussion of its impact.

Socio-economics

- Population peaks at 9.5 billion people in 2070
- GDP continues to grow, with average global income increasing by a factor of 6 by 2100
- Developing countries achieve significant economic growth, reaching current OECD average income levels in the second half of the century

Energy

- Use of fossil fuels continues throughout the century, although at declining rates, with the exception of coal, which rapidly declines to under 2% of the total energy mix by 2030
- Oil demand remains steady through 2030 due to growing demand for liquid fuels in the transport sector, whose growth does not peak until 2035 in the 2°C scenario and 2030 in the 1.5°C scenario
- Reverse emissions technologies and carbon sequestration through land use are critical in mitigating the cost of carbon and reducing emissions
- Use of renewable energy increases, accelerating rapidly after 2030 through transmission, distribution and storage investments
- Biofuels see demand increases, particularly in the second half of the century

Policy

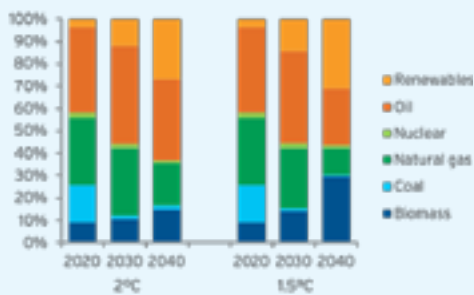
- A global carbon price implemented after 2020 is the sole policy instrument for transition risk in the energy end-use sectors
- The given carbon price is assumed to be the same across all regions, though regions have differing economic responses to prices

Global Carbon Price



Source: Potsdam Institute for Climate Impact Research

U.S. Primary Energy Mix



Source: Potsdam Institute for Climate Impact Research

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Utilities Transition Scenario Analysis

Citi's pilot transition risk analysis for the utilities sector included 39 companies in the U.S. covered by the U.S. Power Sector team. These companies included both regulated utilities and independent power producers, representing approximately \$10 billion in exposure as of December 2017 and 30% of our global exposure to the power sector.

Consistent with the approach recommended in the UNEP FI pilot, we divided our U.S. utilities portfolio into four segments based on whether they are regulated or not and the carbon intensity of their generation assets:

- **Regulated Heavy Carbon:** primarily regulated utilities with significant generation assets for whom fossil fuel generation represents greater than half of their generation portfolio
- **Regulated Low Carbon:** primarily transmission & distribution companies with low fossil fuel generation
- **Unregulated Heavy Carbon:** primarily independent power generation companies with significant fossil fuel generation, including significant coal-fired generation or peak gas-fired assets
- **Unregulated Low Carbon:** primarily independent power generation companies with significant renewable energy or efficient gas-fired assets

Approximately 75% of Citi's exposure in the U.S. utilities portfolio is to regulated utilities, and approximately 60% of Citi's exposure in this portfolio is to heavy carbon companies.

As explained in more detail below, the scenario analysis suggests greater impacts on the utility sector than on the oil & gas sector. The REMIND model's CD-LINKS scenarios use a global carbon price, which is assumed to be paid by the companies that use fossil fuels and emit greenhouse gases. Accordingly, under the scenarios, utilities are directly impacted by the price of carbon, whereas oil & gas producers are indirectly impacted through the reduction in fossil fuel demand caused by carbon prices. Utilities would face the choice of making capital expenditures to generate less carbon or absorb losses from carbon pricing, which increases over time. These

impacts are likely to have the most significant negative effect on utilities in the Unregulated Heavy Carbon segment, with higher carbon intensity and less ability to pass along the new costs to customers.

Key Scenario Assumptions

Citi's scenario analyses relied on the assumptions and outputs of the REMIND model's CD-LINKS 1.5°C and 2°C scenarios. There are a few assumptions in the REMIND CD-LINKS 1.5°C and 2°C scenarios that were key drivers of results in our portfolio-level risk analysis for the utilities sector:

1. The scenarios assume a global carbon price will be implemented to reduce carbon emissions. In the 2°C scenario, there is a global carbon price per ton of carbon dioxide of \$68 (2010 USD) in 2030 that increases to \$111 in 2040. In the 1.5°C scenario, the global carbon price is even higher, at \$117 in 2030 and \$190 in 2040. This assumption adds to the operating costs of utilities, particularly in the Heavy Carbon segments. Utilities can reduce some of the costs from a carbon price by investing in capital expenditures for renewable generation and other low-carbon technologies.
2. The scenarios assume that carbon capture and storage (CCS) technologies will become commercially viable, available and in use after 2030 to mitigate fossil fuel emissions. For utilities that continue to be reliant on fossil fuel generation, are able to withstand the net income erosion until such technologies become available and have the financial strength or regulatory support to afford the acquisition of such technologies, this assumption helps to lower direct emissions costs due to a carbon price. Citi recognizes that this assumption requires rapid acceleration in CCS technology development, beyond what is feasible today.
3. The scenarios assume that electricity prices will increase due to growing adoption of electric vehicles and greater electrification of the transport sector, which drive up demand for electricity. This assumption benefits utilities in both the Regulated and Unregulated segments by increasing revenues.

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2.2 Impact on business, strategy and financial planning

2.2.1 Identifying and quantifying impacts

Figure 2.2.1a National Australia Bank, [Sustainability Report 2019](#)

SASB is a broadly recognized framework for ESG disclosures.

GREEN PRODUCTS AND SERVICES	2019	2018	TREND
Total number of renewable energy (RE) transactions since 2003	130	114	↑
Total Value of RE transactions since 2003 (\$bn committed)	9.4	7.7	↑
Cumulative Green Bonds (by number) issued by NAB and related entities since November 2014	6	6	↔
Cumulative Green and Sustainability Bonds (by number) arranged by NAB and related entities since November 2014 ³	24	16	↑

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Figure 2.2.1b Citi, 2018 Global Citizenship Report

The tabular format below is an easy-to-follow view of metrics throughout the comparative periods.

