INDUSTRY HANDBOOK

INTERNALIZING ENVIRONMENTAL AND CLIMATE CHANGE ASPECTS INTO FINANCIAL INSTITUTION BUSINESS FOR BANKS

THE THAI BANKERS' ASSOCIATION

FOREWORD BY THE BANK OF THAILAND

Thailand is vulnerable to climate and environmental-related impacts via both physical and transition risks. Businesses need to start their sustainability transition according to environmental policies and regulations as well as international commitments and standards. At the same time, the movements of environmental and climate risk management for financial institutions have gained strong momentum since the Network for Greening the Financial System (NGFS) and the Basel Committee on Banking Supervision (BCBS) issued the guidelines and principles for central banks to monitor the banking sector. This trend is in line with the global directions for financial institutions to strengthen their resilience and provide the framework to enhance their supports for clients in climate transition through sustainable and climate financing.

To address these challenges, the Bank of Thailand (BOT) set a strategic direction for the financial sector's sustainable development in "Directional Paper on Transitioning towards environmental sustainability under the new Thai financial landscape" (November 2022), with the key expectation for the financial sector to be able to evaluate climate and environmental opportunities and risks and provide financial products and services that support the real sector's transition towards greener economy. Within this aspiration, "Policy Statement of the Bank of Thailand Re: Internalizing Environmental and Climate Change Aspects into Financial Institution Business" (Standard Practice) was issued in February 2023. This set the expectations for commercial banks in Thailand to systematically assess the environmental impacts, risks and opportunities, and integrate of them in their strategy, decision-making process, operations, and disclosure, in accordance with risk proportionality principle.

Financial sector's knowledge and capabilities to understand and manage environmental and climate risk are essential. Thus, the Thai Bankers' Association (TBA) initiative to develop this handbook demonstrates how the Thai banking industry gives high priority to this issue and also fits into the BOT's objectives to strengthen commercial banks' environmental and climate risk management capability. The best practices and actions prescribed in this handbook suggest the steps that commercial banks should take into account when building the system, process, data, and capability within the organization.

The BOT expects to see Thai banking industry utilizing this handbook to uplift the industry's standard for climate and environmental risk management and support their client's transition in a tangible manner. The handbook will serve as a comprehensive manual for dialogues between the commercial banks and the BOT in order to facilitate the effective implementation of the Policy Statement.

Given the long-term and evolving nature of the topics, the BOT looks forward to working closely with the industry and other stakeholders to enhance commercial banks' capabilities in environmental and climate risk management, and make important steps forward to build an ecosystem for the commercial banks' implementation of the Policy Statement under our supervisory framework.

Bank of Thailand

October 2023

ACKNOWLEDGEMENT BY THE THAI BANKER'S ASSOCIATION

The Thai Bankers' Association (TBA) recognizes the significant role the financial sector has in driving the sustainable finance agenda through the allocation of capital to businesses in their timely effort to adapt to environmental changes. Although environmental and climate (E&C) risks pose an unprecedented challenge to banks in terms of scale, complexity, and urgency, it is imperative that Thai commercial banks build their capabilities and adapt to our move to a low-carbon economy.

The Bank of Thailand (BOT) 's Policy Statement on Internalizing Environmental and Climate Change Aspects in Financial Institution Business ("Standard Practice") (February 2023) has set key expectations for Thai commercial banks to develop their capacity and internal risk management. This is to ensure that Thai commercial banks can facilitate green transitions and sustainability development through sustainable financial products and services. TBA sees this as an industry-level movement to improve the capability of Thai commercial banks to develop capability in their environmental and climate risk management and responses.

This handbook is an industry-led initiative and collaborative effort reflective of the banking industry's aspirations. With the key objective of helping Thai commercial banks of all sizes to successfully integrate E&C risks in their operational procedures, this handbook draws upon relevant international guidelines, regulatory practices, and expectations in other jurisdictions and practical industry practices. This handbook identifies key actions in integrating E&C risks and the capability needed for banks to assess and manage such risks and opportunities, with the aim of facilitating the development of green financial products and services. This will hopefully aid commercial banks in the full implementation of Standard Practice. Alongside rapid regulatory developments, we wish to see a positive change not only within the financial sector but throughout the real sector which is reliant on private green financing through commercial banks.

As the knowledge of environmental and climate science and the landscape of regulatory requirements in this area is rapidly evolving, understanding of the risks and impacts on the banking sector will be enhanced in the coming years. We consider this handbook a living document that can be updated to meet this dynamic, for the benefit of Thai commercial banks' capability development in the future.

We would like to thank the Bank of Thailand for their invaluable contributions and communication on the expectations for commercial banks to implement environmental and climate risk management, which are keys to setting the expected process and capability for Thai commercial banks as prescribed in this handbook. This handbook would not have been made possible without the contributions from our TBA members: Bangkok Bank, Krungthai Bank, Bank of Ayudhya, KASIKORNBANK, TMB Thanachart Bank, Siam Commercial Bank, Kiatnakin Phatra Bank, CIMB Thai Bank, TISCO Bank, Thai Credit Bank, United Overseas Bank, Land and Houses Bank, Standard Chartered Bank (Thai), Industrial and Commercial Bank of China (Thai), and Bank of China (Thai). We also appreciate recommendations from member banks of the Association of International Banks (Thailand).

Special thanks to Bank of Ayudhaya and KASIKORNBANK, which served as lead facilitators for the development of the handbook and also thank Deloitte Thailand for the contribution of their technical expertise.

We hope to see the enhancement of environmental and climate risk management within Thai commercial banks through the utilization of this handbook, for us to take this important role in financing Thailand's accelerated transition to a low-carbon economy.

Thai Bankers' Association
October 2023

ABBREVIATIONS AND ACRONYMS

Acronym	Terms
ASEAN	Association of Southeast Asian Nations
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
BOD	Board of Directors
BOT	Bank of Thailand
DNB	De Nederlandsche Bank
CBI	Climate Bonds Initiative
CCRA	Climate Change Risk Assessment
CCMP	Climate Change Management Plan
CDP	Carbon Disclosure Project
CFRF	Climate Financial Risk Forum
CISL	Cambridge Institute for Sustainability Leadership
EBA	European Banking Authority
E&C	Environmental and climate-related
ECB	The European Central Bank
ED	Exposure Draft
EPs	Equator Principles
ESG	Environmental, Social, and Governance
FSB	Financial Stability Board
FSC	Forest Stewardship Council
GFANZ	Glasgow Financial Alliance for Net Zero
GFIT	Green Finance Industry Taskforce
GHG Protocol	Greenhouse Gas Protocol
GRI	Global Reporting Initiative
HKMA	Hong Kong Monetary Authority
ICAAP	Internal Capital Adequacy Assessment Process
ICMA	International Capital Market Association
IEA	International Energy Agency
IFC	International Finance Corporation
IFRS	International Financial Reporting Standards
ILAAP	Internal Liquidity Adequacy Assessment Process
IPCC	Intergovernmental Panel on Climate Change
ISIC	International Standard Industrial Classification
ISSB	International Sustainability Standards Board
LTS	Long Term Strategies
MAS	Monetary Authority of Singapore
MSPO	Malaysian Sustainable Palm Oil
NCC	National Climate Commitments

Acronym	Terms
NDC	Nationally Determined Contributions
NGFS	Network for Greening the Financial System
OECD	Organization for Economic Co-operation and Development
PACTA	Paris Agreement Capital Transition Assessment
PCAF	Partnership for Carbon Accounting Financials
RCP	Representative Concentration Pathways
RSPO	Round-table on Sustainable Palm Oil
SM	Senior Management
SME	Small and Medium-sized Enterprise
TBA	The Thai Bankers' Association
TCFD	Task Force on Climate-related Financial Disclosures
UNEP FI	United Nations Environment Programme – Finance Initiative

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CHAPTER 1: BACKGROUND

1.1) INTRODUCTION

1.1.1) E&C RISKS SUPERVISION IN THE BANKING INDUSTRY

The challenges posed by climate change in Thailand is prominent. To name one of the key biggest physical risk challenges, Thailand is one of the ten most flood-affected countries in the world (World Bank Group, 2021). Without significant changes in our policies and measures to strengthen responses to environmental and climate change, the impacts will intensify in the long term and cause wide-ranging implications on the society and the economy. It is predicted that climate change will drive the decline of as much as 43.6% of Thailand's Gross Domestic Product (GDP) by 2048 (BOT, 2022). In order to set goal to mitigate the effects of climate change, the Thai government has taken steps to manage these impacts, reflected in Thailand's second Nationally Determined Contribution (NDC) submitted in November 2022, aiming to achieve carbon neutrality by 2050 and net-zero emissions by 2065. For the interim targets, Thailand pledged in the second updated NDC that it will reduce emissions of greenhouse gas by 30 percent from the projected business-as-usual (BAU). To achieve these national agenda, it is expected that Thailand would need immense amount of financing, both from public and private funding, to support the transition to low-carbon economy.

The Bank of Thailand and the financial sector is driving the sustainable finance agenda to mobilize its resources to combat environmental and climate-related risks ("E&C risks") and impacts. In addition to government regulations and support from the private sector, capital mobilization and the greening of the national financial system will be critical in Thailand's transition to meeting its net-zero target. To ensure that commercial banks can support in financing the transition through green financial product and services, it is imperative that banks can understand and manage their environmental and climate risk, to prepare for their key role in sustainable financing.

In this context, E&C risks are becoming the key risk drivers of financial risks of commercial banks in different sizes, complexity of organization, product and services, and business model. The impacts of E&C risks are unique but widespread across industries and geographies, varying in time horizon as to when the impacts materialize, and entails unpredictability and uncertainty (BCBS, 2022). Therefore, central banks have taken steps to ensure that the financial system is resilient to these risks. While governments have the primary responsibility for ensuring the achievement of the NDCs and the success of the Paris Agreement, central banks and supervisors play a substantial role in addressing E&C risks within their mandates and driving the implementation among commercial banks and other financial institutions (NGFS, 2019).

Looking at opportunity for banking industry during this transition period, it is estimated that for developing countries to meet the goals of the Paris Agreement, external climate finance of US$1 trillion per year by 2025, and $2.4 trillion per year by 2030 are required for effective transition to achieving the goal (Sinha, 2023). Although this will require strong support from the government, it also presents an opportunity for the financial sector to support the low carbon economy transition through the means of private financing. Thailand is well poised in this regard considering its mature green bond market relative to peers and growing demand for green investments. The Thai bond market is the second largest among ASEAN bond markets, with an annual average growth of 10% (Climate Bonds Initiative, 2021). This growing awareness, availability and accessibility of green financing can potentially lead to increased adoption of green projects in the region.

These developments contribute to the movements among central banks to ensure that commercial banks are prepared to address E&C risks and opportunities in their business to strengthen resilience of financial systems. Acknowledging this, the **Network of Central Banks and Supervisors for Greening the Financial System (NGFS)** issued its first comprehensive report in April 2019 *("A call for action – Climate change as a source of financial*

risk") which outlines six recommendations for central banks and policymakers to integrate E&C risks into micro-prudential supervision (NGFS, 2019). Building upon this, the NGFS later published a *Guide for Supervisors* in May 2020, offering a guideline for supervisors to incorporate E&C risks into supervisory frameworks, comprising of five recommendations.

Meanwhile, the **Basel Committee on Banking Supervision (BCBS)** began its work on climate-related financial risks in early 2020 by assessing member jurisdictions' regulatory and supervisory initiatives concerning climate-related financial risks. In April 2021, the BCBS published 2 analytical reports: *Climate-related risk drivers and their transmission channels*, and *the measurement methodologies for climate-related financial risks.* In June 2022, BCBS published "*Principles for the effective management and supervision of climate-related financial risks*" to enhance banks' risk management and supervisors' practices in addressing climate-related financial risks (BCBS, 2022).

Additional resources: Publications on the management of E&C risks

To explore more about the publications from the NGFS, please visit:

- NGFS. (2019). *A call for action - Climate change as a source of financial risk*.
- NGFS. (2020). *Guide for Supervisors - Integrating climate-related and environmental risks into prudential supervision*.

To explore more about the publications from the BCBS, please visit:

- BCBS. (2021). *Climate related risk drivers and their transmission channels*.
- BCBS. (2021). *Climate-related financial risks - measurement methodologies*.
- BCBS. (2022). *Principles for the effective management and supervision of climate-related financial risks*.

In response to the supervisory movements mentioned above, central banks across jurisdictions have set out their supervisory expectations on the management of E&C related financial risks through their mandates and guidelines. Notable examples consist of:

- **Bank of England (BoE):** Through the Supervisory Statement 3/19 published in 2019, the BoE took the lead as the first central bank and supervisor to establish supervisory expectations for banks and insurers regarding the management of climate-related financial risks, encompassing areas such as governance, risk management, scenario analysis, and disclosure.

- **The European Central Bank (ECB):** As a supervisor to European banks, the ECB plays a crucial role in ensuring that banks accurately identify, mitigate, and disclose risks, including those arising from climate change (ECB, 2020). The ECB published a Guide on climate-related and environmental risks in 2020, setting out comprehensive expectations related to risk management and disclosure.

- **The Monetary Authority of Singapore (MAS)**: The MAS outlined supervisory expectations on effective governance, robust risk management, and meaningful disclosure of environment-related risks by issuing the Guidelines on Environmental Risk Management to FIs (ENRM Guidelines) in 2020 (MAS, 2020). MAS published the set of guidelines for Banks, Insurers and Asset Managers, taking into consideration the environmental and climate risks as key risk drivers that may expose financial institutions (FIs) to different financial risks throughout financing, insurance, and investment activities.

- **Hong Kong Monetary Authority (HKMA):** the HKMA issued the Supervisory Policy Manual module on climate risk management in 2021, requiring authorized institutions (AIs) to integrate climate risk considerations into their strategies and frameworks, while also providing guidance and expectations for reviewing AIs' management of climate-related risks (HKMA, 2021).

In line with these global movements, the **Bank of Thailand** has also taken an active role in supporting the Thai financial sector, particularly commercial banks, in addressing impacts of environmental changes and managing environmental and climate risks, which will be discussed in the next section.

Additional resources: Supervisory guidelines in different jurisdictions

To explore more about the central banks' supervisory guidelines/statements mentioned above, please visit:

- BOE. (2019). *Enhancing banks' and insurers' approaches to managing the financial risks from climate change*.
- ECB. (2020). *Guide on climate-related and environmental risks*.
- MAS. (2020). *Guidelines on environmental risk management for banks*
- HKMA. (2021). *Supervisory Policy Manual GS-1: Climate Risk Management*.

1.1.2) THE STANDARD PRACTICE AND THE BANK OF THAILAND'S REQUIREMENTS

Acknowledging the financial sector's crucial role in allocating capital to businesses and facilitating their timely adaptation to environmental changes in their operations, The Bank of Thailand has issued a ***policy statement on internalizing environmental and climate change aspects in financial institution business ("Standard Practice")*** in February 2023. The Standard Practice communicates the BOT's expectations to financial institutions and companies within the financial business group.

The BOT outlines that in order achieve tangible results, financial institutions and companies should apply the Standard Practice in accordance with their "organizational structure, business complexity, and materiality of environmental risks on their businesses (risk proportionality)". It is expected that commercial banks should start to apply the Standard Practice in accordance with their risk proportionality principle to meet the BOT's progress evaluation commencement from 2024 onwards.

The Standard Practice offers commercial banks a comprehensive framework to appropriately evaluate E&C opportunities and risks in their business operations, while avoiding the creation of additional risks. It encompasses four fundamental dimensions: **Governance, Strategy, Risk Management**, and **Disclosure,** and are reflected through seven key recommendations, summarized as below:

Governance

- The Board of Directors and senior management should play an important role in setting "Tone from the top". The Board should provide strategic direction and policies, while senior management ensures their implementation, managing opportunities, risks, and internal responsibilities for environmental actions *(item 3.2.1).*

Strategy

- Financial institutions should consider environmental opportunities and risks, integrating them into their strategies, goals, and implementation plans. This should lead to the transformation of work processes, financial products, and services, supporting clients' tangible transition *(item 3.2.2).*

Risk Management

- Financial institutions should integrate environmental risks into their risk culture and management process, aligning with the Three Lines of Defense model. They should have in place policies, processes, and data capabilities to support effective risk management *(item 3.2.3 (1)).*

- Financial institutions should set up policies and processes for identifying and assessing environmental risks both at the transaction and portfolio levels *(item 3.2.3 (2)).*

- Financial institutions should set up policies and processes to control and mitigate environmental risks to an acceptable level both at transaction and portfolio levels *(item 3.2.3 (3)).*

- Financial institutions should set up policies and processes to monitor environmental risks at transaction and portfolio levels. They should consistently report this information to the Board of Directors and senior management in a timely manner *(item 3.2.3 (4)).*

Disclosure

- Financial institutions should publicly disclose climate-related information on governance, strategies, implementation plans, opportunities, and risks management, as well as metrics and targets that reflect current business operations and are in line with international standards such as the recommendations of the Task Force on Climate-related Disclosures (TCFD) or the guidelines from the International Sustainability Standards Board (ISSB) *(item 3.2.4).*

1.2) ABOUT THIS HANDBOOK

1.2.1) KEY RATIONALE OF THE HANDBOOK DEVELOPMENT

This handbook was developed to facilitate Thai commercial banks in their adoption, implementation, and execution of integrating E&C risks in their operations, in line with the Standard Practice. This handbook does not substitute, or override regulations set by Thai regulatory bodies and should be read together with the Standard Practice. The initiative to develop this industry handbook is led by the Thai Bankers' Association (TBA) and was created in accordance with the Bank of Thailand's **Directional Paper on Financial Landscape** to ensure that the financial system can "sufficiently allocate capital and offer financial products and services to serve the business sector's environment-related needs" (BOT, 2022). This initiative establishes a minimum standard for the Thai banking sector, ensuring the allocation of funds and the provision of products and services that effectively support the environmental adaptation of businesses, particularly SMEs.

The content in this handbook aims to aid commercial banks in implementing the BOT's Standard Practices. In addition to the standards and guidance from the Thai regulators, this handbook aligns with other international guidelines and standards. It draws from four main reference sources: (1) the Network for Greening the Financial System's (NGFS) *Guide for Supervisors: Integrating climate-related and environmental risks into prudential supervision* (2020); (2) the Basel Committee on Banking Supervision's (BCBS) *Principles for the effective management and supervision of climate-related financial risks* (2020); (3) the Task Force on Climate-related Financial Disclosures (TCFD) *Recommendations* (2017); the TCFD's *Guidance on Risk Management Integration and Disclosure* (2020); and (4) the IFRS S2 Climate-related Disclosures.

Additional resources: Supervisory guidelines in different jurisdictions

To explore more about the documents, guidelines, and standards mentioned above, please visit:

- The Thai Bankers' Association. (2022, August 29). *ESG Declaration*.
- Bank of Thailand. (2022, August 23). Directional Paper on Transitioning towards Environmental Sustainability Under the New Thai Financial Landscape.
- Bank of Thailand. (2023, February 15). *Policy Statement of the Bank of Thailand - Re: Internalizing Environmental and Climate Change Aspects into Financial Institution Business*.
- The Network for Greening the Financial System. (2020). *Guide for Supervisors - Integrating climate-related and environmental risks into prudential supervision*.
- The Basel Committee on Banking Supervision. (2022). *Principles for the effective management and supervision of climate-related financial risks*.
- The Task Force on Climate-related Financial Disclosures. (2017). *Recommendations of the TCFD*.
- The Task Force on Climate-related Financial Disclosures. (2020). *Guidance on Risk Management Integration and Disclosure*.
- IFRS S2 Climate-related Disclosures. (2023). IFRS S2 Climate-related Disclosures.

1.2.2) OBJECTIVES OF THE HANDBOOK

This handbook aims to support commercial banks in the Thai banking sector, including branches or subsidiaries of foreign commercial banks, in integrating environmental and climate change aspects into their regular business operations. It provides detailed guidance on implementation and unpacks expected practices in line with the Standard Practice.

Additionally, other companies in the financial business group, such as insurance companies, securities companies, consumer finance companies, are also encouraged to utilize this handbook as a framework to enhance their E&C risk management where applicable. **It is expected that all commercial banks in Thailand should comply to the key actions set forth in this handbook, which reflect the requirements of the Standard Practice.**

The objectives of this handbook encompass four distinct elements:

1. To provide detailed and practical industry practices that can accommodate various Thai financial institution's organizational structure, size, business complexity, and environmental materiality.

2. To set key actions for commercial banks in integrating E&C considerations in their risk management system, and business operations. Commercial banks are expected to implement the Standard Practice in line with these key actions, applying the 'comply or explain' principle.

3. To raise the capability of banks to be able to assess and manage their own E&C risks and opportunities.

4. To develop sufficient E&C financial products and services that can facilitate the appropriate allocation of resources to the business sector.

1.3) STRUCTURE OF THE HANDBOOK

This handbook provides key definition, practical guidance, and illustrative examples of current industry practices on E&C risk management integration with the aim to support Thai financial institutions in the implementation of the Standard Practice. It is anticipated that these industry practices on E&C risk management will further develop over time and the banks and Thai industry are encouraged to remain abreast of these developments.

The handbook is divided into three sections: the **Introduction**, which provides context of the development of the handbook, the main scope of application, and key definitions; the **Main content**, which encompasses the four implementation frameworks, including Governance, Strategy, Risk Management, and Disclosure; and the **Supplementary resources**, which includes additional references and relevant publications.

In the first section, **Chapter 1** provides an overview of the context of E&C risk supervision and sets out the key objectives of the handbook. It also discusses the standards behind and frameworks set by the BOT, and introduces the Standard Practice, which forms the foundation and key rationale for this handbook, and outlines the structure of this handbook. **Chapter 2** then describes the scope and implementation of the handbook, provides definitions of E&C risks, and explains how and through which channels these risks can materialize into financial risks.

The main content of the handbook and implementation guidance are the key focuses of Chapter 3 to Chapter 6 of the handbook. **Chapter 3** outlines the guidance on the board and senior management's responsibilities for overseeing E&C dependencies, impacts, risks, and opportunities. **Chapter 4** provides guidance on the effective integration of E&C risks and opportunities into business strategies formulation, transition planning, and risk appetite. It also discusses embedding E&C risk considerations in financial products and services and assisting clients and counterparties in their transition journeys.

Chapter 5 focuses on risk management in six material aspects:

1. Risk management system, which discusses ensuring E&C risk management integration in the organization's risk culture across three lines of defense, and in alignment with the risk appetite.
2. Risk identification and assessment, which covers materiality identification, determination of materiality and good practices for setting materiality thresholds, and client due diligence process.
3. Scenario analysis and stress testing, which introduces guidance and objectives of conducting scenario analysis and stress testing exercises, specific features of scenario analysis implementation, and limitations given data and methodologies.
4. Risk controlling and mitigation, which provides portfolio and transactional level considerations for control and mitigation activities and navigates the development of client engagement policies or exclusion policies for 'hard-to-abate' sectors, as well as the development of risk indicators.
5. Risk management and monitoring, which examines portfolio and transactional level considerations for risk monitoring activities and provides guidance on lending, investment, and asset management activities.
6. Metrics and targets, which recommends a set of considerations and metrics and targets to inform long-term strategy, showcases a sample list of indicators, and discusses certain data gaps and limitations.

Chapter 6 summarizes key disclosure requirements in line with TCFD disclosure recommendations covering governance, strategy, risk management as well as metrics and targets. The chapter also discusses data gaps and limitations, as well as alignment with the IFRS S2 Climate-related Disclosures standard.

In the supplementary resources section, **Chapter 7** compiles additional resources for practice references covering GHG calculation standards including Greenhouse Gas Protocol (GHG Protocol), and the Partnership for Carbon

Accounting Financials (PCAF), an overview of Thailand's sustainable finance initiatives, and the development of the Taxonomy. It also provides a summary of the Taskforce on Nature-related Financial Disclosures (TNFD) roadmap and proposed requirements for risk assessment.

1.4) HOW TO READ THIS HANDBOOK

A. Key in-chapter elements of the handbook

Throughout this handbook, readers can utilize the following legends as helpful references to enhance their understanding of the content. These legends serve as valuable tools to navigate and comprehend the information presented.

Legend	
Key definitions	Explanation of technical terms that are clearly defined within the Standard Practice or other internationally accepted standards and/or organizations.
Standard Practice	The BOT's guidance on banks' environmental and climate-related management as set out in the Standard Practice.
Key Actions	Capabilities that banks are required to develop to comply with the Standard Practice. The key actions set the necessary steps for banks to take to be in full alignment with the Standard Practice; however, it is applied to banks in line with the principles of risk proportionality and comply or explain principles.
Industry practices	Examples from other organizations within the sector that have implemented concrete and effective practices.
Additional resources	Additional resources that the reader can utilize to gain further clarification.

It is important to note that this handbook provide **supplementary support** and should be read alongside the BOT's "*Policy statement on internalizing environmental and climate change aspects in financial institution business" (**Standard Practice)*** **issued in February 2023,** and the *"Directional Paper on Transitioning towards Environmental Sustainability Under the New Thai Financial Landscape" **(Directional Paper)*** **issued in August 2022.**

B. Key Actions

This handbook specifies the actions for all commercial banks to follow in order to meet the expectations of the BOT's Standard Practice, which have been segregated into three groups of actions. Each of these groups relate to actions over a different time horizon (see Appendix A for the full set of actions):

1. **Short-term actions** – The prioritized and immediate actions to be taken by the banks in accordance with their current context and level of capability. These key actions will focus on establishment of governance (roles and responsibilities and Board level oversight), risk management system for the purpose of understanding the exposures (GHG emissions and current risk metrics), building required capability and data structure, and enhancing the capability for internal and regulatory reporting and disclosures.

2. **Long-term actions** – These actions specify the necessary steps that will need to be undertaken to build on the developed capabilities set by the short-term actions (above). In applying the risk proportionality principle, banks of different size and characteristics may have different challenges to achieve the long-term actions. It is therefore recommended that the timeline to achieve the long-term actions should be discussed and agreed with the BOT.

3. **End-state** – All banks should have established the capabilities across the actions for Governance, Strategy, Risk Management, and Disclosure in line with the Standard Practice. This end-state prescribes in detail what the Standard Practice would look like when applied in banks' capabilities. These actions should be met when the banks have implemented the actions contained in (1) and (2) above.

This handbook does not prescribe a specific timeline for implementation to meet the key actions prescribed in the content. Banks should apply these actions in accordance with their context and level of capability, as prescribed by the Standard Practice and through consultation with BOT. This will allow banks to develop their own interim timelines for their prioritized actions, which will allow for appropriate capability building for effective implementation in line with the Standard Practice. The timeline for all banks to achieve **full implementation** of the BOT's Standard Practice shall be determined by the BOT, based on **readiness** and **risk proportionality** principle applied to all banks.

CHAPTER 2: SCOPE

2.1) SCOPE AND IMPLEMENTATION OF THE HANDBOOK

This handbook was developed with the aim to support our member banks in the **implementation of the Bank of Thailand's Standard Practice**, for banks of all sizes to successfully integrate E&C risks in their operational procedures, in line with the risk proportionality principle. The E&C risk integration capability building aims to **ensure that the financial system can allocate funds and provide products and services to support environmental adaptation** of the business sector, especially SMEs.

Scope

The scope of guidelines and recommendations provided in this handbook **applies to businesses in the banking industry.** The main audience of this handbook are the commercial banks registered in Thailand (referred to as "banks" in this handbook), that are subject to the regulatory supervision of the Bank of Thailand (BOT), and therefore following regulatory policy set by the BOT's Standard Practice. Thus, the scope of guidelines and recommendations provided in this handbook focuses mainly on banking operations.

It should be highlighted here that the guidelines and recommendations provided in this handbook follow the **risk proportionality principle in line with the BOT's Standard Practice**. Therefore, it is expected that banks may consider applying this handbook "in accordance with their **organizational structure, size, business complexity and materiality of environmental** (and climate) **risks on their businesses**" (BOT, 2023).

Additionally, banks that function as branches or subsidiaries of a foreign commercial bank, may align their practices with the environmental risk management framework of the parent organization, provided these frameworks adhere to the minimum expectations outlined in the BOT's Standard Practice. However, locally registered banks will be required to have evidence or record of implementation in line with the Standard Practice and local requirements. This includes proof of processes and other detailed policies in place to manage E&C risks.

Key definitions: Risk proportionality Principle

Risk proportionality Principle is defined as to apply in accordance with organizational structure, size, business complexity, risk profile and materiality of environmental risks on their businesses (BOT, 2023b; BCBS, 2022).

Implementation of this handbook

This handbook should be used in conjunction with regulations established by Thai regulatory bodies. If the content of this handbook is used for other financial institutions, the entity should **take into consideration the guidelines, policies, and regulatory requirements set by the supervisory bodies of its industry** (e.g., insurance, asset management).

This handbook is considered a **living document**. The information and methodologies mentioned in this handbook may need to be updated in line with the development and **maturity of E&C risk integration practices in banking operations**. Over time, it is expected that **banks would develop the capability in assessing and managing E&C risks** and utilize **forward-looking methodologies** for quantitative analysis of E&C risks impacts on banks which should also lead to the banks' strategy formation.

2.2) INTRODUCTION TO E&C RISKS

2.2.1) ENVIRONMENTAL RISKS

For banks to establish a comprehensive and effective E&C risk management framework, it is imperative to clearly define the scope to which environmental and climate-related risks entail and understand how they translate into economic and financial risks. This chapter aims to provide clear definitions and explanations of key terms as set out in the Bank of Thailand's Standard Practice, with additional inputs from relevant international standards and frameworks to ensure a comprehensive understanding.

Essentially, environmental risks refer to the risks that financial institutions can face as a consequence of environmental degradation, which may include air pollution, water pollution and scarcity of fresh water, land contamination and desertification, biodiversity loss, and deforestation (NGFS, 2020). For instance, biodiversity loss can negatively affect supply chains or the logistics of a business within a region, which could subsequently lead to financial risks for financial institutions that have exposures to the businesses. Water stress causes economic loss in various industries such as agriculture, food and beverage, and water intensive manufacturing businesses, which may impact their ability to repay loans in the longer run. There is a broad scientific agreement that environmental degradation has escalated to a point where it jeopardizes the stability of ecosystems that are fundamental to the global economy. For instance, environmental degradations impact public health which may contribute to negative growth (NGFS, 2020).

According to the Standard Practice, environmental risks are defined as per the 'Key definitions' box below. It should be noted here that the **definition of environmental risks prescribed in the Standard Practice is not exhaustive,** and banks should consider assessing materiality of all environmental issues related to its operations both at transaction and portfolio levels.

> **Key definitions: Environmental risks**
>
> **Environmental risk** is defined as the probability of loss to business from the issues of environmental and climate change, which includes business conduct of clients or counterparties that create negative externalities such as greenhouse gas emissions, deforestation and destroying biodiversity, polluting (air, land, and ocean), creating toxic material and waste. All of which could have both direct and indirect impacts upon the financial institution's and its stakeholder's financial status and reputation. This can be divided into "physical risk" and "transition risk" (BOT, 2023b).

2.2.2) LINKAGES BETWEEN ENVIRONMENTAL RISKS AND CLIMATE-RELATED RISKS

In addition to the definitions as set out by the Bank of Thailand, the NGFS also recognizes environmental risks to be an umbrella term covering both environmental-related risks and climate-related risks, and that climate-related risks are a subset of the broader category of environmental risks, in which the terms are used interchangeably depending on the context within NGFS' documents and literatures (NGFS, 2020b). For ease of reference, it is important to note here that this handbook will therefore refer to E&C risks as one collective category of risk.

The characteristics of E&C risks can be broadly distinguished below (NGFS, 2020):

1. **Environmental risks** encompassing a broad range of risks associated with anthropogenic activities resulting in environmental degradation and the loss of ecosystem services.
2. **Climate-related risks** specifically referring to physical or transition risks caused by or related to climate change.

Physical		Transition	
Climate-related Risks	Environmental Risks	Climate-related Risks	Environmental Risks
• Extreme weather events • Chronic weather patterns	• Water stress • Resource scarcity • Biodiversity loss • Pollution • Other	• Policy and regulation • Technology • Market sentiment	• Policy and regulation • Technology • Market sentiment

Figure 1: Examples of E&C risk drivers (ECB, 2020).

Whilst there are some overlapping characteristics between environmental risks and climate-related risks, a key distinction between the two is that **not all environmental degradation is a result of climate change** (NGFS, 2020). Additionally, the effects of environmental risks and climate-related risks can be interrelated in that the **combined effects may reinforce each other to potentially create even greater impacts and unpredictability** (ECB, 2020 & NGFS, 2020). For example, the negative impacts of climate change could contribute to environmental degradation and subsequently weaken a region's resiliency to such risks (NGFS, 2020).

Exposure to E&C risks can thus pose new or intensify existing financial risks for banks. E&C risks contain distinctive elements that require a special strategic and management approach different from traditional financial risks, as follows (ECB, 2020):

- **Far-reaching impacts by nature:** Environmental risks are inherently multifaceted and potentially correlated, making them unpredictable and subject to non-linear dynamics. As a result, these risks can have diverse and widespread impacts across various sectors of the economy. The magnitude of these impacts can be much larger than those of other structural changes, posing substantial difficulties in determining and measuring the risks.

- **Varying time horizons and uncertain outcomes**: As transition risks tend to be short-term while physical risks are usually chronic and longer-term, the associated financial risks may take varying time horizons to materialize, their full impact may not be felt until beyond current business planning periods and can be unevenly distributed between and within countries due to socioeconomic factors.

- **Irreversibility**: Although the time horizon and extent of the impacts may be uncertain, there is an overwhelming consensus among literature that beyond a certain threshold of greenhouse gas concentration in the atmosphere, climate change will result in permanent damage to the planet.

- **Dependency on short-term actions:** The future impacts and magnitude of climate change are contingent on the coordinated efforts of various stakeholders, including governments, central banks, businesses, households, and other entities. Their collective actions and responsibilities to mitigate environmental risks are crucial in shaping the future outcomes and severity of climate change impacts.

2.3) CLIMATE-RELATED RISKS: PHYSICAL AND TRANSITION RISKS

According to the existing literature, climate-related risk drivers can be broadly categorized into two groups: physical risks, which are associated with shifts in weather patterns and climate conditions that can directly impact various sectors of the economy, and transition risks, which emerge from the ongoing transition towards a low-carbon economy and include factors such as policy changes, technological advancements, and shifts in market preferences. (BCBS, 2021b).

2.3.1) PHYSICAL RISKS

Key definitions: Physical risks

"**Physical risks**" is defined as the probability of losses to assets and business operations due to acute natural disasters and chronic environmental changes that can occur slowly over time. (BOT, 2023b).

Physical risks can be further categorized into **acute risks** and **chronic risks.**

Acute physical risks arise from natural disasters and extreme weather events and generally consist of heat waves, drought, wildfires and avalanches, floods, hail, and storms, such as tropical cyclones, tornadoes, typhoons as well as extreme precipitation.

Chronic physical risks arise from long-term, progressive shifts in climate patterns. These risks generally include rising average temperatures, rising sea levels, changes in sea currents, rainfall, and winds, increasing variability in extreme weather, and ocean acidification. Extended periods of increased average temperatures can also lead to more extreme chronic climate events, such as desertification, ecosystem disruption, and global biodiversity loss.

Both acute and chronic risks share a close interrelation and can be difficult to distinguish at times. The following examples reflect the differences of events identified in each category – acute and chronic (GFIT, 2021):

- Rising sea levels (chronic) aggravate flooding from storm surges (acute), and more intense heat waves (acute) are intertwined with increasing average temperature levels and global warming (chronic).
- Increasing evaporation rates from warming ocean surfaces (chronic) strongly contribute to higher probabilities for extreme precipitation and flooding associated with tropical cyclones (acute), or with severe convective storms (acute) which are fueled by high levels of atmospheric moisture.

Given the growing occurrence, severity, and unpredictability of extreme weather events, physical risks can materialize and translate into substantial economic impacts and financial losses. Such as the devaluation of properties, re-evaluation of bank-held financial assets or collateral, and the risks of stranded assets.

Physical risks may also pose **knock-on effects**, which are secondary or cumulative impacts cascaded beyond its initial scope of direct impacts, such as the disruption of supply chains or the loss of electricity supply due to the physical impacts on infrastructure networks, or increased migration and displacement of communities due to extreme climate-related events.

While climate change is a global phenomenon, the impacts of physical risks on economies may vary greatly depending on geographic location. These factors include distinctive climate conditions and levels of socio-economic development, which can shape the nature and severity of physical risks faced by different regions. (BCBS, 2021). Exposures and vulnerabilities of each location to specific types of weather events are key factors influencing the severity of physical risk impacts in different regions.

2.3.2) TRANSITION RISKS

Key definitions: Transition risks

"Transition risks" is defined as the probability of losses to assets value, competitiveness, and relevant business operations from changes in various factors including consumers' and investors' preferences, official regulations and policies, and technology developments to address environmental issues and transition towards a low carbon economy (BOT, 2023b).

According to the TCFD, the key categories of transition risks include **policy and legal risks, technology risks, market risks, and reputational risks (TCFD, 2020).** There are several factors that may influence the emergence of these transition risk categories, including:

- **Policy and Legal Risks – Changes in government regulations and transition policies:** Various jurisdictions are introducing several policy initiatives to limit greenhouse gas emissions in line with the Paris Agreement. For example, carbon-pricing mechanisms are being introduced, incentives or subsidies are being implemented for electric vehicles, while those for fossil-based transportation are being removed, and energy efficiency standards are being heightened for commercial properties and manufacturing facilities. However, uncoordinated policy shifts and a lack of clarity in the move towards a low-carbon economy can intensify transition risk.
- **Technology Risks – The availability and affordability of technologies aimed at addressing environmental issues**: The emergence of low-carbon transportation technologies, such as electric vehicles, non-fossil fuels, and battery enhancements, is the key enabler in achieving climate goals outlined in policy initiatives. Automotive manufacturers need to anticipate the changing technologies and financing mechanisms that will substitute the existing practices to avoid the impacts of transition risks.
- **Market Risks and Reputational Risks – The shift in consumers' preference and investor sentiment towards a greener society**: Companies that develop low-carbon products and services stand to gain a competitive edge as consumer behavior shifts towards environmentally conscious consumption. However, those that fail to adapt may experience a decline in profitability and creditworthiness, as more investors consider E&C risk considerations in their investment strategies and decision-making.

2.4) TRANSMISSION CHANNELS AND IMPACTS ON FINANCIAL RISKS

2.4.1) HOW E&C RISKS CAN IMPACT FINANCIAL RISKS

Financial risks arising from environmental and climate change can include both direct and indirect impacts to various sectors of the economy. Through transmission channels, these impacts can potentially lead to systematic risks without proper and timely management.

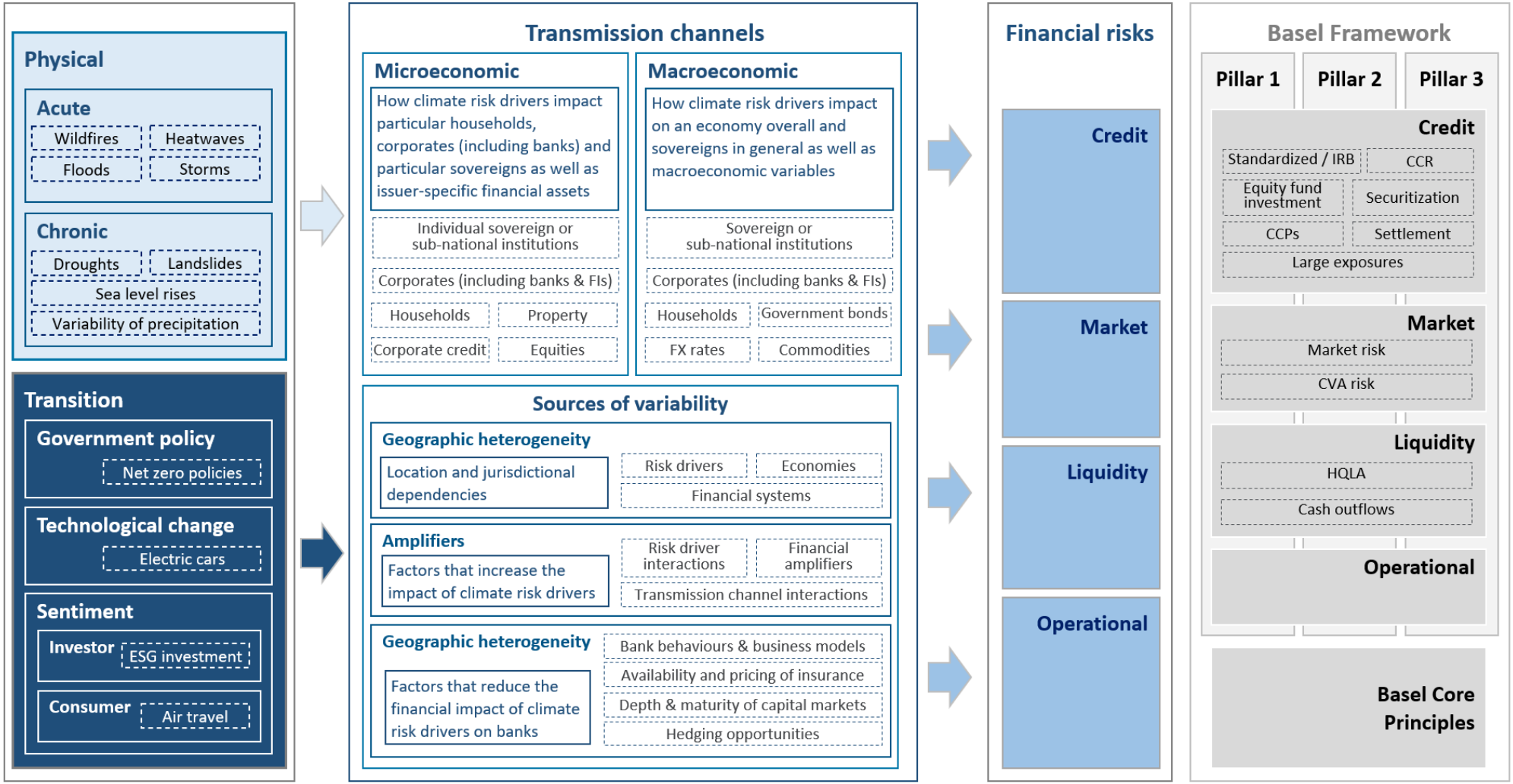


Figure 2: Financial risks from climate risk drivers (recreated from BCBS, 2021b).

Key definitions: Transmission channels

Transmission channels are the causal chains linking these climate risk drivers to the financial risks faced by banks and the banking sector. They can also be viewed as the way through which climate change might materialize as a source of financial risk (BCBS, 2021).

1. Physical risks

Physical risks can impact the financial sector through predominantly two channels: extreme weather events and gradual shifts in climate patterns. The example below illustrates how physical risk drivers manifest as risks to the financial system.

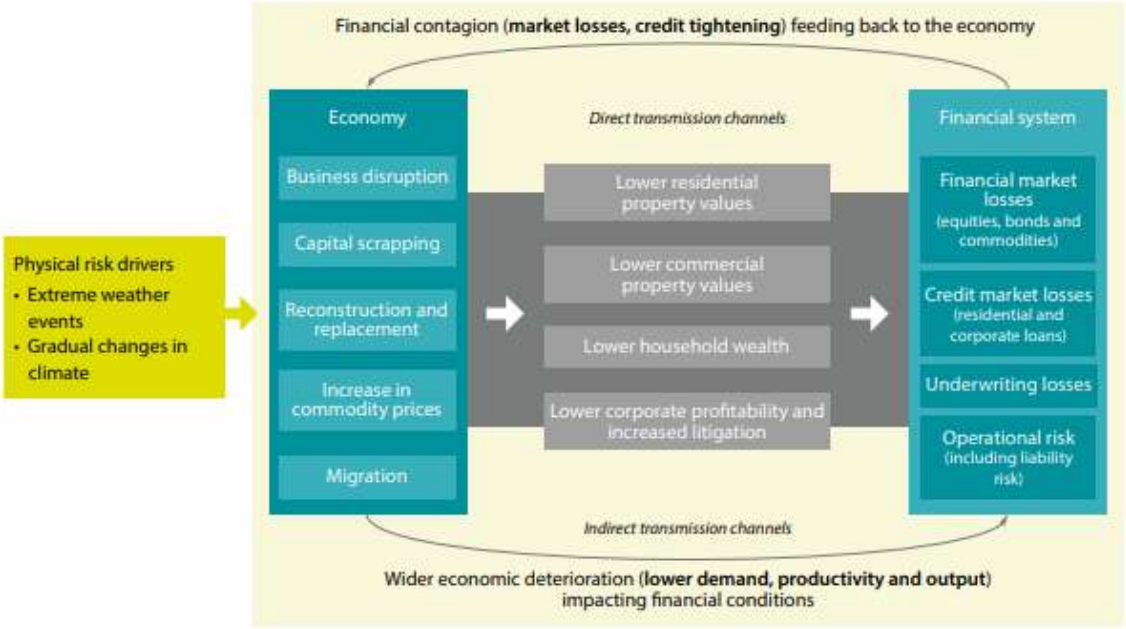


Figure 3: Physical risks to financial stability risks (NGFS. 2020).

Physical risk drivers primarily impact banks in an indirect manner through their counterparties, which include households, corporates, and sovereigns. When physical hazards cause damage or destruction to the physical assets of counterparties, such as housing, inventory, equipment, or infrastructure, it leads to a reduction in asset value and a decline in the counterparty's wealth. These damages can arise from acute physical risks like tropical storms or chronic physical risks like rising sea levels (BCBS, 2021).

2. Transition risks

Transition risks can impact the financial sector through E&C mitigation policies, technological advances, and shifts in public sentiment, demand patterns, and preferences and expectations (NGFS, 2020). The example below illustrates how transition risk drivers manifest as risks to the financial system.

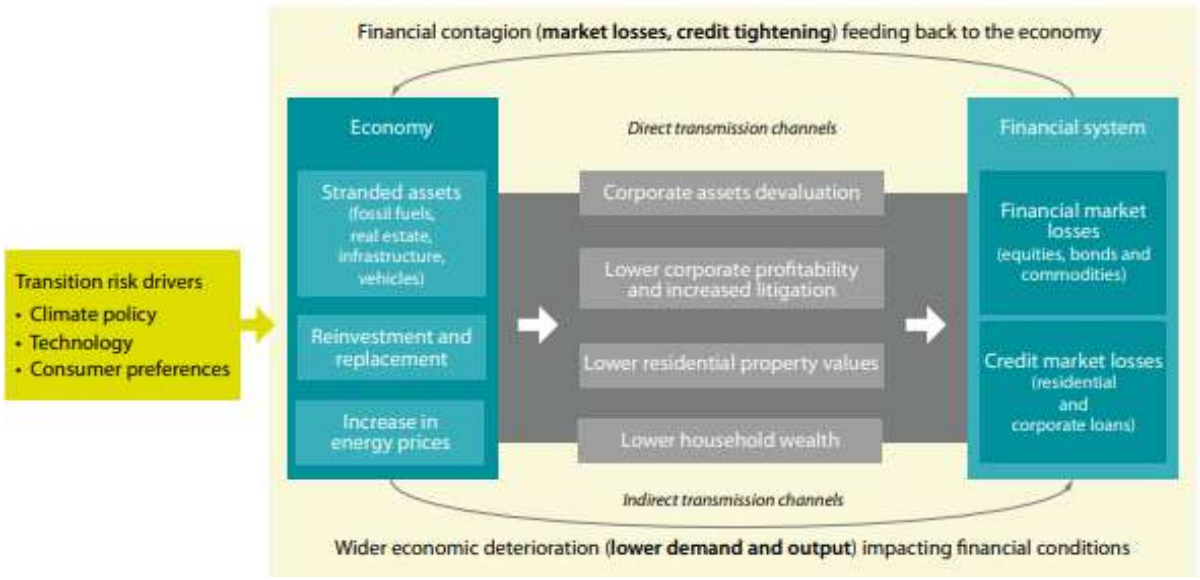


Figure 4: Transition risks to financial stability risks (NGFS. 2020).

A key example of a direct transmission channel of transition risk driver associates with asset devaluation from the low-carbon transition. The risk of **"stranded assets"**, which are assets that suffer losses in their economic value, through unanticipated or premature write-downs, devaluations, or conversion to liabilities, as a result of changes associated with the shift to a low-carbon economy. The risk of stranded assets can pose a serious threat to the stability of financial systems due to the large-scale lending and financial exposure to businesses with vulnerable assets. For instance, if the risk of stranded assets is not fully reflected in the current market value of companies that rely on fossil fuels or engage in carbon-intensive operations, their assets may suffer sudden and unexpected write-downs before the end of their anticipated life. This can result in significant losses in both capital and income for owners, while also increasing credit and market risks for lenders and investors (GFIT, 2021).

2.4.2) MICROECONOMIC AND MACROECONOMIC TRANSMISSION CHANNELS

To better analyze banks' financial risks in key areas, this handbook identifies transmission channels of E&C risks and splits the channels into two groupings: microeconomic and macroeconomic. The BCBS defines transmission channels as the "causal chains that explain how climate risk drivers give rise to financial risks that impact banks directly or indirectly through their counterparties, the assets they hold and the economy in which they operate" (BCBS, 2021b). The two channels are classified as follows:

Key definitions: Economic transmission channels

- **Microeconomic** impact on households, business, and assets
  - Loss of income
  - Damaged and stranded assets
- **Macroeconomic** impacts on the overall economy
  - Higher production cost
  - Lower national productivity
  - Loss of competitiveness.

(BOT, 2023b).

Key definitions: Microeconomic transmission channels

Microeconomic channels include the causal chains by which climate risk drivers affect banks' individual counterparties, potentially resulting in climate-related financial risk to banks and to their financial system. This includes the direct effects on banks themselves, arising from impacts on their operations and their ability to fund themselves. Microeconomic channels also capture the indirect effects on name-specific financial assets held by banks (BCBS, 2021b).

Key definitions: Macroeconomic transmission channels

Macroeconomic channels are the mechanisms by which climate risk drivers affect macroeconomic factors and how these, in turn, may have an impact on banks through an effect on the economy in which banks operate. Macroeconomic channels also capture the effects on macroeconomic market variables such as risk-free interest rates, inflation, commodities, and foreign exchange rates. (BCBS, 2021b).

In brief**, microeconomic transmission** channels describe how "climate risk drivers can impact banks both directly and indirectly through exposures to counterparties and financial assets." Meanwhile, **macroeconomic transmission** channels reflect the climate risk drivers' indirect effects on banks, through changes at the macroeconomic level. **Macroeconomic** impacts are expected to largely affect banks' credit risks and market risks. Significant impacts can also occur from liquidity and operational risks, although there is limited research on this (BCBS, 2021b).

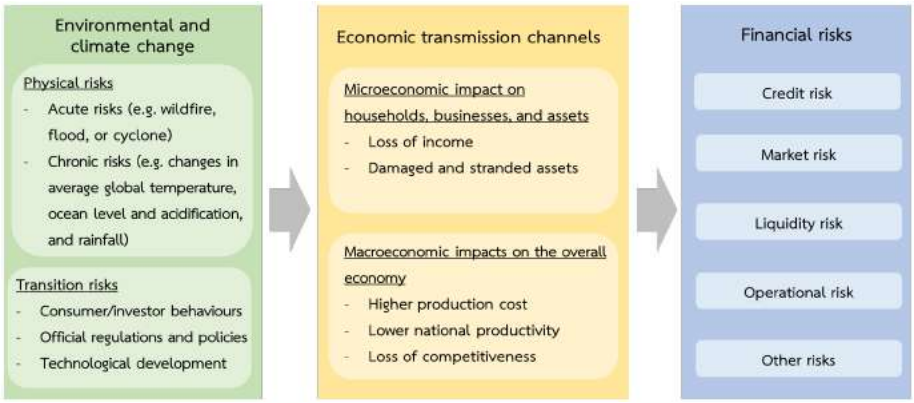


Figure 5: Environmental risk transmission mechanism (BOT, 2023).

2.4.3) ENVIRONMENTAL AND CLIMATE-RELATED RISKS AS RISK DRIVERS

The E&C risks (both physical and transition) are drivers of existing financial and non-financial risks, including **credit risk, market risk, liquidity risk, operational risk (including liability risk), and other risks (e.g., reputational risk).** In addition, the physical and transition risks are also drivers of other and sub-categories of existing risks, such as strategic risk, and credit spread risk (ECB, 2020)

The next section will explain how E&C risks drive existing risks, and key consideration for effective management of each risk category.

1. **Credit risk:**

E&C risks have direct impacts on the **ability of parties to repay and maintain financial obligations to banks**. Impacts of E&C risk drivers on credit risk profiles (including counterparty credit risk) includes potential reduction of collateral value and ability to repay debts, particularly in event of default.

> **Key definitions: Credit risk**
>
> **Credit risk**: Loan default can occur from clients that exposed to severe impact from environmental changes as they might not be able to generate adequate income to repay financial institutions.
>
> Guideline: Financial institutions should understand and assess the impact of environmental risks on their credit risk exposure by establishing policies and tools in identifying, assessing, monitoring, controlling, and reporting the impact of environmental risks throughout the credit cycle (BOT, 2023b).

Examples of the impacts of E&C risk drivers on credit risk include, through physical risk – the company operating nearby a forest may be damaged by a wildfire, hence increasing the probability of default and, through the transitional risk – the development of new energy efficiency requirement may impair the value of collateral.

To assess and control the impact on credit risk because of these risk drivers, banks should therefore focus on:

(1) **Default risk** of borrowers in portfolio (e.g., through exposure to severe climate events, or events where a borrower's increased capital expenditures from transitioning activities lead to financial difficulties, impacting their ability to meet loan obligations to the bank, and putting the bank' balance sheet and cash flow under stress). On the contrary, the financing green transition also pose financial impact, for example, firms' cash flows and profitability may decrease due to higher capex, research and development cost, and rising operational cost.

(2) **Concentration risk** of the banks' reliance on specific industries that are exposed to E&C risks (e.g., concentration in oil & gas business which may get impacted by changes of policy such as fossil fuel phaseout)

(3) **Other risks** such as downgrade risk (e.g., downgraded credit rating of debt security due to issuer's poor financial performance after adoption of stringent E&C policies, or changes in rating agency's criteria to integrate E&C risks consideration)

Due to these impacts on banks' credit risks, general guidance is to integrate E&C risks in credit-granting procedures, and to manage and monitor the risks at portfolio level (ECB, 2020).

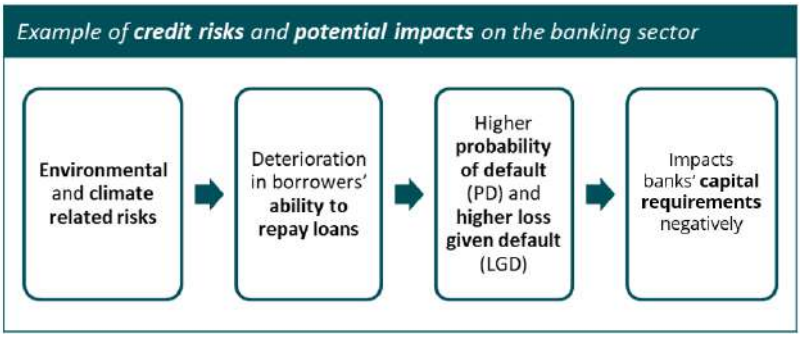


Figure 6: Example of credit risks and potential impacts on banks

2. **Market risk:**

Market risk covers **financial losses due to changes in market prices and financial markets**. E&C risks lead to potential shifts in supply and demand for financial instruments (e.g. securities, derivatives), products and

services, with a consequent impact on their values (ECB. 2020), as abrupt weather changes and the development of green policies may affect the pricing of financial instruments. Banks' market risk increases because of falling market prices or heightened market price volatility in related sectors that are affected by physical or transition risks (NGFS, 2020).

Key definitions: Market risk

Market risk: Physical or transition risks may cause volatility to prices of financial instruments with exposed underlying assets and may lead to financial losses for financial institutions.

Guideline: Financial institutions should understand and assess the impact of environmental risks on the financial instruments in their portfolios by evaluating potential losses and volatilities as well as having in place a process to control the risks and adjust their investment strategies and portfolio allocation in line with the risks (BOT, 2023b).

Examples of market risks include price changes in severe climate events such as floods which impact collateral valuation, movements in corporate debt and value of securities due to changes in market conditions, particularly drops in prices of security issued by high-emitting companies (NGFS, 2020). In addition, carbon tax policies may increase the cost of the carbon-intensive industries, shift investment patterns which influence pricing, and subsequently increase volatility in in financial markets. These events highly influence investors' perception of profitability, followed by a revaluation of their investments. This may cause a market sell-off, followed by banks' decreased portfolio values, and eventually affect their financial stability.

These potential impacts of physical and transition risks on market risks call for banks to monitor impacts on value of financial instruments in portfolios and evaluate the risk of loss due to changes and volatility, using E&C risk integrated stress test and sudden shock scenario to understand banks' trading book (BCBS, 2022).

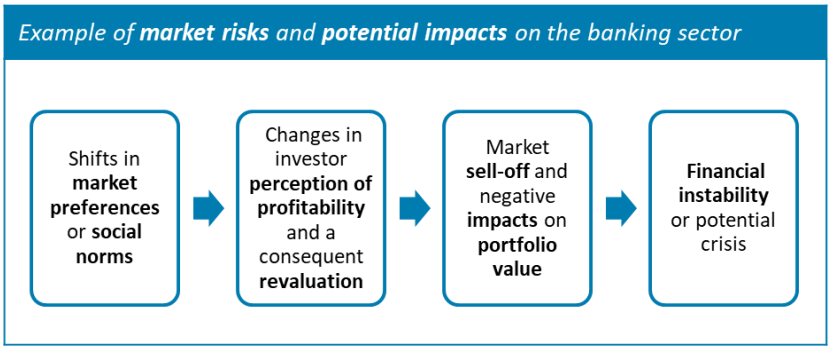


Figure 7: Example of market risks and potential impacts on banks

3. Liquidity risk

Climate risk drivers impact banks' liquidity risks both directly and indirectly. The key macroeconomic transmission channel that increases liquidity risk include the changes in asset valuation, counterparty behavior, and funding conditions (BCBS, 2021b). Physical risk is highly relevant to impacts on the liquidity risks of banks, particularly after the shocks of severe weather events or natural disasters (BCBS, 2021).

Key definitions: Liquidity risk

Liquidity risk: Natural disasters that create widespread loss could lead to sudden liquidity needs from clients or counterparties.

Guideline: Financial institutions should understand and assess the impact of environmental risks on their net cash outflows. For example, the need for credit and deposit withdrawals may increase from clients who are impacted by environmental issues (BOT, 2023b).

Liquidity risk arises as a second order impact from credit and market risk (e.g., negative mark to market gives rise to margins, lack of profitability gives rise to short-term funding). Banks' reduced access to funding as a result of changes in market conditions also affect the banks' liquidity when counterparties draw down deposits and credit lines (BCBS, 2021b), for example, in responses to the severe weather events. Examples of impacts on liquidity risks are clear during natural disaster events. To repair widespread impacts and damages on property, the demands for funds and emergency loans soar and intensify the challenges faced by the financial sector to absorb such shock by providing financial liquidity to households and the economy.

To effectively manage liquidity risk, banks need to monitor net cash outflows, (BCBS, 2022) and monitor their liquidity position that may be affected by E&C risk events, particularly in case where the value of liquidity buffers may be impaired. These projections should use forward-looking methodologies, in stress conditions and in scenario where physical risks meets with other risk areas identified as the banks' vulnerabilities (ECB, 2020).

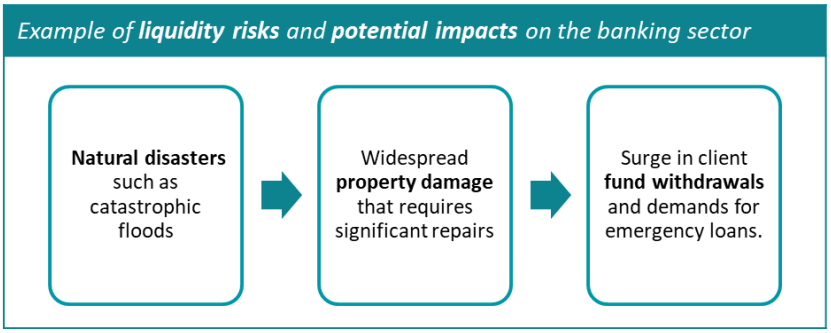


Figure 8: Example of liquidity risks and potential impacts on banks

4. Operational risk

Operational risk in the banking industry is driven by potential reputational damage, liability risk, compliance risk, and business continuity disruption. In these contexts, extreme weather events, and increasing liability and regulatory compliance costs associated with climate-sensitive investments and business activities heighten banking operational risks (HKMA, 2021).

Key definitions: Operational risk

Operational risk: Natural disasters such as floods may cause damages to financial institutions' assets and resources such as buildings, equipment, and personnel which may impact their business operations.

Guideline: Financial institutions should understand and assess the impact of environmental risks on their ability to carry out normal business operations, particularly for critical business functions and integrate them as one of the factors when considering the business continuity plans (BOT, 2023b).

Examples of operational risks posed by E&C risk drivers include impacts on banks' business continuity in extreme weather events, due to damages that affect functions of critical units and banks' main service providers. Another example of liability risk and litigation risk is that a bank and its customer may be charged by affected parties who suffered losses from E&C impacts to claim remediation from parties they believe responsible in such cases (NGFS, 2020). For transition risk drivers, banks are more exposed to reputational risk and compliance risks if they are funding projects that cause controversial environmental damages.

To effectively manage the operational risks impacted by E&C risk drivers, banks should monitor factors, events and scenarios that may affect business continuity, both from physical and transitional risk perspectives. Banks should develop the capability to recover from the physical and policy disruptions with consideration that E&C risks will be included in the internal process for operational risk management.

5. Other risks

Apart from the key existing financial risks, banks should consider other risks impacted by E&C risks within the scope of their operations, related business functions, and portfolio management. In this context, BCBS identified other risks as, among others, strategic, reputational, and regulatory compliance risks, while taking into consideration liability cost related to investments in climate-sensitive activities and counterparties (BCBS, 2022). Meanwhile, ECB also identifies business model risk as another risk to be considered, as "transition risk drivers may affect the viability of some business lines and lead to strategic risk for specific business models if the necessary adaptation or diversification is not implemented" (ECB, 2020). This reflects the variety of types and scope of risks impacted by E&C risk drivers. For the BOT, the Standard Practice includes strategic risk and reputational risks as examples of other risks.

Key definitions: Other risks

The Standard Practice mentioned two examples of other risks to be considered affected by E&C risk drivers: strategic risk and reputational risk. These risks are not exhaustive, and banks can identify other types of risks.

Strategic risk: Changes in government policies and regulations that reduce or forbid certain businesses may impact financial institutions' business plans, leading to losses in revenue and business opportunities.

Reputational risk: Financing or providing financial services to businesses that cause damages to the environment will impact financial institutions' reputation.

Guideline: Financial institutions should evaluate other risks that may occur from impacts of environmental risks and integrate them as part of the processes to set organizational strategies and risk management (BOT, 2023b).

For example, banks need to manage the strategic risks driven by the transition risk as new climate regulations and incentives affects the bank's competitiveness and loss of their business position in the market amidst the new policy environment (HKMA, 2021). For reputational risk, banks may approve loans for project which subsequently causes negative impacts in the community and impact the image and business relationships, as the perception of banks' changes in association with the environmental damages caused by the borrowers.

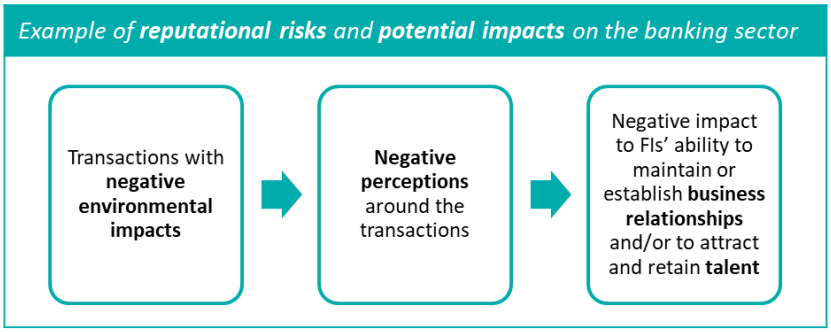


Figure 9: Example of reputational risks and potential impacts on banks

CHAPTER 3: GOVERNANCE

Strong governance of E&C risks is an imperative to managing and mitigating a bank's exposure to the impacts of key environmental and climate-related risk (E&C risks) drivers. The governance, through key senior groups of stakeholders, including the Board of Directors and senior executives, is significant for the development and implementation of a robust procedures to identify, assess and manage the potential impacts of E&C risk drivers on their operations and ecosystems in which they operate.

The management bodies' roles in incorporating relevant material E&C risks in its risk management framework, risk appetite and business strategy are vital, as E&C risks could impact the bank's operations and their portfolios at different severity and over various time horizons (BCBS, 2022).

3.1) GUIDANCE ON BOARD OVERSIGHT AND ACCOUNTABILITY

The Board of Directors have a key role in setting the "tone from the top", as well as overseeing and providing the strategic direction and key policies for E&C actions (BOT, 2023). The Board should clearly delegate E&C responsibilities to its members and/or committees and exercise effective oversight of E&C financial risks, as well as identify responsibilities throughout the organization structure (BCBS, 2022).

3.1a) Standard Practice

The Bank of Thailand has recommended a set of responsibilities for the Board of Directors as follows:

BOT's Standard Practice: Board of Directors' responsibilities in promoting environmental actions *(item 3.2.1 (1.1,1.2 & 1.3))*

The Board of Directors has three important responsibilities in promoting environmental actions within the organization:
(1) The Board of Directors should **set strategic directions, risk appetite, key policies, and overall framework** to address both short-term and long-term environmental changes. The Board of Directors should regularly review and adjust strategies based on management reports to effectively respond to emerging opportunities and risks.

(2) The Board of Directors should **establish a clear governance structure, roles, and responsibilities for managing environmental issues**. This includes integrating environmental considerations into various business operations, such as strategy development, risk management, credit underwriting, investment analysis, disclosure, and internal audit.

(3) The Board of Directors must **place importance on adequate resource allocation** to support environmental actions to achieve the target (BOT, 2023b).

3.1b) Key Actions

Key Actions 3.1: Board oversight and accountability

Key Item	Short-term Actions	Long-term Actions
3.1.1 Setting strategic directions / key decision-making process (a. Strategy)	1. The BoD **sets strategic direction for E&C risk management**. The formation of strategic directions includes the **different timespan, and the risks banks are exposed to in short & long term.**	1. The BoD **sets strategic directions, oversee the inclusion of E&C risks in risk appetite and setting up of transition plan, and approve E&C-related target. The transition plan and E&C-related target must be considered for different timespans, and the risks banks are exposed to in short, medium, and long term.**
3.1.2 Setting strategic directions / key decision-making process (b. Policy and framework)	1. The BoD should review and approve overall policy and framework guiding the E&C risk management. The policy and framework should **align with the bank's material E&C risks**. Senior management should develop, review, and implement the policies in line with the guidance given by the Board.	1. The BoD should ensure all policies and risk frameworks guiding the E&C risk management are **align with the bank's E&C-related targets, and transition plan, and oversee the implementation of the policies and transition plan against the targets**. Senior management should implement and monitor of performances in line with the bank's strategy and transition plan, against the E&C-related targets.
3.1.3 Governance structure, roles and responsibility	1. The BoD has the role to oversee establishment of a **clear governance structure (including roles and responsibilities) relating to E&C risk** in the organization and **approve material decisions** related to E&C concerns. 2. E&C risk framework/s, whether integrative to existing risk framework/s or considered separately, should appoint **clear mandate of BoD related to E&C risk management.** 3. E&C risk and opportunity management is **included as a key mandate in one of the BoD sub-committees.**	N/A
3.1.4 **Resource allocation**	1. **Resource allocation and capability are clearly defined** to support bank's E&C risk actions.	1. Resource allocation and capability are clearly defined to support bank's E&C risk actions **in achieving key climate-related targets.**
3.1.5 **Expertise / Capability building**	1. BoD has **enhanced expertise and capability to oversee the E&C actions in line with their responsibility, and proportional to the bank's E&C Risk exposures.**	1. BoD has **enhanced expertise and capability, reflected in E&C risk integrated in strategy formation** and **key strategic business decisions.**

The necessity for E&C oversight at the Board level: Proper governance plays a crucial role in ensuring that E&C risks are thoroughly understood, managed, and accounted for in banks, particularly at the Board level. Depending on the legal and corporate governance structure of a bank, the Board, which may be at the group level, holds the ultimate responsibility for a bank's long-term health and resilience. Therefore, as with established financial and non-financial risks, the Board must fully comprehend and oversee the bank's approach to E&C risk management to establish effective governance.

Top-Down governance approach: To foster effective governance in banks, it is essential to establish a top-down approach through senior governance committees and individuals. This approach aims to comprehensively understand risks and their integration into the enterprise risk management system. Consequently, personnel in relevant business functions must clearly comprehend their respective banks' approaches, tools, and approval authorities. This ensures that environmental risks are consistently identified, assessed, and managed at all appropriate levels within the banks and their value chain. Addressing critical aspects within this context becomes an imperative.

Establishment of oversight through board committees: The Task Force on Climate-related Financial Disclosures (TCFD) highlights the crucial role of governance in effectively addressing and leveraging climate-related risks and opportunities. To achieve this, it is recommended that the Board or a dedicated committee set strategic direction, risk appetite, key policies, and overall framework/s considering opportunities and risks which could occur from environmental changes both in the short and long term. Banks should also consider updating the terms of reference for board committees to explicitly include E&C risk management, to further ensures its due priority within the bank's governance framework.

3.1c) Recommended Approach

Key definitions: Board of Directors

"**Board of Directors**" is defined as Board of Directors of the financial institution. This also refers to the management committee with similar responsibility and authority in case of foreign commercial bank branch. (BOT, 2023b).

Industry Practice 1: Integration of E&C considerations in policy framework

De Nederlandsche Bank (DNB, the central bank of the Netherlands) has assessed existing practices in the Dutch banking sector related to E&C risks management, and provides a good practice example of a bank's integrating E&C considerations in policy framework as follows:

A bank integrates a general climate policy within its governance arrangements, ensuring accountability for climate-related risks across all layers of the risk organization (CRO, risk committees and risk function). This includes **formal escalation procedures to report material risks to the management board**. The general climate policy is cascaded down to business line and portfolio level by setting sector-specific requirements for the management of climate-related risks (DNB, 2020).

Industry Practice 2: Environmental and Social Policy Framework

Deutsch Bank's Environmental and Social (ES) Policy Framework applies globally to the bank's operations across Corporate Bank, Investment bank, and Private Bank activities. The framework defines rules and responsibilities for risk identification, assessment, and decision-making, and specifies the requirements for environmental and social due diligence. The bank applies a risk-based approach and focuses on sectors with elevated potential for negative environmental and social impacts.

Figure 10: E&S Policy Framework process and responsibilities (Deutsche Bank, 2023b).

Deutsche Bank also develops the bank's main positions and minimum standards of E&S due diligence, both for cross-sectoral issues as well as sector-specific issues, which are summarized in the table below (Deutsche Bank, 2023b).

Area	Enhanced due diligence/norm compliance	Environmental and/or social principles applied
Cross-sectoral		
Human rights	Yes	No engagement in business activities where the bank has substantiated evidence of material adverse human rights impacts without appropriate mitigation, e.g. child and forced labor
Deforestation	Yes	No direct involvement in deforestation of primary tropical forests
World Heritage Sites	Yes	No activity within or in close proximity to World Heritage Sites, unless the respective government and UNESCO agree that such activity will not adversely affect the site's outstanding universal value
Sectoral		
Industrial agriculture and forestry	Yes	Soft commodities (e.g. soy, beef, timber): Expectations regarding membership in certification as well as environmental and social management schemes for growers and primary processers, including public commitment to the No Deforestation, No Peat and No Exploitation standard New development of related lands is only permissible if a High Conservation Value assessment determines that the land is not of High Conservation Value
Palm oil	Yes	Minimum requirement of a time-bound implementation plan for the Roundtable on Sustainable Palm Oil certification by 2025 at the latest
Metals and mining	Yes	Enhanced ES due diligence requirements; potential exclusions based on outcome
Oil and gas	Yes	Oil sands: No financing of new projects involving exploration, production, and transport/processing in the Arctic region (as demarcated by the 10°C July isotherm boundary); no financing of new oil and gas projects Oil and gas extracted by means of hydraulic fracturing: No financing of projects in countries with extremely high water stress
Thermal coal power and mining	Yes	No financing of new coal power plants and new thermal coal mining projects or the associated infrastructure Scope of the policy effective as of May 2023 includes companies with a) a thermal coal revenue dependency of 30% or above, b) an absolute thermal coal production of 10 megatons p.a. or above, or c) a thermal coal power capacity of 10 gigawatts or above For corporations within the scope of the policy: No financing if no credible diversification plans, including the phasing-out of thermal coal by 2030 in OECD-countries and 2040 in non-OECD countries Exclusions for financing Mountain Top Removal mining
Hydropower	Yes	Enhanced ES due diligence requirements; potential exclusions based on outcome
Nuclear energy	Yes	Enhanced ES due diligence requirements; potential exclusions based on outcome and exclusion for certain jurisdictions
Tobacco	Yes	Enhanced due diligence requirements with a focus on electric cigarettes and cannabis; potential exclusions based on outcome
Defense/controversial weapons	Yes	Enhanced due diligence requirements with exclusions including controversial weapons, conflict countries, private military security companies, as well as civilian-use automatic and semi-automatic firearms and human-out-of-the-loop weapon systems
Adult entertainment	Yes	Enhanced due diligence requirements; exclusion of any business directly associated with adult entertainment (commercial enterprises related to the sale or purchase of sex-related services, ranging from individual workers in prostitution to the pornographic entertainment industry), the associated branded products or services, or prostitution
Gaming	Yes	Enhanced due diligence required; exclusion of online gambling business-to-consumer operators with exposure to markets where gambling is prohibited

Figure 11: Main positions *and minimum standards of E&S due diligence (Deutsche Bank, 2023b).*

Industry Practice 3: Environmental and Social Risk Policy Framework

ING has an Environmental and Social Risk (ESR) framework in place that applies to all its businesses and products. Depending on client and product scope, ING applies (ING, 2021):

a) **Basic ESR screening:**
   1. ESR list of restricted activities
   2. ESR lists of fully restricted companies
   3. ESR Self-declaration for Business Banking (SMEs/Midcorps) clients only
   4. ESR Client Assessment for Wholesale Banking (WB) clients only

b) **Full ESR screening:**
   1. Basic ESR screening
   2. ESR Transaction Assessment
   3. ESR sector policies
   4. ESR sector evaluation with due attention to specific approaches:
      i. Supply chain (as explained in the individual ESR Sector chapters)
      ii. Equator Principles (EP), covering particular project-related transaction types including Project
      iii. Advisory services

ESR client and transaction assessments for all in-scope business engagements are combined to arrive at a total ESR outcome (ING, 2021).

Transaction ESR Performance	Client ESR Performance			
	Low Risk	Normal Risk	Increased Risk	Unacceptable
Transaction Low Risk	ESR Low risk	ESR Low risk	ESR Medium risk	Unacceptable
Transaction High Risk	ESR Medium risk	ESR High risk	ESR High risk	Unacceptable
Unacceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable

Figure 12: Total ESR outcome (ING, 2021).