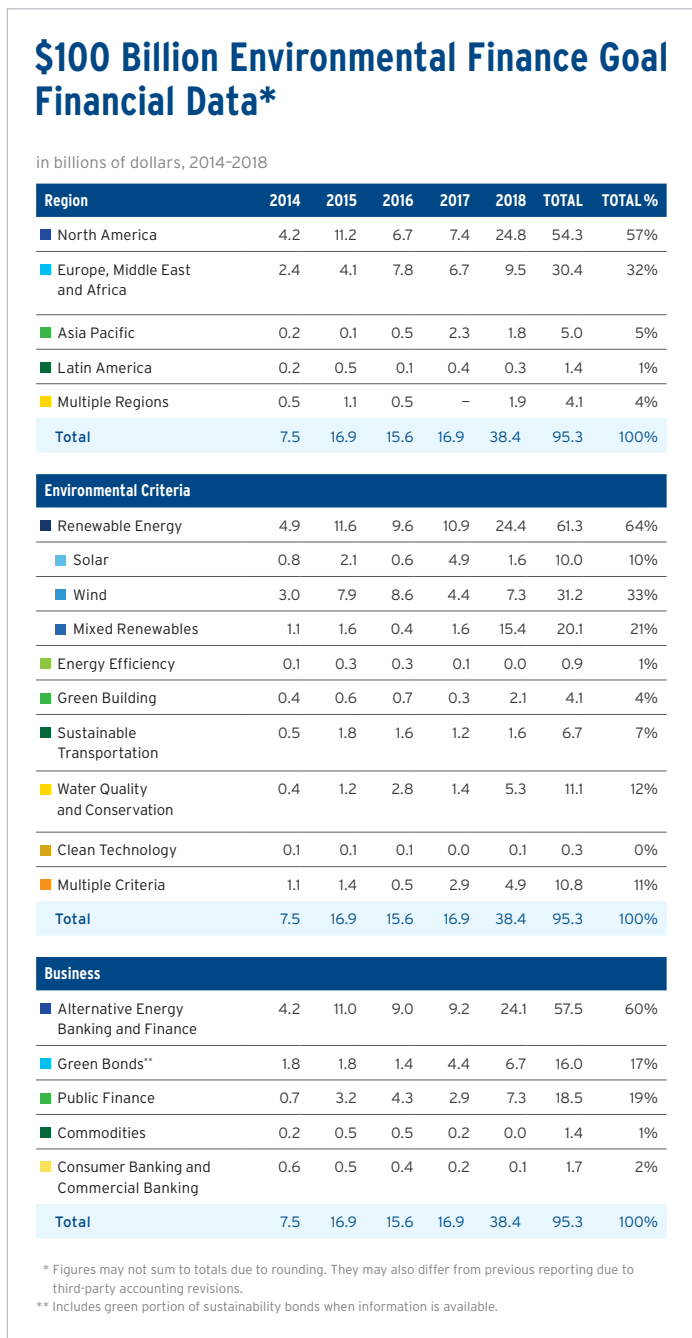
Impact Data*						
Environmental Impacts	2014	2015	2016	2017	2018	TOTAL
Avoided GHG Emissions (mt)	1,360,092	1,740,659	325,676	1,058,809	3,987,444	8,472,680
Renewable Energy Project Finance	1,294,788	1,590,612	180,739	1,057,022	3,922,551	8,045,712
Energy Efficiency Finance	60,061	145,524	140,149	-	63,229	408,963
Public Finance	2,224	1,672	1,453	1,246	1,664	8,258
Consumer/ Commercial Banking	3,019	2,851	3,335	541	-	9,746
Renewable Energy Capacity Added (MW)	563	869	278	619	3,154	5,483
Social Impacts	2014	2015	2016	2017	2018	TOTAL
Jobs Supported	11,574	29,494	30,140	22,995	37,364	131,567
Renewable Energy Project Finance	4,870	8,069	4,378	4,357	5,098	26,772
Public Finance**	6,704	21,425	25,762	18,638	32,266	104,795
People Served by Water Quality and Conservation Projects	211,346	6,916,113	28,831,321	7,617,037	12,363,540	55,939,357
Families Served by Affordable Housing Activity	1,237	1,004	1,166	1,340	956	5,703
Trips on Transit System Projects (in billions)	-	3.5B	3.1B	4.2B	3.2B	14.0B

* Figures may not sum to total due to rounding.
 ** The 2017 amount of Public Finance jobs supported is revised from previous reporting to accurately reflect our methodology.

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Figure 2.2.1c Citi, 2018 Global Citizenship Report

The illustration below provides a breakdown of financing goals by environmental criteria, region and business over the comparative period.



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2.2.2 Managing impact

Figure 2.2.2a ING Groep N.V., [2019 ING Terra Progress Report](#)

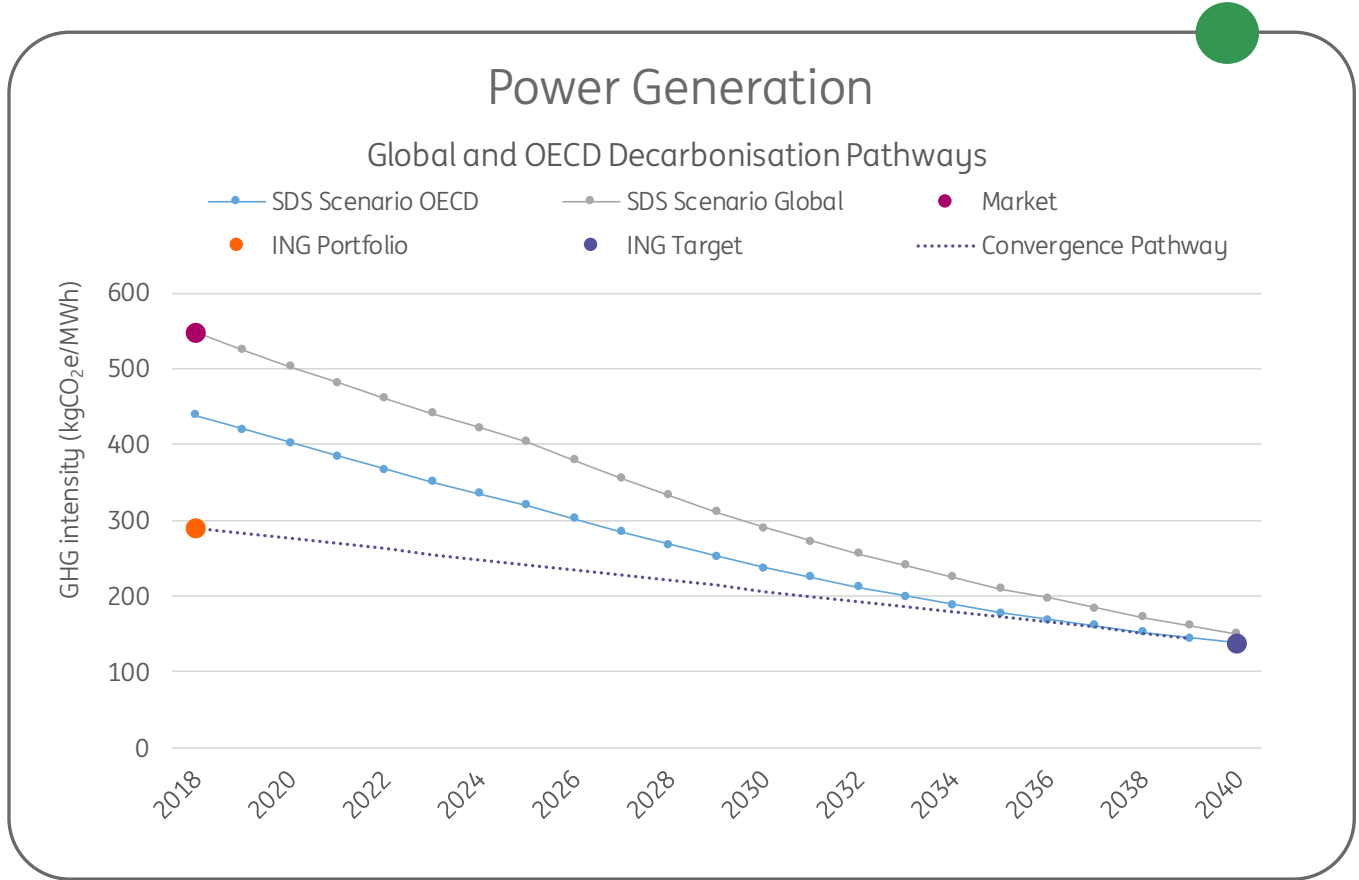
The table outlines the sector-by-sector methodology for measurement and target-setting.

Sector	Measurement Methodologies	Target-setting Methodologies	Metrics used
Power generation	PACTA ³	PACTA	kg CO ₂ /MWh
Automotive	PACTA	PACTA	kg CO ₂ /km
Commercial real estate (NL)	DeltaPlan	Paris Proof Method	kg CO ₂ /m ²
Residential real estate (NL,DE)	PCAF ⁴	SBTi SDA	kg CO ₂ /m ²
Cement	PACTA	SBTi SDA	kg CO ₂ /tonne cement
In development			
Steel	PACTA	SBTi SDA	kg CO ₂ /tonne steel
Fossil fuels (oil, gas and coal)	PACTA	PACTA/Carbon Tracker Initiative	In progress
Shipping	Poseidon Principles	Poseidon Principles	kg CO ₂ /tonne nautical mile
Aviation	PACTA	SBTi SDA ⁵	kg CO ₂ /passenger km

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Figure 2.2.2b ING Groep N.V., 2019 ING Terra Progress Report

The graphic below is a sector example on the RAG status and decarbonization pathway over specified time horizon.