A. Board Oversight

Measures for effective governance: One effective approach to ensure that the Board takes ownership of the environmental risk management agenda, as well as establishes capability and accountability in providing oversight is by implementing measures such as training programs for board members and inviting external experts to provide regular briefings. Through this approach the Board can enhance their understanding of environmental risk and gain valuable insights on emerging environmental challenges (GFIT, 2021).

By implementing these measures, banks can promote effective governance in E&C risk management. This, in turn, enhances the institution's ability to address E&C challenges and seize opportunities, while aligning environmental considerations with its overall business objectives.

Industry Practice 4: Board Sustainability-related Committee that includes climate and environmental considerations and oversight as its duties

The responsibility of Maybank's Board Sustainability Committee also covers the oversight of climate-related considerations. The Board is responsible for overseeing existing Board-level committees that provide oversight on specific aspects related to climate and sustainability. The Board is supported by the Board Sustainability Committee, the EXCO Sustainability Committee, and other Board-level and Management Committees. The Chief Sustainability Officer and Exco Member also report to the Group President & CEO (GPCEO) in addition to supporting the Board.

Figure 13: Climate Governance (Maybank, 2022).

Board of Directors' remuneration: It is important to note that there is no specific requirement to link the board remuneration package to E&C risk oversight. However, considering the increasing significance of E&C risks and the need for strong governance in addressing them, it may be beneficial for banks to explore the possibility of integrating E&C performance metrics into the remuneration framework for board members. Such a step could incentivize and reward effective oversight and decision-making regarding environmental risks, further reinforcing the bank's commitment to sustainable practices.

Industry Practice 5: Non-exhaustive list of observed climate-related remuneration KPIs

Type of climate-related remuneration KPI	Description	Annual or multi-annual
Financed emissions reduction targets	Emissions intensity reduction targets are met at portfolio level.	Multi-annual
Product targets	A set amount of "sustainable" or "green" finance products has been issued.	Annual and multi-annual
Target-setting	A variable remuneration incentive is triggered based on the number of science-based targets set by the institution.	Multi-annual
Policy targets	The institution meets predefined milestones as per its C&E-related risk management strategy (e.g., adopting certain policies within the institution).	Annual and multi-annual
Rating targets	The institution achieves a predetermined level of sustainability ratings from a set pool of rating agencies.	Annual

Figure 14: Non-exhaustive list of observed climate-related remuneration KPIs (ECB, 2022).

B. Board Accountability

The role of the Board as the highest governing body in banks holds immense importance, particularly in the assessment of E&C risks and opportunities and the approval of material decisions. The Board has a responsibility to carefully consider the long-term sustainability of the organization in relation to environmental concerns.

In supporting senior management, the Board assumes several important roles regarding E&C risks. They are responsible for **overseeing the development of key policies that address E&C risks and opportunities**, ensuring that senior management formulates strategies that align with the organization's objectives. The Board also plays a crucial role in **reviewing assessments provided by senior management**, such as **materiality assessments and scenario analyses**, to ensure a comprehensive understanding of the potential impacts of E&C risks on the organization. Moreover, the Board should **keep abreast of emerging regulations and potential reputational risks related to E&C risks,** offering guidance to senior management in navigating these challenges effectively.

By actively participating in these areas, the Board enhances the decision-making process of senior management and fosters a culture of sustainability and responsibility within the organization. Their reviews, supervision, and guidance help align the banks' operations with environmental considerations and enable effective E&C risk management in a rapidly evolving landscape.

Additionally, it is essential for the Board to **transparently communicate its role, responsibilities, and the range of environmental issues** it addresses to stakeholders, such as during annual general meetings, as well as to regulatory bodies. Although there are **no specific guidelines mandating the frequency of Board discussions on E&C issues**, it is essential for banks to proactively participate in regular discussions. This ensures active engagement in addressing E&C concerns, with the flexibility for banks to determine the specific meeting frequency that best suits their needs.

Industry Practice 6: Frequency of Board Meetings

Standard Chartered illustrates clear processes and **agenda frequency** by which the board and board committees (e.g., audit, risk, or other committees) are informed and convenes on climate-related issues.

Governance body	Chair	Climate-related agenda frequency and inputs	Key purposes and responsibilities related to climate	Climate-related topic 2022
Board	Standard Chartered PLC Group Chairman	Twice during 2022. Climate Risk updates delivered via Group CRO Reports	• Oversee the Group's overall net zero approach. • Responsible for the net zero pathway shareholder advisory vote proposal.	• Discussed and reviewed the Group's net zero pathway, approved its approach and reviewed the progress on delivery. • Completed training focusing on how Climate Risk is being embedded across the three lines of defence.
Board Risk Committee (BRC)	Independent non-Executive Director	Three times a year. Climate Risk updates to BRC in Group reports seven times a year, delivered via Group Chief Risk Officer's Reports Quarterly Climate Risk information provided as part of the Risk Information Report, covering key metrics based on the concentration of transition and physical risks in our portfolio.	• Provide oversight of the Group's key risks on behalf of the Board and is the primary Risk Committee at the Board level that oversees Climate Risk. • Consider the Group's Risk Appetite and make recommendations to the Board on the Risk Appetite Statement (RAS). • Assess risk types (including Climate Risk) and the effectiveness of risk management frameworks and policies. • Provide oversight and challenge of the design and execution of climate-related stress testing.	• Reviewed, discussed and challenged the Group's Management scenario analysis. • Reviewed and recommended Group Climate RAS to the Board. • Reviewed Climate Risk Information Report (RIR) quarterly. • Monitored adherence to RA metrics including any relevant breaches.
Culture and Sustainability Committee (CSC)	Independent non-Executive Director	Four times in 2022.	• Oversee the Group's overall sustainability strategy. • Monitor the development and implementation of the sustainability framework to align with the Group's net zero approach.	• Discussed ESG benchmarking and indices progress, including via CDP climate change survey. • Reviewed Group Sustainability Strategy (including climate). • Discussed Board engagement protocols on sustainability.
Audit Committee	Independent non-Executive Director	Once in 2022 (Q4). This will be quarterly from 2023.	• Responsible for oversight of the Group's quantitative reporting metrics.	• Reviewed proposal to integrate TCFD-aligned disclosures and metrics into Annual Report and agreed this approach.

Figure 15: Governance committees' climate responsibilities (Standard Chartered, 2022).

3.2) GUIDANCE ON MANAGEMENT OVERSIGHT AND ACCOUNTABILITY

In addition to the Board of Directors, senior management also plays a significant role in ensuring that the strategic direction and policies related to E&C risk actions have been put into practice, such as managing opportunities and risks and establishing adequate internal responsibilities and resources (BOT, 2023).

3.2a) Standard Practice

Practice Guidance from the BOT's Standard Practice: Senior management's responsibilities in driving environmental actions ((item 3.2.1 (2.1,2.2,2.3 & 2.4))

Senior management has several important responsibilities in driving environmental actions within the organization:

(2.1) Senior management should **establish a responsibility structure and allocate internal resources** to support environmental actions effectively.

(2.2) Senior management must **set an environmental implementation plan that encompasses the management of opportunities and risks**. Senior management should also communicate the direction, policies, and implementation plans related to environmental actions to ensure relevant departments are well-informed and capable of tangible implementation.

(2.3) Senior management should **consistently monitor the progress and achievement** of the implementation plan, providing regular reports to the Board of Directors.

(2.4) Senior management should **prioritize knowledge and capacity building for staff across all levels**, particularly in environmental risk management. This ensures readiness for changes and strengthens support for the organization's environmental actions (BOT, 2023b).

To foster effective governance, senior management within relevant functions must comprehend their bank's approach, tools, and approval authorities related to E&C risk management. Senior management plays a crucial role in ensuring that E&C risks are addressed at all appropriate levels within their bank.

The key to the accountability of senior executives is the oversight of implementation and execution of management of E&C risk and its integration to their banks' business operation, in contrast to the Board's key accountability in risk oversight and strategic direction setting. The assessment and management of E&C risks and opportunities by senior management is a critical component of responsible corporate governance. Once the primary responsibility for E&C risk management is delegated to the Chief Executive Officer or equivalent and senior management, it becomes their duty to effectively respond to these risks.

3.2b) Key Actions

Key Actions 3.2: Senior management E&C risks oversight

Key Item	Short-term Actions	Long-term Actions
3.2.1 SM governance / delegation	1. **Clearly defined and appointed role** for SM position, or committee, and **delegated functions or personnel** to take responsibility of E&C risk management.	N/A
3.2.2 Implementation plan / communication plan	1. **Internal E&C implementation pla**n issued by SM 2. **Internal communication plan** on E&C risk management issued by SM.	N/A
3.2.3 Risk Identification and Assessment	3. **Implement qualitative (e.g., sector-based risk management approach) and quantitative measures (e.g., integration to existing risk identification and assessment capabilities for material risks, and linkages to existing quantitative measures and KRIs)** to manage E&C risks.	1. E&C risks are **integrated in the development of key business strategy and key business operations** 2. **Set risk thresholds/limits on financing** of specific activities within a defined timeframe, including phasing out involvement in certain industries and setting activity-based financing targets.
3.2.4 Monitoring / KRI	**1. SM to set and monitor** KRIs of material E&C risks, with regular updates and review on plans and policies for high-risk clients and sectors. Monitoring quantitative indicators in the short term **should cover quantitative carbon emission exposures for high-risk sectors, and existing quantitative risk metrics and KRIs for potential integration of E&C risks in KRIs in the short term.**	1. **SM to set and monitor qualitative and quantitative** KRIs of material E&C risks with regular updates and review on plans and policies for high-risk clients and sectors, **and consider inclusion of the KRIs in the bank's risk appetite.**
3.2.5 Resource allocation & Capacity building	1. **Resource allocation and capability are clearly planned** to support the bank's climate actions to **achieve the minimum level of compliance.** 2. E&C risk knowledge sharing and capacity building **set as annual required training agenda** for: a. Board of Directors b. Senior Management c. Three lines of defense d. employees (level of risk awareness, see Strategy Chapter)	1. **Resource allocation and capability are clearly planned** to support the bank's climate actions to **achieve the key climate-related targets.**

Regular reporting from senior management to the Board of Directors: Senior management has the responsibility to **provide regular updates to the Board, covering E&C risk-related issues** faced by business and

operational units, emerging opportunities, and the progress made in implementing environmental risk management. The frequency at which senior management should monitor progress and report to the Board of Directors should be determined by the Board of Directors themselves.

3.2.1c) Recommended Approach

Key definitions: Senior Management

"**Senior management**" is defined as senior executives in accordance with the definition in the Notification of the Bank of Thailand RE: Corporate Governance of Financial Institutions and Financial Business Groups (BOT, 2023b).

"Senior executives" shall include financial institution's managers, deputy managers, assistant managers and advisors who perform any duties in the capacity of a manager, deputy manager or assistant manager but holding the position as an advisor, including those who perform the similar duties but holding any other positions (BOT, 2023).

A. Senior Management Oversight

Responsibility of Senior Management: Senior management, particularly within relevant functions, plays a critical role in the effective management of E&C risks in banks. While the Board holds ultimate responsibility, senior management is responsible for implementing the Board's guidance and ensuring that E&C risks are consistently identified, assessed, and managed within the bank and its value chain.

Measures for effective management: In addition to their oversight responsibilities, senior management can enhance their understanding of E&C risk through training programs and by leveraging external experts specializing in physical and transition risks. This enables them to stay updated on emerging challenges and incorporate E&C considerations into their respective banks' overall strategy, business plans, risk appetite, and annual budget. By fulfilling their role in E&C risk management, senior management contributes to effective governance in banks and enhances the institution's ability to address E&C challenges and seize opportunities.

Implementation of capacity building work: Senior management has the responsibility to ensure knowledge development and capacity building efforts related to E&C risk management for staff at all levels. It is important for senior management to assess and identify any knowledge gaps that may exist among specific employee groups and take necessary steps to address them. Adequate capacity-building initiatives should be provided to bridge these gaps. These initiatives can be developed and conducted internally within the organization or can be provided by external experts.

Senior management's remuneration: There is no specific requirement for senior management to integrate E&C oversight into their remuneration package. However, given the growing significance of E&C risk management and the impact of climate change on the financial industry, it is advisable for organizations to consider incorporating this linkage. By aligning executive compensation with the organization's ability to manage E&C risks and promote sustainability, senior management can demonstrate their commitment to addressing E&C challenges and driving long-term value creation.

FSB (2023) studied the practices of climate-related financial risk factors in compensation frameworks and found that the compensation practices are mostly incorporate in non-financial measures of senior management's balanced scorecard. However, in companies where financial metrics are included, the indicators cover GHG emissions (Scope 1&2); growths in sustainable finance business/assets/investments; and external metrics including ESG ratings and indices benchmarking. Climate-related metrics remain a small part of overall compensation, but some financial institutions are planning to put more weight on climate-related metrics as a component of compensation (FSB, 2023)

Industry Practice 7: Executive's and senior management's remuneration

Citi group integrates sustainability and climate-related goals into executive scorecards, which play an important element for performance management and determining incentive compensation. These scorecards for the Executive Management team and senior management include progress on Net Zero Plan and target setting (Citigroup, 2022). Below are examples of specific scorecard elements for certain positions:

- CEO - Driving the delivery of environmental and social finance under our $1 Trillion Sustainable Finance Goal; and
- CEO of ICG, Chief Risk Officer, Global Head of Enterprise Services and Public Affairs, and Global Co-Heads of BCMA - Supporting the development and operationalization of Citi's Net Zero Plan and applicable 2030 targets, and driving the delivery of environmental and social finance under the $1 Trillion Sustainable Finance Goal.

Figure 16: Incorporation of sustainability and climate-related goals into executive scorecards (Citigroup, 2022).

B. Senior Management Accountability

It is important to recognize that the roles and responsibilities of the Board of Directors and management bodies differ in terms of their supervisory and implementation functions. The table below provides a summary of the key actions expected from each level of management across various aspects of E&C risk management (BOT, 2023b & GFIT, 2021):

Responsibilities	Key actions by Board of Directors	Key actions by Senior Management
a. Strategy	• Set strategic directions, both short-term and long-term, to address environmental changes within the organization. • Establish the risk appetite concerning environmental issues, determining the level of risk it is willing to accept.	• Communicate the direction, policies, and implementation plans related to environmental actions to ensure relevant departments are well-informed and capable of tangible implementation.
b. Policy and framework	• Set key policies and overall framework that provide guidance for environmental actions, considering both short-term and long-term goals of the organization.	• N/A
c. Governance structure, roles, and responsibilities	• Ensure clear governance structure that outlines roles and responsibilities pertaining to environmental actions within the organization.	• Establish a responsibility structure and allocate internal resources effectively to support environmental actions.
d. E&C risk identification and assessment	• Ensure clear responsible authority to manage environmental opportunities and risks within the organization's stipulated framework.	• Ensure that environmental considerations risks are integrated into key business operations such as strategy development, risk management, credit underwriting, investment analysis, disclosure, and internal audit.
e. E&C risk monitoring and reporting	• N/A	• Consistently monitor the progress and achievement of the environmental implementation plan

Responsibilities	Key actions by Board of Directors	Key actions by Senior Management
		and provide regular reports to the Board of Directors.
f. Resource allocation	• Place importance on allocating adequate resources to support environmental actions, ensuring that the necessary resources are available to achieve the environmental targets.	• Allocate resources to implement environmental policies and meet environmental goals and targets.
g. Capacity building	• N/A	• Ensure knowledge and capacity building for staff across all levels, particularly in E&C risk management, to ensure readiness for changes and strengthen support for the organization's environmental actions.

When selecting senior management to oversee E&C risk, careful consideration should be given to their experience in managing other financial risks within the first and second lines of defense. This may include selecting key individuals such as business unit heads, Chief Risk Officer (CRO), Chief Financial Officer (CFO), Chief Sustainability Officer (CSO), or a combination of senior executives.

The role of senior management should involve **establishing and reviewing policies that provide guidance to business units regarding risk appetite, considering factors such as the transition to a lower carbon economy or setting risk thresholds for higher E&C risk industries like fossil fuels, aviation, shipping, or agricultural commodities**.

Senior management has a crucial role to play in ensuring **E&C risk policies are regularly assessed and updated.** They should also obtain progress reports from internal teams regarding portfolios and ensure the effectiveness of internal processes for **communicating E&C risk-related matters to the Board of Directors as well as the stakeholders**. To accomplish these objectives, senior management can implement qualitative measures like gradually phasing out involvement in specific industries, as well as quantitative measures such as setting limits on financing certain economic activities within a defined timeframe.

Industry Practice 8: Senior Management Roles and Responsibilities

Citi delegates the role of assessing and managing climate-related risks and opportunities as a **shared responsibility** across senior management. Senior managers from the "Institutional Clients Group, Risk Management, Enterprise Services and Public Affairs, Finance and Legal collaborate and work simultaneously to manage climate risk and implement Citi's Net Zero Plan" (Citigroup, 2022).

Citi's **ESG Council**, who provide review and guidance of ESG activities and goals including on climate risk and opportunities, is made up of senior management members and subject matter experts who meet on a near **monthly basis** (Citigroup, 2022).

3.3) E&C RISKS IN BOARD OF DIRECTOR AND SENIOR MANAGEMENT MEETING AGENDA AND REPORTING

It is vital that businesses recognize the significance of E&C risk considerations in their decision-making processes. By adopting an E&C-integrated risk approach, organizations can not only mitigate their negative impact on the environment but also capitalize on opportunities to advance their sustainability objectives. Therefore, by incorporating E&C risk concerns into their existing committees' agendas, firms can demonstrate their commitment to sustainable practices and lead the way for other organizations to follow suit.

Practice Guidance from the BOT's Standard Practice: Senior management's responsibilities in driving environmental actions ((item 3.2.1 (2.3))

(2.3) Senior management should **consistently monitor the progress and achievement** of the implementation plan, providing regular reports to the Board of Directors.

3.3b) Key Actions

Key Actions 3.3: Management bodies meeting agenda and reporting on E&C Risks

Key Item	Short-term Actions	Long-term Actions
3.3.1 Regular updates and reporting to the BoD	1. **The BoD should include E&C risk as a regular agenda for discussion and set cycle of reporting** from Senior management. The reporting **must include updates on material E&C risk at transaction and portfolio level** (including key investment and lending / project financing decisions).	1. The periodical reporting **must expand to cover performances against E&C-related targets, progress in alignment with transition plan, and the bank's business strategy**.
3.3.2 Communication / reporting to the BoD	1. Regular progress updates and discussions with BoD on E&C risks, with **agenda to be discussed** including the **E&C risk profile of the bank, changes and drivers influencing the changes in the E&C risk profile, key management plan, qualitative KRIs and key quantitative indicators such as GHG emissions/exposures for high-risk sectors and existing quantitative risk metrics.**	1. Regular progress updates and discussions with BoD on **progress against climate-related targets, quantitative and qualitative KPIs and KRIs, and strategy related to E&C risk management** (e.g., progress against transition plan and E&C-related targets).

3.3c) Recommended Approach

In the context of banks in Thailand, there are no specific requirements regarding the number of topics or the specific topics that sub-committees must discuss. Banks have the flexibility to establish, discuss at the management level as regular agenda, and integrate management duties and topics in committees with respective responsibilities and oversight. These topics may include, but are not limited to, the following:

- **E&C Risk management and integration in banks' risk management framework** – to ensure that the banks have comply with regulatory while expectations and taking into consideration E&C risks that will have material impacts on their operations and portfolios.

- **Net-zero or decarbonization commitment and transition plans** – to ensure that the banks' performances is aligned with their commitment, the transition plan takes into consideration material E&C risks material to each bank and ensure that the transition plan is taken into consideration to inform each bank's strategy.

- **Sustainable and/or transition finance product development** – the bank's development strategy and frameworks for sustainable product offerings should be closely overseen by management bodies, to ensure that the direction is aligned with regulators' expectations[1], and should, while creating business benefits for the banks (e.g., to contribute to the bank's climate goals), incentivize and provide benefits for clients in their transition journey. The management body should also focus on discussion to prevent greenwashing through deploying the banks' sustainability and/or transition finance products.

Industry Practice 9: Management Committee Meeting Agendas

At Barclays, oversight and management of climate strategy is increasingly embedded in **business-as-usual** management structures The executive management committees receive **regular briefings** on matters surrounding climate change, including climate-related risks and opportunities (Barclays, 2022).

[1] According to the BOT's Directional Paper, it is the regulator's expectation that "banks should manage their risks effectively to offer financial products and services that serve the needs of the business sector in their transitioning, at prices that appropriately reflect actual costs and risks" (BOT, 2022)

CHAPTER 4. STRATEGY

Throughout the E&C risk integrated risk management, banks will become informed of their E&C risks, planning for their transition to limit exposure of E&C risk, and ultimately adapt their business strategy to address such transition. Within the area of E&C risk management strategy, supervisory expectations may not be as clear as the risk management mechanism itself. This is due to the nature of strategy planning that should be contextualized to fit each bank's business operation, risks, and portfolio.

Banks can understand the impact of E&C risks on their operations and portfolio through assessing materiality of such risks. Once the material E&C Risks are identified, they will inform the banks' business planning, potential transition plan and target settings, Key Risk Indicator (KRI) identification to be included in risk appetite framework, and identify strategies for their product, services, and client engagement. This chapter aims to address these areas of actions and is structured in line with the three key areas outlined under the Strategy section of the Standard Practice: (1) E&C risk consideration in business planning, (2) implementation evaluation and monitoring, and (3) product and client engagement strategy to support the transition towards the low-carbon economy.

The following graphics explains transition planning risk management cycle, which capture the process of materiality assessment, relevance with target setting and inclusion of E&C risk on risk appetite framework, and the design of transition finance product offering. From ECB's experience, banks that can "draw the link between their assessment of material transition risk drivers, strategic targets, risk appetite framework and risk management tools" (ECB, 2022). This chapter will reflect how banks should consider E&C risk management strategy along this process, in line with the expected practices prescribed in the Standard Practice.

Figure 1

Stylised example of transition planning risk management cycle

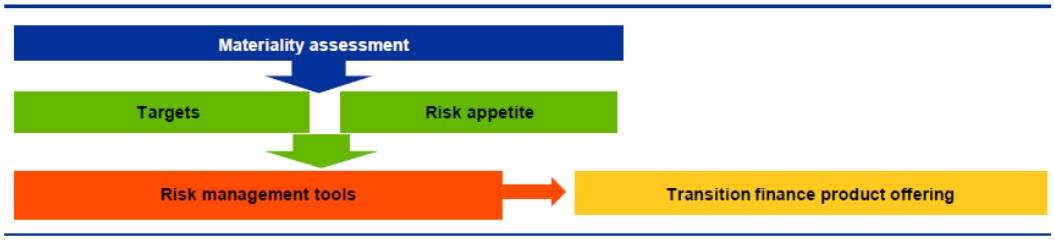


Figure 17: ECB Stylized example of transition planning risk management cycle (ECB, 2022).

4.1) INTEGRATING E&C RISKS AND IMPACTS IN BUSINESS PLANNING

The essential aspect of incorporating E&C risk considerations into business strategy is in recognizing the prolonged time horizons until the risk materialize, different consideration on types of risks, and intensifying effects over time (Dikau et al, 2022). Not only has it been demonstrated that impacts of E&C risks increasingly exacerbate over different time horizons, the interaction between E&C risks may also increase the severity and volatility of such risks. This is in contrast with traditional financial risks where traditional time horizons stretch to 3-4 years, while E&C risk consideration expands over immediate time horizon to 10 or more years. It is therefore crucial that E&C risks are given special consideration when integrating and translating identified material E&C risks into a strategic approach to manage them.

Many banks have addressed E&C risk management strategy through transition planning, and effective target setting, as well as, in advanced cases, cascading targets to KRIs for inclusion on risk appetite. In current practices, integrating E&C risks into banks' business strategy, transition risk has primarily been prioritized over

physical risk drivers (ECB, 2022). The use of transition planning, which focuses on transition risk, also influence such focus on one aspect of E&C risk. However, it should be noted here that banks should always consider physical risk in their strategic planning.

This section lays out the areas in which banks should integrate materially determined E&C risk factors. This includes the process of setting and reviewing: strategic plans, risk appetite, as well as the implementation plans. A component of this can include transition planning, in which time horizons should be determined to assess the E&C risks that will impact their business strategy in the short-, medium- and long-term.

The environmental and climate changes have altered the business environment requiring banks and their stakeholders to reshape their strategy to be more resilient and responsive to both E&C opportunities and risks (BOT, 2023b). The changes in business environment from the E&C risk may stem from a wide range of external factors and trends such as the macroeconomic variables, the competitive landscape, policy and regulation, technology, societal/demographic developments, and geopolitical trends.

Example of the impacts of E&C risks on a business environment

Factors	Description
Macroeconomic variables	E&C risks may influence the economic growth
Competitive landscape	E&C risks may shift the supply chain and/or the development of green financing market as well as consumer preference
Weather event	E&C risks may cause from drought/flood which impact to the agricultural production
Policy	E&C risks may promote policies that focus on E&C resilience

Understanding the changes in a business environment and associated risks often, directly or indirectly, have an influence on the business strategy and decision making. In setting the business strategy and corresponding implementation plans, it should be based on the up-to-date materiality assessment of the underlying E&C risks in the bank.

4.1.1 MATERIALITY ASSESSMENT – IDENTIFICATION OF MATERIAL E&C RISKS AND MATERIAL SECTORS

To initiate the strategies, goals, and transition plans, banks should develop an understanding of the short - and long - term impact of the E&C risk towards its business environment (ECB, 2020). This includes understanding the current and future business conditions that would heighten banks' exposures to E&C risks and/or material risks related to geographic locations where banks operate.

4.1.1a) Standard Practice

Standard Practice: Integration of E&C factors as part of business strategic plan *(item 3.2.2 (1))*

Financial institutions should integrate environmental factors as part of the process in setting and reviewing **strategic plans, risk appetite**, and both **short and long-term implementation plans** in accordance with the materiality that may directly and indirectly impact the financial institutions. Furthermore, financial institutions should have in place **materiality assessment processes** with relevant stakeholders to regularly review various strategies (BOT, 2023b).

4.1.1b) Key Actions

Key Actions 4.1: Materiality assessment

Key Item	Short-term Actions	Long-term Actions
4.1.1 Materiality assessment	1. Banks are required to **assess material E&C risks (either based on existing risk assessment methodologies or qualitative threshold), exposures and their concentration related to industry, economic sectors and geographic regions.** Banks should also monitor **concentration of exposures to geographies and sectors with higher E&C risks** to be integrated and inform strategy formation.	1. Banks set **clear definitions and quantitative/qualitative thresholds for materiality and recognize E&C considerations in integrated firm-wide perspective on risk.** 2. Put in place **impact materiality assessment** (involving external stakeholders) and **financial materiality assessment** (internal existing process, integrating E&C risks).

A. Identification of material E&C risks

The materiality assessment process is key to understanding E&C risks that impact banks and a crucial input for E&C risk to be integrated in the development of strategy, risk appetite, and implementation plans. The materiality assessment process is therefore critical when determining business strategy in that it helps to understand the potential impact of the risks across the various time horizons. With the understanding of the factors that drive the changes in the business environment, banks should proactively assess E&C risks through the qualitative and quantitative materiality assessment to be able to pinpoint areas of material risks exposures and account for those risks when setting up the business strategy.

Key Actions 4.2: Sectoral targets / Exposure targets

Key Item	Short-term Actions	Long-term Actions
4.2.1 Sectoral targets / exposure targets	N/A	1. Banks to **develop exposure targets, exclusion list, and sectoral targets** that align with their transition plan and climate-related targets. Banks should prioritize the sectors with high E&C risks.

B. Identification of material sector

According to BCBS, banks are expected to assess E&C financial risks, understand all material risks and their concentrations related to industry, economic sector, and geographic regions. Banks should also "monitor concentration of exposure to geographies and sectors with higher E&C risk (BCBS, 2022). This reflects sector-based E&C risk management as key to addressing E&C risk and opportunities in broader business context and strategy formation.

4.1.1c) Recommended Approach

A. Identification of material E&C risks

Materiality assessment is a crucial set of steps to understand E&C risks and opportunities for strategy formation and actions prioritization. In line with the Standard Practice, the process of materiality assessment should be done in two aspects: (1) assessing material E&C risks and opportunities as impacts on banks' financial performances; and (2) assessing ESG materiality, with views from internal and external stakeholders. The first aspect, conducting financial materiality assessment and available methodologies can be referred to in Chapter 5. The second aspect, conducting ESG materiality assessment, should be done in alignment with globally accepted guidance and frameworks such as the Global Reporting Initiative standard (GRI 3: Material Topics) and European Financial Reporting Advisory Group's Implementation Guidance for the Materiality Assessment.

When assessing materiality, banks should regularly conduct at least a basic assessment of materiality on the main risk factors (see Chapter 5.2 on industry practice for materiality assessment) and determine E&C targets (i.e., Net Zero and 1.5°c-aligned), in accordance with relevant portfolio exposure. In this light, material E&C risk factors are highly relevant in target setting and exposure assessment, which are part of strategy formation. Therefore, identified material E&C risks should be considered at the corporate level in various processes that impact strategy formations, in a forward-looking manner in the following processes:

1. KRIs setting (reflected in risk appetite)
2. Short, medium, and long-term target setting, and implementation planning
3. Development of transition plan

Identification of material sectors (e.g., carbon-intensive sectors) is an important step for banks to set their E&C targets and transition plan. UNEP FI guidelines identify the following sectors as the most carbon-intensive sectors: agriculture, aluminum, cement, coal, commercial and residential real estate, iron and steel, oil and gas, power generation, and transport (UNEP FI, 2022). Material sector identification is crucial for banks to set sectoral mitigation targets and their respective portfolio decarbonization strategies by sector. For instance, banks may set a target to reduce financed emissions on high-exposure sectors near the short term when assessing materiality.

Industry Practice 10: Identifying material sectors

UOB has identified six focus sectors that are material contributors to GHG emissions regionally as well as to UOB's corporate lending portfolio. The prioritization of the six focus sectors were based on the following considerations (UOB, 2022):

- **Significance and interconnection in the path to net zero –** particularly, oil, gas and coal sectors represent 73% of direct emissions globally, while power, automotive, real estate and steel sectors account for 67% of the emissions arising from fossil fuel combustion.
- **Exposure and impact** – the six sectors represent approximately 60% of UOB's corporate lending portfolio and majority of the bank's financed emissions.
- **Accessibility and availability of methodology and data** – UOB focuses its decarbonization commitments on sectors where it can obtain reliable emission data and where the data methodology is well-established.

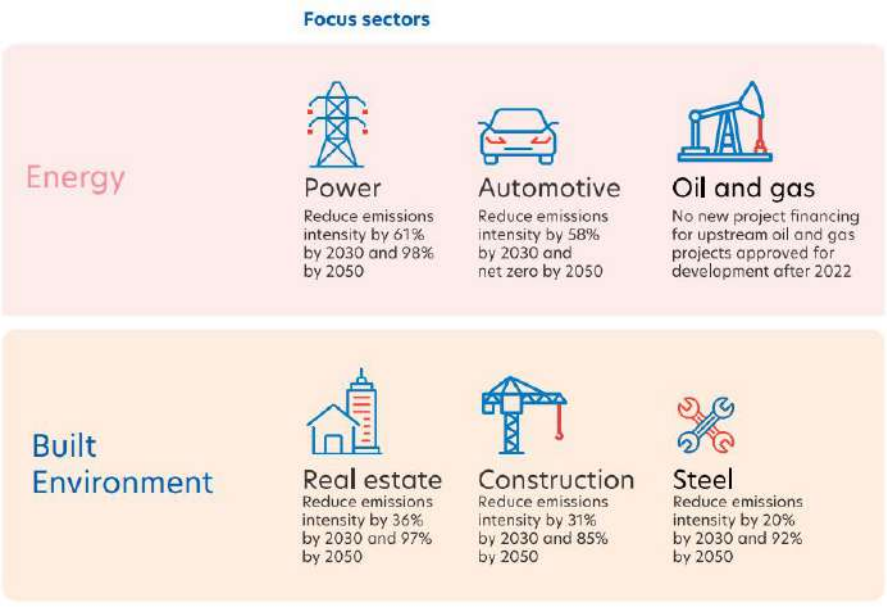


Figure 18: Six focus sectors (UOB, 2022).

4.1.2 TIME HORIZON FOR E&C STRATEGY PLANNING

4.1.2a) Standard Practice

Standard Practice: Integration of E&C factors as part of business strategic plan *(item 3.2.2 (1))*

Financial institutions should integrate environmental factors as part of the process in setting and reviewing **strategic plans**, risk appetite, and both **short and long-term implementation plans** in accordance with the materiality that may directly and indirectly impact the financial institutions. Furthermore, financial institutions should have in place materiality assessment processes with relevant stakeholders to regularly review various strategies (BOT, 2023b).

4.1.2b) Key Actions

Key Actions 4.3: Time Horizon

Key Item	Short-term Actions	Long-term Actions
4.3.1 Time Horizon	2. Banks are expected to **integrate E&C risks (emerging in the short-to-medium term) in alignment with their current business planning horizon (3-5 years).** The process to inform the short-to-medium- term business direction should focus on **assessing impacts on risk exposures and assess solvency and liquidity impacts period of time.**	1. Banks should **develop an E&C strategic plan (emerging across all time horizons) to address evolving physical and transition risk** [Typically: short (0-2 years), medium (2-5 years), and long term (more than 5-10 years)].

Banks should prepare strategic planning to address E&C risks on the longer time horizon, with regular and timeous updates on the plan as the risks and opportunities evolves , both from the consideration of physical risks and transition risks. Risk impacts should be integrated into the business strategy, in which materiality assessment can be used to define risk at different time horizons.

4.1.3c) Recommended Approach

The time horizon plays a significant factor when considering the impacts of E&C risk, as the traditional risk frameworks and strategy planning normally focus on the short-to-medium time horizon. On the contrary, E&C risks expand the time horizon to 10 years as transition risks are slow to emerge, while the severity of physical risks are likely to become material after 5 years in almost all climate scenarios.

E&C risks at different time horizons may be identified through the materiality assessment as the following (ECB, 2020):

- Short- to medium-term assessment, normally at 3-5 years, should be performed on E&C risk exposure within its current business planning.
- A longer-term assessment (over 5 years) should be performed on E&C risk exposure in alignment with transition commitment.

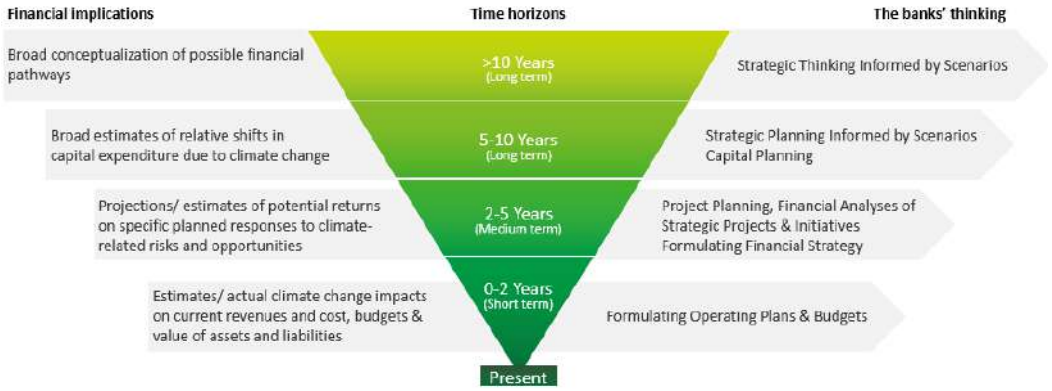


Figure 19: Disclosing Business-Relevant Time Horizons (TCFD, 2020).

Industry Practice 11: Time horizons

In Standard Chartered's strategic business planning, 'short-term' means the time horizon of less than two years, 'medium-term' is considered to be two to five years and 'long-term' is considered to be anything beyond five years (Standard Chartered, 2022).

a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long term		
Relevant short-, medium-, and long-term time horizons	• In our strategic business planning, we consider 'short-term' to be less than two years, 'medium-term' to be two to five years and 'long-term' to be beyond this. For climate scenario analysis we can run 30-year scenarios for both Physical and Transition Risk. Some elements of our Physical Risk scenario analysis can also extend to 2100.	Our net zero timeline – page 73 Scenario analysis – page 90

Figure 20: Identification of time horizons (Standard Chartered, 2022).

4.1.3 TRANSITION PLANNING – STRATEGIC PLANNING AND IMPLEMENTATION PLANS

4.1.3a) Standard Practice

Standard Practice: Integration of E&C factors as part of business strategic plan *(item 3.2.2 (1))*

Financial institutions should integrate environmental factors as part of the process in setting and reviewing **strategic plans**, risk appetite, and both **short and long-term implementation plans** in accordance with the materiality that may directly and indirectly impact the financial institutions. Furthermore, financial institutions should have in place materiality assessment processes with relevant stakeholders to regularly review various strategies (BOT, 2023b).

4.1.3b) Key Actions

Key Actions 4.4: Implementation plan / transition plan

Key Item	Short-term Actions	Long-term Actions
4.4.1 Implementation plan / transition plan	1. Adoption of **comprehensive bank-wide transition plan (Scope 1 & 2, and Scope 3) and comprehensive sector transition plans (Scope 1 and Scope 2)** to manage E&C risk within the material sectors that the bank is exposed to, at the different time horizon (short-, medium-, and long-term), to set targets and actions within an aspect of an organization's overall business strategy to facilitate the transition towards a low-carbon economy.	1. Adoption of **comprehensive bank-wide transition plan including scope 3** (prioritizing categories most material to the bank) to manage E&C risk, at the different time horizon (short-, medium-, and long-term), to set targets and actions within an aspect of an organization's overall business strategy to facilitate the transition towards a low-carbon economy. 2. **E&C risks reflected on the business strategy** of the bank.

A transition plan outlines a set of targets and actions within an aspect of an organization's overall business strategy to facilitate the transition towards a low-carbon economy, including actions such as the reduction of GHG emissions. The transition plan should provide high-level guidance to support organizations' efforts in their decarbonization journey, with the objective of achieving a low-carbon economy. Banks' transition plan should reflect its individual circumstances, business environment, and business context of its respective organization (TCFD, 2022b).

Key characteristics of effective transition plan and recommended elements (TCFD, 2021b):

- **Aligned with strategy:** A transition plan should be part of, and aligned with, an organization's plan for addressing E&C risks and opportunities.
- **Anchored in quantitative elements, including E&C metrics and targets:** A transition plan should be designed to consider and contribute to the achievement of specific targets within an organization's planned transition to a low-carbon economy. The transition plan should also be aligned with broader economy- or sector-wide science-based pathways to a low-carbon economy.
- **Subject to effective governance processes:** A transition plan should describe the approval process and oversight and accountability responsibilities within an organization.
- **Actionable, specific initiatives:** A transition plan should articulate specific initiatives and actions the organizations will undertake to effectively implement the plan such as regular milestones.
- **Credible:** A transition plan should contain sufficient information to enable users to assess its credibility.
- **Periodically reviewed and updated:** The organizations should review the transition plan in accordance with their E&C targets review processes, at least every five years and updated if necessary.

According to the TCFD, a transition plan should comprise of the details of four key pillars: governance, strategy, risk management, and metric and targets. To highlight the alignment with strategy, inclusion of activities and temperature goal, and linkages to forward-looking quantitative analysis (scenario analysis and stress test), the table below highlights the key elements that the transition plan needs to address in the areas of the plan's strategy, and linkages to E&C risk management (TCFD, 2021b).

Key pillar	Elements to consider and clearly designed
Strategy	**1.** Plan assumptions: describe assumptions around transition pathway uncertainties and implementation challenges. The assumptions should be consistent with those used by organization in its financial accounts, capital expenditure, and investment decisions **2.** Prioritized opportunities: describes how to maximize prioritized E&C opportunities in transition to a low carbon economy **3.** Action plan: outlines short-term and medium-term tactical and operational plans and describes how actions address material sources of GHG emissions. The plan introduces E&C risks and increase opportunities **4.** Financial plans: describes supporting financial plans, budgets, related financial targets **5.** Scenario analysis: test achievability of the transition plan and associated targets using multiple climate scenarios
Risk Management	**1.** Description of risks: Describes the risks that the organization faces from a transition to a low-carbon economy **2.** Plan challenges and uncertainties: Describes assumptions, uncertainties, and challenges the organization faces in executing the transition plan

4.1.3c) Recommended Approach

Key definitions: Transition Plan

"A transition plan is a detailed multi-year account of targets and actions that sets out how a given firm will ensure that its business model and strategy are compatible with a specific environmental objective, such as the goal of limiting global warming to 1.5 Degree above pre-industrial levels in line with the Paris Agreement." (Dikau et al, 2022)

"A transition plan is an aspect of an organization's overall business strategy to lays out a set of targets and actions supporting its transition toward a low-carbon economy, including actions such as reducing its GHG emissions." (TCFD, 2021b)

A. Example of effective transition plan structure - GFANZ net-zero transition plan framework (GFANZ, 2022):

Transition planning is a crucial mechanism for banks to achieve net-zero and 1.5°C-alignment targets. It helps banks integrate their targets into a business strategy and develop an action plan for a successful transition. Transition planning can be used to define and set forth the pathway to net zero GHG emissions and reduction of real economy GHG emissions (GFANZ, 2022). It primarily focuses on two aspects: strategy and risk. On the strategy aspect, it is designed to account for and inform external parties about how each bank sets its business strategy in response to the net-zero transition. On the risk aspect, it focuses on the risk management associated with the real economy (NGFS, 2023). A Net-zero transition plan is a long-term commitment. As the transition progresses, banks should regularly review and update their transition plan.

Key definitions: Real economy

Real economy refers to economic activity outside of the financial sector. Financial institutions are significant intermediaries that support activity in the real economy — production and consumption by households, businesses, and government — through their lending, investing, underwriting, and advising activities (GFANZ, 2022).

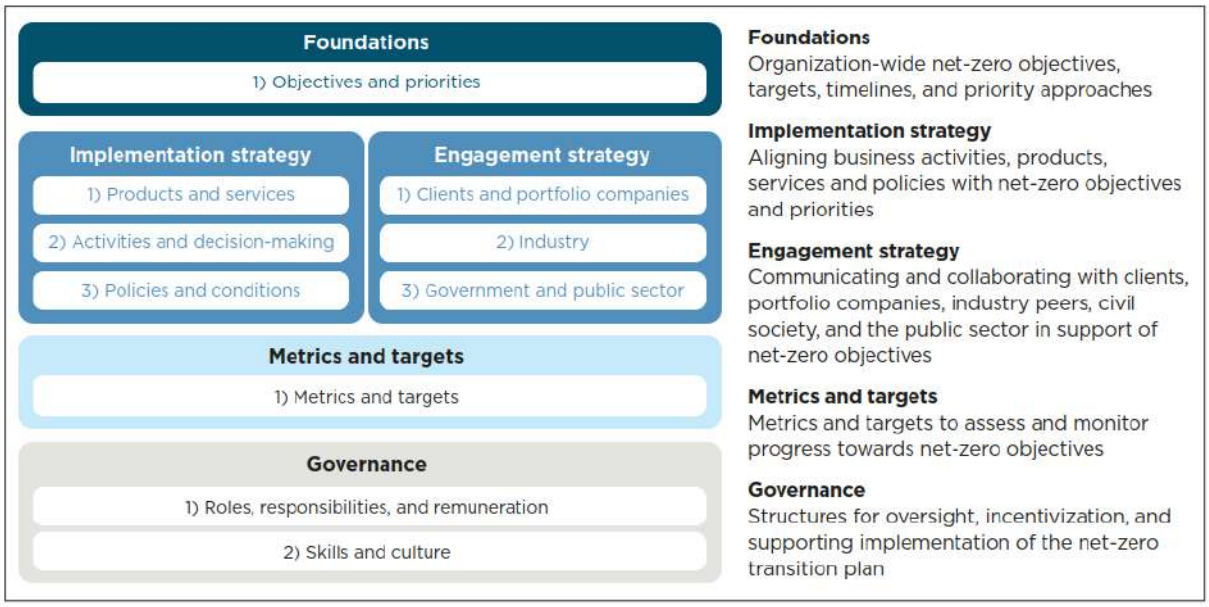


Figure 21: GFANZ financial institution net-zero transition plan framework (GFANZ, 2022).

To develop a transition plan, there are available frameworks which can be described into five themes and ten components (as shown in Figure 4.4 above) (GFANZ, 2022):

<table>
<tr><th>Key components</th><th>Description</th></tr>
<tr><td>1. Foundations</td><td>To align with the net-zero GHG emissions target, banks need to define the transition plan by setting clear objective and priorities including targets and timeline, to develop a detailed and strategic net-zero transition plan which led to the resourcing, incentives, products and services, engagement approaches, and other core business levers.</td></tr>
<tr><td>1.1 Objectives and priorities</td><td>The objective and priorities articulate the direction and decision to the resourcing, incentives, products and services, engagement approaches, and other core business levers.
<table>
<tr><th>Elements</th><th>Description</th></tr>
<tr><td>Scope</td><td>To clarify the rationale behind the net-zero objective and consider what to include and exclude from the objective to facilitate comparison and identify future undertaking.</td></tr>
<tr><td>Timing</td><td>To set timing to achieve the net-zero target. For example, banks may set target to achieving net-zero greenhouse gas (GHG) emissions by 2050 in alignment with the global transition.</td></tr>
<tr><td>GHG emission reduction target</td><td>To set short term and long-term target for the bank’s portfolio GHG emissions (financed emission)</td></tr>
</table></td></tr>
<tr><td>2. Implementation Strategy</td><td>When the banks have set clear objectives and integrated the priorities into their core business activities and decision-making processes, Implementation Strategy comes into play.</td></tr>
<tr><td>2.1 Product and services</td><td>The implementation strategy plans its emission reduction through its products and services. With the variety of products and services across the business line, banks may focus on the products and services that have significant influence or potential to the real economy. The following aspects may be considered when designing products and services (See more details in Chapter 4.3 Product and Client Engagement strategy).
<table>
<tr><th>Aspects</th><th>Consideration</th></tr>
<tr><td>Real-economy impact</td><td>How will products and services drive the incentives/influence the client or portfolio?</td></tr>
<tr><td>Transparency and integrity</td><td>To design the product and service with clear and transparent objective.</td></tr>
<tr><td>Data availability</td><td>The sufficiency of the data needs to be considered when developing and monitoring product and services.</td></tr>
<tr><td>Scale</td><td>To secure the meaningful scale, measuring the product and service against the specific performance indicators can be considered</td></tr>
<tr><td>Acceleration</td><td>The product and services should be planned in alignment with the transition target.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Key components</th><th>Description</th></tr>
<tr><td>2.2 Activities and decision-making</td><td>The objectives and priorities need to stem in banks' oversight structure and core business activities to both top-down/oversight structures and bottom-up monitoring and reporting tools.</td></tr>
<tr><td>2.3 Policies and conditions</td><td>In context of policy, each bank should entail clear and precise objectives in connection with its net zero strategy. Under the policy making, it should be based upon the science-based transition scenarios and best available information. The policy setting typically draws from sectoral decarbonization pathways depending on credible methodology and best available information.

The policies and conditions should be developed in support of the transition plan, at the minimum of high emitted sectors and harmful activities. This is to define the business boundaries as well as manage high-emitting activities and physical assets in alignment with the objectives and priorities of net-zero pathway.

<u>Elements in policies on emissions-intensive assets/activities</u>

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>Objective</td><td>A statement to clarify the goal/target of the policy and how it accounts the transition to net-zero transition commitment and priorities</td></tr>
<tr><td>Scope</td><td>Description of the assets, project, business activity that the policy applied. The scope can be defined at the business activity (i.e., lending, underwriting, investing, advising services) geographies or/and sectors.</td></tr>
<tr><td>Condition</td><td>Criteria or conditions align with the net zero transition including the product and service within the activities, geographies, and sectors under the policy scope.</td></tr>
<tr><td>Exclusions</td><td>Description of the type of specific company, assets, projects, and/or activities that banks does not serve of finance.</td></tr>
<tr><td>Timelines</td><td>A timeline or roadmap for the transition to net zero that outline the key action, milestones and/or conditions and exclusions will apply.</td></tr>
<tr><td>Transparency</td><td>The disclosure of the methodologies and metric used within the policy to illustrate compliance and progress of the transition.</td></tr>
</table>
</td></tr>
<tr><td>3. Engagement Strategy</td><td>As banks play a key role in transitioning the economy to net-zero, the transition does not only impact the internal stakeholders but also external stakeholders. Banks can adopt three main approaches to achieve Net-zero commitments, strategies, and targets: through clients and portfolio companies, collaboration at the industry level, and engagements with the government and the public sector.</td></tr>
<tr><td>4. Metrics and targets</td><td>Banks should develop a set of metrics and targets that drive the implementation of the transition plan and track progress in the short, medium, and long term. These metrics and targets should be closely integrated with the strategy and aligned with the industry standards to ensure transparency and comparability.

Three key areas of metrics that banks should focus on include:</td></tr>
</table>

<table>
<tr><th>Key components</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>Areas of Metrics and targets</th><th>Description</th></tr>
<tr><td>Real-economy transition</td><td>Metrics and targets that monitor the bank’s progress in allocating capital to real-economy, which banks can support through the following four financing strategies:
Financing for climate solutions aimed at real-economy emissions reduction
Financing for companies/assets that are already aligned with the 1.5°c trajectory
Financing for companies/assets that are in the process of transitioning to the 1.5°c trajectory
Financing for high-emitting assets with a phaseout plan</td></tr>
<tr><td>Plan execution</td><td>Metrics and targets that indicate the organization’s progress in executing their transition plan. These may include metrics for the implementation strategy, engagement strategy, governance, and business foundations.</td></tr>
<tr><td>Financed emissions</td><td>Metrics and targets for the bank’s financed emissions which should align with sector-specific guidance and industry standards.</td></tr>
</table>
Note that more examples of metrics and targets are provided in Industry Practice 4.4.
</td></tr>
<tr><td>5. Governance</td><td>Set the oversight and implementation of roles and responsibilities, integrated remuneration, and established skills and culture to manage E&C risks and decarbonization to execute in line with the transition plan.</td></tr>
</table>

Industry Practice 12: Example of net-zero transition plan

NatWest Group outlines below its transition plan to achieve net zero across its financed emissions and operational value chain by 2050. The plan is aligned with the 1.5°c stabilization objective of the 2015 Paris Agreement in addressing the climate challenge.

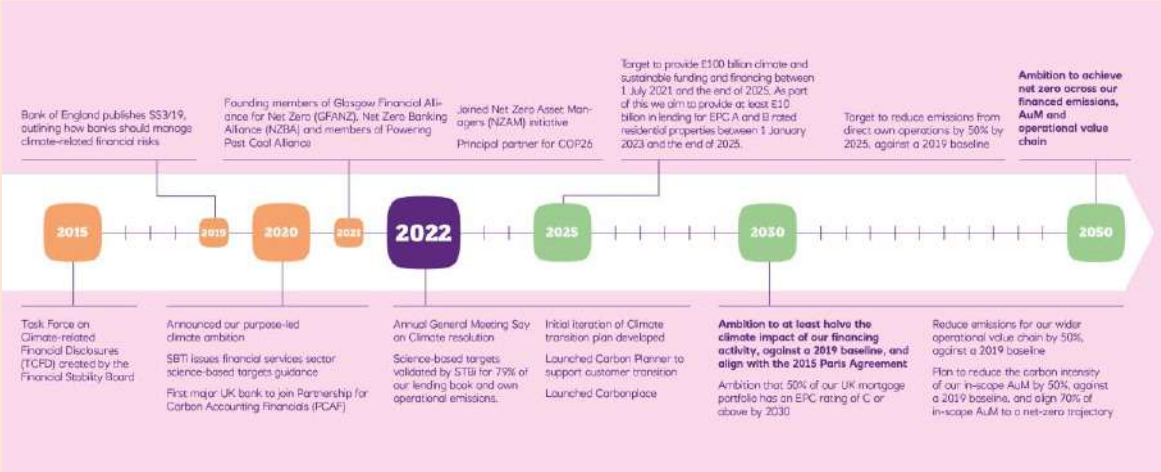


Figure 22: Example of NatWest Group's transition to net zero (NatWest Group, 2023).

GFANZ, Transition Planning Taskforce and TCFD recommendations was used to guide the development of the plan. The table below is an index to relevant climate transition plan content included within NatWest's Climate-related Disclosures Report:

Element	Section
1. Foundation including approach and linkage to strategy	1.1, 1.2, 1.4, 3.1 3.3, 3.4, 3.7, 4.1, 5.4, 5.5.
2. Implementation strategy including financial planning, products, services and business models and external dependencies	2.3, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.2a, 4.3, 5.4, 5.5
3. Engagement strategy including Industry and government, and colleagues	3.2, 3.4, 3.5, 3.7,
4. Metrics and Targets including GHG emissions metrics and targets, financial and business metrics	1.2, 1.3, 1.4, 3.3, 3.4, 3.7, 5.1, 5.2, 5.3, 5.4, 5,5, 5.6, 5.7
5. Governance including Board oversight, roles and responsibilities, incentives and remuneration, and training	2.1, 2.2, 2.3, 2.4, 3.5, 4.3

Figure 23: Climate transition plan content index (NatWest Group, 2023).

Industry Practice 13: Example of Net-zero transition plan with key metrics and targets

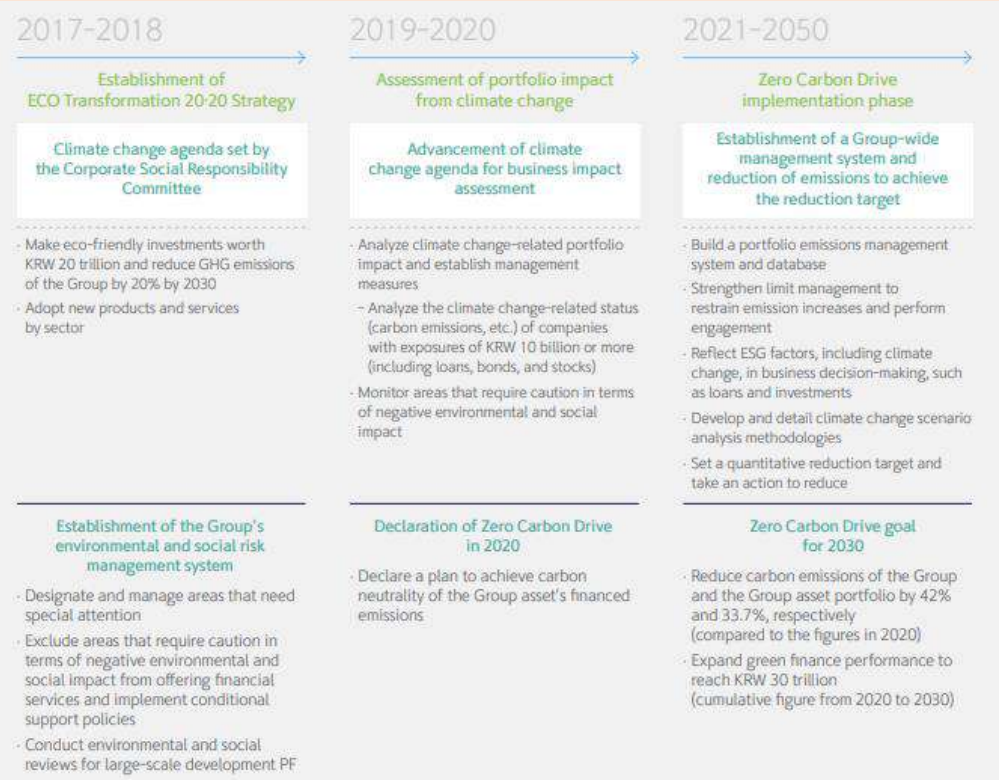


Figure 24: Zero Carbon Drive Roadmap (Shinhan Financial Group, 2021).

In 2021, Shinhan Financial Group declared their "Zero Carbon Drive" strategy, pledging the group's ambition to achieve Net Zero in their financed emissions by 2050, and to provide green (transition) financial support for industries with high emissions to adopt eco-friendly business practices. Their key metrics and targets include:

(1) Metrics and targets for the real economy transition: As part of their Roadmap, the Group developed green finance performance targets of 30 trillion KRW dedicated to investing in new eco-friendly technologies/companies and increasing equity investments in renewable energy.

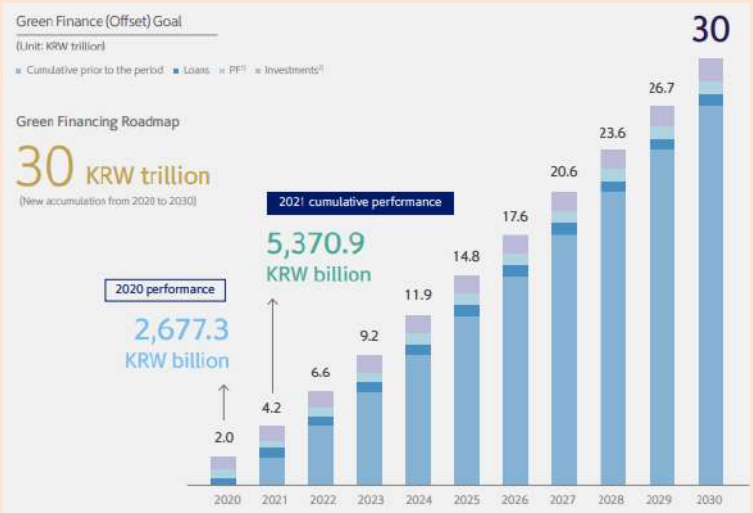


Figure 25: Green finance performance targets (Shinhan Financial Group, 2021).

Industry practice 13: Example of Net-zero transition plan with key metrics and targets (continued)

(1) Metrics and targets for plan execution: Shinhan Bank applies the Equator Principles in the implementation of large-scale development projects and reports on the execution. In 2021, the Bank applies the principles to 5 large-scale project financing cases, considering metrics such as sectors, regions, designation of country, and independent review.

Equator Principles Reporting

	2021			Jan. 2022 – Jun. 2022		
	A	B	C	A	B	C
Sector						
Mining						
Infrastructure	1					
Oil and gas						
Power generation		4				
Others					1	3
Total	**1**	**4**			**1**	**3**
Region						
The Americas						1
Europe / Middle East / Africa		1				
Asia-Pacific	1	3			1	2
Total	**1**	**4**			**1**	**3**

	2021			Jan. 2022 – Jun. 2022		
	A	B	C	A	B	C
Designated Country or Non-designated Country						
Designated Country	1	4			1	3
Non-designated Country						
Total	**1**	**4**			**1**	**3**
Independent Review						
Yes	1					
No		4			1	3
Total	**1**	**4**			**1**	**3**

Figure 26: Plan execution targets (Shinhan Bank, 2022)

(2) Metrics and targets for financed GHG emissions: the Group manages and sets interim and long-term reduction goals to achieve net zero in their financial assets' financed emissions by 2050. In 2021, it established a PCAF-based financed emissions measurement database, becoming the first Korean financial company to set reduction goal and monitor emission figures by year and industry.

Figure 27: Financed emissions reduction goals and targets (Shinhan Financial Group, 2021)

B. Key elements to ensure the credibility of the transition plan

The OECD Guidance on Transition Finance suggests ten elements that constitute a credible transition plan based on emerging industry practices and existing literature. The elements cover aspects such as climate action, sustainability commitments, financial performance, and risk management, enabling both corporate and financial market participants to make informed decisions and contribute to meaningful climate action. The ten elements are as follows (OECD, 2022):

1. **Setting temperature goals, net-zero, and interim targets** in line with the Paris Agreement's global temperature goal. The targets should be based on science and aligned with the IPCC's 1.5°C trajectory. The plan should also consider national policies and relevant Nationally Determined Contributions (NDCs) while prioritizing near-term interim targets for urgent emissions reductions.
2. **Using sectoral pathways, technology roadmaps, and taxonomies**: The plan should utilize available sectoral pathways and technological roadmaps to support net-zero and interim targets. It should clearly define the emissions trajectory and the main technologies used to achieve these goals, explaining how it aligns with national-level frameworks and addresses any discrepancies. Additionally, the plan should outline the future expenditures on required technologies, based on available sustainable, green, or transition taxonomies.
3. **Measuring performance and progress through metrics and KPIs:** The plan should use credible metrics and KPIs to measure performance towards net-zero targets, covering GHG emissions throughout their life cycle, both in absolute terms and intensity-based, including scope 1, 2, and as a rule, 3 emissions. Since reporting scope 3 emissions can be challenging due to data uncertainty, the plan should explain scope 3 emissions coverage and provide a detailed explanation for exclusions to ensure comparability and avoid greenwashing.
4. **Providing clarity on use of carbon credits and offsets:** Given the differing views and standards on the use of carbon credits/offsets, ensuring transparency in the plan is crucial. It should carefully consider the role of carbon credits/offsets and adhere to best practices, including providing explicit descriptions of their use, verification schemes, quality criteria, and a declining share of emissions to be mitigated by offsets over time.
5. **Setting out a strategy, actions, and implementation steps, including on preventing carbon-intensive lock-in**: The plan should set out a clear strategy to achieve targets, assessing transition risks and opportunities in the short-, medium- and long-term, and using multiple climate-related scenarios, whenever feasible, to increase credibility. Concrete actions and capital investments should be outlined, focusing on decarbonization strategies along the value chain.
6. **Addressing adverse impacts through the Do-No-Significant-Harm (DNSH) Principle and RBC due diligence:** Integrating environmental and social objectives alongside climate targets can enhance plan credibility. Although applying the DNSH Principle can also further boost credibility, challenges exist in operationalizing it (e.g., level of application, limited applicability outside the EU, and limited activity and sectoral coverage.) An alternative approach is using OECD Due Diligence Guidance for Responsible Business Conduct (RBC) can be used to comprehensively identify, prevent, and mitigate sustainability risks.
7. **Supporting a just transition:** The plan should consider the impacts on workers, suppliers, local communities, and consumers, aiming for positive gains while mitigating negative effects. It should follow relevant ILO and OECD guidelines for a Just Transition to ensure fair and inclusive processes. Regular stakeholder engagement with representatives of workers, unions, and affected communities should also be part of the plan.

8. **Integration with financial plans and internal coherence:** The plan should be integrated into the organization's business plan, aligned with financial reporting, and address capital and operating expenditures needed for the transition. It should be linked to capital allocation plans, retraining costs, and low-carbon production practices. Additionally, the plan should be linked with purchasing, marketing, policy, and advocacy plans for engagement with suppliers, customers, trade unions, industry associations, and policymakers.
9. **Ensuring sound governance and accountability**: The plan should take a "whole-of-entity" approach, involving all stakeholders and clearly defining responsibilities for monitoring, reporting, and updating progress towards targets regularly. It should include board and senior management approval and oversight.
10. **Transparency and verification, labelling and certification**: The targets, progress, as well as third-party verification of the plan should be regularly disclosed to both internal and external stakeholders. Although there is no international framework for accreditation of verifiers for corporate transition plans, existing initiatives such as from Carbon Disclosure Project (CDP) and Climate Bonds Initiative (CBI) can provide some guidance on the appropriateness of different verifiers.

C. Current practices of transition plan development and usage

NGFS (2023) has taken stock of the practices of developing transition plans among financial institutions. The general reflection from NGFS, as the coalition of central banks and supervisors, is that a transition plan is considered relevant and one of the effective tools for central banks' micro prudential responsibility. It is therefore expected that Transition Plan may become one of the key element central banks are looking for to effectively understand commercial banks' climate-related targets, strategy, and plans in the future.

The key findings from the current practices on climate transition plans are that Transition Plans are given multiple definitions, and used for different purposes, while the key objective, target audience and concerns for the development is highly influenced by corporate disclosure. NGFS also highlights the significance of key differences between 'Transition Plan' and 'Transition Planning'. The latter focuses on the process of development of the plan, which is key to integrate climate related risks in strategy consideration. Moreover, decision-making discussions and data used in transition planning are confidential for strategy development, with limited disclosure on the action transition plan. Therefore, banks should ensure that the process of transition planning is equipped and supported by effective data groundwork and real understanding of E&C risks and exposures. In addition, in current practice transition plans share common elements which central banks can use to assess commercial banks' safety, soundness, and objectives related to financial stability and market integrity (NGFS, 2023).

Additional resources: Transition Planning

To explore more about transition planning, please visit:

- For TCFD's recommendations on transition plan's elements for all sectors: TCFD. (2021). *TCFD Guidance on Metrics, Targets, and Transition Plans*.
- For GFANZ's detailed recommendations on Net Zerto transition planning for financial sector: GFANZ. (2022). *Recommendation and Guidance: Financial institution net-zero transition plans.*
- For OECD's elements of credible corporate transition plans: OECD. (2022). *OECD Guidance on Transition Finance: Ensuring Credibility of Corporate Climate Transition Plans*

4.2) EVALUATION & MONITORING OF IMPLEMENTATION PLANS

This section highlights the importance of monitoring and evaluating the implementation plans in place to transform work processes and financial products and services. Relevant E&C target setting plays key roles both in action plannings and monitoring of E&C risks. This section will touch on the two types of targets: green funding or green product targets, and science-based emission reduction targets. In addition, it discusses the key process for E&C risks to be integrated into the business decisions, which is to set E&C risks within banks' key risk indicators (KRIs), which subsequently reflects on banks' risk appetite framework.

4.2.1) TARGET SETTING

4.2.1a) Standard Practice

Standard Practice: Evaluation and monitoring of effectiveness of implementation plans *(item 3.2.2 (2))*

Financial institutions should put in place an evaluation process to measure the success of implementation plans within the organization's risk appetite framework, including setting **clear target and key performance indicators** for effective assessment and monitoring, such as setting the target on environmentally friendly funding within the specified timeframe or science-based emission reduction targets (BOT, 2023b).

4.2.1b) Key Actions

Key Actions 4.5: Targets and KPIs

Key Item	Short-term Actions	Long-term Actions
4.5.1 Targets and KPIs	N/A	1. Banks set **climate-related targets, and interim targets (short, medium, and long term), which align with the bank's strategy and risk management goals, with results from scenario analysis and stress tests considered.** 2. The KPIs and target **can be quantitative or qualitative**; However, the bank should consider the KPI's suitability to effectively monitor E&C risks and performances. 3. Process for **measuring the progress** on E&C risk management, in line with the KPIs and target.

E&C targets should possess a few key characteristics to effectively drive action. Firstly, they should align with banks' strategy and risk management goals, incorporating climate science and scenario analysis findings. Secondly, they should be linked to defined metrics to monitor progress and enable regular reviews. Targets should also be quantifiable, measurable, and time-bound, with clear definitions of baselines, time horizons, and interim targets. Furthermore, it is important to present them in an understandable and contextualized manner, providing clear language and explanations of limitations. Lastly, targets should be reviewed every five years and reported annually, including updates on new targets and progress made (TCFD, 2021b).

4.2.1c) Recommended Approach

Key definitions: Climate-related targets

A climate-related target refers to a specific level, threshold, quantity, or qualitative goal that the organization wishes to meet over a defined time horizon in order to address its climate-related risks and opportunities. An organization's climate-related targets should inform, and be informed by, its strategy and risk management and be linked to its climate-related metrics (TCFD, 2022b).

Within these practices, there are various types of targets banks have set to accelerate transition to low carbon and managing E&C risks. The key objectives for banks to set these targets are for financing transition needs of clients and counterparties, scaling and developing solutions and technologies for climate mitigation, reducing exposure to carbon-intensive sectors and phasing-out of carbon intensive assets. These targets include (Deloitte, 2022):

1. Phase-out targets (e.g., exit from thermal coal financing by 20XX)
2. Exposure targets (e.g., a percentage of reduction in exposure to a particular type of counterparty by 20XX)
3. Coverage targets (e.g., a percentage of counterparties with a robust transition plan in place by 20XX)
4. Emission reduction targets (e.g., a percentage reduction in a loan book's emission intensity by 20XX)
5. Financing targets (e.g., an amount of sustainable finance deployed by 20XX)

The following section discusses E&C targets mentioned in the Standard Practices and examples of target setting and tracking in current practices.

A. Sustainable finance targets in the banking industry often include specific percentage targets for funding within a defined timeframe. Examples include targets for financing renewable energy, green buildings and infrastructure, and low-carbon transportation. Key performance indicators (KPIs) can be used to track progress, such as the amount of funding allocated to sustainable projects, reduction in greenhouse gas emissions, the number of renewable energy installations, or square footage of green buildings financed. These targets and KPIs may vary between banks based on their respective sustainability strategies and market focus. The overall goal is to promote sustainable finance practices and support the transition to a low-carbon economy.

Industry Practice 14: Examples of sustainable finance targets

HSBC aims to provide and facilitate between $750bn and $1tn of sustainable finance and investment by 2030, as part of the wider commitment to align its financed emissions to net-zero by 2050 or sooner. HSBC's sustainable finance and investment activities falls within three categories of initiatives, including: sustainable finance, sustainable infrastructure, and sustainable investment. These products are in line with internationally recognized frameworks such as the ICMA Green and Social Bond Principles, ICMA Sustainability Bond Guidelines, and the LMA Green Loan Principles. HSBC also monitors developments in taxonomies and changing market guidelines in relation to this (HSBC, 2022b).

Figure 28: Sustainable finance and investment (HSBC, 2022).

B. Science-based targets in the banking industry: the UNEP FI's *guidelines for Climate Target Setting for Banks* suggests that banks shall set intermediate targets, which should include a 2030 target (or earlier), while long-term targets should include a 2050 target. Banks should use widely accepted science-based decarbonization scenarios when setting these targets, which should encompass banks' lending and investment activities (i.e., scope 3 category 15), including their clients' scope 1, scope 2, and scope 3 emissions, where significant and data availability allows.

Common steps in setting banks' science-based targets (UNEP FI, 2022):

1) Determine the bank's financed emissions profile and establish the baseline.
2) Identify material and carbon-intensive sectors to prioritize within the bank's total financed emissions.
3) Select the approaches for target setting, with the emissions-based targets at a sector level being the most used and preferred method at present.
4) Identify appropriate climate scenario(s) to use, such as those from the International Energy Agency (IEA), the Intergovernmental Panel on Climate Change (IPCC), and the Network for Greening the Financial System (NGFS).
5) Calculate the degree of alignment to assess the gap between the bank's projected portfolio in comparison to a chosen climate scenario.
6) Formulate intermediate sector targets for the bank's portfolio in the short term (typically by 2030 or sooner). These targets should include both absolute and intensity targets.

Industry Practice 15: Example of emission-based sector target setting

DBS has included seven sectors in setting emissions reduction targets including power, oil & gas, automotive, steel, aviation, real estate, and shipping and has set data coverage targets for the food & agribusiness and chemicals sectors for future decarbonization roadmaps. The bank has established three sets of targets for the select sectors: 1) Emissions intensity reduction targets; 2) Absolute emissions reduction targets; and 3) Data coverage targets.

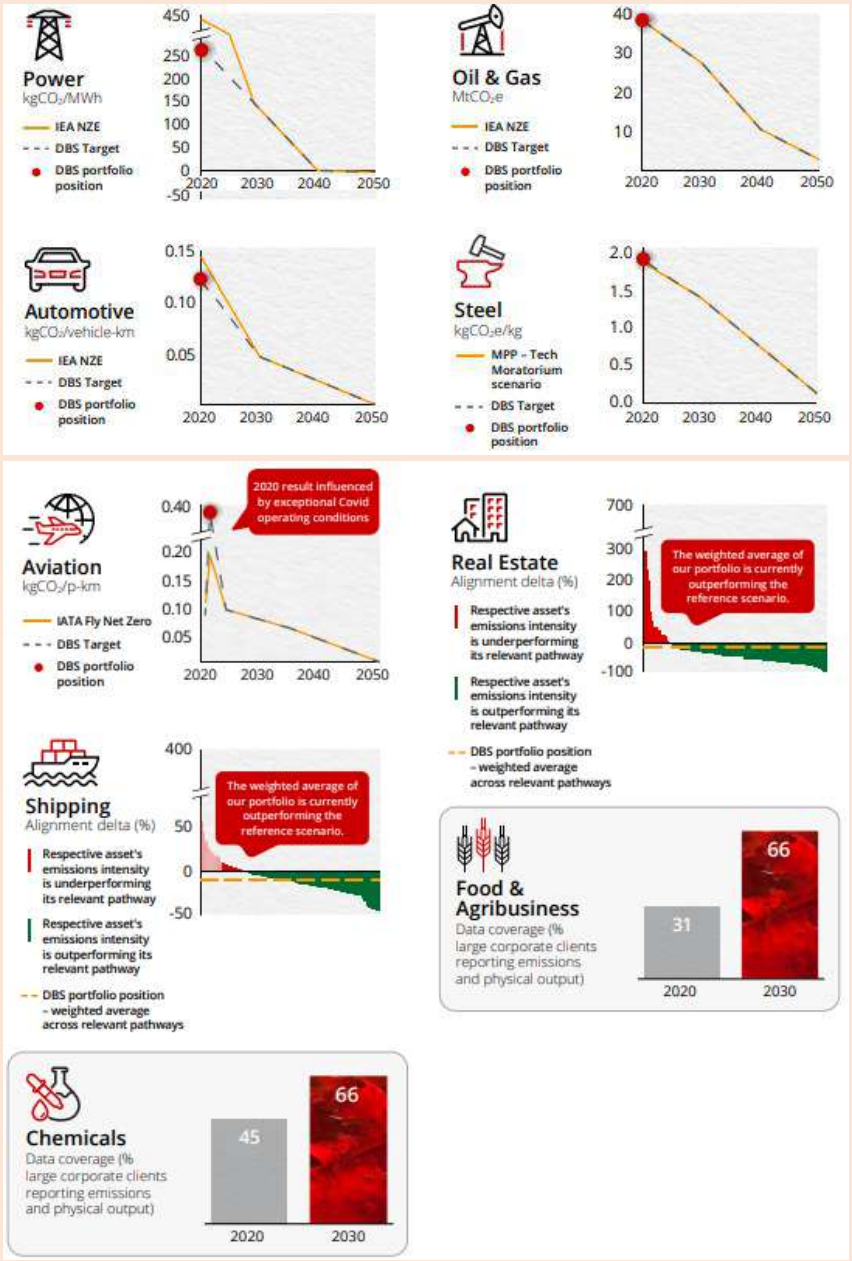


Figure 29: Example of emission-based sector target setting by DBS (DBS Bank, n.d.).

Additional resources: E&C target Setting for Banking Industry

To explore more about E&C target setting for the banking Industry, please visit the target setting guidelines for various purposes issued by the Principle for Responsible Banking (UNEP FI):

- UNEP FI. (2021b). *Guidelines for climate target setting for banks*.
- UNEP FI. (2022). *Foundations of climate mitigation target setting*.
- UNEP FI. (2022b). *Guidelines for climate target setting - Supporting notes*.

To explore science-based target setting, SBTi has issued various guides for financial institutions' target setting, including:

- Guidance and criteria for financial institutions to set Science-based Targets – SBTi. (2022). *Financial Sector Science-based targets guidance*
- For the guide on net-zero target setting in line with SBTi for financial institutions, as of July 2023, the draft guidance is in the process of public consultation. Banks can follow the development at SBTi's *Net-Zero for Financial Institutions* webpage

4.2.2) SETTING KEY RISK INDICATORS IN THE RISK APPETITE

4.2.2a) Standard Practice

Standard Practice: Evaluation and monitoring of effectiveness of implementation plans *(item 3.2.2 (2))*

Financial institutions should put in place an evaluation process to measure the success of implementation plans within the organization's risk appetite framework, including setting clear target and **key performance indicators** for effective assessment and monitoring, such as setting the target on environmentally friendly funding within the specified timeframe or science-based emission reduction targets (BOT, 2023b).