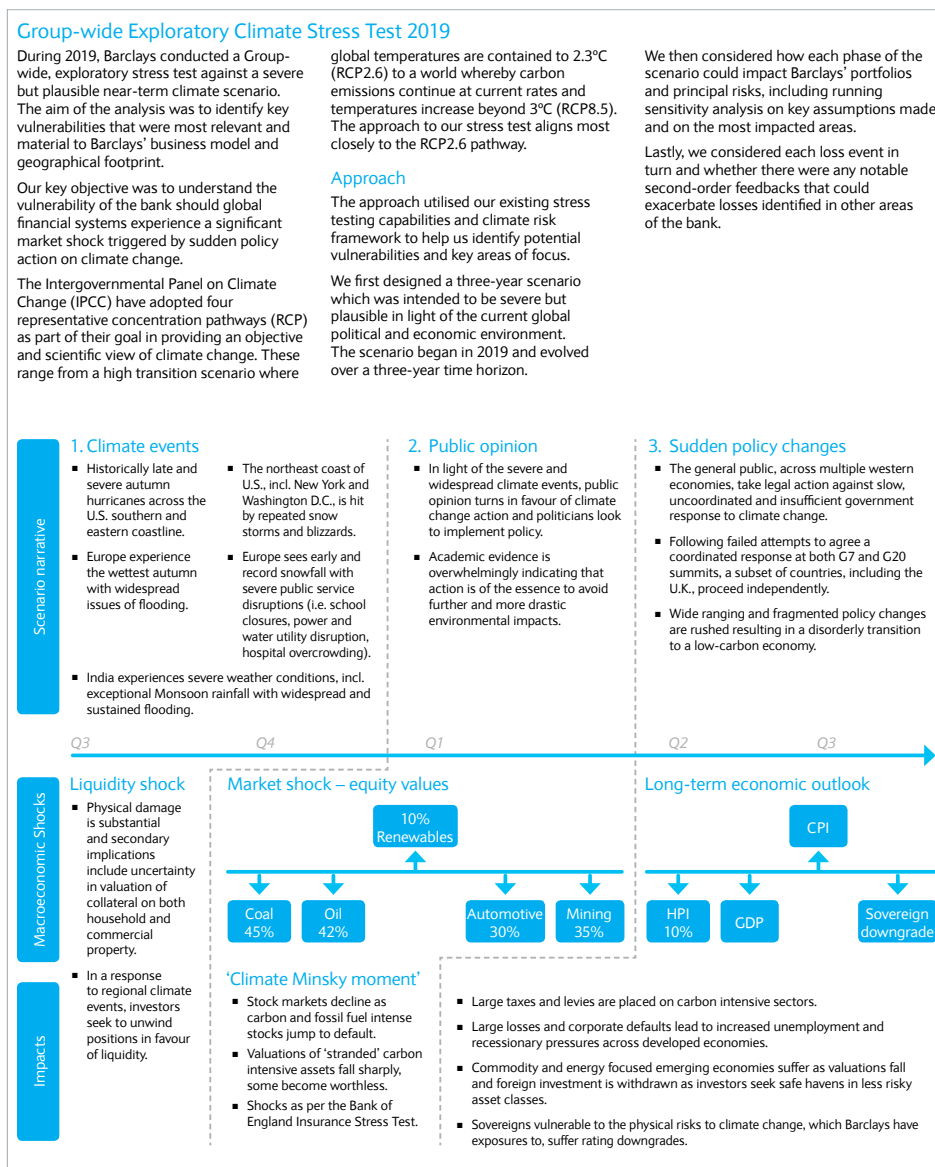
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2.3 Scenario analysis and resilience strategy

2.3.1 Scenario analysis

Figure 2.3.1a Barclays, Barclays 2019 ESG Report

This provides a view of a scenario analysis based on a stress test and the impact on different aspects of the business, the resilience to physical/transition risk, and the impact on profit and loss.



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Scenario narrative

The scenario commences with a severe escalation of physical climate events across Europe, US and India, causing a sharp withdrawal of liquidity from financial markets. Public opinion rapidly shifts in response leading to a sharp revaluation of assets, with carbon-intensive sectors particularly impacted. These combine to force governments to introduce wide ranging, but fragmented policy changes, which lead to broader macroeconomic impacts.

A range of economic variables were sourced from the PRA's 2019 Life Insurance stress test.

Key assumptions

This stress testing exercise was exploratory in nature, we made a number of key assumptions partly to simplify the exercise, but also where they were consistent with the severity and plausibility of the scenario narrative. Sensitivity analysis of key climate-based assumptions highlighted the below as the most notable:

- No material climate events occur outside of our key physical locations;
- The Thames Barrier is sufficient to prevent wide-spread flooding across the City of London; and
- Major household insurance providers remain solvent throughout the forecast horizon.

Physical impacts

- Widespread issues of flooding across the UK impacted the valuation of flood-prone residential and commercial property, including Barclays-owned real estate, and led to an increase in default rates across our Home Finance and Business Banking (primarily Agriculture) portfolios.
- A historically late and severe hurricane season on the US southern and eastern coastlines led to a significant increase in property damage and subsequent spike in insurance claims across impacted states, affecting the credit quality of certain non-life insurance companies and local municipalities.
- The impact of severe weather in India affected Barclays' business operations, albeit resilience plans negated major disruption or loss.

Transition impacts

- The rapid transition to a low carbon economy impacted the credit quality and funding requirements of clients within carbon-intensive sectors, particularly those exposed to i) changes in regulatory, supervisory and climate policies; ii) shift in technology towards less carbon intensive products; and iii) behavioural changes from shifting consumer demand patterns.
- The response within financial markets was a decline in equity, credit and securitised product valuations across key sectors, affecting the valuation of assets measured at fair value, including those held in the trading book, leverage finance underwrites, equity positions held as principal investments, assets held for liquidity purposes and investments within Barclays' pension fund.

Connected impacts

As a result of this analysis, we identified second order (or 'connected') risks whereby:

- The higher cost of carbon in certain sectors, including utilities, was then passed through to the end consumer resulting in an increase in energy prices. This in turn reduced the affordability and credit quality of our retail customers in the UK and US.
- The connected impact of all the above loss events ultimately led to higher unemployment and recessionary pressures in developed economies. This resulted in an increase in impairment across all portfolios and geographies, a reduction in net interest income from lower balances, albeit partially offset by slightly higher rates to combat inflationary pressures, and lower fees from banking products.

Outcome

Climate risk is an emerging risk and as such, there is currently no defined approach across the banking industry for identifying, measuring, aggregating and reporting climate risks. As a result, the approach we have taken for this stress test is the first step on that journey and our techniques will naturally evolve over time. Whilst the outcome of any forecast is inherently uncertain, there will be more uncertainty within these results than more traditional macroeconomic-based scenarios. The losses displayed below are approximations only and should be treated with a high-level of caution given the caveats mentioned above.

Climate risk	P&L contribution by risk type
Physical	4%
Transition	49%
– of which relates to higher Corporate downgrades and defaults in elevated-risk sectors	20%
– of which relates to market-related movements	22%
– of which relates to other impacts, such as higher operating costs	7%
Connected	47%
Total	100%

The approximate capital impact was comfortably within that observed as part of the Bank of England's 2019 Annual Cyclical Scenario and primarily driven by transition and connected risks. Barclays' risk profile is well positioned in relation to short-term physical events; however, we recognise that longer-term scenarios will be required to assess a greater range of impacts, most notably the physical implications of global temperature increases that go beyond those committed to as part of the Paris Climate Accord.