4.2.2b) Key Actions

Key Actions 4.6: Risk Appetite

Key Item	Short-term Actions	Long-term Actions
4.6.1 Risk Appetite	N/A	1. BoD and SM should **define E&C risks in the risk appetite framework.** 2. Banks should include current and forward-looking E&C risks on **the bank's risk appetite statement.** Banks should **set threshold or limit for activities related to E&C risks,** such as E&C risk concentration threshold by sector or geography. 3. Banks are expected to **incorporate portfolio performance-related metrics, particularly financed emissions, that align with the bank's transition plan, into their risk appetite framework.** 4. Define **clear escalation process when limits are breached and embed E&C KRIs** in regular monitoring process.

Banks are increasingly incorporating granular and forward-looking E&C key risk indicators (KRIs) into their risk appetite frameworks (RAFs). This is in line with the ECB's good practices guidelines, which recommend that banks **define clear escalation arrangements when limits are breached and embed E&C KRIs in their regular monitoring processes** (ECB, 2022).

By tracking these KRIs, banks can get a better understanding of the risks posed by climate change and take steps to mitigate these risks. This can help to ensure that the bank's risk appetite is aligned with its E&C risk objectives.

4.2.2c) Recommended Approach

After the materiality assessment has been performed, the target monitoring tools (i.e., key performance indicators ("KPIs")) and the portfolio allocation (i.e., key risk indicators ("KRIs")) on E&C risk are implemented (ECB, 2022). KRIs help ensure that the appropriate and timely action is taken to address E&C risks.

For instance, the translation of its portfolio alignment metrics and target may be converted into key risk indicators. The KRIs can be used for measuring the intensity emission that banks have exposure to within certain sectors. If the level of intensity emission exceeds the target, the KRIs are triggered. Examples of quantitative KRIs that banks can use to assess their exposure to E&C risks are as follows:

- **Indicator type: Quantitative limit at sectoral level** – e.g., the percentage of the bank's loan portfolio that is exposed to sectors that are highly exposed to climate change, such as the energy sector.
- **Indicator type: Financed emission** – e.g., the average carbon intensity of the bank's loan portfolio.
- **Indicator type: Portfolio (mis)alignment** – e.g., thresholds for misalignment along transition trajectory

The risk appetite framework can also be used to monitor the intermediate portfolio alignment targets. Under the risk appetite framework, the quantitative exposure limit is establishing an exposure reduction path to the target date (see more details on the risk appetite section in Chapter 5).

Industry Practice 16: Performance-related metrics in the risk appetite

Hang Seng Bank has incorporated **metrics** related to their high transition risk sectors in their wholesale portfolio and physical risk exposures in their retail portfolio into the initial risk appetite.

Hang Seng Bank's **risk appetite** "supports the oversight and management of the financial and non-financial risks from climate change, meets regulatory expectations and supports the business to deliver our climate ambition in a safe and sustainable way", in which they are transparent in acknowledging that the appropriate metrics are to be developed, with regular review of their risk appetite (Hang Seng Bank, 2022).

4.3) SUPPORTING THE ECONOMIC TRANSITION THROUGH PRODUCT DEVELOPMENT AND CLIENT ENGAGEMENT STRATEGY

4.3a) Standard Practice

Standard Practice: E&C product and service offerings *(item 3.2.2 (3))*

Financial institutions should support the economic transition towards environmental sustainability by providing advice to **raise awareness and financial products and services that create incentives for clients or counterparties to change their business practices** to be more environmentally friendly. This includes green bonds, sustainability bonds, green loans, and sustainability-linked loans that support appropriate business transition. These products and services should be in line with accepted Green Taxonomies, such as the ASEAN Taxonomy for Sustainable Finance or Thailand Taxonomy. Furthermore, the involvement of experts in the issuance and verification processes is recommended to prevent potential Greenwashing (BOT, 2023b).

4.3b) Key Actions

Key Actions 4.74: E&C product and service offerings

Key Item	Short-term Actions	Long-term Actions
4.7.1 Client engagement and awareness	1. Clearly **defined engagement and communication strategy** with clients to promote Green financial products and services, and to understand transition strategy should the bank's clients have started to develop transition plan.	N/A
4.7.2 Counterparty engagement	N/A	1. **Screen counterparties based on their E&C impacts and performances** and inquire counterparty to manage E&C risks or to set up implementation plan.
4.7.3 Green product frameworks	N/A	1. **Issued green/sustainable finance product framework**, in line with accepted international standards (ICMA, LMA)

Another practice guidance outlined by the Bank of Thailand under the strategy section is for banks to drive the transition of the economy towards environmental sustainability through their financing activities. It is expected that banks will **introduce products and services that actively encourage and tangibly support clients in their transition efforts.** This section emphasizes raising awareness and supporting clients' decarbonization journey, through product and service offerings and client engagements to shift their business practices to align with a transition to the low carbon economy.

4.3c) Recommended Approach

A. Client engagement

In order for banks to effectively drive transition efforts, it is imperative that they engage clients, especially starting with large corporate clients, in meaningful conversations about their decarbonization plans and

associated financing needs. Recognizing that banks' relationship managers may not possess climate-specific expertise, it also becomes crucial to equip and empower client-facing professionals with the necessary knowledge.

While there is no single definition of client engagement regarding climate and transition plan dialogues in the banking industry, existing literature offers guidance on how relationship managers can frame client conversations, gain deeper insights into clients' business and financing needs, and establish the groundwork for stronger strategic partnerships with clients.

As a start, GFANZ has provided the key components to consider in structuring bank-client engagement approach, which include (GFANZ, 2022b):

- Establish clear objectives: the desired outputs or results from clients
- Set timeframe of engagement: length, deadlines, milestones to indicate progress
- Decide on the coverage: extent of the engagement (e.g., percentage of the portfolio) and where to prioritize (e.g., areas with greatest influence potential or highest emissions)
- Define methods/forms of engagement: such as periodic meetings, letters, conferences, educational materials, and other considerations including levers available to the banks (e.g., side letters, insurance contracts)

In 2021, The University of Cambridge Institute for Sustainability Leadership (CISL) and members of the Banking Environment Initiative have published the guide to Bank-client engagement, which aims to equip banks and relationship managers to have strategic conversations with clients about their decarbonization plans and transition activities.

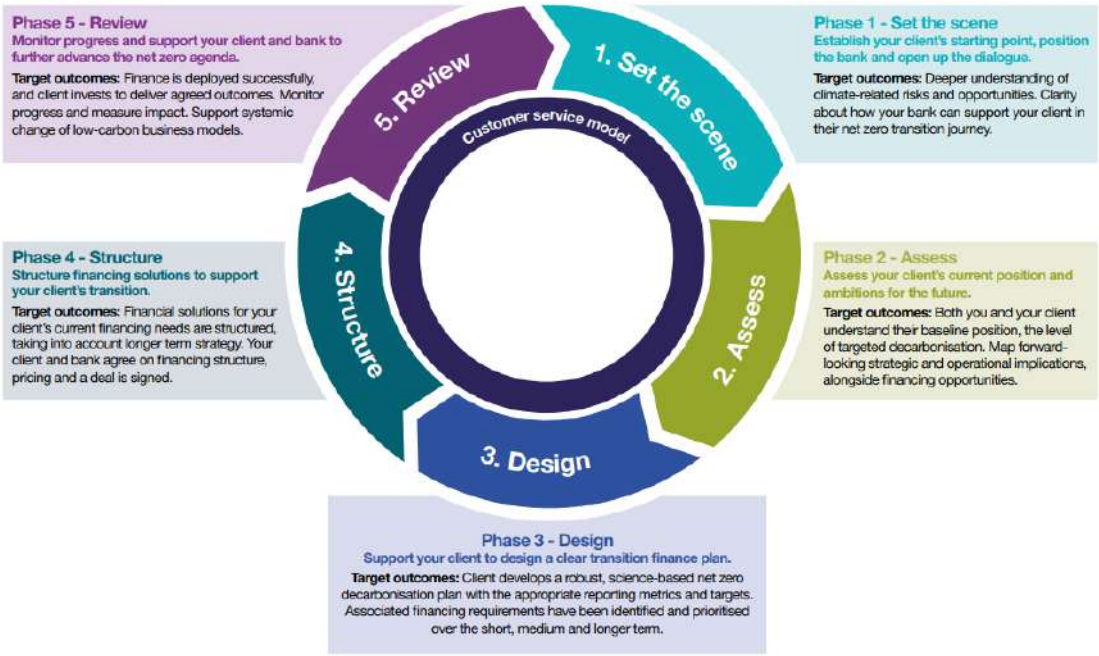


Figure 30: five-phase approach to bank-client engagement (CISL, 2022).

According to the CISL, the key influence to lead clients towards a transition to the low carbon economy is to reshape the client relationships through dialogues, engagements, and product and services offerings. The Guide provides five key phases, along with potential questions to facilitate client's data collection, and targeted outcomes to influence changes among banking clients, as follows (CISL, 2021 and CISL, 2022):

Phase	Potential questions to facilitate client's data collection	Target outcome
1. Set the scene: Establish the client's starting point, position the bank, and open up the dialogue	▪ Does your organisation have a climate action strategy outlining climate-related risks and opportunities? ▪ How connected are the finance team to the management's climate-related strategy, risk, planning and implementation? ▪ What team should we engage with to further assess your decarbonisation strategy and financing needs?	Deeper understanding of E&C risks and opportunities. Clarity about how banks can support your client in their net zero transition journey.
2. Assess: Assess your client's current position and ambitions for the future	▪ Have you determined the current/potential climate-related impacts on your business strategy and financial planning across the short, medium, and long terms? ▪ What emissions measurement capabilities (scope 1, 2 and 3) does your company have or is considering? ▪ Does the company have clear short, medium, and long-term targets in place? And how do you measure progress towards the targets?	Both the bank and client understand baseline position, the level of targeted decarbonization. Map forward-looking strategic and operational implications, alongside financing opportunities thought: 1. Data collection – standardized criteria for E&C data to expect insights from client's E&C data analysis 2. Assessment of baseline positions – through data leveraged by client-facing staff (e.g., relationship managers) 3. Evaluation of forward-looking plans – utilizing scenario analysis for planning of financing products for different time horizon
3. Design: Support the bank's client to design and clear transition finance plan	▪ What data infrastructure do you need to facilitate efficient business decisions towards KPI achievement?	Client develops a robust, science-based net zero decarbonization plan with the appropriate reporting metrics and targets. Associated financing requirements have been identified and prioritized over the short, medium, and longer term.
4. Structure: Structure financing solutions to support your client's transition	▪ Does your company require additional financing facilities? What changes (e.g., refinancing) could we assist you with to facilitate suitable financing for your decarbonization/transition needs?	Financial solutions for your client's current financing needs are structured, taking into account longer term strategies. The bank and client agree on financing structure, pricing and a deal is signed.
5. Review: Monitor progress and support the bank and its client to further advance the net zero agenda	▪ Is there anything else your company requires to enhance the monitoring and reporting of climate data? ▪ What further information would it be helpful for us to provide in terms of insights and updates?	Finance is deployed successfully, and the client invests to deliver agreed outcomes. Monitor progress and measure impact. Support systemic change of low-carbon business models

It is important to note that available client engagement guidelines should be tailored to correspond with the starting positions of individual banks and their respective clients. This implies that engagement approach should be an iterative process and should vary depending on (CISL, 2021):

- The bank's structure, strategy and business models, markets, capabilities, and product offerings.
- The client's sector, size, geographical footprint, availability of their decarbonization plan and/or activities, and the extent of their efforts in the decarbonization journey.
- The dynamic between the bank and clients, including the strength of the relationship and the common understanding of climate-related risks and opportunities.

B. Green / sustainable finance product frameworks

Benefits to banks in introducing green / sustainable finance product framework: The development of sustainable/transition finance products not only benefits the overall well-being of the economy but also offers several advantages for banks as outlined below:

Advantages to banks	Description
Enhanced data availability and verification	Banks can better collect and analyze data on clients' sustainability performance and progress, ensuring the reliability and accuracy of the reported data and enhancing transparency in the financial sector.
Increased awareness and access to green capital for clients	Banks' awareness-raising efforts make clients more attractive to green capital providers, increasing future financing opportunities aligned with E&C objectives.
Contribution to banks' own risk management practices	Banks can better assess and manage E&C risks associated with loan portfolios and investments, strengthening resilience and long-term sustainability
Fostering a systemic change within banks	Integrating E&C considerations into the bank's core operations, culture, and decision-making processes creates a transformative shift towards a proactive and sustainable mindset across the organization

Green / Sustainable finance product instruments: Banks can introduce a variety of green and sustainable finance products that promote environmental sustainability and incentivize clients in their transition journey. The table below provides a summary of green and sustainable finance product instruments, along with definitions and relevant guidelines from the International Capital Market Association (ICMA) and the Loan Market Association (LMA).

Instruments	Description	Proceeds	Standards
Green Bond	Green bonds are bond instruments where the proceeds exclusively applied to finance or re-finance eligible green projects, whether they are new and/or existing.	Green	ICMA. (2021). Green Bond Principles (GBP)

Instruments	Description	Proceeds	Standards
Sustainability Bonds	Sustainability bonds are bond instruments where the proceeds are utilized exclusively to finance or refinance a combination of both Green and Social Projects.	Green & Social	ICMA. (2021b). Green Bond Principles (GBP)
Social Bonds	Social bonds are bond instrument in which the proceeds are dedicated to financing or refinancing in part of or in full new and/or existing eligible social projects.	Social	ICMA. (2023a). Social Bond Principles (SBP)
Green Loan	Green loans are loan instruments specifically provided for the purpose of financing or refinancing eligible projects, whether they are new or existing.	Green	LMA. (2018). Green Loan Principles (GLP)
Sustainability-Linked Bond	Sustainability-linked bonds refer to bond instruments that can have flexible financial and/or structural characteristics based on whether the issuer achieve predefined sustainability/ESG objectives.	Not specified. Proceeds can be used for general purposes in pursuit of identified SPTs (Sustainability Performance Targets)-	ICMA. (2023c). Sustainability-Linked Bond Principles (SLBP)
Sustainability-Linked Loan	Sustainability-linked loans aim to facilitate and support environmental and social projects.		LMA. (2019). Sustainability Linked Loan Principles (SLLP)

Additional resources: Product and client engagement strategy

To explore more about client engagement strategy for banks, please visit:

- To explore the overview of the steps to engage with banking clients on climate change and influence changes to benefit portfolio E&C risk management and economic transition – Cambridge Institute for Sustainability Leadership (CISL). (2021). *Let's Discuss Climate: the essential guide to bank-client engagement*.
- To explore in detail the process of assessing banking clients to ensure solid understanding of client's current position and for forward-looking analysis in portfolio – Cambridge Institute for Sustainability Leadership (CISL) and UNEP FI. (2022). *Leadership strategies for client engagement: Advancing climate-related assessments*.

Industry Practice 17: Client engagement strategy

The Energy Transformation Strategy Project Team (Ex Strategy PT) was established by the Japanese Corporate & Investment Banking Business Group to explore how the financial sector can support customers' energy transformation. As part of this, MUFG holds monthly meetings with approximately 3000 employees from the sales division to engage with customers, industry associations, and government agencies to develop strategies on energy transformation.

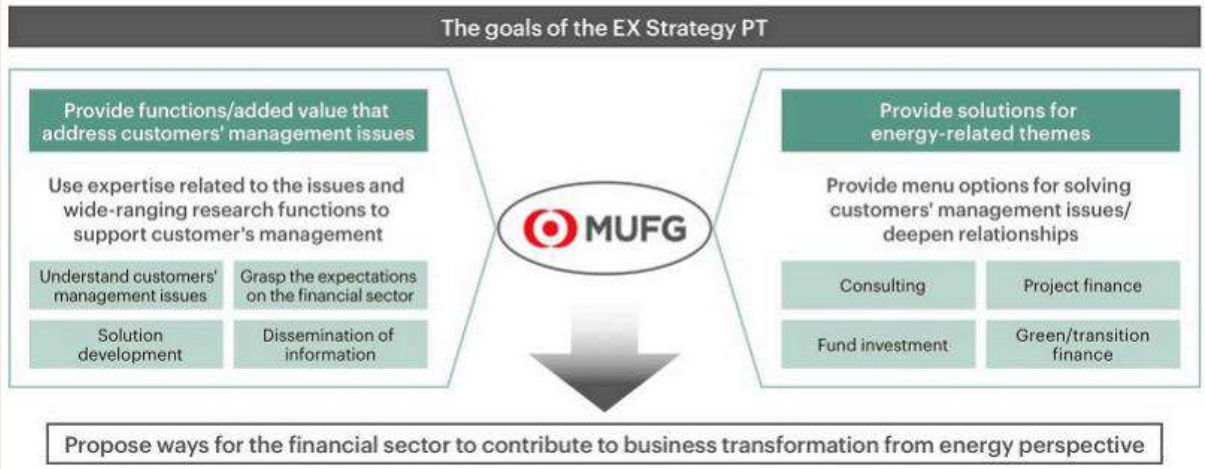


Figure 31: Energy Transformation Strategy Project Team (MUFG, 2022).

Additionally, MUFG supports customers on their decarbonization efforts through the provision of diverse solutions such as GHG emission measurement, TCFD consulting services, deployment of overseas carbon credits to Japanese companies, as well as financial support. In terms of financing, MUFG continues to upgrade sustainable finance products to support customers' decarbonization efforts. In 2021, MUFG engaged in dialogue with approximately 550 domestic and foreign clients on the status of their sustainability and decarbonization initiatives and the solutions provided by MUFG.

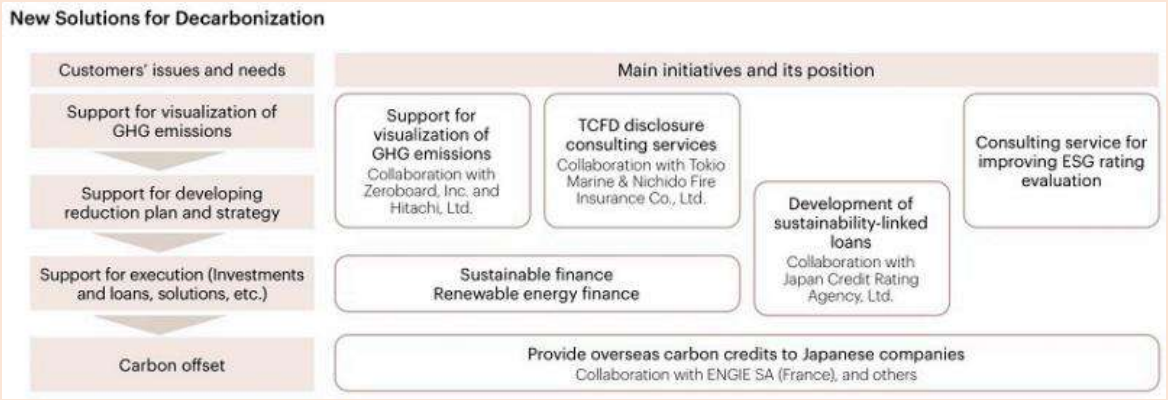


Figure 32: New Solutions for Decarbonization (MUFG, 2022).

4.4) ENSURING ALIGNMENT WITH TAXONOMIES AND PREVENTION OF GREENWASHING

In addition to engaging with clients to increase their awareness of E&C impacts during their environmentally sustainable journey, banks can also support on their low-carbon transition by providing financial products and services that are specifically designed to "create incentives for clients and counterparties to change their business practices to be more environmentally friendly" (BOT, 2023b). Green products and services and the need for alignment with accepted taxonomies, and their contributions to the prevention of greenwashing is detailed within this section.

4.4a) Standard Practice

Standard Practice: Ensuring alignment with accepted green taxonomies for E&C product and service offerings *(item 3.2.2 (3))*

Financial institutions should support the economic transition towards environmental sustainability by providing advice to raise awareness and financial products and services that create incentives for clients or counterparties to change their business practices to be more environmentally friendly. This includes green bonds, sustainability bonds, green loans, and sustainability-linked loans that support appropriate business transition. These products and services should be **in line with accepted Green Taxonomies**, such as the **ASEAN Taxonomy** for Sustainable Finance or **Thailand Taxonomy**. Furthermore, the involvement of experts in the issuance and verification processes is recommended to **prevent potential greenwashing** (BOT, 2023b).

4.4b) Key Actions

Key Actions 4.85: Alignment with taxonomies

Key Item	Short-term Actions	Long-term Actions
4.8.1 Alignment with taxonomies	**1. Sustainable / Green finance framework sets clear alignment with accepted taxonomy (e.g., Thailand taxonomy, ASEAN taxonomy) and consider the use of external verification parties** to ensure that the bank's financial product and investments do not contribute to greenwashing.	N/A

Green financial products and services may include green bonds, sustainability bonds and green loans; of which the use of proceeds should be aligned with accepted Green Taxonomies. Examples of acceptable Green Taxonomies include the ASEAN Taxonomy for Sustainable Finance and the Thailand Taxonomy. **Taxonomy-aligned means that the products issued will be in accordance with environmental standard and hold more integrity and will thus help to prevent potential greenwashing.**

Banks can utilize the taxonomy and ensure project or activity alignment by (UNEP FI, 2021):

1. **Categorizing the proceeds of a transaction** – either through:
   a. Defining the use of proceeds of the loan or credit facility that will be used for specific purposes or;
   b. Classifying exposure on the basis of clients' business activities in the case where general-purpose facilities cannot be attributed to a specific asset or purpose.

2. **Checking the alignment of the activity against the taxonomy** – this includes identifying if the funds are intended for activities that are "green" (1.5°C aligned) or "amber" (activities with a transition pathway) and to what extent. Benchmarking with the technical screening criteria in the taxonomy will promote standardized classification across the industry, as well as prevent the risk of greenwashing.

Additional resources: Examples of acceptable Green Taxonomies and its usability guide

To explore more about acceptable Green Taxonomies in the region, please visit:

- For the latest (2nd) version of the ASEAN Taxonomy – ASEAN Taxonomy Board. (2023). *ASEAN Taxonomy for Sustainable Finance (Version 2)*.
- For the latest publication of Thailand Taxonomy – Bank of Thailand. (2023). *Thailand Taxonomy Phase 1*
  - Usability Guideline for Thailand Taxonomy – Bank of Thailand. (2023). *Thailand Taxonomy Guideline*
  - Business Guide, Case Studies and FAQ – Bank of Thailand. (2023). *Thailand Taxonomy Business User Guide FAQ*

Greenwashing risks can be an eminent concern when issuing green and sustainable products and services, especially with tighter regulatory requirements and clearly developed identification of green activities. Banks will need to take a proactive management approach to avoid greenwashing, which could have major impacts on their financial and reputational risks, including through (Dawson & Staight, 2023):

- **Loss of shareholder trust**: exaggerated or false green credentials of products can result in accusations of irresponsibility and poor management from shareholders.
- **Competitive disadvantage**: As third parties can pass through greenwashing risks to an entity that they support, accusations of a bank's greenwashing practices could indirectly affect the bank's clients, particularly large institutional clients with a strong concern for societal issues such as climate change. Clients need to be reassured in banks' management of their own greenwashing risks.
- **Liability claims**: as regulatory requirements evolve; banks may be subject to litigation over reports on misleading green credentials on green products and services in the near future.

Banks that are facilitating the issuance of green products and services must review their existing risk architecture to ensure they are identifying, assessing, and managing the risk of greenwashing. Banks need a cross-cutting approach that can promptly respond to regulatory developments and effectively manage the risks associated with green products and services (Dawson & Staight, 2023):

Adapting firms' risk architecture to address risks of greenwashing

- **Identifying new risks**: banks should assess whether the design of existing controls appropriately consider greenwashing risk and whether there are any risks not considered by traditional controls.
- **Integrating new risks**: banks should integrate new risks into existing risk taxonomies or architectures.
- **Third parties**: banks must consider the risks related to the reliability and accuracy of third-party data (e.g., through establishing in-house expertise).

4.4c) Recommended Approach

Greenwashing in product lifecycle

Whilst there are existing definitions and a common high-level understanding of greenwashing, there is still a need for clear definitions and methodologies. The European Supervisory Authorities have identified key characteristics for further clarification on the potential scope of greenwashing, of which it can be a result of (EBA, 2023):

- Misleading communications due to the omission of information or actual provision of information that is false, deceives or is likely to deceive stakeholders
- Result of misconduct which may lead to misleading actions
- Intentional or unintentional spread of misleading claims

It may occur (EBA, 2023):

- In relation to the application of specific disclosures required by a bank's relevant regulatory framework or supervisory authority
- At different stages of the business cycle of financial products or services or of the sustainable finance value chain

There should be clear lines of responsibility regarding product management along the lifecycle to minimize the risk of greenwashing. The most likely stages within a product's lifecycle where greenwashing could occur is estimated to be in the product delivery stages, which includes (EBA, 2023):

- Marketing (advertisements, non-regulatory information)
- Sales: information asymmetry (under or over emphasis of certain product features)
- Mis-selling due to misleading information/disclosure

Industry Practice 18: Examples of greenwashing most relevant in the context of banking activities

The European Banking Authority illustrates how greenwashing can happen in the context of banking activities, covering the overall spectrum of banking businesses. Greenwashing can occur at product, service, and financial instrument level, as well as at entity level (EBA, 2023).

		Retail banking	Corporate banking	Investments services	Payment services	Own funds, funding, and liquidity management
1. Misleading statements on the current sustainability characteristics	*misleading claims in regulatory disclosure*	- Misleading disclosures on EU taxonomy alignment (GAR) of mortgages and car portfolios	- Misleading disclosure of EU taxonomy alignment (GAR) of loans to NFCs	- Misleading product classification of financial products (funds, managed portfolio) under article 8 and article 9 of the SFDR.		
	other misleading statements	- Green retail loans and mortgages that are not used to finance goods, products, activities or properties which qualify as (fully) green. - Misleading reference to green loans standards and /or label. - Linking credit card purchases to unproven sustainability-related benefits such as "for each substantial amount X spent on purchases with your credit card, a tree will be planted in developing country Y". - Saving products labelled as green but the institution does not clearly commit on the extent to which the savings collected will be used to finance sustainable projects.	- Sustainable or sustainability linked financing to activities (commercial real estate, CAPEX) and/or entities which do not qualify as (fully) sustainable.	- False or inaccurate statement on the extent to which the service (e.g., portfolio advice or investment) considers clients' sustainability preferences. - Investment fund marketed as green, but the green related considerations are not significant in the manager's investment decision. - Investment fund portrayed as sustainable without providing any actual information about its sustainability. - Investment fund portrayed as sustainable while financing directly or indirectly dubious activities or countries (under violation of international law). - Showcasing the syndication activities around sustainable bonds without mentioning the syndication of securities from fossil-heavy companies, while the latter is much more material in terms of volumes.	- Misleading commitment by a payment service provider to compensate carbon emissions produced by crypto currency by purchasing carbon offsets.	- Marketing stocks and bonds as sustainable or green without ensuring they will be used for such purposes (no (fully) green use of proceeds and/or/ (no fully) green collaterals) - Misleading references to ESG bond label - -Inaccurate ESG rating of the instrument.
2. Misleading statements on the sustainability results and/ or 'real world' impact	*misleading claims in regulatory disclosure*			- Incorrect statements on product results under article 11 of the SFDR		
	other misleading statements	-Unsubstantiated (e.g., without being supported by sufficient evidence) claim that ascertains that a green loan/ investment (e.g., in energy improvement) will allow the customer to reduce for example home energy consumption by X.	- Sustainability linked loans presented as having real world impact while their structure does not necessarily allow it and/or with low quality of contractual commitments (e.g., step-up where borrowing companies get a discount if they hit their targets but no penalty if they do not). - 'Unsubstantiated claims on the impact of investments to corporates, like Potentially Avoided Emissions.	- A fund claiming to have a strategy to invest in companies contributing to 'positive environmental impact' but i) which includes no information on how this positive environmental impact is measured or ii) which invests in companies that are not green but just 'better than benchmarks'. - Misuse of the term, 'impact investing'.		- Sustainability linked bonds of which KPIs account for only a tiny portion of CO2 emissions of the issuer or where the KPI relates to something the issuers would achieve anyway. - Ambiguity between the 'use of proceeds' earmarked for green purposes by the bond issuer and the actual financing of the activities suggesting that the instrument leads to additional investment in the earmarked green activities (while the proceeds are used to refinance existing assets).
3. Misleading statements on future sustainability commitments	*misleading claims in regulatory disclosure*					
	other misleading statements	- Institutions making public commitments to reduce scope 3 emissions and/or reach net zero emissions for a given retail portfolio (e.g., mortgages, car loans) but transition plan is not credible	- Institutions making public commitments to reduce scope 3 emissions and/or reach net zero emissions on their exposures to the energy sector / manufacturer but transition plan is not credible.	- Institutions making public commitments to reduce scope 3 emissions and/or reach net zero emissions for its funds/assets under management but transition plan is not credible.	- Crypto-assets providers making a public statement to move to an eco-friendlier method of settling transitions (which will require less energy consumption) but technology is not yet advanced to support the transition.	- Misleading claims on how climate considerations are integrated into funding plans (i.e., capital allocation and financing decision). - Misleading claims on how the proceeds from stocks and bonds marketed as sustainable or green feed into the transition plans of the entity as a whole.

Figure 33: Greenwashing examples at product, service, and financial instrument level (EBA, 2023).

A. Uses of green taxonomies and Second Party Opinion

Banks should also involve experts in the issuance and verification process to further prevent the issuance of misleading products and services. In this light, the use of Second Party Opinion is encouraged for risk-adjusted sustainability products; sustainability-linked loans and bonds.

The Second Party Opinion (SPO) is an independent, point-in-time analysis of a sustainable finance instrument, program, or framework, which provides additional transparency to investors seeking to understand and act upon potential contributions to a sustainable future. With the use of a SPO, banks can benefit from the following list of use case (S&P Global, 2023):

- Demonstrate to stakeholders that the banks' sustainability objectives are aligned to relevant market principles (such as ICMA, LMA, Green Taxonomies)
- Obtain an independent opinion that delivers the transparency and accuracy sought by investors and lenders
- Align the use of proceeds to the UN Sustainable Development Goals
- Navigate access to both the public and private sustainable debt markets
- Acquire unbiased, research-based evaluations of green financing frameworks, firmly grounded in climate science to determine their environmental viability

Taxonomy can be considered as a benchmarking tool in determining eligibility for projects and to help direct capital flows towards sustainable economic activities. With the development of taxonomy as the reference of green economic activities in respective economies, ensuring alignment of banks' products and services has direct contributions to directing transition and green products to funding projects and activities in line with the national decarbonization pathway.

Industry Practice 19: Responding to Green Taxonomy Developments

Shinhan Financial Group established the "K-Taxonomy Task Force" to respond to the Korean green classification system (K-Taxonomy) that was announced in December 2021. The K-Taxonomy is to be used as guidelines only for "green bonds" in the short term, in which a pilot project will be executed.

The scope will subsequently be increased to include green loans, green funds, and green project financing, as well as applied to overall disclosures of financial institutions and companies. The K-Taxonomy Task Force is an ad hoc network of all Group subsidiaries to respond to the taxonomy, ease risks that may arise from this adoption, and proactively identify business opportunities in green finance (Shinhan Financial Group, 2021).

B. Considerations for greenwashing controls

- **Enhance the review and approval process for financial promotions**: banks will need a robust review and approval process to ensure all sustainability-related communications are clear and consistent with the sustainability profile of the product or service.
- **Improving entity-level data architecture**: banks should consider the importance of reviewing and enhancing their product and entity-level data architecture to assess data lineage and traceability of sustainability-linked products, which includes supporting timely and accurate reporting requirements for data that feeds into Key Performance Indicators.
- **Clear lines of responsibility for product management along lifecycle**: clear definition of responsibilities will facilitate effective monitoring of product distribution.
- **Training requirements**: banks should consider the need for in-house training or capabilities to adequately respond to greenwashing challenges.
- **Alignment between business line and corporate level reporting**: banks should consider the management information (MI) and controls in place around their product, business line, and legal entity levels of ESG reporting that would feed into their disclosures.

Industry Practice 20: Greenwashing as an emerging risk

HSBC considers greenwashing to be an important emerging risk, which is reflected in their climate risk approach as well as first and second lines of defense.

Climate risk – thematic risk drivers		Details
Greenwashing	**Firm**	Failure to be accurate and transparent in communicating our progress against our net zero ambition
	Product	Not taking steps to ensure our 'green' and 'sustainable' products are developed and marketed appropriately
	Client	Failing to check our products are being used for 'green' and 'sustainable' business activity and assessing the credibility of our customers' climate commitments and/or progress against key performance indicators

Figure 34: Consideration of greenwashing as part of E&C risk (HSBC, 2022).

Industry Practice 21: Prevention of greenwashing through internal taxonomy

Santander has developed their own **internal taxonomy**, the Sustainable Finance Classification System (SCFS), which enables them to identify lending for economic activities that contribute to climate change mitigation and adaption. It draws upon international industry guidelines and prevents the risk of greenwashing whilst reinforcing transparency and commitment of sustainable finance products.

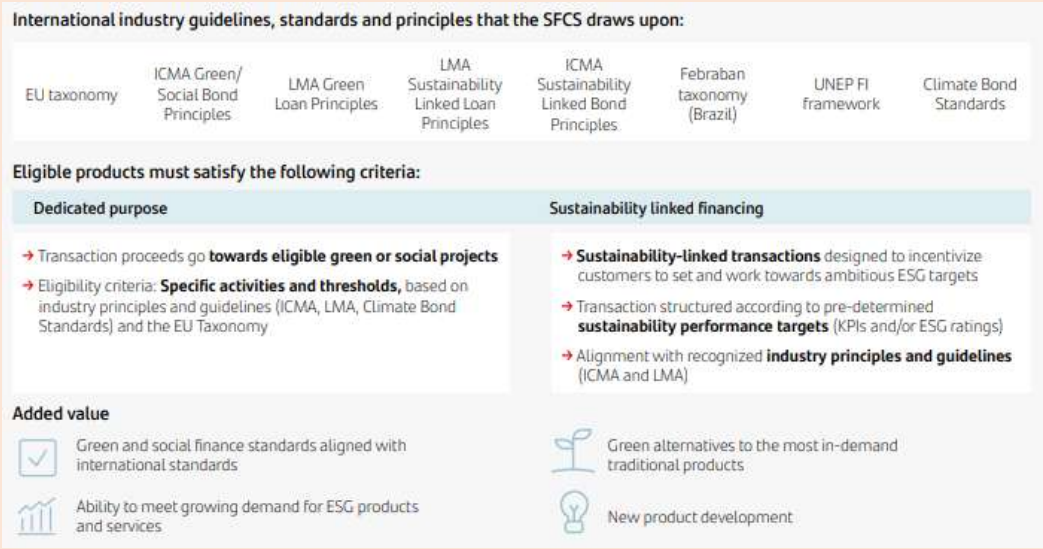


Figure 35: Sustainable Finance Classification System (Santander, 2022).

CHAPTER 5: RISK MANAGEMENT

Establishing E&C integrated risk management is key for banks to systematically manage E&C risks in line with the expectations of the Standard Practice. The latter prescribes key expectations on E&C integrated risk management for banks to develop or integrate the following management approach and capabilities (BOT, 2023b):

1. Embedded risk culture and integrate E&C risk into the bank's risk management process,
2. Identification and assessment of E&C risks both at the transaction and portfolio levels,
3. Capability to control and mitigate E&C risk at the acceptable level, and
4. Capacity to monitor and report the risk for decision making and informing business implementation planning.

This chapter will explain key concepts, methodologies, and available practices to effectively establish E&C risk management system, procedure, and capabilities. The chapter will introduce processes (such as materiality analysis and sector exposure analysis, climate scenario selection and climate-integrated stress testing) applicable to each of the four steps mentioned in the standard practice.

5.1) RISK MANAGEMENT SYSTEM AND RISK CULTURE

The key to managing E&C risk effectively is to integrate the consideration of both risks in the bank's existing risk management framework. In risk management frameworks, banks should incorporate E&C risks into their existing risk management framework to identify, assess, control, monitor, and report these relevant risks which may impact financial position and performance. To ensure that all E&C risks are considered comprehensively, banks should establish trustworthy processes to manage these risks covering the three lines of defense to ensure effective risks management. The risk management framework must recognize the specific characteristic of E&C risks and integrate the consideration (prolonged time horizon and continued impacts) throughout the risk management cycle below.