Climate risk is complex and the industry is at the beginning of a journey to understand physical risks and impacts on our clients and exposures over time. For example, as part of this stress test, we undertook a deep dive review of our UK mortgage portfolio where we were able to assess the flood risks associated with our home loans using data from the UK Government's Department for Environment, Food and Rural Affairs (DEFRA). This analysis, using granular postcode level data within England, found that a small portion of our credit exposure currently falls in high or medium risk zones. However, we recognise we will need to understand how this profile may change under different scenarios over longer time horizons.

The table below details gross loans and advances to the UK Home Finance portfolio only for clients classified by DEFRA as being in a flood risk postcode, the majority of these are in postcodes classified as being very low risk.

As at 31 December 2019	Description	Gross loans and advances
Barclays UK		
High risk	Each year, there is a chance of flooding of greater than 1 in 30 (3.3%).	479
Medium risk	Each year, there is a chance of flooding of between than 1 in 30 (3.3%) and 1 in 100 (1%).	1,691
Low risk	Each year, there is a chance of flooding of between than 1 in 100 (1%) and 1 in 1000 (0.1%).	2,701
Very low risk	Each year, there is a chance of flooding of less than 1 in 1000 (0.1%).	6,097

Key learnings and next steps

This Group-wide climate change risk stress testing exercise was a useful means for the bank to continue to explore the use of its existing risk management and assessment infrastructure to assess climate change risk and to continue to build the capabilities of different teams within the bank who are responsible for understanding and assessing risk.

Following the publication of the Bank of England discussion paper in December 2019, on stressing the UK financial system to climate-related risks – Barclays will participate in the Bank of England's Biennial Exploratory Scenario on climate-related risks. Work is progressing to enhance our capabilities in order to meet the proposals set out in the Discussion Paper, leveraging work already undertaken during 2019 to support this going forward.

We recognise that supervisors and regulators globally will increasingly move in the direction of requiring assessments of climate-related risks, including using stress testing tools. As climate change is a global issue, we believe a global assessment makes the most sense and we welcome increasing co-ordination between regulators on this issue, for example in terms of scenario development and modelling approaches, through bodies including the Network for Greening the Financial System (NGFS).

Figure 2.3.1b UBS, 2019 Sustainability Report

Provides a historical breakdown of assessments conducted, scenarios used and corresponding outcomes. Additionally, includes whether approach was top-down or bottom-up.

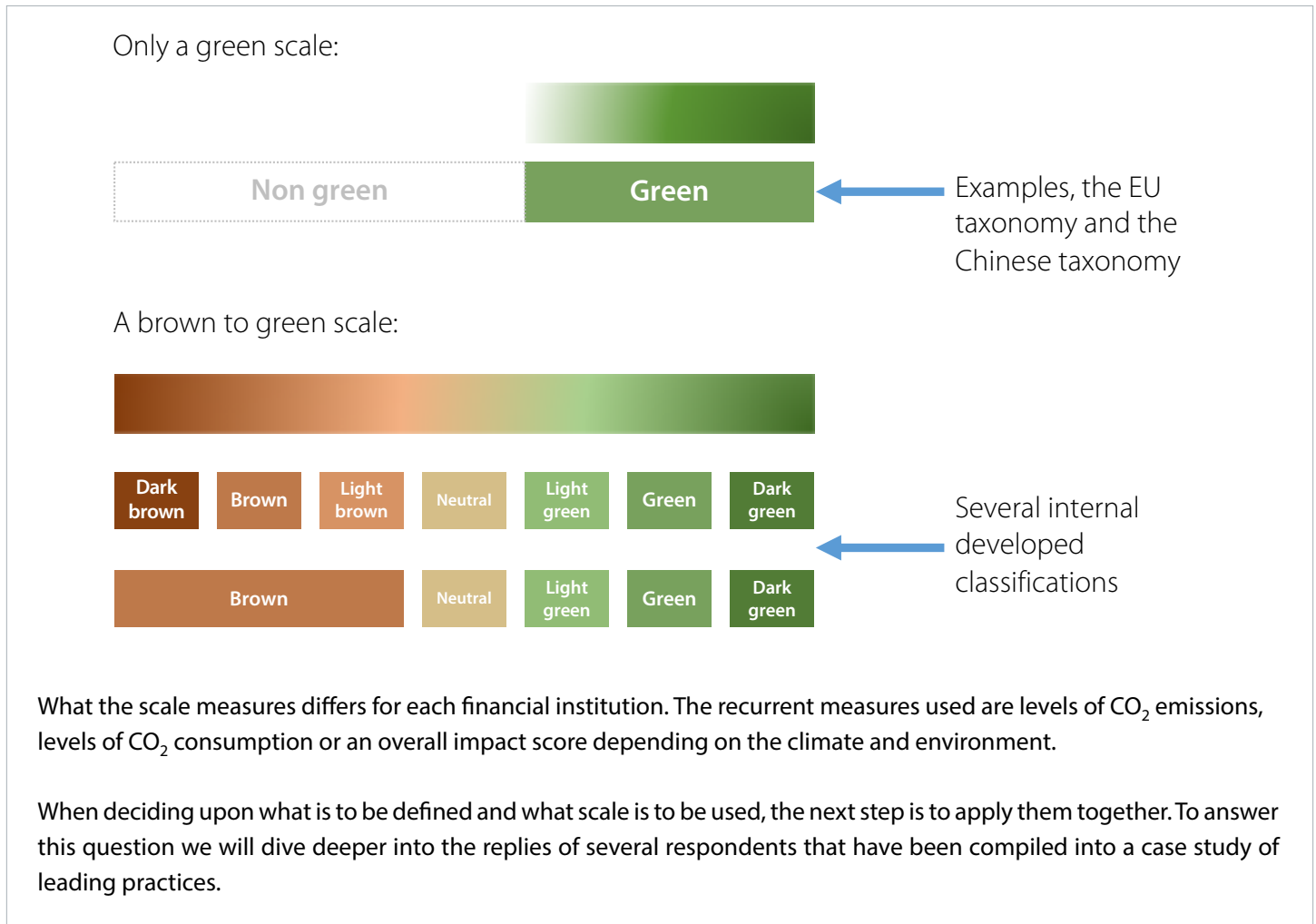
	Assessment	Year	Scenarios used	Outcomes
In-house scenario analysis	Top-down			
	UBS climate stress test to assess UBS's vulnerability (balance sheet, operational income and physical assets) to climate change.	2014	Climate scenario developed in-house	Moderate financial impact in line with other stress scenarios, such as those that foresee an oil shock.
	Bottom-up			
	Assessment on exposure of loan portfolios secured by real estate to climate-related hazards.	2015	Climate scenario developed in-house	Low financial impact due to insurance coverage and loan maturity profile.
	Assessment on impacts of changing oil, gas and coal prices on oil, gas and electric utilities credit portfolios.	2015	Climate scenario developed in-house	Low financial impact due to high quality and maturity profile of portfolio.
Industry collaboration	Drought stress test (Natural Capital Finance Alliance tool) on UBS's energy portfolio.	2017	Based on historic academic precipitation observations	No significant production impact from drought.
	UNEP FI TCFD pilot project for banks: standardizing climate risk identification and translating climate risks into credit impacts. Testing in 2019 focused on our power utilities credit portfolio, work on other sectors continues in 2020.	2018 – 2020	Integrated Assessment Modelling Consortium (IAMC)	No significant credit loss from transition risks in 1.5 and 2 degree scenarios, nor from physical risks in 2 and 4 degree scenarios.
	Paris Agreement Capital Transition Assessment (PACTA): testing alignment of corporate lending portfolios with Paris Agreement benchmarks.	2019 – 2020	<ul style="list-style-type: none"> • IEA¹ • B2DS² • SDS³ • NPS⁴ • CPS⁵ 	Low lending exposure to high-carbon sectors.