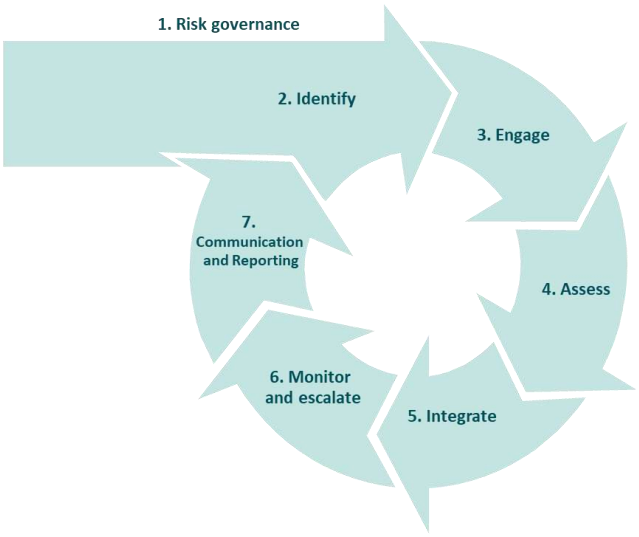


Figure 36: Risk management cycle

1. **Risk governance**: Provide management oversight on E&C risks and maintain on-going monitoring and ensure alignment to the organisation's risk appetite.
2. **Identify**: Conduct a gap analysis to understand the full spectrum of the bank's E&C risks

3. **Engage**: Leverage subject matter experts to interpret E&C risks (often driven through the classification of the impacted risk area/category)
4. **Assess**: Prioritize material E&C issues based on the impact & likelihood for inclusion into the existing risk management framework
5. **Integrate**: Mapping E&C issues to one or multiple of existing risk area/category
6. **Monitor and escalate**: Monitor the implementation and performance of E&C risks relative to targets/limits/KRIs and revise if progress falls short of expectations
7. **Communication and Reporting**: Establish communication channels to cascade E&C risk information to internal & external parties

Impacts of E&C risks on business operations and risk exposures associated with their assets and business to physical risks and transition risks should be identified and assessed both at the transaction level and portfolio level, including risks arising from concentration at portfolio level, such as sectors, products, and geography. Banks are expected to consider the approach of assessing risk drivers in various risk areas, for instance, credit, market, liquidity, and operational risks including strategic and reputational risks both short term and long term in potential scenarios. Banks should establish approaches for risk mitigation to manage residual risks, monitor and report risk exposures to the Board of Directors and senior management. In addition, banks should update existing frameworks and policies periodically to be used in operations effectively.

5.1.1) EMBEDDED RISK CULTURE

5.1.1a) Standard Practice

Standard Practice: E&C risk management *(item 3.2.3(1.1))*

Financial institutions should integrate environmental risks as part of the **risk culture**, attitude, and behavior of staff across all levels within the organization, which covering **risk awareness, risk- taking, and risk management** in normal business operations, in accordance with the Bank of Thailand's Policy Statement on Financial Institutions' Risk Culture (BOT, 2023b).

5.1.1b) Key Actions

Key Actions 5.1*6*: Risk Culture

Key Item	Short-term Actions	Long-term Actions
5.1.1 Risk awareness and risk culture	1. **E&C risk awareness is integrated in the risk culture training**, with enhanced capability building for E&C **risk taking and risk management** for all relevant functions	N/A

5.1.1c) Recommended Approach

On risk culture, it is expected that banks should have embedded the understanding of policies, procedures, and controls to address and manage E&C risks across the entire organization. The E&C risk policy should embed material E&C risks, while establishing clear roles and responsibilities to relevant functions across business units within the bank (BCBS, 2022). The key roles and responsibilities should also be taken by the three lines of defense, in which bank employees should have general awareness about E&C risks and overview of its impacts on its banking operations and portfolio.

This should start with the clear risk management process and policies for identification, assessment, control, monitoring, and reporting of E&C risks which are material to each bank. Banks should then enhance awareness based on the E&C risk management policy across the organization to ensure that employees understand the impact when taking E&C risks, particularly the frontline officers. To achieve this, the bank should establish policies and procedures, allocate enough resources for risk culture building, and continuously develop capacity for employees to gain deeper understanding of their expected roles in managing E&C risks in their day-to-day work.

Industry Practice 22: Embedding E&C risks into the organization's risk culture

Maybank has integrated E&C risk considerations into its risk culture and operations. In 2022, Maybank's internal Risk Academy introduced a series of ESG risk-related programmes aimed at enhancing understanding and decision-making regarding ESG and climate risk factors across different business units, contributing to a more comprehensive approach to managing ESG and climate-related risks within the bank (Maybank, 2022).

ESG Risk Culture

To effectively identify, assess and manage our exposure to ESG risks, we aim to cultivate a strong ESG risk culture throughout our operations. Establishing a robust risk culture calls for strong leadership from the top, which shapes how employees conduct themselves in the course of their work and enables us to build long-term value for our stakeholders while preserving the Group's integrity and reputation.

The Annual Board Risk Workshop, which sees the participation of the Board, senior management and business leads, discusses current and future risk trends. This year, several key new ESG-related areas were also discussed, including the need for greater oversight and awareness on sustainability and climate change. Some of the action items which the Group intends to address include the need for clearly aligned deliverables and risk appetite for our investment time horizons, as well as employing agile tactical solutions to meet customer and business needs while staying the course on our strategy execution.

In an effort to develop a risk-resilient workforce, Maybank's Risk Academy coordinated multiple ESG risk-related programmes in 2022. These included brown bag sessions and programmes to address Risk Management, Regulatory & Internal Risk Policies and Procedures Application, Climate Change Risk and Environmental Risk among others. Through these programmes, participants were able to effectively interpret, illustrate and discuss terminology and concepts of ESG and climate risks, identify and communicate ESG and climate risk factors for better business decisions, develop effective control management of ESG and climate risks within their units/business and identify and apply best practices in managing ESG and climate risk issues.

Figure 37: ESG risk culture (Maybank, 2022).

HSBC has incorporated climate risk into its existing risk taxonomy and group-wide risk management framework, where climate risk is recognized as one of the bank's top and emerging risks (as part of the ESG risk category). The bank has implemented policies, controls, and responsibilities across the three lines of defense, as well as conducted climate scenario exercises. Exposure levels and risk metrics have also been established for monitoring purposes (HSBC, 2022).

We have integrated climate risk into our existing risk taxonomy, and incorporated it within the risk management framework through the policies and controls for the existing risks where appropriate.

Through our climate risk programme, we continued to embed climate considerations throughout the organisation, including updating the scope of our programme to cover all risk types, expanding the scope of climate-related training, developing new climate risk metrics to monitor and manage exposures, and developing our internal climate scenario exercise.

Figure 38: Climate risk approach and policy (HSBC, 2022).

5.1.2) THREE LINES OF DEFENSE

5.1.2a) Standard Practice

Standard Practice: Responsibilities of the three line of defense *(item 3.2.3(1.2))*

Financial institutions should establish clear structure and scope of responsibility to support environmental risk management which cover **three lines of defense**:

- Business units or the first line of defense should preliminarily evaluate and control environmental risk to ensure that business decisions are appropriately accounted for environmental risks. This includes, for example, enquiry about environmental actions and impacts as part of the processes for accepting new clients and reviewing existing clients' risks profiles, especially in the case of high-risk industries.
- Second line of defense such as risk management, compliance, and credit review units should integrate environmental risks as part of the organization's overall risk assessment and establish risk assessment frameworks that can balance the decision-making power. This includes for example, the right to object to the first line's decision, and ensure that the environmental risk assessment process is aligned with the risk appetite, other relevant regulations, and laws.
- Internal audit units or third line of defense should be independent in their audit of the risk management framework, internal control, and related monitoring. This is to ensure that the overall organizational conduct supports environmental risk management effectively in an end-to-end manner (BOT, 2023b).

5.1.2b) Key Actions

Key Actions 5.2: Three lines of defense

Key Item	Short-term Actions	Long-term Actions
5.2.1 Overview of the Three Lines of Defense's responsibility	1. E&C risks are **integrated into the responsibility of the Three Lines of Defense and provided continued capability development** for the Three Lines of Defense on E&C risk identification, assessment, and management	N/A
5.2.2 First line of defense	1. First line of defense can assess E&C risks of new and existing clients**/products based on the client's/product's E&C risk profile.**	1. First line of defense **can make business decision** based on the client's/ product's E&C risk profile **and in alignment with the bank's transition plan.**
5.2.3 Second line of defense – credit review	1. **E&C risks and opportunities are one of the criteria for credit approval** consideration.	1. The **clients' / product's current E&C performances and their transition plan** are considered for credit (other material risk) approval decision-making, in alignment with the bank's transition plan.
5.2.4 Second line of defense - compliance	1. Second line of defense **integrate E&C transition risks into loan approval consideration**, taking into account the E&C risks' impacts on client's business in the medium and long terms.	1. Second line of defense **integrate E&C transition risks into loan approval** (other material risk) **consideration**, taking into account the impacts on client's business in the medium and long terms, in line with **the bank's risk appetite and the bank's transition plan**.
5.2.5 Third line of defense	N/A	1. Third line of defense should **review** overall **internal policies, processes and controls** to ensure that they comply with both external and internal requirements.

The detail of expected role and responsibility of the three lines of defense is explained in the table below.

To reinforce capability of human resources, banks may provide necessary training on relevant E&C risks to applicable functions. The illustration below shows role and responsibilities of three lines of defense (BCBS, 2022):

Three lines of defense	Role and Responsibility
The first line	• Business units should identify, assess, control, monitor and report their own E&C risks including due diligence on existing and prospective clients. Climate-related risk assessments that may be conducted by the first line of defense are client onboarding, credit application and credit assessment, for instance, credit scoring or credit rating. • The first line staff should have necessary knowledge to have awareness and identify potential E&C risks by training, group discussion and related documents.
The second line	• Risk management, compliance, and relevant functions such as the legal team, as their responsibility might extend, should oversee business functions to ensure that overall business decisions comply with laws, regulations and are in line with risk appetite set by the Board of Directors. The second line should be responsible for conducting E&C risks independently from the first line of defense including challenging their business decision. • The risk management function is responsible for ensuring that the first line of defense identifies, assesses, controls, monitors, and reports E&C risks to relevant parties properly. The analysis and expert judgement on potential risk exposures from risk management function are expected to provide to the first line of defense independently. • Compliance function should provide guidance to the first line of defense for assessing E&C risks impacts from existing and changing regulatory environment to ensure compliance with law, rules, regulations, and relevant standards, which is supported by legal team, as their responsibility might extend, to ensure correctness of related contracts, as generally, sustainability standards may evolve over time.
The third line	• The independent assurance function should provide assurances via independent assessment by qualified parties, which are subject matter expert and approved by regulators according to prevailing requirements at implementation time, on the overall quality and effectiveness of the risk management framework, internal control, risk profile, existing and new product developments. • The internal audit function should review overall internal policies and procedures that need to comply with external requirements.

5.1.2c) Recommended Approach

Across the workstream and business units within each bank, the three lines of defense have the most important roles in integrating E&C risk awareness, risk taking, and risk control in their work. The three lines of defense with mandate on E&C risk considerations will establish the procedures for banks to identify, manage, control, and monitor E&C risks in a systematic manner, ensuring the risks are managed at operation and portfolio levels.

Responsibilities and working procedures of the three lines of defense should be defined and informed to the relevant functions clearly. Banks should describe the linkage between their structures and working procedures

to ensure understanding of all parties. Furthermore, banks should estimate required human resources from existing structures to transitional structures for managing E&C risks especially in related function (ECB, 2020).

Industry Practice 23: Embedding E&C risks into the second line of defense

"**Climate-related risks and the second line of defense**: Institutions have defined the tasks and responsibilities of the risk management function for identifying, assessing, measuring, monitoring and reporting E&C risks. These tasks cover a wide range of activities, such as providing expert opinions on client transactions and developing institutions' risk management policies. Other examples of observed tasks include the development and roll-out of institutions' methodologies for portfolio alignment assessments (e.g., using PACTA) and measuring financed emissions (e.g., using PCAF).

The compliance function is typically tasked with ensuring compliance with climate-related laws, rules, regulations and standards, including in relation to products offered by the institution. Against the backdrop of regulatory developments and commitments it has voluntarily made, one institution found, for example, that there is an increasing need to mitigate the risk of greenwashing. The institution adopts a quantitative approach to assessing the possible consequences of this risk. Following this assessment, follow-up actions are defined, which relate, among other things, to staff knowledge and expertise, data and methodologies, governance and internal control frameworks" (ECB, 2022).

Industry Practice 24: Embedding E&C risks into the third line of defense

"**Embedding E&C risks into internal audit reviews:** Institutions have assigned roles and responsibilities of the internal audit function for E&C risks and included these risks in the multi-year audit plans approved by the audit committee. The list below provides a non-exhaustive list of examples of past and planned internal audit reviews concerning E&C risks (ECB, 2022):

- *Materiality assessment:* Assess the consideration of E&C risks in the bank's materiality assessment.
- *Strategy:* Review the integration of E&C risks in the bank's business strategy
- *Regulatory framework:* Align the bank's policies and processes with the regulatory framework for E&C risks.
- *E&C policies:* Review the bank's E&C policies and review the consideration of E&C risks in transaction due diligence.
- *E&C credit risk:* Review the effectiveness of the E&C credit risk assessment process and the transparency of the underlying methodology and assess the level of the bank's compliance with its climate-related loan origination policies, including related monitoring arrangements.
- *Product offering:* Review the bank's sustainable finance products and services, review of governance and internal control frameworks for the categorization of loans as "green," and review of compliance of sustainable investment product policies and processes with regulatory requirements.
- *Stress testing:* Review of the bank's framework for climate risk stress testing.
- *Disclosures:* Review of the sustainability disclosures to assess compliance with regulatory requirements

Industry Practice 25: E&C responsibilities across the three lines of defense

Maybank manages their E&C risks through the ESG risk management framework, which prescribes relevant responsibilities across the three lines of defense. The ESG risk management governance structure promotes active involvement of all parties in the ESG risk management process, while ensuring accountability and an appropriate level of independence and segregation of duties between the parties (Maybank, 2022).

Figure 39:Three lines of defense model with ESG-related responsibilities (Maybank, 2022).

Meanwhile, Hang Seng Bank has specifically incorporated climate-related risks into its risk management framework, which sets out the relevant responsibilities of how the bank identifies, assess, and manage their E&C risks throughout the three lines of defense model, and ensues that the Board and senior management have visibility and oversight of the key E&C risks (Hang Seng Bank, 2022).

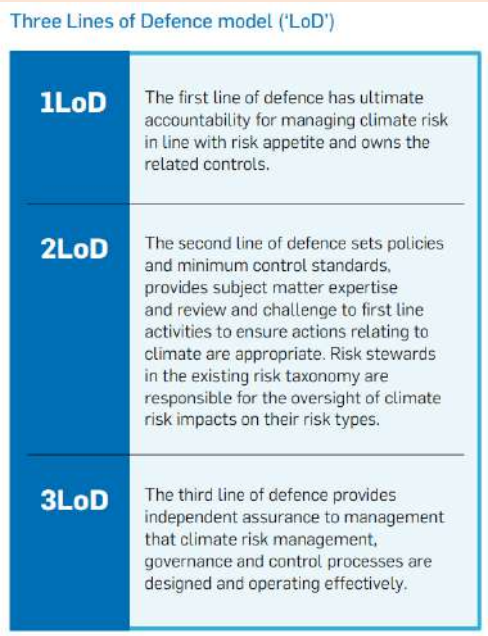


Figure 40: Three lines of defense model (Hang Seng Bank, 2022).

5.1.3) RISK POLICIES & PROCESSES

As banks recognize the importance of E&C risks, efforts should be made to integrate the consideration of the E&C risk factors to enhance risk policies and processes to enhance business resiliency towards physical and transitional risk, priming themselves to grow towards a sustainable future. Banks should have transparency, clarity, and consistency for establishing policies and processes (GFIT, 2021). Processes including key assumptions, limitation and rational related to environmental risks should be communicated effectively to the working team and be aligned with industry standards.

5.1.3a) Standard Practice

Standard Practice: E&C risk management policies *(item 3.2.3(1.3))*

Financial institutions should establish policies and processes for systematic environmental risk management both at the **transaction and portfolio levels**. This also includes communicating to relevant staffs to raise awareness and understand the guidelines. Furthermore, there should be an appropriate and consistent review of the policies and processes in line with the materiality of environmental risk. Furthermore, there should be an appropriate and consistent review of the policies and processes in line with the materiality of environmental risk (BOT, 2023b).

Standard Practice: E&C risk exposures *(item 3.2.3(1.4))*

Financial institutions should assess the potential environmental impact on the business operations and risk exposures including **credit, market, liquidity, operational, and other risks** such as strategic and reputational risks. Furthermore, there should be appropriate risk management systems and adequate capital regarding the materiality of each of risk dimensions (BOT, 2023b).

5.1.3b) Key actions

Key Actions 5.3: E&C risk management policies

Key Item	Short-term Actions	Long-term Actions
5.3.1 E&C Risk Management Policies	1. Banks should establish **E&C risk management policies.** The policy should be integrated and applied in credit and investment activities. 2. **Major risk policies should incorporate E&C risk drivers** for their assessment, including policies and processes to manage credit risk 3. Banks should **integrate common environmental risk standards of credit and investment activities** to establish policies appropriately. 4. The policy should **consider impacts of E&C risk on all traditional risk types**, including credit risk, and other risks (but not limited to) operational risk and reputational risk, and keep record in the risk inventory). 5. The policy should **specify cycle for reviews to update process and the context of material risk.**	1. Banks should establish **E&C risk management policies that align with business directions, exclusion policy, bank's E&C targets and bank's transition plan**. The policy should be integrated and applied in credit and investment activities. 2. **Major risk policies should incorporate E&C risk drivers** for their assessment, including policies and processes to manage credit risk, market risk, and liquidity risk.
5.3.2 E&C risk management framework	**1. Internal E&C risk management framework issued or integrated into the existing risk management framework** with specified E&C risk assessment criteria. The impacts of E&C risks to be assessed may include, but not limited to, credit risk.	1. **Internal E&C risk management framework issued or integrated into the existing risk management framework** with specified E&C risk assessment criteria. The impacts of E&C risks to be assessed may include, but not limited to, credit risk, market risk, and liquidity risks.

5.1.3c) Recommended Approach

Banks should establish E&C risk management policies that align with business directions and exclusion policies. Companies breaching global standards should be avoided to associate with (GFIT, 2021). Consideration of exclusion conditions should be incorporated into policies, such as income exposure ratio to exclusion of business activities (GFIT, 2021). Requirements for financing in hard-to-abate or high emitter sectors should also be met by companies.

The enhancement of existing risk policies and processes to embrace the significance of E&C risks can start with the understanding of which categories of E&C risk events that could impact business operations of banks, from the macro level which is the signatory of the country to international agreements and cooperations, such as the Paris Agreement, down to the entity level which are the individual E&C risk goals, such as target year to achieve net-zero status and stance of the organization on E&C risks which should be elaborated in the Risk Appetite Statement.

The non-exhaustive list of **major risk policies and processes** that should be enhanced to include climate and environmental risks and example of relevant business cases are:

1. **Credit Risk Management**: The underwriting process should incorporate climate and environmental risks through qualitative and quantitative analysis. Necessary scenario analysis should be conducted to evaluate the impact on banks in influencing financing decisions, prospective clients, and society. E&C factors should be considered as determinants, particularly in collateral valuations, as the prices of residential or commercial properties may be affected by climate and environmental situations, thus impacting the creditworthiness of borrowers and the potential for recoveries in case of default. For example, Thailand is a country that is already prone to monsoon flooding, especially in the northern half where agricultural farmlands and industrial estates are densely located. The torrential rain, which often exceeds the capacity of dams, can damage infrastructure and cause supply chain disruptions.

2. **Market Risk Management**: E&C factors can have both direct and indirect impact on various aspects which in turn affecting the price of market parameters. Here is the list of several scenarios that are currently in sight:

    - The carbon price is expected to steadily rise. The carbon price can be in the form of a tax on emissions or an emission trading scheme, allowing companies to trade emission allowances, as defined by the ECB. This creates powerful incentives for businesses to optimize their carbon footprint in production and operations, while households can also benefit by managing carbon consumption to maintain purchasing power. As a result, the carbon price becomes a critical market parameter, fostering systematic consideration throughout the entire production and consumption ecosystem.

    - The ongoing global heatwave phenomenon and other adverse weather conditions have the potential to disrupt agricultural production, resulting in reduced raw material availability for food production. This, in turn, could drive up inflation rates, leading to decreased purchasing power for consumers.

    - Energy prices, including those of gas and crude oil, may experience fluctuations due to production disruptions caused by natural disasters such as hurricanes. The resultant increase in energy costs can be transmitted to manufacturing and operating expenses, thereby impacting macroeconomic growth and overall market sentiments.

    While the current impact may not always appear severe, it is crucial to acknowledge that ongoing deterioration of E&C factors could lead to more pronounced consequences in the future. Strengthening the monitoring team's role becomes imperative to proactively track and analyze significant climate and environmental events and their influence on market parameters. By doing so, we can better grasp the potential risks and opportunities associated with these developments, fostering a more resilient and informed approach to market dynamics.

3. **Operational Risk Management**: Extreme climate events may potentially disrupt the provision of financial services to clients and business partnerships. Even for digital services, infrastructure could be damaged due to power outages resulting from other natural disasters. The policies and processes should be enhanced to include the incorporation of these risks into business continuity plans, and periodic rehearsals should be conducted to ensure that practitioners are familiar with the responsive actions.

4. **Liquidity Risk Management**: Banks exhibit a heightened sensitivity to meeting payment obligations, necessitating vigilant monitoring of liquidity status and ensuring ample cash or liquid assets are readily

available. Typical cash sources may stem from customer deposits, debt repayments, collateral liquidation, or interbank borrowings, among others.

When borrowers default, banks proceed with liquidating pledged collaterals, typically commercial or residential estates, and vehicles. However, liquidity stemming from such liquidation could be jeopardized by environmental and climate factors, presenting potential challenges

- Commercial or residential estates in flood-prone or degraded areas may struggle to find willing buyers, leading to diminished cash realization during hurried liquidation, possibly resulting in steep discounts.
- Factory assets or vehicles with low energy efficiency and minimal future market value can hinder liquidity prospects.

Furthermore, accessing interbank market operations for cash borrowing to cover shortfalls may be challenging if banks cannot demonstrate compliance with climate and environmental standards, potentially leading to unfavorable funding terms.

To address these liquidity risks, banks must establish robust policies outlining how to secure funding from counterparties during a progressive shift towards greener operations. Additionally, they should implement rigorous processes for evaluating collateral acceptance and conducting efficient liquidations. By doing so, they can proactively navigate market uncertainties and position themselves advantageously amid changing environmental landscapes.

It is to be noted that risks in one category can be interconnected with others, leading to potential ripple effects. For instance, liquidity risk arising from challenges in collateral liquidation can elevate the borrower's loss given default, a crucial metric in credit risk analysis. Therefore, it is imperative to conduct a comprehensive assessment, considering all relevant risk categories, to effectively manage associated risks. Taking a holistic approach will enable a more thorough understanding of the risk landscape, allowing for proactive risk mitigation strategies.

Furthermore, it is imperative to optimize policies and monitoring frameworks, incorporating robust scenario analysis and stress testing methodologies. These practices serve dual purposes—enhancing business resilience and addressing regulatory imperatives. Demonstrating transparency, banks must divulge climate and environmental risks and opportunities to stakeholders, bolstering public confidence and adhering to relevant financial reporting standards within their jurisdiction. Embracing these strategies enables institutions to navigate the evolving landscape with confidence and seize competitive advantages in this climate-conscious era.

Industry Practice 26: E&C risk management policies

Hang Seng Bank has identified and incorporated climate risk into the policies and processes of priority risk areas, which are wholesale credit risks (through credit applications of new money requests), retail credit risks, resilience risks and regulatory compliance risks (Hang Seng Bank, 2022).

Climate Strategy

Wholesale credit risk

Identification and assessment

We have identified six key sectors where our wholesale credit customers have the highest climate transition risk, based on their carbon emissions. These are oil and gas, building and construction, chemicals, automotive, power and utilities, and metals and mining. We continue to roll out our transition and physical risk questionnaire to our largest customers in high-risk sectors, with the addition of four more sectors: agriculture, industrials, real estate and transportation. The questionnaire helps us to assess and improve our understanding of the impact of climate changes on our customers' business models and any related transition strategies. It also helps us to identify potential business opportunities to support the transition.

Management

In 2022, we updated our credit policy to incorporate climate considerations in credit applications for new money requests. We continued using a scoring tool, which provides a climate risk score for each customer based on questionnaire responses. The scoring tool will be enhanced and refined over time as more data becomes available. The results of the tool have been provided to business and risk management teams. In 2023 we aim to further embed climate risk considerations in our credit risk management processes.

Aggregation and reporting

We internally report our transition risk exposure consumed by the six high-risk sectors in the wholesale portfolio.

Retail credit risk

Identification and assessment

We continue to enhance our identification and assessment of climate risk, prioritising our largest portfolios, by increasing our investment in physical risk data and by developing internal capabilities.

In 2022, we undertook an internal climate stress testing exercise to further our understanding and assessment of the potential impact of physical risk to our mortgage portfolios.

Management

We continue to review and update our retail credit risk management policies and processes to further embed climate risk, whilst also monitoring local regulatory developments to ensure compliance.

Aggregation and reporting

We implemented physical risk exposure metric for retail mortgage portfolio in 2022.

Resilience risk

Identification and assessment

Our Operational and Resilience Risk under Risk Department is responsible for overseeing the identification and assessment of physical and transition risks that may impact on the organisation's operational and resilience capabilities.

We are developing a deeper understanding of the risks to which our properties are subject to, and assess the mitigants to ensure ongoing operational resilience.

Management

We align with the operational and resilience risk policies developed by HSBC and the underlying measurement capability to embed climate risk management within HSBC's risk management framework.

Aggregation and reporting

With our ambition to achieve net zero in our own operations, we are particularly focused on developing measures to facilitate proactive risk management and assess progress against this strategic target.

Operational and Resilience Risk is represented on the climate risk related committees and working groups.

Climate Strategy

Regulatory compliance risk

Identification and assessment

During 2022, key regulatory compliance risks under consideration have evolved to also include post-sale servicing, complaints handling, and market abuse. The priority risk focus remains on greenwashing, namely the development and ongoing governance of new, changed or withdrawn products / services and ensuring sales practices and marketing materials are clear, fair and not misleading.

To support the ongoing management and mitigation of greenwashing risk regarding our products, related functions have worked across all business lines to enhance our product controls. This has improved our ability to identify, assess and manage product-related greenwashing risks throughout the product governance lifecycle. Examples of ongoing enhancements include:

- Integrating the consideration and mitigation of climate / ESG-related risks within the Regulatory Compliance Risk Taxonomy and Control Library ('RTCL') and the existing New and Ongoing Product Management Policy.
- Ensure climate risk is actively considered and documented in the enhanced product templates / forms by the business within product review and creation,
- The HSBC Group's Regulatory Conduct has implemented requirements in the Group Product Governance Enhancement Guide to ensure climate risks are robustly assessed, documented and mitigated, and will be seeking assurance validation and roll out at regionally level covering the Bank.

Management

Our policies continue to set the standards that are required to manage the risk of breaches of our regulatory duty to customers, including those related to climate risk, ensuring fair customer outcomes are achieved. Our product and customer lifecycle policies have been enhanced to ensure consideration of climate risks and are reviewed on a periodic basis to ensure they remain relevant and up-to-date.

The Compliance sub-function continues to focus on improving the capability of Compliance colleagues through the provision of ongoing training, communications and dedicated guidance. An area of particular focus is ensuring Compliance colleagues remain up-to-date with changes in the evolving regulatory landscape.

Aggregation and reporting

Global Compliance function of HSBC continues to operate an ESG and Climate Risk Working Group at a HSBC Group level to track and monitor the integration and embedding of climate risk within the management of regulatory compliance risks. In addition, the working group continues to monitor ongoing regulatory and legislative changes across the sustainability and climate risk agenda. In Asia-Pacific, a working group was established in February 2022 to coordinate the regional implementation of climate risk-related enhancements across the Compliance Advisory function. The Bank's Compliance Function is a member of this Asia-Pacific working group.

Figure 41: Management approach and key climate policies (Hang Seng Bank, 2022).

5.1.4) RISK MANAGEMENT STRUCTURE AND IMPACTS ON RISK APPETITE

5.1.4a) Standard Practice

Standard Practice: E&C data governance *(item 3.2.3(3.3))*

Financial institutions should develop risk indicator targets to control risk levels in line with the **risk appetite.** This includes, for example, setting the industry targets to increase the proportion of environmentally friendly transactions, or setting targets to reduce or control the concentration of industries that pose environmental risks (BOT, 2023b).

5.1.4b) Key Actions

Key Actions 5.4: E&C Risk management structure and impacts on risk appetite

Relevant actions in this section are as follows:

Key Item*	Short-term Actions	Long-term Actions
4.6.1 Risk Appetite*	N/A	1. BoD and SM should **define E&C risks in the risk appetite framework.** 2. Banks should include current and forward-looking E&C risks on **the bank's risk appetite statement.** Banks should **set threshold or limit for activities related to E&C risks,** such as E&C risk concentration threshold by sector or geography. 3. Banks are expected to **incorporate portfolio performance-related metrics, particularly financed emissions, that align with the bank's transition plan, into their risk appetite framework.** 4. Define **clear escalation process when limits are breached and embed E&C KRIs** in regular monitoring process.
5.3.2 E&C risk management framework*	**1. Internal E&C risk management framework issued or integrated into the existing risk management framework** with specified E&C risk assessment criteria. The impacts of E&C risks to be assessed may include, but not limited to, credit risk.	1. **Internal E&C risk management framework issued or integrated into the existing risk management framework** with specified E&C risk assessment criteria. The impacts of E&C risks to be assessed may include, but not limited to, credit risk, market risk, and liquidity risks.

*Note: *The actions for this section related directly to section **4.2.2** Setting key risk indicators in the risk appetite and section **5.1.3** Risk policies and processes.*

Banks should integrate E&C risks into their risk appetite framework to identify both existing and forward-looking potential risks as well as strengthen their capability to manage risk exposures effectively. For instance, the threshold or limit for activities highly related to E&C risks, concentration threshold of sector or geography should be set by banks to manage relevant risks (ECB, 2020).

The Board of Directors and senior management should define E&C risks in the risk appetite framework explicitly. Risk appetite, which is determined to reflect their acceptable level of risk, should be in line with business strategy in the short- and long-term to ensure that the financial institution will operate effectively to achieve both business and environmental risk targets (ECB, 2020).

The risk appetite statement should have the measurement of the financial impacts on customers in comprehensive scenarios. **Banks may use key metrics, such as credit exposures, credit quality, tenor, or geography to monitor E&C risk within their portfolios to support business decision making.** Banks should identify E&C risk through channels of credit, market, liquidity, operational, including strategic and reputational referred to in the BOT's Standard Practice. Furthermore, banks can identify impact comprehensively from other risk channels upon their capacity.

Existing risk type*	Detail of impacts on existing risk types
Credit	Wholesale: Location of operations, assets collaterals, clients' business models Retail: Location of collaterals (residential real estate)
Market	Weather events affecting commodity prices, transition risks affecting commodity price / exchange rate volatility
Operational	Weather events comprising own property and critical operations, plus critical third-party suppliers
Capital & Liquidity	Assessment of the bank's capital adequacy through the Internal Capital Adequacy Assessment Process (ICAAP)
Reputational	Societal and investor response to the Group not acting responsibly to reduce emissions and manage risk
Compliance	Failure to comply with regulations e.g., Prudential Regulatory Authority (PRA)

Note: *BOT identified key risk types for assessment of potential E&C risks including **credit, market, liquidity, operational and other risks** such as strategic and reputational risks. The risk types listed here are examples of the existing risk types banks can consider in assessing the impacts of E&C risks. This list is not exhaustive, and the BOT do not limit the types of risks to be considered in the assessment of E&C impact on existing risk types.

5.1.4c) Recommended Approach

In current and widely adopted risk management practices, traditional metrics predominantly focus on short-term indicators like counterparty default probabilities, providing precision for only a few subsequent years due to market dynamics and unforeseen events. However, E&C risks demand attention over much longer time horizons, with Sustainable Development Pathways often extending beyond 2050 for instance.

To effectively incorporate E&C risk factors into their risk appetite, banks should adopt a progressive approach. This entails aligning E&C considerations with the risks they are willing to accept and limit, in line with their business strategies. For instance, a strategic plan could be devised to curtail exposure to carbon-intensive sectors gradually, reducing financing to such sectors over time instead of an abrupt halt. This approach also allows clients to adjust their operations based on their climate action plans while keeping time for banking strategies to improvised accordingly.

Furthermore, banks can mitigate risks by limiting funding to entities in disaster-prone areas, thereby reducing associated credit and liquidity risks. By embracing such measures, banks demonstrate their commitment to sustainable and resilient practices while maintaining long-term profitability.

By proactively incorporating E&C risk factors into their risk management frameworks, banks are better positioned to address the complexities and challenges posed by climate change, fostering a more resilient and forward-looking market ecosystem. The non-exhaustive table below provides guidelines on the channels which banks should consider establishing a risk appetite (GFIT,2021).

E&C risks are intricately interconnected, transcending traditional risk management silos, and impacting various domains, including market risk, credit risk, operational risk, and liquidity risk. Banks with ample human and capital resources prioritize dedicated departments responsible for monitoring these cross-cutting risks at an organizational level, displaying their commitment to enterprise-wide risk management.

However, for banks with limited resources, the absolute necessity lies not in maintaining dedicated teams that break down traditional silos but in ensuring capable resources are in place to comprehensively understand and incorporate E&C risks across all risk management departments. This approach empowers each function to incorporate qualitative and quantitative E&C factors into their risk measurements effectively, fostering a holistic and robust risk management framework.

Effectively quantifying E&C risks is essential for banks to manage their risk appetite and credit limits for specific customers. Rather than treating E&C risks separately, integrating them into existing risk appetite measurements ensures their consideration in the overall risk calculation is a feasible practice during the transition period. As banks gain more resources and understanding of E&C factors in risk management, they can progressively enhance their practices. With the growing availability of E&C data, these advancements become more achievable and beneficial as institutions can leverage sophisticated analytics and cutting-edge models, gaining deeper insights into potential risks and opportunities.

By seamlessly incorporating E&C risks into the risk appetite framework, banks can make informed decisions while minimizing potential exposures. This approach not only bolsters risk management effectiveness but also aligns with emerging sustainability trends and regulatory requirements. As E&C risks evolve, proactive adaptation becomes imperative for institutions aiming to thrive in the ever-changing financial landscape.

Industry Practice 27: Integrating E&C risks into the Risk Appetite Framework

Recognizing climate-related risks as part of the bank's "top risks", MUFG has integrated such risks into the bank's Risk Appetite Statement, effective from the fiscal year 2021, which aligns with the bank's business strategy and financial plan (MUFG, 2022).

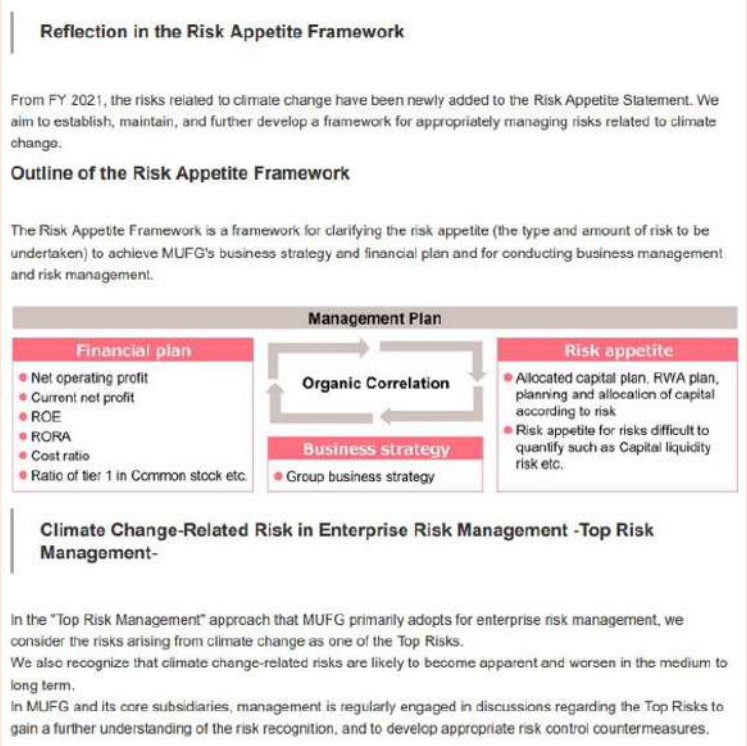


Figure 42: Integration of climate risk into the Risk Appetite Framework (MUFG, 2022).

5.1.5) DATA GOVERNANCE FOR E&C RISK ANALYSIS AND MANAGEMENT

5.1.5a) Standard Practice

Standard Practice: E&C data governance *(item 3.2.3(1.5))*

Financial institutions should compile, store, and report **necessary information** for the assessment and management of environmental opportunities and risks, such as **clients and counterparties'** environmental performances, as well as ensure the quality of information to be in line with the recognized environmental standards so that such information can be utilized in risk analysis and management effectively." (BOT, 2023b).

5.1.5b) Key Actions

Key Actions 5.5: Data collection and management

Key Item	Short-term Actions	Long-term Actions
5.5.1 Data and calculation capability	1. **E&C risk-related data points clearly identified and collected** through a standardized template or data collection system during client onboarding. 2. **Capability to aggregate data and calculate financed emissions developed** to inform portfolio exposure analysis and portfolio-level risk management, prioritizing high-emission sectors.	1. **E&C risk-related data points clearly identified and collected** through a standardized template or data collection system for all material E&C risk drivers.

The necessary data of customers including counterparties related to E&C risks should be stored for assessment and management. Banks are advised to aggregate climate-related and environmental data into their data reporting frameworks as an essential component of their comprehensive data governance and IT infrastructure, aiming to provide valuable insights for decision-making at the management level. To achieve this, banks should consider building internal capacity, seeking expert advice, recruiting specialized talents, strengthening the relevant data systems, and improving data governance and quality (BCBS, 2022).

5.1.5c) Recommended Approach

When banks rely on external consultants, vendors, or outsourced processes for data or methodologies, it is essential to establish appropriate processes for evaluating the quality and reliability of the products or services provided. Additionally, it is not uncommon for the existing data systems of banks to be insufficient in effectively managing such risks at present. In such instances, proactive action should be taken to devise an action plan aimed at enhancing the data collection process and adapting the systems to capture the necessary data for the effective implementation of climate strategies (BCBS, 2022).