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2.3.2 Resiliency strategy

Figure 2.3.2a [Network for Greening the Financial System, Guide for Supervisors](#)

NGFS scale for measuring CO₂ emissions, which can be used to standardize measurement across sectors.



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3. Risk management

3.1 Process for identifying and assessing risks

Figure 3.1a UBS, 2019 Sustainability Report

Detailed display of lending portfolio exposure by high climate impacted sectors.

UBS corporate lending to climate-sensitive sectors 2019

banking products across Personal & Corporate Banking and the Investment Bank

As of 31.12.19

<i>USD million, except where indicated</i>	Gross exposure ²	Share of total exposure to all sectors (%)
Climate-sensitive sector ¹		
Aerospace and defence ³	2,115	0.9
Automotive	449	0.2
Chemicals	1,052	0.4
Constructions and materials ⁴	3,993	1.6
Food and beverage ⁵	2,460	1.0
Industrial Materials ⁶	345	0.1
Machinery and equipment ⁷	2,576	1.1
Mining ⁸	3,000	1.2
Oil and gas ⁹	1,415	0.6
Plastic and rubber	356	0.1
Primary materials ¹⁰	332	0.1
Real estate ¹¹	15,031	6.2
Transportation ¹²	3,272	1.3
Utilities ¹³	1,186	0.5
Total exposure to climate-sensitive sectors	37,582	15.5
Total exposure to all sectors	242,565	100.0

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Figure 3.1b UBS, 2019 Sustainability Report

Detail level description of bank activity related

Climate-related standards in the energy and utilities sectors		
Coal	Coal-fired power plants	<p>Not providing project-level finance to new coal-fired power plants globally.</p> <p>Only supporting financing to transactions of existing coal-fired operators (>30% coal reliance) who have a transition strategy in place that aligns with a pathway under the Paris Agreement, or the transaction is related to renewable energy.</p>
	Coal mining	<p>New: Not providing financing where the stated use of proceeds is for greenfield¹ thermal coal mines.</p> <p>Continuing to severely restrict lending and capital raising to the coal mining sector.</p>
	Mountaintop removal (MTR)	<p>Not providing financing to coal mining companies engaged in MTR operations.</p>
Oil and gas	Arctic oil and oil sands	<p>New: Not providing financing where the stated use of proceeds is for new offshore oil projects in the Arctic or greenfield¹ oil sands projects.</p> <p>New: Only provide financing to companies which have significant reserves or production in arctic oil and/or oil sands (>30% of reserves or production) where the stated use of proceeds is related to renewable energy or conventional oil & gas assets.</p>
	Liquefied natural gas (LNG) and ultra-deepwater drilling	<p>New: Transactions directly related to LNG infrastructure assets are subject to enhanced Environmental & Social Risk (ESR) due diligence considering relevant factors such as management of methane leaks, and the company's past and present environmental and social performance.</p> <p>New: Transactions directly related to ultra-deepwater drilling assets are subject to enhanced ESR due diligence considering relevant factors such as environmental impact analysis, spill prevention and response plans, and the company's past and present environmental and social performance.</p>

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3.2 Process for managing risks

Figure 3.2a Barclays, [ESG Report 2019](#)

This table provides a description of how Barclays considers climate change to impact on certain principle risks and their measurement approach for quantifying climate change as it relates to each principal risk.

Risk	<i>Measurement approach for quantifying climate change</i>
<p>Credit risk The risk of loss to the Group from the failure of clients, customers or counterparties, including sovereigns, to fully honour their obligations to the Group, including the whole and timely payment of principal, interest, collateral and other receivables.</p> <p>The Group manages credit risk under a framework of controls which enable the identification, assessment, measurement and monitoring of credit risk from the level of individual credit facilities up to the total portfolio in each business.</p> <p>Transition and physical risks from climate change may lead to credit risks to the Group. This is an evolving risk theme and robust understanding of the risk, severity, level of interconnectedness, and time horizons relating to these risks are developing.</p>	<p>A Credit Risk Materiality Matrix (Credit Climate Lens) was introduced in 2019 to understand, assess and manage how climate change may impact the Group's credit risk exposures. The Credit Climate Lens is a series of questions which is applied to a counterparty to which the Group is exposed in order to assess its climate change risk.</p> <p>The Credit Climate Lens considers transition factors such as a counterparty's sensitivity to policy changes, reliance on fossil fuels and adaptive strategy, as well as exposure to acute and chronic physical risks. The Credit Climate Lens is applied to clients operating in elevated risk sectors with exposure of more than £5m. Where an obligor is rated as medium or high, the details are referred to the Environmental Risk Management team, a dedicated team in the Group Credit Risk Management function, who conduct enhanced due diligence.</p> <p>A lens based review is also applied for portfolio and country risk reviews for elevated risk sectors and countries. There are currently over 500 counterparties in scope for the Credit Climate Lens, in sectors most exposed to climate change risks. To support the introduction of the Credit Climate Lens, over 600 credit risk executives were trained on climate change risks.</p>
<p>Market risk The risk of loss arising from potential adverse changes in the value of the Group's assets and liabilities from fluctuation in market variables including, but not limited to, interest rates, foreign exchange, equity prices, commodity prices, credit spreads, implied volatilities and asset correlations.</p> <p>Climate change may lead to market risk through a disorderly transition to a low-carbon economy or via physical climate events and shifts in supply and demand for financial instruments, which may then impact market prices for susceptible sectors or countries.</p>	<p>Stress tests are used to assess and aggregate exposures arising from physical and climate change related risks. Stress test scenarios are applied to a range of assets, reflecting the impact of climate change across sectors, countries and regions.</p>