Industry Practice 28: Data governance

Data collection: Data sources

To overcome data gaps, institutions should develop tools such as a centralized data catalogue to track the status of the data gaps. They can also identify synergies across various initiatives within the group or entity to overcome the observed gaps. Typically, institutions make use of several external data sources, including: (i) client disclosures, (ii) publicly available or open-source data bases, tools and registers, and (iii) third-party data providers. An institution might use open-source tools to collect E&C risk information, for example, as part of the calculation of PACTA portfolio alignment.

Data collection: Client questionnaires

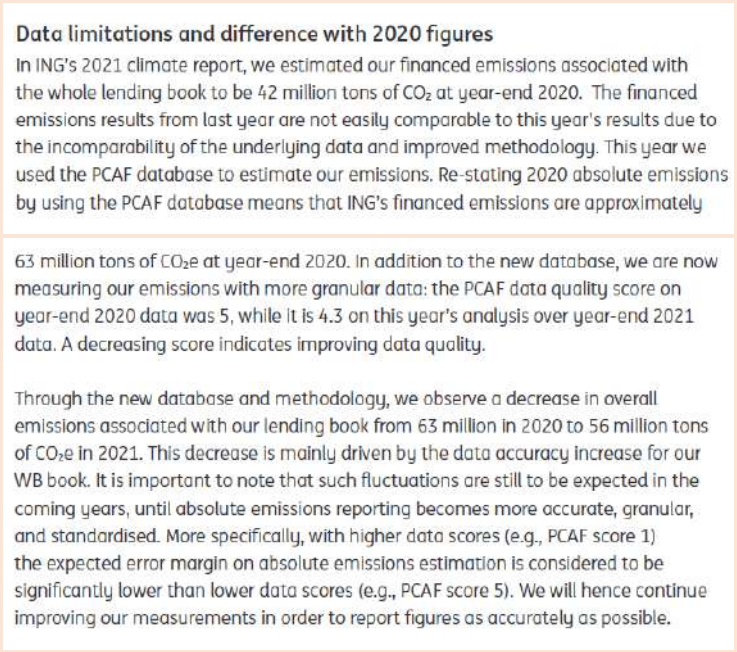
Both small and large institutions typically use dedicated E&C risk questionnaires to collect client or asset-level data from a wide scope of customers. In term of processes, this is usually embedded within their overall due diligence and client engagement procedures.

Data collection: Third-party providers

Currently, institutions tend to rely on a combination of internal and external data. External data are often procured from third-party providers. One institution carries out an assessment of its data providers, covering aspects such as data completeness and data quality. Another institution drew up a catalogue of the data-related criteria it uses to evaluate third-party providers. (ECB, 2022).

Industry Practice 29: Banks' approaches in addressing climate-related data limitations

Enhancing data quality and accuracy: moving from 2020 to 2021, ING Group improved the estimation of their financed emissions by leveraging the PCAF database by selecting data with higher scores and incorporating increased granularity and achieving more accurate information, which led to a decrease in their overall emissions (ING Group, 2022).



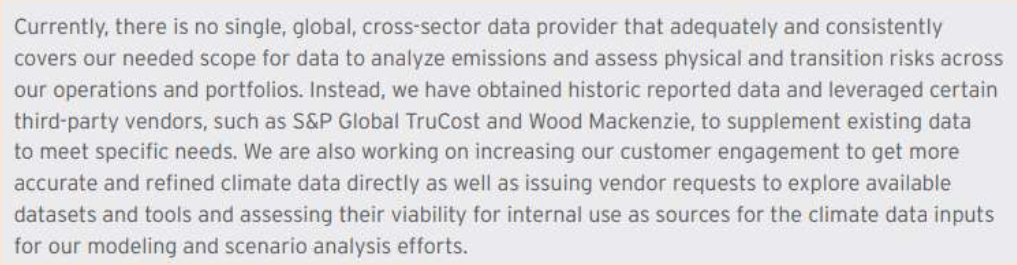
Data limitations and difference with 2020 figures

In ING's 2021 climate report, we estimated our financed emissions associated with the whole lending book to be 42 million tons of CO_2 at year-end 2020. The financed emissions results from last year are not easily comparable to this year's results due to the incomparability of the underlying data and improved methodology. This year we used the PCAF database to estimate our emissions. Re-stating 2020 absolute emissions by using the PCAF database means that ING's financed emissions are approximately 63 million tons of CO_2e at year-end 2020. In addition to the new database, we are now measuring our emissions with more granular data: the PCAF data quality score on year-end 2020 data was 5, while it is 4.3 on this year's analysis over year-end 2021 data. A decreasing score indicates improving data quality.

Through the new database and methodology, we observe a decrease in overall emissions associated with our lending book from 63 million in 2020 to 56 million tons of CO_2e in 2021. This decrease is mainly driven by the data accuracy increase for our WB book. It is important to note that such fluctuations are still to be expected in the coming years, until absolute emissions reporting becomes more accurate, granular, and standardised. More specifically, with higher data scores (e.g., PCAF score 1) the expected error margin on absolute emissions estimation is considered to be significantly lower than lower data scores (e.g., PCAF score 5). We will hence continue improving our measurements in order to report figures as accurately as possible.

Figure 43: Data limitations and difference with previous year calculation (ING Group, 2022)

Collaborating with external data providers: Citi group leverages third-party vendors, such as S&P Global, TruCost, and Wood Mackenzie to enhance and actively enhances customer engagement to obtain more accurate and refined climate data. The bank also collaborates with multiple vendors to explore available data sets and tools that can be utilized as sources for climate data inputs in the bank's modeling and scenario analysis exercises (Citi Group, 2022).



Currently, there is no single, global, cross-sector data provider that adequately and consistently covers our needed scope for data to analyze emissions and assess physical and transition risks across our operations and portfolios. Instead, we have obtained historic reported data and leveraged certain third-party vendors, such as S&P Global TruCost and Wood Mackenzie, to supplement existing data to meet specific needs. We are also working on increasing our customer engagement to get more accurate and refined climate data directly as well as issuing vendor requests to explore available datasets and tools and assessing their viability for internal use as sources for the climate data inputs for our modeling and scenario analysis efforts.

Figure 44: Risk inherent in climate-related data (Citi Group, 2022)

5.2) RISK IDENTIFICATION AND ASSESSMENT

5.2.1) MATERIALITY AND EXPOSURES IDENTIFICATION – E&C RISK IDENTIFICATION AND CONCENTRATION

5.2.1a) Standard Practice

Standard Practice: Policies and processes to identify and assess E&C risks *(item 3.2.3(2&2.1))*

Financial institutions should have in place an up-to-date policies and processes in **identifying and assessing** environmental risk both at the **transaction and portfolio levels.**

Financial institutions should establish policies and processes in identifying and assessing environmental risk to support the decision-making process. This includes, for example, inquiring environmental information from clients during loan and investment analysis so that they can appropriately evaluate clients' and counterparties' environmental risk levels and risk management capacity. High materiality risk transactions should be evaluated by environmental experts with no conflict of interests in such transactions (BOT, 2023b).

Standard Practice: Tools and processes to identify and assess E&C risks *(item 3.2.3(2.2))*

Financial institutions should develop **tools and processes** in identifying and assessing environmental risks such as setting up portfolio heatmaps and risk indicator indexes to categorize clients or counterparties in accordance with their level of environmental risks to ease overall risks monitoring. Financial institutions may reference guidelines from environmental certification or international environmental standards such as the International Finance Corporation (IFC) Performance Standards. Furthermore, financial institutions should establish additional practices for loan, investment, and other contractual obligations in high-risk industries or business sectors (e.g., requiring approval by higher-level management) (BOT, 2023b).

5.2.1b) Key Actions

Key Actions 5.6: Materiality assessment

Relevant actions in this section are as follows:

Key Item*	Short-term Actions	Long-term Actions
4.1.1 Materiality assessment*	1. Banks are required to **assess material E&C risks (either based on existing risk assessment methodologies or qualitative threshold), exposures and their concentration related to industry, economic sectors and geographic regions.** Banks should also monitor **concentration of exposures to geographies and sectors with higher E&C risks** to be integrated and inform strategy formation.	1. Banks set **clear definitions and quantitative/qualitative thresholds for materiality and recognize E&C considerations in integrated firm-wide perspective on risk.** 2. Put in place **impact materiality assessment** (involving external stakeholders) and **financial materiality assessment** (internal existing process, integrating E&C risks).

*Note: *The actions for this section related directly to section **4.1.1** Materiality assessment- Identification of material E&C risks and material sector*

5.2.1c) Recommended Approach

A. Identification of material E&C risk drivers:

A thorough risk management process requires the systematic identification of relevant risk factors. Institutions widely acknowledge E&C risks as drivers that manifest within existing risk categories, and they distinguish between the different drivers of transition and physical risks. The level of detail and comprehensiveness in identifying these risk factors and mapping their pathways of impact may vary among institutions. Leading institutions consider the full range of risk drivers arising from environmental degradation and climate change, considering their unique characteristics, such as their forward-looking nature. Typically, this mapping of E&C risk drivers and their transmission channels is documented in the institutions' risk inventory. The following table shows the non-exhaustive list of observed E&C risks (ECB,2022b).

Non-exhaustive list of observed physical risk drivers	
Climate-related risk	Other environmental risk
Heat waves and wildfires	Earthquakes, volcanos
Droughts	Over-fishing, illegal fishing vessels, controversial practices, or aquaculture techniques
Riverine and sea floods	Water stress and pollution
Hail, storms, and hurricanes	Soil pollution by hazardous materials, excessive fertilisation, soil erosion (over-exploitation)
Rising sea levels	Deforestation and unconventional site clearance
Changing rainfall patterns	Animal welfare (controversial living conditions, use of conditions)
Reduced soil productivity	Invasive species/disruption of natural systems
Lack of sunshine and wind	Biodiversity loss (loss of flora / fauna)
Non-exhaustive list of observed transition risk drivers	
Climate-related risk	Other environmental risk
Environmental taxation and subsidies	
Regulatory requirements (e.g., sustainability certificates, disclosures)	
Behavioural changes of consumers, suppliers, employees	
Behavioural changes of investors	
Technological developments	
Energy and transport policies (e.g., reduction of CO2 emissions)	Ban of certain environmentally damaging materials/chemicals
Climate protectionism	Animal testing rules

Upon the identification of E&C risk drivers, institutions should proceed to assess which drivers could have a significant impact on their risk profile and operations (e.g., potential financial losses, business disruptions or legal claims and reputational damages).

Industry Practice 30: Identification of material E&C risk drivers

The following examples illustrate how banks identify and define their E&C risk drivers, encompassing both transition and physical risks, across different time horizons (Santander, 2022; Commonwealth Bank, 2022).

OVERALL MATERIALITY ASSESSMENT SYNTHESIS

Climate Risk Type	Climate Drivers		Main affected Time Horizon
Transition Risk	Market & Customers	→ Change in consumer behaviours including deliberate move to more sustainable products → Potential loss of competitive advantage with our green product proposition or pricing risks → Increased market volatility and cost, sourcing restrictions for carbon heavy raw materials	Short - Medium Term
	Policy-Making	→ More demanding policy environment affecting our customer's business operations → Increased green house gas (GHG) emissions pricing to foster movement to renewable sources	Short - Medium - Long Term
	Technology & Data	→ Investment in technology to reduce emissions or improve energy efficiency ratings → Lack of procedures and systems to obtain and store reliable data for risk assessments and disclosure	Medium Term
	Regulatory Pressure	→ New public disclosure products which increase the risk of misrepresentation, increased regulatory requirements which increases the potential of non-compliance, increased use of external analytics providers which increases the potential for data privacy breaches, all of which could result in fines, payment of damages and the voiding of contracts → Increasingly demanding banking regulation (disclosure, stress testing, taxonomies, etc) → Inefficiencies as consequence of different climate regulations, with special attention in those financial entities with international scope	Short - Medium Term
	Reputational	→ Risk of slow, lack or not sufficient reaction from financial entities impacting its reputation; extreme events that would cause damages to financial entities and employees own sites could challenge, if readiness response plans fail, the ability of the banks to prompt react to restoration of service and customers attention in vulnerable situations due to the damages → Increased scrutiny from different stakeholders (e.g. supervisors, regulators, media, NGO's, shareholders, investors, etc) → Perceived not to be meeting, sufficiently progressing, or providing transparency on climate-related commitments and transitioning → Liability implications as an intermediary in several value chain (e.g. data, products, financial services) → Reputational impact from potential misalignment of emissions reduction commitments with performance in specific portfolios	Short - Medium -Long Term
Physical Risk	Acute	→ More frequent and severe climate events such as flooding, drought, etc, that could affect financed assets and the value of the collaterals	Short - Medium - Long Term
	Chronic	→ Alterations in weather patterns and stability of local ecosystems affecting food production and living environment. → Rising temperatures affecting working conditions, living conditions and local infrastructure. → Rising sea levels affecting local ecosystems, increasing subsidence and flood risks	Long Term

Figure 45: Definition of climate risk drivers (Santander, 2022).

Risk type	Climate risk drivers	Potential impacts	Time horizon to impact
Strategic			
Environmental and social	**Transition** – reputation **Physical** – acute and chronic	• Potential decline in financial performance. • Revenue from new sustainability products and services does not offset revenue from carbon intensive products and services. • Increased cost of capital or funding and carbon border adjustment taxes.	◔
Capital adequacy	**Physical** – acute and chronic	• Risk of insufficient capital to withstand impacts of climate events.	◔ ◑
Reputation	**Transition** – policy and legal and reputation	• The Bank's E&S Framework and Policy, emission reduction strategies (including financed emissions) or continued financing of carbon intensive or non-environmentally friendly industries could fail to meet stakeholder expectations.	◔
Financial			
Credit – default	**Physical** – acute and chronic	• Defaults on loans by businesses and households. • Potential for assets used as collateral to decline in value.	◔
Credit – stranded asset	**Transition** – policy and legal and reputation **Physical** – acute and chronic	• Inability to repay loans to the Bank due to physical and transition risks impacting the viability of existing business models.	◑ ◕
Market	**Transition** – market	• Value of securities held is negatively affected.	◔
Liquidity	**Physical** – acute and chronic	• Increased demand for liquidity in response to extreme weather events.	◑ ◕
Non-financial			
Compliance – conduct	**Transition** – policy and legal and technology **Physical** – acute and chronic	• Increased number of vulnerable customers and hardship cases. • Access to financial products and services. • Potentially inadvertent unfair treatment of customers.	◔
Compliance – regulatory and licencing	**Transition** – policy and legal	• Failure to comply with current and emerging climate risk regulations.	◔
Operational – third party	**Transition** – policy and legal	• Third parties performing services for, or on behalf of, the Bank failing to comply with current and emerging climate risk regulations or Bank policies.	◔
Litigation	**Transition** – policy and legal and reputation	• Potential legal action or penalties arising from strategies, policies, actions or decisions not being aligned to public disclosures or commitments.	◔
Operational – business disruption	**Physical** – acute and chronic	• Higher risk of business disruption to various services in these areas.	◔

◔ Short-term – up to five years ◑ Medium-term – five to 10 years ◕ Long-term – more than 10 years

Figure 46: Mapping climate risks to other risks (Commonwealth Bank, 2022).

B. Assessment of materiality

Banks employ different qualitative and quantitative methods to evaluate the significance of risks based on the type of exposure and risk driver involved. Typically, banks utilize qualitative approaches and supplement them with proxy-based quantitative data. Advanced banks utilize scenario analyses to assess the potential impact on the probability of default (e.g., through changes in client revenues/costs) or loss given default (e.g., through changes in the value of collateral) or credit-related exposures, as well as loss estimates for market and operational risk-related exposures.

The following table presents a range of observed analyses with varying levels of complexity that are used to assess the materiality of physical and transition risk drivers.

Methods to assess the materiality of physical risk drivers (ECB, 2022)

Complexity	Type of analysis	Portfolios in scope	Description
Low	Exposure analysis	Wholesale	An institution identifies physical risks based on sector-specific vulnerability to climate-related events and assigns sensitivity scores. By combining sector and geography, the institution creates a matrix to assess the impact of physical risks. Exposures are mapped onto this matrix, resulting in a heat map for further analysis.
Low	Sensitivity analysis	Trading portfolio (equity, FX, commodity)	An institution develops stress scenarios to evaluate and quantify the impact of extreme weather events on its trading book's profit and loss. By simulating shocks and assessing individual positions, the institution determines the overall impact on P&L and solvency.
Medium	Business continuity analysis	Business operations and IT servers	An institution identifies physical risk events that may affect its personnel, data, services, and facilities. Using forward-looking maps from external sources, the institution evaluates the exposure of its buildings and third-party vendors to these events, leading to qualitative conclusions on risk materiality.
High	Collateral analysis	Commercial and residential real estate	Through a location-specific analysis, an institution quantifies physical risks using geospatial mapping and local characteristics. By constructing vulnerability curves and incorporating hazard maps, the institution calculates risk estimates at a postal code level, considering building types and any existing protections or mitigation measures. The institution translates these risk estimates into expected damages and losses for its collateral portfolio.

Methods to assess the materiality of transition risk drivers (ECB, 2022)

Complexity	Type of analysis	Portfolios in scope	Description
Low	Exposure analysis	Commercial and residential real estate	An institution categorises its exposures based on energy performance certificates and classifies clients into different risk levels (low, medium, high, very high). This helps identify high-risk clients who may face challenges with rising energy costs or lack resources for renovation measures.

Complexity	Type of analysis	Portfolios in scope	Description
Medium	Qualitative scenario analysis	All	An institution examines reputation risks, such as greenwashing and financing of polluting industries. Scenarios are defined, stakeholders are identified, and potential losses are estimated using expert judgment and historical data. Plausible loss values are assessed, discussed, and adjusted before being aggregated to provide a quantitative approximation.
High	Portfolio Alignment	Commercial and residential real estate	An institution utilizes a monitoring tool to assess the alignment of its real estate portfolio with regulatory decarbonization scenarios. Relevant climate and environmental risk metrics, including energy consumption, building type, renovation measures, materials, and public transport connections, are collected. The likelihood of collateral becoming non-compliant with country/regional regulations and the materiality of climate risks for the real estate portfolios are evaluated.

Industry Practice 31: Materiality assessment of E&C risks

Deutsche Bank conducted a materiality assessment of E&C risks to identify key impacts across potentially affected risk types in varying time horizons. The risk drivers covered in the materiality assessment are then used to integrate E&C risk considerations into the risk identification process which functions as a basis for the group risk inventory and reviewed against internal controls (Deutsche Bank, 2023).

Figure 47: Materiality assessment of E&C risks (Deutsche Bank, 2023).

C. Determination of materiality and setting of thresholds

Banks are expected to assess materiality for all significant E&C risks annually or upon the occurrence of material changes in environmental-related circumstances or regulations, utilizing their internal definition. To effectively manage these material risks, banks should adopt a strategic approach and employ a comprehensive range of risk management tools. The practices below outline the thresholds employed by banks in this context and the subsequent actions taken to address identified areas of material risk. It is important to consider these follow-up actions alongside other recommended practices outlined in this handbook.

Banks may establish a threshold as part of the materiality assessment process to make a final determination. These thresholds can be quantitative or qualitative, depending on the feasibility of conducting a quantitative assessment. Various types of thresholds have been observed for E&C risk consideration, and each bank sets a maximum limit for each threshold based on its solvency and liquidity position. These threshold types include:

1. *Capital impact:* The amount of capital at risk, assessed from both a normative (e.g., Common Equity Tier 1 ratio) and economic perspective (e.g., economic capital).
2. *Liquidity impact:* The level of net outflows, evaluated from both a normative (e.g., liquidity coverage ratio) and economic perspective.
3. *Qualitative assessment:* The qualitative evaluation of the risk event and its anticipated impact, considering adverse consequences for the institution's reputation or compliance ability.
4. *Concentrations:* The magnitude of exposure affected by the risk event relative to the total exposure. Risk concentrations can result in significant impact even under relatively mild market conditions.

Industry Practice 32: Heatmaps and concentration analysis

Rabobank utilizes climate risk heatmaps that combine the level of threat and event impacts to which its clients are exposed. These heatmaps consider factors such as geographic location, sector, and time horizon, and provide insights into the concentration of inherent risk within the portfolio. The results of the heatmap and concentration analysis are used to prioritize scenario analyses and inform climate risk stress testing, sector strategies, assessments of vulnerable sectors, and client-level evaluations (Rabobank, 2022).

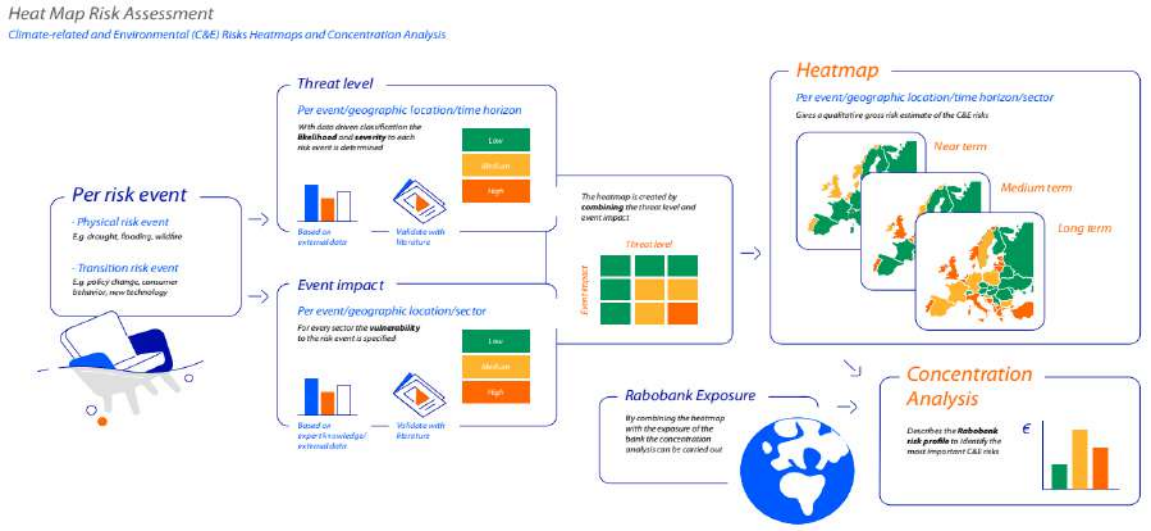


Figure 48: E&C risks heatmaps and concentration analysis (Rabobank, 2022).

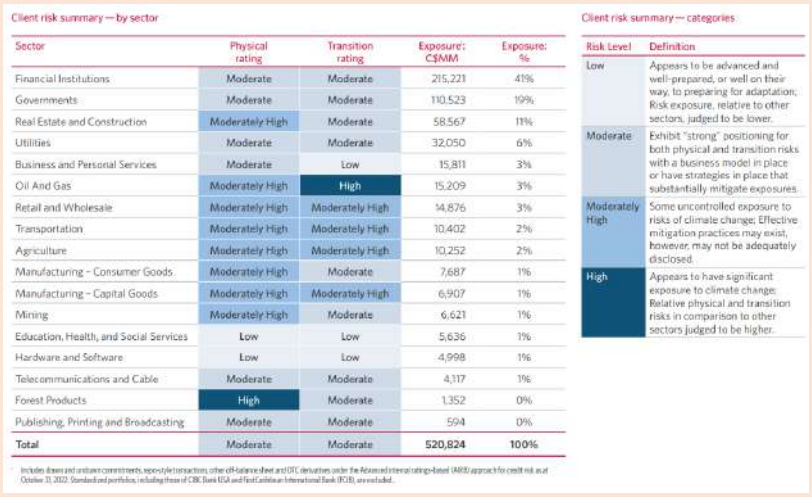
D. Exposures identification

Banks face E&C risks through their exposures to various entities, such as corporations, small and medium-sized enterprises (SMEs), households, and governments. Depending on the type of exposure, banks employ different qualitative and quantitative methods to assess the risks' materiality. Initial analyses often involve using proxy-based quantitative techniques that utilize both client and external data to identify areas of risk. Leading banks go beyond these initial analyses and employ more advanced assessment methods to obtain a more accurate estimation of the risk level. These methods may include portfolio alignment approaches, sensitivity analysis, and evaluating financed emissions. The practices outlined in this section highlight the qualitative and quantitative approaches that banks adopt to determine the materiality of E&C risks.

Industry Practice 33: Approaches to identify exposure levels

In 2021, CIBC developed a heatmap approach to identify the impacts of physical and transition risks on its business and government sectors and applied it to their considerations of loan exposures. The heatmap provides a visual representation of the industry sector and the relative sensitivity to E&C risks (CIBC, 2022). Looking in-depth indicator for assessment of risk, for example, to consider physical risks, the bank uses sector risk levels are a function of three components:

1) *Vulnerability* – captures both direct and indirect physical impacts on investments from a changing climate, accounting for chronic changes as well as extreme events.
2) *Hazard* – climate variables from vulnerability that drives negative or positive performance of the indicator.
3) *Exposure data* – geographic presence of the portfolio segments exposed to hazards.



Client risk summary — by sector

Sector	Physical rating	Transition rating	Exposure: C$MM	Exposure: %
Financial Institutions	Moderate	Moderate	215,221	41%
Governments	Moderate	Moderate	110,523	19%
Real Estate and Construction	Moderately High	Moderate	58,567	11%
Utilities	Moderate	Moderate	32,050	6%
Business and Personal Services	Moderate	Low	15,811	3%
Oil And Gas	Moderately High	High	15,209	3%
Retail and Wholesale	Moderately High	Moderately High	14,876	3%
Transportation	Moderately High	Moderately High	10,402	2%
Agriculture	Moderately High	Moderately High	10,252	2%
Manufacturing – Consumer Goods	Moderately High	Moderate	7,687	1%
Manufacturing – Capital Goods	Moderately High	Moderately High	6,907	1%
Mining	Moderately High	Moderate	6,621	1%
Education, Health, and Social Services	Low	Low	5,636	1%
Hardware and Software	Low	Low	4,998	1%
Telecommunications and Cable	Moderate	Moderate	4,117	1%
Forest Products	High	Moderate	1,352	0%
Publishing, Printing and Broadcasting	Moderate	Moderate	594	0%
Total	Moderate	Moderate	520,824	100%

Client risk summary — categories

Risk Level	Definition
Low	Appears to be advanced and well-prepared, or well on their way, to preparing for adaptation; Risk exposure, relative to other sectors, judged to be lower.
Moderate	Exhibit "strong" positioning for both physical and transition risks with a business model in place or have strategies in place that substantially mitigate exposures.
Moderately High	Some uncontrolled exposure to risks of climate change; Effective mitigation practices may exist, however, may not be adequately disclosed.
High	Appears to have significant exposure to climate change; Relative physical and transition risks in comparison to other sectors judged to be higher.

Figure 49: Exposure analysis by sector (CIBC, 2022).

Similarly, Santander leverages qualitative and quantitative heatmap data to identify strategically positioned customers and portfolios, track the evolution of strategic risks, and develop metrics for risk management, credit policies, and business strategy. The materiality assessment encompasses more than 80% of the bank's balance sheet (Santander, 2022).

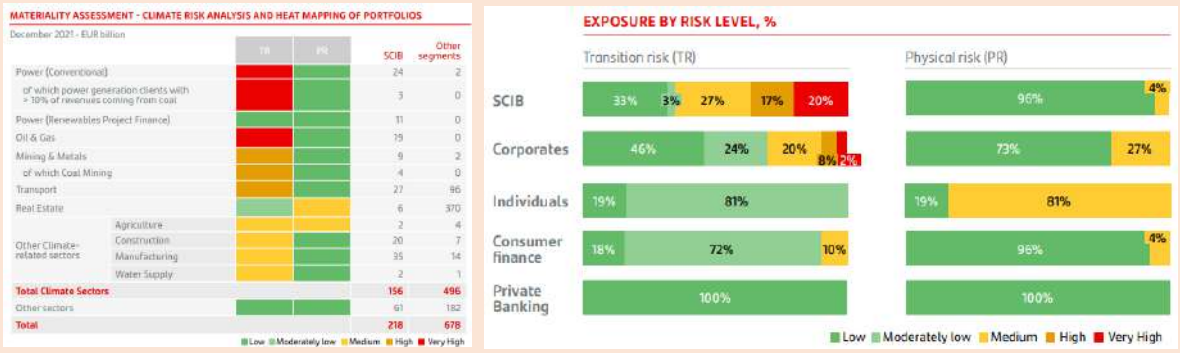


Figure 50: Climate risk analysis and heat mapping of portfolios (Santander, 2022).

Once materiality is determined, institutions undertake various actions to ensure their risk management framework and processes effectively address these material risks. A strategic approach is adopted to enhance the resilience of their business model. The table below illustrates a non-exhaustive list of observed practices in this regard.

Non-exhaustive list of observed follow-up actions after determination of materiality (ECB,2022b):

Type of action	Description
Risk inventory	Institutions regularly update their risk inventory by identifying and documenting newly discovered significant climate and environmental risk factors. This involves mapping these risk drivers, understanding their transmission channels, and assessing their (theoretical) potential impact on different risk categories.
Sector policies and strategies	The materiality assessment informs the development of sector-specific policies and strategies. For instance, institutions may choose to reduce their exposure to climate-sensitive activities, client types, or sectors while increasing exposure to climate-resilient alternatives.
Risk appetite limits	The materiality assessment is utilized to adjust sector limits within the institution's risk appetite statement. For sectors highly sensitive to physical and/or transition risks, the institution applies haircuts to exposure-at-default sector limits, typically ranging from 5% to 10% depending on the level of sensitivity.
Stress testing	The materiality assessment prompts a re-evaluation of risk coverage in the institution's standardized stress tests. It may also trigger ad-hoc stress tests focusing on specific climate and environmental risk drivers.
Capital allocation	Institutions allocate economic capital specifically for managing material transition and physical risk drivers. Economic capital is assigned to credit, market, or operational risk based on outcomes from climate-related scenario analyses, such as those provided by NGFS scenarios or business continuity scenarios. In some cases, institutions include E&C risks as part of their management buffer.

5.2.2) POLICIES AND PROCESSES FOR E&C MATERIAL RISK IDENTIFICATION AND ASSESSMENT

5.2.2a) Standard Practice

Standard Practice: Policies and processes to identify and assess E&C risks *(item 3.2.3(2&2.1))*

Financial institutions should have in place an up-to-date policies and processes in identifying and assessing environmental risk both at the **transaction and portfolio levels.**

Financial institutions should establish **policies and processes** in identifying and assessing environmental risk to support the decision-making process. This includes, for example, inquiring environmental information from clients during **loan and investment analysis** so that they can appropriately evaluate clients' and counterparties' environmental risk levels and risk management capacity. High materiality risk transactions should be evaluated by environmental experts with no conflict of interests in such transactions (BOT, 2023b).

5.2.2b) Key Actions

Key Actions 5.7: Policy and Process for risk identification and assessment; Loan and investment analysis

Key Item	Short-term Actions	Long-term Actions
5.7.1 Policy and process for E&C risk identification and assessment (transactional & portfolio level)	1. Established procedure for **E&C risk integrated due diligence process and portfolio risk assessment, particularly for E&C high-risk portfolios and clients in high-risk/high-emission sectors.** 2. At portfolio level, banks should use **key metrics to monitor clients**/products, such as credit exposures, credit quality, or geography to monitor E&C risks.	N/A
5.7.2 Loan and investment analysis	1. **Lending and investment policy should incorporate E&C risks perspectives.**	1. Set **exclusion criteria and phase out criteria as assessment criteria in lending and investment policy**, in alignment with the bank's transition plan 2. **Banks to issue exclusion policy by activity or sector**, to prevent high E&C risk transactions and investment.

5.2.2c) Recommended Approach

To manage E&C risks at transaction and portfolio levels, banks need to set up policies or processes to ensure that the identification of E&C risks can be assessed at both levels. For the level of portfolio, there are various tools and methodologies banks can deploy, such as exposure assessment and through monitoring mechanisms (to be discussed in 'risk monitoring' section).

Risk identification and assessment of clients at transaction level is key to screening and assessing E&C risks before banks enter financial relationships with counterparties who may have high E&C risks and may affect the bank's portfolio in the medium or long-run. Therefore, it is crucial for banks to develop systematic approaches to incorporating E&C risks into their client due diligence and lending policies.

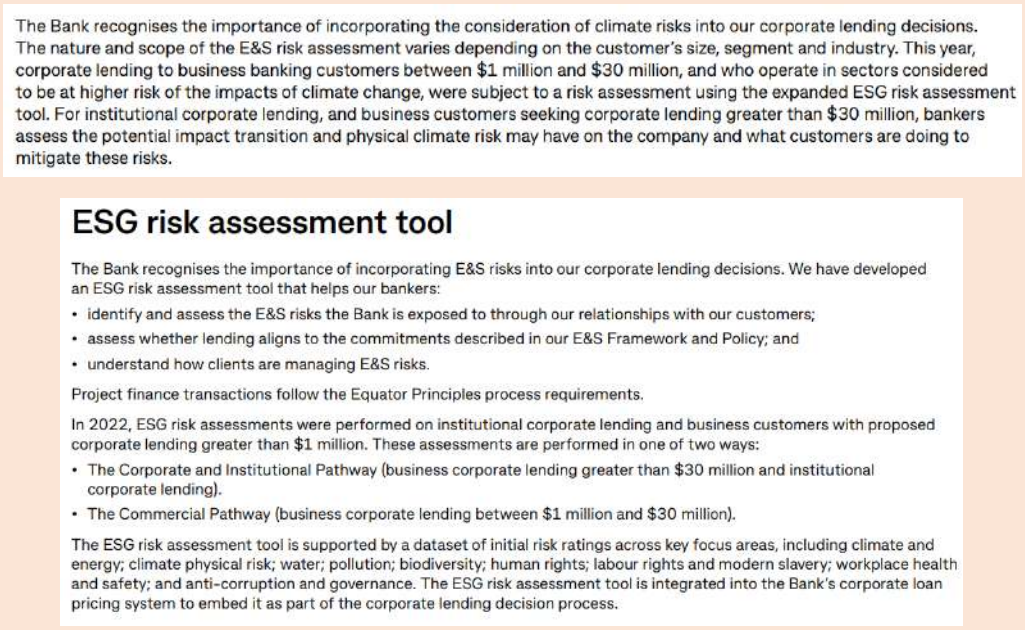
Lending Criteria Assessment

Banks begin to integrate E&C risks into their client due diligence and lending policies by establishing lending criteria aligned with their risk appetite. These criteria can involve exclusion criteria that determine which activities are not acceptable to finance from an E&C risk perspective, and phasing out criteria, which set long-term targets to limit concentration or phase out specific types of exposure. Examples of both criteria are as follows:

- **Exclusion criteria:** Avoiding financing companies heavily reliant on coal for more than 25% of their energy mix.
- **Phasing out criteria:** Setting targets to phase out exposures to high CO2-intensive sectors by a certain date, which also affects the maximum loan duration for new debtors.

Industry Practice 34: E&C risk considerations in lending decisions

Commonwealth bank incorporates considerations of E&C risks into their corporate lending decisions through the use of an ESG risk assessment tool. This assessment is applied to both institutional corporate lending clients and business corporate lending clients with loan amounts exceeding $1 million, or those operating in sectors identified as having high climate risk. Approval of corporate lending decisions is made by bankers, with higher-risk decisions being escalated to management or committees for decision (Commonwealth Bank, 2022).



The Bank recognises the importance of incorporating the consideration of climate risks into our corporate lending decisions. The nature and scope of the E&S risk assessment varies depending on the customer's size, segment and industry. This year, corporate lending to business banking customers between $1 million and $30 million, and who operate in sectors considered to be at higher risk of the impacts of climate change, were subject to a risk assessment using the expanded ESG risk assessment tool. For institutional corporate lending, and business customers seeking corporate lending greater than $30 million, bankers assess the potential impact transition and physical climate risk may have on the company and what customers are doing to mitigate these risks.

ESG risk assessment tool

The Bank recognises the importance of incorporating E&S risks into our corporate lending decisions. We have developed an ESG risk assessment tool that helps our bankers:

- identify and assess the E&S risks the Bank is exposed to through our relationships with our customers;
- assess whether lending aligns to the commitments described in our E&S Framework and Policy; and
- understand how clients are managing E&S risks.

Project finance transactions follow the Equator Principles process requirements.

In 2022, ESG risk assessments were performed on institutional corporate lending and business customers with proposed corporate lending greater than $1 million. These assessments are performed in one of two ways:

- The Corporate and Institutional Pathway (business corporate lending greater than $30 million and institutional corporate lending).
- The Commercial Pathway (business corporate lending between $1 million and $30 million).

The ESG risk assessment tool is supported by a dataset of initial risk ratings across key focus areas, including climate and energy; climate physical risk; water; pollution; biodiversity; human rights; labour rights and modern slavery; workplace health and safety; and anti-corruption and governance. The ESG risk assessment tool is integrated into the Bank's corporate loan pricing system to embed it as part of the corporate lending decision process.

Figure 51: Approach to identifying and assessing climate risks (Commonwealth Bank, 2022).

5.2.3) CLIENT DUE DILIGENCE

5.2.3a) Standard Practice

Standard Practice: Policies and processes to identify and assess E&C risks *(item 3.2.3(2&2.1))*

Financial institutions should have in place up-to-date policies and processes in identifying and assessing environmental risk both at the **transaction and portfolio levels.**

Financial institutions should establish policies and processes in identifying and assessing environmental risk to support the decision-making process. This includes, for example, inquiring environmental information from **clients** during **loan and investment analysis** so that they can appropriately evaluate clients' and counterparties' environmental risk levels and risk management capacity. High materiality risk transactions should be evaluated by environmental experts with no conflict of interests in such transactions (BOT, 2023b).