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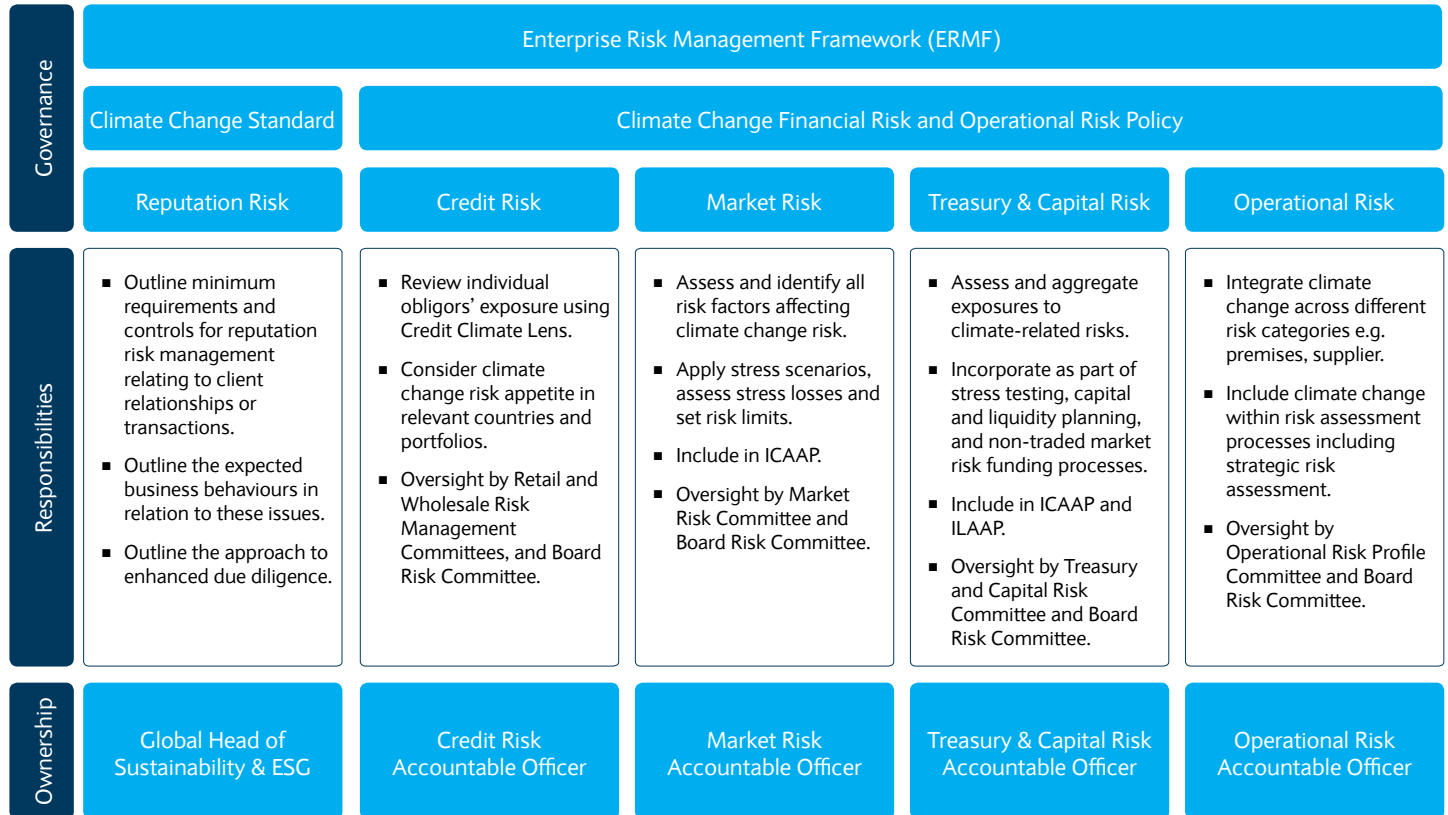
Risk	<i>Measurement approach for quantifying climate change</i>
Treasury and capital risk	<p>This comprises:</p> <p>Liquidity risk: the risk that the Group is unable to meet its contractual or contingent obligations or that it does not have the appropriate amount, tenor and composition of funding and liquidity to support its assets.</p> <p>Capital risk: the risk that the Group has an insufficient level or composition of capital to support its normal business activities and to meet its regulatory capital requirements under normal operating environments or stressed conditions (both actual and as defined for internal planning or regulatory testing purposes). This also includes the risk from the Group's pension plans.</p> <p>Interest rate risk in the banking book (IRRBB): the risk that the Group is exposed to capital or income volatility because of a mismatch between the interest rate exposures of its (non-traded) assets and liabilities.</p> <p>The Treasury function manages treasury and capital risk exposure on a day-to-day basis with the Group Treasury Committee acting as the principal management body, ensuring that these risks remain acceptable boundaries and thresholds. The Treasury and Capital Risk function is responsible for oversight and provides insight into key capital, liquidity, IRRBB and pension risk management activities.</p> <p>The broad range and severity of risks associated with climate change means that the impacts on Barclays' capital and liquidity positions in a range of scenarios and time horizons must be considered.</p>
Operational risk	<p>The risk of loss to the Group from inadequate or failed processes or systems, human factors or due to external events (for example, extreme weather events) where the root cause is not due to credit or market risks.</p> <p>Barclays is exposed to climate change risks in its operations, either directly or via the operations of its suppliers.</p> <p>The Group Property Standard outlines Barclays approach to addressing environmental risks with respect to the availability of operational premises. Additionally, when selecting locations for new strategic sites exposure to extreme weather events is considered.</p> <p>Our Resilience programme outlines Barclays requirements (including requirements of its suppliers) to maintain services and respond robustly to business disruption, including if caused by climate-related events. Barclays deploys and validates appropriate business recovery strategies for its critical processes, including the ability to transfer processing to alternative locations or premises.</p> <p>For our suppliers, resilience requirements are articulated through our Supplier Control Obligations (SCOs). Each supplier is required to attest to their compliance with the SCOs on an annual basis and further testing is undertaken on a risk based approach.</p>

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3.3 Integration into overall risk management

Figure 3.3a Barclays, ESG Report 2019

This graphic demonstrates the integration of climate risk management into the overall risk management framework.



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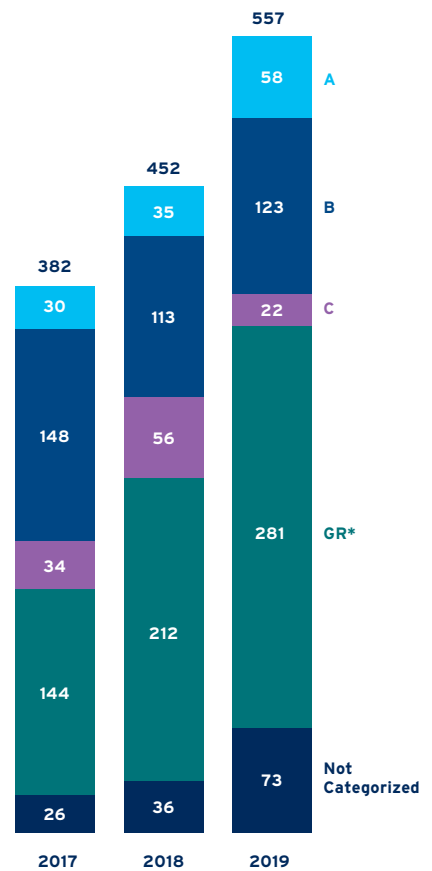
Figure 3.3b Citi, [Global ESG report](#)

Shows transactions screened by Citi's Environmental and Social Risk Management team, regardless of whether they proceeded to financial close.

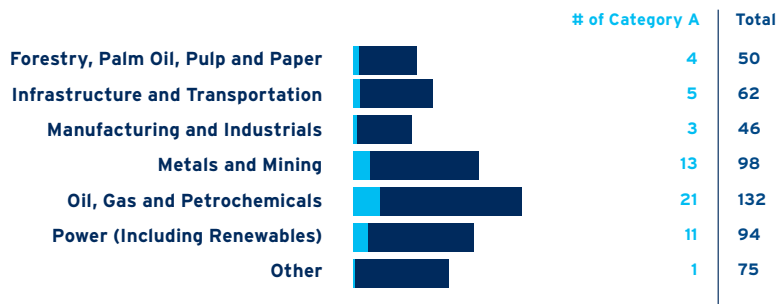
By Region



Total Transactions Receiving ESRM Review



By Sector



By Product Type



* General Review (GR) is used for corporate reviews and transactions for general corporate purposes.

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4. Metrics and targets

4.1 Metrics

For GHG/emissions, please refer to Figure 5.2.a.

The below illustrations are tabular formats that disclose key metrics throughout the comparative periods and are easy to follow.

Figure 4.1a Waste Generation, [State Street 2019 Corporate Responsibility Report](#)

Waste Generation				
	2019	2018	2017	2016
Total Waste Stream (tons)	4,695	4,853	5,163	5,472
Landfill Waste (tons)	664	865	1,053	975
Energy Recovery (tons)	641	749	793	1,010
Total Recycled (tons) (excluded Energy Recovery)	3,389	3,239	3,317	3,488
Landfill Waste per Person (pounds)	32	43	56	52
Diverted Waste per Person (pounds)	161	162	175	241
Diversion from Landfill Rate	72%	67%	64%	64%
Operational Control Footprint	2019	2018	2017	2016
Employees	42,001	39,996	37,846	37,350

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Figure 4.1b Water Consumption, [State Street 2019 Corporate Responsibility Report](#)

Water Consumption				
	2019	2018	2017	2016
Water Consumption – Office Only (million cubic feet)	16.10	16.84	16.51	17.35
Water Consumption per Person – Office Only (cubic feet)	384	421	436	465
Water Consumption – Office + Data Center (million cubic feet)	18.54	19.19	18.93	20.17
Water Consumption per Person – Office + Data Center (cubic feet)	441	480	500	540

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Figure 4.1c Climate-related metrics, UBS 2019 Sustainability Report

The example below details climate-related metrics for risk management (e.g., carbon-related assets) and opportunities (e.g., sustainable investments) over comparative periods.

Climate-related metrics 2019	For the year ended			% change from 31.12.18
	31.12.19	31.12.18	31.12.17	
Risk management				
Identified significant climate-related financial risk on balance sheet ¹	None	None	None	
Carbon-related assets (USD bn) ²	1.9	3.2	5.8	(41)
<i>Proportion of total banking products exposure, gross (%)</i>	<i>0.8</i>	<i>1.6</i>	<i>2.8</i>	
Total exposure to climate-sensitive sectors (USD bn) ³	37.6	38.6	42.6	(3)
<i>Proportion of total banking products exposure, gross (%)</i>	<i>15.5</i>	<i>19.6</i>	<i>20.5</i>	
Weighted carbon intensity of the Climate Aware equities strategy (in tons CO ₂ e per million of USD revenue) ⁴	74.8	95.6	117.5	(22)
<i>Compared to benchmark (FTSE Developed World Index) (%)</i>	<i>(56.0)</i>	<i>(55.7)</i>	<i>(44.0)</i>	
Number of climate-related shareholder resolutions voted upon	44	43	34	2
<i>Proportion of supported climate-related shareholder resolutions (%)⁵</i>	<i>81.8</i>	<i>88.0</i>	<i>82.0</i>	
Opportunities				
Climate-related sustainable investments (USD bn) ⁶	108.0	87.5	74.0	23
<i>Proportion of UBS clients' total invested assets (%)</i>	<i>3.0</i>	<i>2.8</i>	<i>2.3</i>	
Total deal value in equity or debt capital market services related to climate change mitigation and adaptation (CCMA) ⁷ (USD bn)	52.7	31.6	44.3	67
Total deal value of financial advisory services related to CCMA (USD bn)	34.5	24.9	5.5	39
Number of strategic transactions in support of Switzerland's Energy Strategy 2050	12	8	4	50
Own operations				
GHG footprint (kilotons CO ₂ e) ⁸	104	132	148	(21)
<i>Percentage change from baseline 2004 (Target: -75% by 2020) (%)</i>	<i>(71.2)</i>	<i>(63.4)</i>	<i>(59.0)</i>	

¹ Methodologies for climate-related financial risk are emerging and may change over time, as described earlier under Scenario Analysis. ² Carbon-related assets exposures are adjusted from previous years' versions to align with IFRS 9: Banking products across Investment Bank and Personal & Corporate Banking. IFRS 9 gross exposure including other financial assets at amortized cost, but excluding cash, receivables from securities financing transactions, cash collateral receivables on derivative instruments, financial assets at FVOCI, irrevocable committed prolongation of existing loans and unconditionally revocable committed credit lines and forward starting reverse repurchase and securities borrowing agreements. As recommended by the TCFD, carbon-related assets are defined as assets tied to the energy and utilities sectors (Global Industry Classification Standard). Non-carbon-related assets, such as renewables, water utilities, and nuclear power are excluded. For grid utilities, the national grid mix is applied. ³ Gross banking products across Investment Bank and Personal & Corporate Banking (IFRS 9). Climate-sensitive sectors defined as inventory of activities with higher vulnerability to transition and physical climate risks, for more see in-text description. ⁴ Year-on-year decrease of carbon intensity is mainly driven by higher carbon targets of the investment strategy. Carbon intensity is based on scope 1 and 2 CO₂ emissions of investee companies, which often rely on third-party estimates. ⁵ On all proposals that we supported, we voted against the recommendation provided by the issuer. ⁶ Invested assets of products such as sustainably managed properties and infrastructure, and renewable energy. ⁷ Refer to "Calculating and reporting on climate change-related financing and advisory activities" in the Appendix of this document. ⁸ GHG footprint equals gross GHG emissions minus GHG reductions from renewable energy and GHG offsets (gross GHG emissions include: direct GHG emissions by UBS; indirect GHG emissions associated with the generation of imported / purchased electricity (grid average emission factor), heat or steam and other indirect GHG emissions associated with business travel, paper consumption and waste disposal). A breakdown of our GHG emissions (scope 1, 2, 3) is available in the in-house environmental section in this document.

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4.2 Scopes I, II and III emissions

Figure 4.2a Greenhouse Gas (GHG) Emissions, [State Street 2019 Corporate Responsibility Report](#)

The below figures provide a tabular format disclosing GHG emissions over the comparative periods and are easy to follow.

Greenhouse Gas (GHG) Emissions

Direct and Indirect GHG Emissions (Scopes 1, 2 and 3)				
Amounts in Metric Tonnes CO ₂ Equivalent	2019	2018	2017	2016
CO ₂ Direct	6,582	7,335	6,601	6,902
CH ₄ Direct	16.90	17.13	15.02	16.22
N ₂ O Direct	3.73	4.60	4.02	4.50
HFCs Direct	2,340	2,458	3,060	1,322
Total Direct (Scope 1)	8,943	9,814	9,680	8,244
Biogenic CO ₂	4.39	4.50	2.53	3.11
Total Indirect (Scope 2)	75,728	78,678	90,185	92,344
Total Scope 3	90,872	95,888	96,283	87,031
Total GHG Emissions	175,543	184,380	196,148	187,619

GHG Intensity

GHG Intensity Ratio					
	Denominator	2019	2018	2017	2016
GHG Emissions Intensity Ratio	Metric Tonnes of CO ₂ Equivalent per Employee	2.02	2.21	2.64	2.69
List of included gases		Carbon Dioxide (CO ₂), Methane (CH ₄), Nitrous Oxide (N ₂ O)			

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4.3 Targets

Figure 4.3a Targets, Barclays 2019 ESG Report

The below examples provide a good format to provide a summary of targets and performance against those targets. The format can be leveraged to also disclose targets related to the business, which is where financial institutions have more material impacts on climate (e.g., any commitments to reducing emissions intensities in specific portfolios).

Looking forward 2018 – 2030 Targets (progress to date)			
Theme	Target	2019 Progress	New accelerated 2020 target
Greenhouse gas reduction	Achieve a combined 80% reduction of Scope 1 & 2 emissions, aligned to Science Based Target methodology, by 2025.	In 2019, we achieved a 53% reduction of Scope 1 & 2 emissions vs. 2018.	80% emission reductions from Scope 1 & 2 by 2021.
Energy use	Purchase electricity from renewable sources: 90% by 2025 and 100% by 2030. 3% energy savings per annum.	To date, 60% of our energy is purchased through renewable means. We have a Regional Guarantee of Origin (REGO) for all of our mainland sites in UK in addition to a number of green contracts across a number locations in Continental Europe.	90% by 2021 and 100% by 2030. 15% energy savings by 2023.
Water	25% reduction in water by 2025. 100m litres recycled by 2025.	We have spent 2019 evaluating water recycling pilots at key locations with a view to a wider deployment of initiatives in 2020.	
Waste	75% diversion from landfill by 2025. 5 Point Plastic Plan to remove or replace single use plastics by 2020.	Over 80% of the 5 Point Plastic Plan has been delivered across all of our corporate sites globally. We have removed or replaced 22 million single use plastic items. Our remaining focus for 2020 will be on reducing our coffee cup usage. At the end of 2019, we achieved a 91% global diversion from landfill rate.	In 2020, we will set a global waste reduction target to 2025 which will complement our diversion from landfill target. This will form part of our accelerated waste management programme. As the 5 Point Plastic Plan draws to a close, we are evaluating the remaining plastic items that exist in our portfolio and will look to remove these items as part of our accelerated waste management plan.
Paper	95% of paper recycled by 2025.	98% of paper recycled.	In 2020, we will create a paper policy that mandates purchase of sustainably sourced paper for all office printing.
Vendor engagement	90% CDP Supply chain response rate by 2025. 80% of suppliers reporting GHG emissions by 2025.	Barclays has been listed on the 2019 CDP Supplier Engagement Leader Board and we requested 120 of our suppliers to complete CDP's Climate Change Questionnaire and achieved a 56% response rate in 2019.	

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5. Future plans and related climate initiatives (optional)

Figure 5.1a Future plans, Citi [TCFD Report \(2018\)](#)

This excerpt, from Citi's 2019 stand-alone TCFD report, discusses major data limitations and offers clear, concrete next steps to improve their next TCFD report.

Given this imperative, Citi understands that even though our pilot scenario analysis exercise did not indicate that climate change will pose material financial risks to our business in 2030 and 2040, this was not an exhaustive or conclusive analysis. Regardless, we must take action today to do our part to avoid the worst potential impacts of climate change. To enable this transition, we must work closely with our clients in climate-exposed sectors to help them transition and become more resilient through enhanced climate adaptation and mitigation measures.

This pilot analysis highlighted several difficult challenges associated with conducting climate scenario analysis and understanding climate-related risks that we will need to address:

- Long-term climate projections tend to be inaccurate. This is made even more challenging by the fact that climate risks and impacts are expected to accelerate and get worse over time. Non-linearity is hard to capture and forecast with the currently-available tools for climate risk assessment.
- There are significant data gaps, including data on the linkage between climate risk and credit quality and asset-level data on asset utilization and climate mitigation factors at a facility.
- Climate impacts can be very local and affect different geographies and sectors differently. This will require more granular data at the local and asset level.
- Climate-related losses may be due to indirect,

second-order impacts, such as impacts on critical infrastructure or the supply chain, not just direct impacts. This is hard to measure and estimate at this time and will require additional data.

It will take time and collaboration with stakeholders for us to find solutions to these challenges, but we are committed to building upon the pilot project and further implementing the TCFD recommendations. Some potential next steps we are exploring include:

- Conducting climate scenario analysis on other sectors and/or geographies
- Exploring and potentially testing other methodologies, models, tools and scenarios that have been developed by third parties
- Continuing to collaborate with UNEP FI and the pilot group to refine the transition risk and physical risk methodologies that we have developed
- Engaging with clients and other stakeholders to further our collective understanding of climate risks and opportunities, particularly in the supply chain
- Engaging with clients to support investments in climate change solutions for climate adaptation and/or mitigation
- Working with stakeholders to improve data availability and fill data gaps
- Working with climate modelers to adapt climate scenarios for financial analysis

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Figure 5.2a Related climate initiatives, [RBS 2019 Annual Report](#)

The following image is from the RBS' 2019 Annual Report. It contains references to other approaches and initiatives that the institution is part of to combat climate change.

Approach to non-financial performance reporting

We note the requirements under the provisions of the Companies Act 2006, relating to the preparation of the Strategic Report which have been amended by the Companies, Partnerships and Groups (Accounts and Non-Financial Reporting) Regulations 2016, which implements EU Directive 2014/95/EU (on non-financial and diversity information). As a result of these changes, we have integrated non-financial information across the Strategic Report, thereby promoting cohesive reporting of non-financial matters. These include specific sections on where readers can read more on our business model and policies (How we do Business; Building a more sustainable bank), due diligence and outcome of such policies (Governance and compliance), principal risk and mitigatory actions (Risk Management), and performance measures (2019 highlights and our future strategy). We have also begun reporting in accordance with guidance from the International Integrated Reporting Council and the recommendations of the Taskforce on Climate-related Finance Disclosures (TCFD) (Climate-related financial disclosures).

Further information on environmental, social, employee and human rights matters, together with detailed information on our sustainability performance can be found on our Sustainable Banking web pages on [rbs.com](#)

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About the authors

David Carlin

UNEP FI
david.carlin@un.org

Remco Fischer

UNEP FI
kai.fischer@un.org

About United Nations Environment Programme Finance Initiative (UNEP FI)

UNEP FI is a partnership between UNEP and the global financial sector to mobilize private sector finance for sustainable development. UNEP FI works with more than 300 members – banks, insurers, and investors – and over 100 supporting institutions – to help create a financial sector that serves people and planet while delivering positive impacts. We aim to inspire, inform and enable financial institutions to improve people's quality of life without compromising that of future generations. By leveraging the UN's role, UNEP FI accelerates sustainable finance.

We work with our members, technical experts and key stakeholders, to convene ambitious collective action, facilitate shared learning and co-develop practical resources to equip financial institutions with the knowledge and expertise to embed sustainability into their strategies and operations. We facilitate collaborative projects to develop methodologies and tools, encourage harmonization, promote advances in good practice, and support leadership to accelerate growth in the quantity and quality of sustainable financial institutions.

Jeremy McDaniels

IIF
jmcdaniels@iif.com

Sonja Gibbs

IIF
sgibbs@iif.com

About the Institute of International Finance

The Institute of International Finance (IIF) is the global association of the financial industry, with close to 500 members in more than 70 countries. Its mission is to support the financial industry in the prudent management of risks; to develop sound industry practices; and to advocate for regulatory, financial and economic policies that are in the broad interests of its members and foster global financial stability and sustainable economic growth. IIF members include commercial and investment banks, asset managers, insurance companies, sovereign wealth funds, hedge funds, central banks and development banks.

Through its Sustainable Finance Working Group (SFWG), engaging over 175 members, the IIF delivers a coherent global industry agenda on sustainability, climate, and ESG issues. This is achieved by advancing industry initiatives and capital market solutions, developing tools and resources for member firms, supporting the development of policy and regulatory frameworks, and engaging with international entities, standard-setters, and multilateral fora (e.g. G20) to scale up and mainstream sustainable finance at the global level.

Peter Marshall

EY
peter.marshall04@ey.com

Paul MacIntosh

EY
paul.macintosh@ey.com

About EY's Climate Change and Sustainability Services

Governments and organizations around the world are increasingly focusing on the environmental, social and economic impacts of climate change and the drive for sustainability. Businesses may face new regulatory requirements and rising stakeholder concerns. There may be opportunities for cost reduction and revenue generation. Embedding a sustainable approach into core business activities could be a complex transformation to create long-term shareholder value. Operating across many industry and countries, as well as your extended business relationships, introduce specific challenges, responsibilities and opportunities.

Our global, multidisciplinary team combines our experience in assurance, consulting, strategy, tax and transaction services with climate change and sustainability knowledge and experience in financial services and across other industry. We support clients with the right professionals, tailored services, and global methodologies to address issues relating to specific sustainability goals and needs.

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