5.2.3b) Key Actions

Key Actions 5.87: Tools for E&C risk assessment (transaction & portfolio)

Key Item	Short-term Actions	Long-term Actions
5.8.1 Data collection/ management for E&C risk management	1. For the purpose of **exposure assessment**, banks should have established **data management procedure to collect and manage clients' data**, in line with the bank's data reporting framework, and at the minimum, segregated by sector and geography. 2. **First line of defense should have an understanding of the E&C data required,** and of how to acquire relevant data for effective client's E&C risk monitoring	1. For the purpose of **financed emission data collection and sectoral targets setting**, banks should have established **data management procedure to collect and manage clients' data**, in line with the bank's data reporting framework, and at the minimum, segregated by sector and geography. 2. **Established data points on client's E&C performances, in line with criteria to consider E&C risks in credit policy,** to acquire key E&C data for credit decision making, and E&C risk management at portfolio level.
5.8.2 Tools for E&C risk assessment (transaction & portfolio)	1. Banks should establish **tools and processes for risk identification and record of the E&C risk assessment** (in form of qualitative and quantitative approaches). 2. The **risk assessment should be done by sector, and by clients** or counterparties, prioritizing high-emission sectors. 3. Banks should establish **additional consideration for transactions and credit activities with high-risk sectors**. At the minimum, loans and investment in high-risk sector should be noted and monitored by high-level management using current/existing risk appetite, risk thresholds and limits.	1. Banks should establish tools and processes for risk identification and record of the E&C risk assessment (in form of qualitative and quantitative approaches), with **identified indicators used for assessment in line with the bank's climate-related KRIs.** 2. Banks should establish **additional consideration for transactions and credit activities with high-risk sectors.** At the minimum, loans and investment in high-risk sectors should be approved by senior/executive management, with key information on E&C risks **clearly defined for decision-making.** 3. Banks should establish **an internal policy for E&C risk at transaction & portfolio level.** This can be integral to transition plan, exclusion list, or established risk appetite threshold.

5.2.3c) Recommended Approach

For clients who are not excluded from financing based on the established criteria, banks proceed with a client-level risk assessment as part of the due diligence process. To develop this assessment, banks utilize a client questionnaire to gather client and asset-specific data necessary for evaluating relevant transition and physical risk drivers. Both quantitative and qualitative risk data are collected from various sources. The table below provides a non-exhaustive overview of observed practices in this aspect.

A. Client Data collection for E&C risk assessment

Enhanced due diligence that address E&C risks should be carried out on clients for banks to form a view on the level of risk and to be able to make an appropriate credit decision. Banks should engage directly with counterparties or customers to gather their risk profiles, allowing for a comprehensive understanding of their behaviors. This engagement is crucial for aligning with a long-term perspective aimed at improving the sustainability rating or credit rating of the counterparty (ECB, 2020).

Banks may use the following topics to serve as guide when engaging with counterparties to enhance their understanding of their counterparties. These topics are structured around three perspectives – transition, physical, and reputational risks (GFIT, 2021):

a) Engagement on transition risks
   a. Impacts from environmental change
   b. Perspectives on the potential transition risks that the company may encounter over the next few years
   c. Internal governance processes, disclosures, policies, targets, and progress to address environmental risks
   d. Strategies in adapting and managing risks
   e. Identification and management of reputational risks

b) Engagement on physical risks
   a. Impact of physical risks on operations and assets, and subsequent mitigation actions
   b. Policies to review and mitigate impacts of physical risks on assets
   c. Impact of environmental change on assets

c) Engagement on reputational risks
   a. Activities in environmentally sensitive sectors
   b. Alignment with the bank's reputational appetite

The data collected from clients should be both in qualitative and quantitative form. Qualitative data is crucial for understanding the E&C risk management process and information on exposure to risks which are unquantifiable. Quantitative data is also crucial as banks would require such data as input in metric for exposure monitoring and risk assessment at the portfolio level.

Non-exhaustive list of data items collected to inform risk assessment during due diligence for:

Qualitative Data		
Data	Description	Targeted risk driver
Adverse media check	Examination of client's involvement in controversies related to climate change and/or environmental degradation.	Reputational and liability risk
Assessment of impact of E&C regulations	Assessment of client's consideration of the impact of forthcoming regulations pertaining to climate change and environmental degradation.	Transition risk
Adherence to sustainability reporting	Evaluation of client's adherence to sustainability reporting standards (e.g., CSRD).	Reputational and liability risk
Implementation of E&C risk policies	Analysis of client's policies addressing key potential issues related to climate change and environmental degradation in their operations.	Transition and physical risks
Production, use or disposal of chemicals	Identification of whether the client produces, uses, or disposes of chemicals.	Transition risk

Qualitative Data		
Data	Description	Targeted risk driver
Time-bound emission reduction plans	Verification of the presence of time-bound plans by the client to align their GHG emissions with objectives such as those outlined in the Paris Agreement.	Transition risk
Quantitative Data		
Data	Description	Targeted risk driver
Current and projected total GHG emissions	Estimation of the total current and future greenhouse gas (GHG) emissions of financed assets categorized by Scope 1, 2, and 3 emissions (e.g., metric tons of CO_2 or CO_{2e} per produced unit).	Transition risk
Fossil fuel dependency	Percentage of revenues or production volumes attributed to the production, processing, distribution, storage, or combustion of fossil fuels.	Transition risk
Geographical location data	Detailed data regarding the geographic location of financed assets and/or primary client activities (e.g., postal codes).	Physical risk
Energy consumption intensity	Assessment of client energy consumption (e.g., gigawatt hours - GWh), including the breakdown of renewable and non-renewable sources.	Transition risk
Water consumption intensity	Evaluation of client water consumption in million cubic meters (m^3).	Physical risk
Energy performance certificate	Energy Performance Certificates (EPC) for both residential and commercial real estate.	Transition risk
Sustainable building certificate	Verification of sustainability certificates for construction projects (e.g., BREEAM or LEED).	Transition risk

Utilising this data, banks can form a risk perspective, often assigning client-specific E&C risk ratings. These ratings serve to differentiate risks (such as high, medium, or low) and enable banks to compare and rank clients based on various factors, such as sector classification, thereby assessing them relative to their peers.

B. Check alignment with international standards and guidelines for Project Financing (Optional)

In addition to conducting a client due diligence process, banks should also ensure compliance with internationally accepted guidelines such as the International Finance Corporation (IFC) Performance Standards and the Equator Principles (EPs).

The IFC Performance Standards provides a framework for managing environmental and social risks and impacts, while the EPs are a set of voluntary guidelines adopted by financial institutions to assess and manage environmental and social risks in project financing. The fourth and most recent version of the EPs ("EP4") officially came into effect for all EP Financial Institutions on 1 October 2020. The scope includes Project Finance Advisory Services, Project Finance, Project-Related Corporate Loans, Bridge Loans, and Project-Related Refinance and Acquisition Finance (Equator Principles, 2020).

Both guidelines provide financial institutions with a robust framework for E&C-related client due diligence. Guiding aspects of this include risk and impact assessment of clients' projects and activities, performance requirements of client borrowers, and disclosure requirements of clients' climate-related data and information. It is especially important in assessing and managing climate risks associated with project financing during client onboarding, in which banks can utilize the guidelines to:

1. Identify and evaluate climate-related risks
2. Evaluate clients' risk management practices and strategies
3. Establish tracking and monitoring mechanisms
4. Assess level of clients' commitment through client engagement

By adopting these guidelines, banks can systematically evaluate and manage climate-related risks whilst aligning their lending and investment activities with internal climate targets and regulatory commitments. It is therefore encouraged for banks to adopt these guidelines when performing E&C due diligence for clients.

Industry Practice 35: Adoption of Equator Principles

MUFG adopted the Equator Principles framework to perform E&C related due diligence for clients with different levels of risks. The framework, which is handled and participated by senior management, minimises potential damage on MUFG's corporate value or the materialisation of a reputational risk (MUFG, 2023).

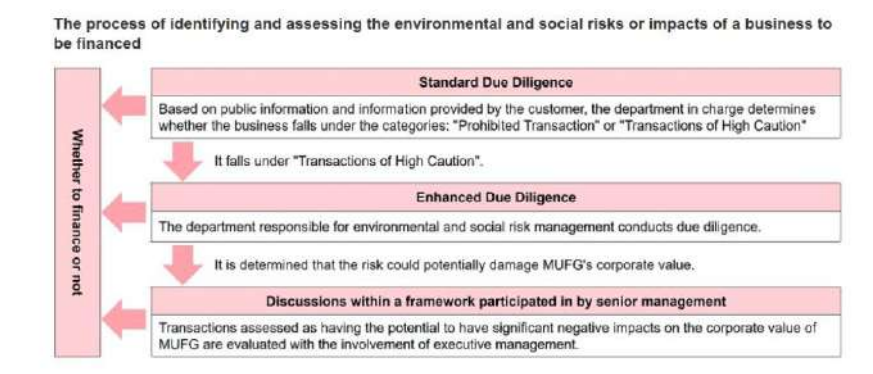


Figure 52: Process of identifying and assessing the E&S risks or impacts of a business to be financed (MUFG, 2023).

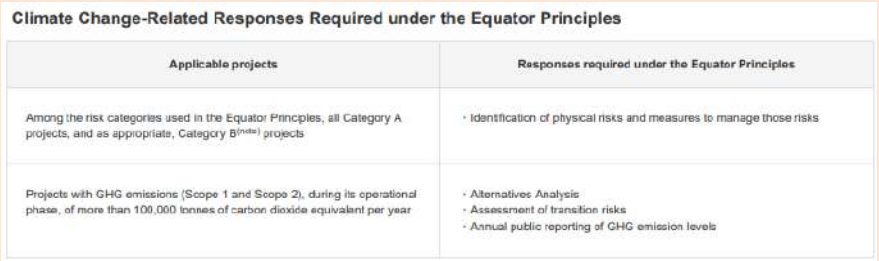


Figure 53: Climate change-related responses required under the Equator Principles (MUFG, 2023).

The Equator Principles: Climate Change Risk Assessment for Project Finance

The supplementary guidance document from the EP, which supports the implementation of Climate Change Risk Assessment (CCRA) requirements under EP4, suggests a two-phased approach to CCRA in project financing. (Equator Principles, 2023):

Given that the EP is a voluntary risk management framework within the financial industry, the Guidance Note, as a supplementary document to EP4, does not introduce new principles, and therefore applies the same principles as EP4. Nonetheless, the framework has gained substantial adoption across the financial sector and is widely recognized as a valuable instrument for assessing and managing environmental risks in projects. Several global banks have also reportedly embedded EP requirements as part of the banks' E&C risk policies.

Figure 54: Overview of the two-phased CCRA framework structure (Equator Principles, 2023).

Phase 1: The preliminary compatibility review of National Climate Commitments (NCCs), which is further divided into physical risks and transition risks review. EP also sets the threshold for GHG emissions for specific projects where the amount is significantly high (for the applicability of the emissions threshold, please see section 2.2 of the Guidance Note).

- The CCRA should consider the project's compatibility with the NCCs of the host country, which may include NDCs, Long Term Strategies (LTS) and objectives of the Paris Agreement (for projects located in countries that are not party to the Paris Agreement).
- Lenders should assess whether the project is compatible with the host country's adaptation/resilience approaches (i.e., addressing **physical risks**) and mitigation approaches (i.e., **transition risks**). The project's compatibility with the NCC should be assessed as either 'Aligned', 'Not Aligned', or 'Conditional.'

Figure 55: Levels of alignment with national and international climate goals (Equator Principles, 2023).

- Whilst there are clear criteria for the compatibility review of transition risks, there is no predefined list of sectors or activities automatically aligned with physical risks. Physical risk alignment relies on two key questions: (1) Is the project consistent with national policies and commitments for climate adaptation or resilience? And (2) Have project-related physical risks been identified and addressed.

Phase 2: Developing Climate-Resilient Project Design and Strategy. The CCRA process is divided into 3 stages: risk screening, risk assessment, and risk management for both physical and transition risks (in alignment with TCFD recommendations). This can be summarized as follows:

- Physical risks
    - Risk screening – lenders should review a set of climate hazard data and sector vulnerabilities relevant to the project's geography.
    - Risk assessment – lenders should consider physical climate hazards specific to the project's local context, determine the project's exposure to those hazards, and assess project vulnerability in more details, based on a thorough analysis of climate data and projections across various future scenarios.

- Risk management – all identified material risks must be addressed in the management plan to build up climate resilience. The plan should outline how each risk will be managed through a mechanism of either mitigate, transfer, accept or control.

- Transition risks: the summary of risk screening, risk assessment, and risk management approaches for transition risks are outlined in the table below.

Assessment type	Lifecycle stage	Objective	Approach	Information requirements
Resilient Project Design and Strategy - Transition risk screening	Feasibility	Identify potentially material transition risks for the Project to inform business case and strategy, prevent lock-in and reduce risk management costs.	Identify typologies of potentially material risks for the Project based publicly available transition trajectories and sectoral risks analyses: 1) transition risk heatmaps and third-party transition risk analyses 2) a low-GHG development pathway for that country (i.e. NDC). 3) transition trajectory for the sector	Project operations, energy sources, technological choices, products, customer, markets
Resilient Project Design and Strategy - Transition risk assessment	Design	Assess residual exposure to transition risks (revenue generation, Client; credit risk, lender) based on design and business case.	Full CCRA using scenario analysis to stress-test the resilience of the strategy, and the adequacy of the transition action plan (governance, strategy, risk management, metrics and targets).	Business base case, transition risk mitigation and opportunity enhancement measures, transition scenarios.
Resilient Project Operation and Strategy – Transition plan	Design	Anticipate and manage transition risks over the Project operation.	Develop a plan for the management of residual material risks to the Project associated to the transition to a low-carbon economy (i.e. Climate Change Transition Management Plan).	Residual risk and associated management, metrics, monitoring and reporting, governance structure, frequency of revisions.

Figure 56: Overview of CCRA steps and approaches for transition risk (Equator Principles, 2023).

C. Acceptance criteria and portfolio thresholds

Banks subsequently evaluate whether the extent of E&C risk aligns with their risk tolerance. Some institutions opt not to provide financing to debtors classified as having high E&C risk, while others may require the involvement of E&C risk experts or impose specific conditions in the loan agreement, such as risk mitigation through insurance or the implementation of a transition plan.

At the portfolio level, certain banks establish threshold levels for accepting clients with unfavourable E&C risk classifications. These relative thresholds specify the percentage of clients within a particular loan portfolio for which a poor E&C risk rating is deemed acceptable. These thresholds complement absolute limits on accepting clients with unfavourable E&C risk ratings.

D. Ongoing review

After establishing a client relationship, banks conduct regular due diligence, with the frequency determined by the client's risk classification. In addition to ongoing reviews for new clients, banks also assess existing clients for E&C risk on a periodic basis.

Additional resources: Due diligence

To explore more about relevant E&C due diligence standards and guidance, please visit:

- International Finance Corporation (IFC) Performance Standard: IFC Performance Standards on Environmental and Social Sustainability
- Equator Principles (2020): The Equator Principles
- Equator Principles (2023): Guidance Note on Climate Change Risk Assessment
  - Data reference for sector vulnerability (Annex 1)
  - Guidance on climate change data procurement and assessment (Annex 2)
- OECD (2018): OECD due diligence guidance for responsible business conduct

5.3) SCENARIO ANALYSIS & STRESS TESTING

5.3a) Standard Practice

Standard Practice: Forward-looking method to assess E&C risks (*item 3.2.3(2.3)*)

Financial institutions should assess and review environmental risks and impact that may result in financial risks regularly, using forward-looking method, both quantitatively and qualitatively. This includes, for example, considering environmental factors when conducting **scenario analysis and stress testing** and use the results as part of developing business strategy, risk management, internal capital adequacy assessment process, and financial performance reporting. In this regard, financial institutions should decide the frequency of risk assessment and review in line with clients' and counterparties' risk materiality, sectors, type of transactions or portfolios (BOT, 2023b).

5.3b) Key Actions

Key Actions 5.9.1: Scenario analysis and stress testing

Key Item	Short-term Actions	Long-term Actions
5.9.1 Scenario Analysis & Stress testing	For the ad hoc regulatory stress-testing exercise/s to be undertaken by the banks: 1. Banks should **determine the objective they are seeking to achieve through the use of scenario analysis or stress-testing exercise.** The objective of E&C stress test may include identifying vulnerabilities to material risks (including both physical and transition risks), assessing the E&C impacts, testing strategies and determining risk appetite/tolerances. **Stress testing objectives will determine the approach and complexity of the methodology.** The results of the E&C scenario analysis and stress tests should be incorporated into the bank's risk management and risk appetite process. 2. Banks with material E&C risks are required to **incorporate the material E&C risks into their E&C scenario analysis and stress testing processes** (for both baseline and adverse scenarios). 3. The E&C stress tests should form part of the bank's stress testing framework and should cover both economic and normative aspects. **The normative perspective should extend at least 3 years and the economic perspective should consider a longer time horizon.** 4. When performing scenario analysis and stress testing of E&C risks, it is essential to consider the following factors from both an economic and normative perspective: i) Assess the **potential impact of both physical and transition risk** ii) Evaluate the evolution of **E&C risks in different climate scenarios recognizing that these risks may not be adequately represented in historical data.** iii) Understand how E&C risks may manifest in the **short-, medium- and long-term,** depending on the specific scenarios being considered.	1. Climate stress test should be **integrated in the bank's periodic stress testing framework/s**.

Key Actions 5.9.2: Capital and liquidity adequacy

Key Item	Short-term Actions	Long-term Actions
5.9.2 Capital and liquidity adequacy	N/A	1. Banks have developed **process and assessment criteria to evaluate solvency impact using quantitative and forward-looking methodology** (within their capital planning horizons) of E&C risks and **integrate in their internal capital adequacy assessment process (ICAAP) for all short-term, medium-term, and long-term time horizons** 2. Banks have developed assessment criteria to identify impacts on cash outflows or depletion of liquidity buffers (both in BAU and stress situation, through scenario analysis and stress testing) over different time horizons and **have integrated E&C risks into their internal liquidity management processes.** **3. Banks can also utilize ad hoc scenario analysis and stress testing based on the scenario and input parameter set by regulator to inform their solvency and liquidity position.**

5.3.1) OBJECTIVES FOR CONDUCTING SCENARIO ANALYSIS AND/OR STRESS TESTING

5.3.1b) Key Actions

Banks may seek to **accomplish different objectives when using stress testing and scenario analysis**. These include **identifying vulnerabilities** to material risks (both physical and transition), **assessing their impacts**, **testing strategies, and determining risk tolerance**. The specific objective pursued will determine the approach and complexity of the exercise. The results of climate stress tests can also be incorporated into the bank's risk management and risk appetite process (UNEP FI, 2021).

Scenario analysis & Stress testing: Definition and key considerations
Scenario analysis: An exercise used to assess and understand potential future risks and opportunities that may impact a bank's sustainability performance. Scenario analysis involves the identification, analysis, and evaluation of various scenarios to better comprehend the potential impacts of different events or conditions on the organisation's sustainable development goals. Stress testing: An exercise that considers the impact of a specific set of severely adverse conditions on the financial condition of the bank. Stress testing often focuses on unlikely events which may occur as instantaneous shocks, such as financial market stresses or a catastrophic event. Stress testing can be valuable in evaluating the near-term impact of transition risks, such as sudden policy changes or technological shifts that could create financial market or liquidity stresses. It is also effective in

Scenario analysis & Stress testing: Definition and key considerations

assessing chronic physical risk, which refers to the long-term shift in climate pattern, such as rising sea levels, rising average temperatures, and ocean acidification (BCBS, 2021b). Chronic physical risks arising from such factors can affect labor, capital, land and natural capital in specific areas. Temperature increase, for example, can cause business disruption especially for labour-intensive industries. This impact can be measured by a ratio of labour productivity loss. Temperature increase can also affect the agricultural industry as the increase in sea level may negatively impact production, which can be modelled by ratio of arable land. In terms of scenario data, there are several data providers, such as NGFS and NEX-GDDP. However, stress tests may not be effective in assessing acute physical risks over the medium and long term, as they may not generate meaningful results that capture the evolving nature of these risks. Acute physical risks are generally considered to include lethal heatwaves, floods, wildfires and storms, including hurricanes, cyclones and typhoons as well as extreme precipitation (BCBS, 2021b).

To address the impacts of these risks in longer time horizons, additional assumptions, and considerations (including management actions and interdependencies with socioeconomic factors) are necessary:

- From a bank's perspective, when using a static balance sheet assumption, the balance sheet remains constant over the stress testing horizon in terms of total volume, maturity, and product mix. In simpler terms, banks cannot consider specific actions or strategic changes they might take to counter the stressed scenarios.
- On the other hand, employing a dynamic balance sheet assumption enables banks to incorporate individual circumstances and realistic mitigating actions. For example, they can divest or direct capital into particular industries or sectors based on their counterparties' transition plans.
- Climate risk stress testing aims to forecast a firm's performance in climate-adjusted scenarios described by transition pathways. The dynamic balance sheet takes into account changes in production, consumption, price, technology mix, labour productivity, etc., and factors them into the firm's financial impact. This assumption is necessary to quantify the climate impact at the firm and counterpart levels.

While various central banks and regulators have started incorporating these assumptions and considerations in recently proposed exploratory climate stress tests, the methodology is still in its early stages and will continue to develop over time.

In contrast to stress tests, multi-year scenarios encompass a wide range of assumptions, from baseline to pessimistic and optimistic, enabling climate risk analysis to provide decision-makers with the most relevant information.

Qualitative vs. Quantitative approaches for environment risk related scenario analysis:

Definitions and Key consideration

Qualitative approach: This approach examines relationships and trends where limited or no statistical data is available. It is preferred for addressing uncertainties associated with long-term projects and helps firms to raise risk awareness and make high-level strategic decisions despite data limitations and uncertainties, especially regarding forward-looking aspects of required underlying data.

Quantitative approach: This approach employs models and analytical techniques to assess measurable trends and relationships. Preferred for measuring the impact of risk factors and conducting stress tests. It can be adopted by using external scenarios and models or developing in-house modelling capabilities.

When using external scenarios, caution is necessary to ensure their relevance and suitability to the organisation's risk profile. The results of such analysis may not yield precise values but can provide a better understanding of sensitivities to environmental risks and opportunities, as well as a range of potential outcomes for risk management, depending on the objectives of the exercise.

It is to be noted that the choice between a qualitative or quantitative approach depends on the time horizons and the type of risk being evaluated. Transition risk and chronic physical risk are typically measured over a longer period, extending up to 30 years, often until 2050. On the other hand, acute physical risk is assessed over shorter timeframes, typically up to 2030.

Expectations for banks

Banks with significant E&C risks are required to assess the suitability of incorporating these risks into their stress testing exercises, including both baseline and adverse scenarios. The stress scenarios should encompass all material risks that could deplete internal capital or impact regulatory capital ratios. These stress tests should be part of the banks' comprehensive stress-testing program, covering both economic and normative perspectives.

5.3.1c) Recommended Approach

In the process of scenario design, banks are strongly advised to have already achieved a precise understanding of the purpose and potential usefulness of the exercise. The aim is not to focus on creating more complex scenario analyses, but rather to select appropriate tools that align with the organisation's needs, risk profile, business nature, and the intended outcomes of the exercise.

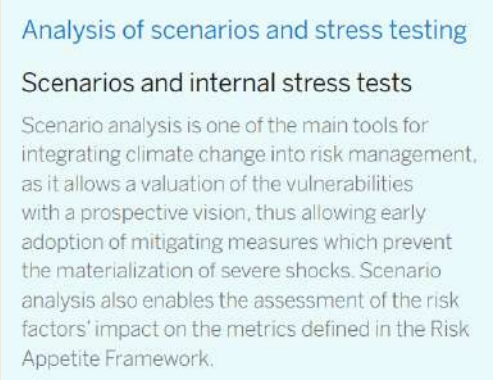
Banks are advised to utilize scenarios aligned with scientific climate change pathways, such as those provided by the IPCC, the NGFS or the IEA. Specifically, for transition risk, scenarios should reflect various policy outcomes (considering both early and late transitions) and should incorporate plausible considerations for the associated physical impacts. This includes examining how chronic climate effects associated with a late transition scenario can potentially reinforce policy actions.

It is important to acknowledge that projecting business processes beyond typical planning periods introduces significant uncertainty. Banks should consider that the results of mid- to long-term scenario analysis need to be carefully analyzed in relation to other potential factors not accounted for in the scenarios but could hold relevance in future years. Banks should therefore approach the guidance in this section based on its purpose, its relevance to the nature of their business and their risk profile.

The development of scenario analysis and stress tests to assess E&C risks is still in its premature stages and thus requires further attention to systematically evaluate risks for banks. Progress in this field is expected from scientific findings to inform the process, such as from national and international initiatives and cross-sector collaboration.

Industry Practice 36: Objectives of climate-related scenario analysis and stress testing exercise

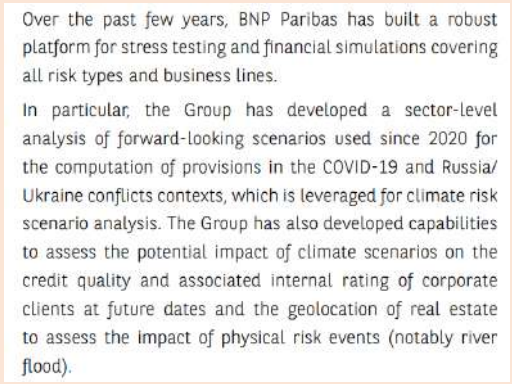
The examples below illustrate how global banks, including BBVA and BNP Paribas in Europe, Nomura bank in Japan, and Maybank in Malaysia, utilize scenario analysis and stress testing exercises as strategic tools to evaluate impacts of E&C risks. The exercises provide forward-looking insights into how the banks' business strategies and financial performance may be influenced by E&C risks, and inform the bank's capabilities in managing and mitigating such risks (BBVA, 2021; BNP Paribas 2022; Maybank, 2022; Nomura, 2023).



Analysis of scenarios and stress testing

Scenarios and internal stress tests

Scenario analysis is one of the main tools for integrating climate change into risk management, as it allows a valuation of the vulnerabilities with a prospective vision, thus allowing early adoption of mitigating measures which prevent the materialization of severe shocks. Scenario analysis also enables the assessment of the risk factors' impact on the metrics defined in the Risk Appetite Framework.



Over the past few years, BNP Paribas has built a robust platform for stress testing and financial simulations covering all risk types and business lines.

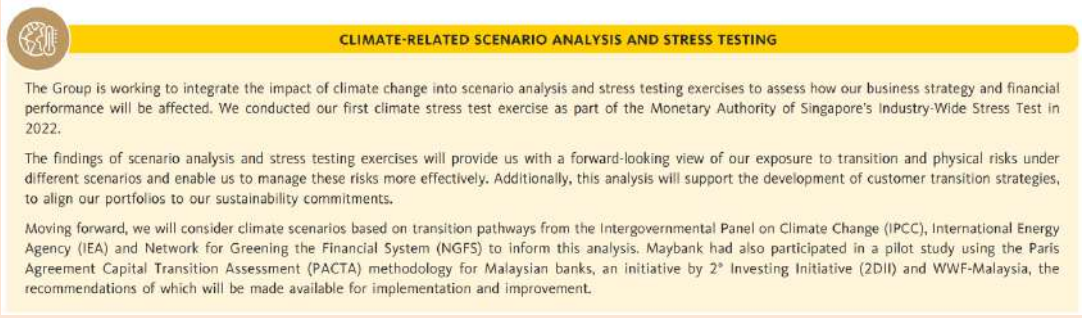
In particular, the Group has developed a sector-level analysis of forward-looking scenarios used since 2020 for the computation of provisions in the COVID-19 and Russia/ Ukraine conflicts contexts, which is leveraged for climate risk scenario analysis. The Group has also developed capabilities to assess the potential impact of climate scenarios on the credit quality and associated internal rating of corporate clients at future dates and the geolocation of real estate to assess the impact of physical risk events (notably river flood).

Figure 57: Analysis of scenarios and stress testing (BBVA, 2021).
Figure 58: Assessing potential impacts through climate scenario analyses and stress testing (BNP Paribas, 2022).

Overview of scenario analysis

Stress testing is typically performed to capture risks that are not easily identified by other risk management methods. In response to the risks of climate change, Nomura began developing stress scenarios for climate change in the fiscal year 2020 and assessing the impact on our company's portfolio.

Figure 59: Overview of scenario analysis (Nomura, 2023).



CLIMATE-RELATED SCENARIO ANALYSIS AND STRESS TESTING

The Group is working to integrate the impact of climate change into scenario analysis and stress testing exercises to assess how our business strategy and financial performance will be affected. We conducted our first climate stress test exercise as part of the Monetary Authority of Singapore's Industry-Wide Stress Test in 2022.

The findings of scenario analysis and stress testing exercises will provide us with a forward-looking view of our exposure to transition and physical risks under different scenarios and enable us to manage these risks more effectively. Additionally, this analysis will support the development of customer transition strategies, to align our portfolios to our sustainability commitments.

Moving forward, we will consider climate scenarios based on transition pathways from the Intergovernmental Panel on Climate Change (IPCC), International Energy Agency (IEA) and Network for Greening the Financial System (NGFS) to inform this analysis. Maybank had also participated in a pilot study using the Paris Agreement Capital Transition Assessment (PACTA) methodology for Malaysian banks, an initiative by 2° Investing Initiative (2DII) and WWF-Malaysia, the recommendations of which will be made available for implementation and improvement.

Figure 60: Climate-related scenario analysis and stress testing (Maybank, 2022).

5.3.2) SCENARIO ANALYSIS & STRESS TESTING METHODOLOGY

5.3.2b) Key Actions

When performing scenario analysis and stress testing regarding E&C risks, it is essential to consider the following factors from both normative and economic perspectives:

- Assessing the potential impact of physical and transition risks on the bank.
- Evaluating the evolution of E&C risks across different scenarios, recognizing that these risks may not be adequately represented in historical data.

- Understanding how E&C risks may manifest in the short, medium, and long term, depending on the specific scenarios being considered.

Additionally, banks should also consider incorporating climate consideration within their business strategy and financial planning outputs. Once that position is approved, scenario and sensitivity analysis can be introduced to test that strategy for specific vulnerabilities that climate change may pose to the bank or the markets that it operates in. The level of scenario analysis undertaken should be proportionate and aligned to the materiality of climate related risks and opportunities faced by the bank.

5.3.2c) Recommended Approach

A. Scenario Analysis

The CFRF (Climate Financial Risk Forum of the Financial Conduct Authority, UK) Scenario Analysis Chapter (June 2020) refers to three distinct timeframes:

1) 1 to 5 years: This timeframe is significant for boards to establish risk appetite, develop strategies, and formulate business plans.
2) 3 to 5 years: In addition to establishing their strategies, banks have the option to assess their business model's resilience to macroeconomic stresses within the financial system over the capital planning horizon during this timeframe.
3) 10-year or more: long-term, in line with the long-term time horizon of impacts of E&C risks, both for physical and transition risks

Scenario analysis within these timeframes involves several key considerations:

- **Baseline:** The first step is to establish a baseline view that aligns with the bank's internal perspective. Comparisons between the bank's baseline and externally available climate scenarios must be meaningful, necessitating alignment of assumptions for accurate interpretation of results.
- **Scenario selection:** Banks should identify the most relevant scenarios for their specific portfolios, business units, or groups. Factors such as socioeconomic context, geographies, climate policies, emissions pathways, time horizons, and climate outcomes (e.g., degrees of temperature increases) should be considered. Scenarios from industry-recognized and well documented sources should be chosen.
- **Scenario output metrics:** Appropriate outputs, qualitative or quantitative, should be selected to inform the use-case. These may include overall business strategy viability, financial metrics like earnings impact, credit risk ratings, or capital ratios. Consistency with existing metrics aids comparability, and regular review ensures alignment with the latest science-based scenarios.
- **Understanding assumptions and limitations:** Scenario analysis involves inherent uncertainties and limitations due to the exploratory nature of the activity. Long time-horizons, uncertain climate feedback loops, and tipping points contribute to modelling uncertainty. Stakeholders should be aware of these assumptions and limitations to appropriately interpret and utilize the results in decision-making.
- **General considerations:** Additional practical factors influence the shape of scenario analysis within a bank. The materiality of climate risk to the business model determines the level and nature of analysis conducted. The bank's infrastructure also impacts the deployment and maintenance of modelling solutions.

Additional resources: Available climate scenarios & portfolio alignment

To explore more about available climate scenarios, please visit:

- The Network for Greening the Financial System (NGFS) climate scenarios NGFS Scenarios Portal
- The International Energy Agency (IEA): Global Energy and Climate Model
- The International Panel on Climate Change (IPCC) Scenario-based Projections and Near-term Information

To explore more about available portfolio alignment, please visit:

- Paris Agreement Capital Transition Assessment (PACTA) PACTA homepage
- PACTA is a tool developed by the 2° Investing Initiative (2DII) to help banks align their portfolios with the goals of the Paris Agreement. Rather than a scenario, PACTA provides a framework or pathway information for assessing the alignment of investment portfolios with different climate scenarios, particularly with the objective of limiting global warming to well below 2 degrees Celsius.

Industry Practice 37: Scenarios selection

The stress scenarios developed by Nomura bank are informed by the transition scenarios provided by the NGFS, and the RCP (Representative Concentration Pathways) scenarios extracted from the IPCC. The bank has also updated its scenarios in alignment with the NGFS Phase 3 update in 2023 (Nomura, 2023).

In developing stress scenarios related to climate change, we use transition scenarios from the Network for Greening the Financial System (NGFS) and RCP scenarios from the Intergovernmental Panel on Climate Change (IPCC). Nomura views climate change risk as a long-term risk and has conducted analyses focusing on the impact of climate change on the credit-worthiness of Nomura's counterparties.

In the fiscal year 2023, we have refreshed our scenarios pursuant to the NGFS Phase 3 Update, which incorporates the latest economic and climate data and policy commitments. We conducted an analysis of climate change impact on Nomura's risk-weighted assets and capital. We have also expanded our analysis to Market Risk, including the development of a climate "wrong way risk" measure.

Figure 61: Overview of scenario analysis (Nomura, 2023).

Similarly, Hang Seng Bank demonstrates a proactive approach by formulating 4 internally developed scenarios that incorporate its own climate risk assessments and vulnerabilities into publicly available scenarios from the NGFS, IPCC, and IEA (Hang Seng Bank, 2022).

Our Internal Climate Scenario Analysis Exercise ('ICSA')

Making reference to external publicly available climate scenarios, such as the ones produced by the Network of Central Banks and Supervisors for Greening the Financial System ('NGFS'), Intergovernmental Panel on Climate Change ('IPCC'), and the International Energy Agency ('IEA'), our ICSA exercise assessed four internally developed scenarios, incorporating our own climate risks and vulnerabilities (e.g. our corporate strategy for the oil & gas sector):

We have quantified the impact of climate change across portfolios, geographies, perils, and risk types. Transition risks are expected to affect all sectors of society and will start to materialise in the near-term. Physical risks are expected to materialise over a longer-term and have more acute implications on exposed assets.

We expect the high emitting sectors from our wholesale corporate lending portfolio, such as construction & building materials, oil & gas, and metals & mining to be most impacted by the possibility of higher carbon prices, under the CS scenario.

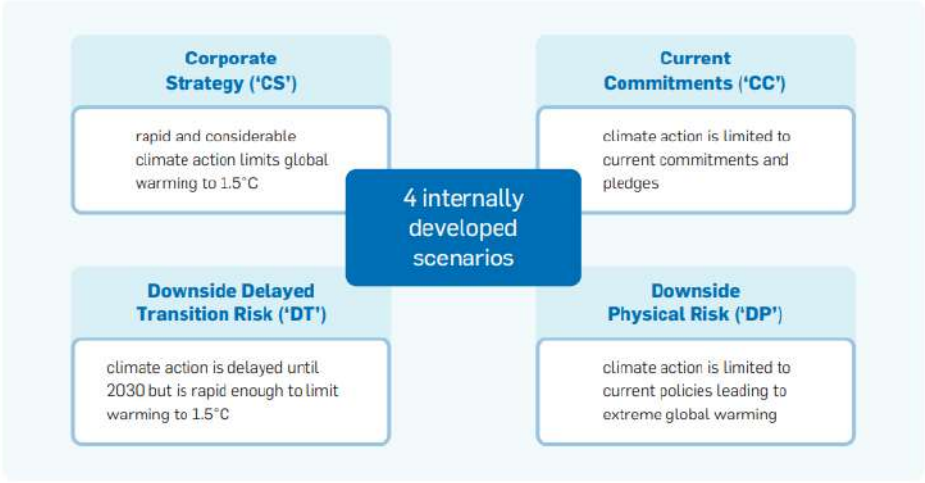


Figure 62: Internal climate scenario analysis exercise (Hang Seng Bank, 2022).

B. Stress Testing

There are two main approaches that are used in performing a climate stress test. Namely, a top-down and a bottom-up approach. A top-down (simplified) approach is when a supervisory authority performs the test themselves using their own framework (UNEP FI, 2021). This approach facilitates a high-level analysis to identify vulnerable sectors/companies and assess value change and credit impact over a 30-year transition period. The outcome of this analysis would point to a heat-map of portfolio hotspots where greater action/investigation may be required. A bottom-up approach, on the other hand, is when a bank uses its own framework as part of a system-wide or supervisory exercise (BIS, 2018). This approach allows the user to run very detailed granular analysis on a name specific basis. Both approaches have their own advantages and limitations.

Developing the financial sector's expertise in scenario analysis and climate risk assessment is a crucial outcome of these exercises. Furthermore, bottom-up approaches have enabled banks to directly engage with counterparties, leading to valuable data on firm-level exposures. This data has provided regulators and banks with new insights into the risks faced by financial firms and the overall financial system. As banks gather more robust data, the use of bottom-up approaches is expected to become more prevalent over time.

Some exercises have taken a hybrid approach, combining elements of both top-down and bottom-up methods. For instance, the Swiss National Bank (SNB) and the Swiss Financial Market Supervisory Authority (FINMA) conducted a top-down assessment to estimate sectoral shocks and asset valuations based on climate scenarios. They complemented this with bottom-up assessments reported by participating banks. The chart below illustrates the prevalent use of top-down approach as it allows supervisory authorities to cover a large sample of institutions.

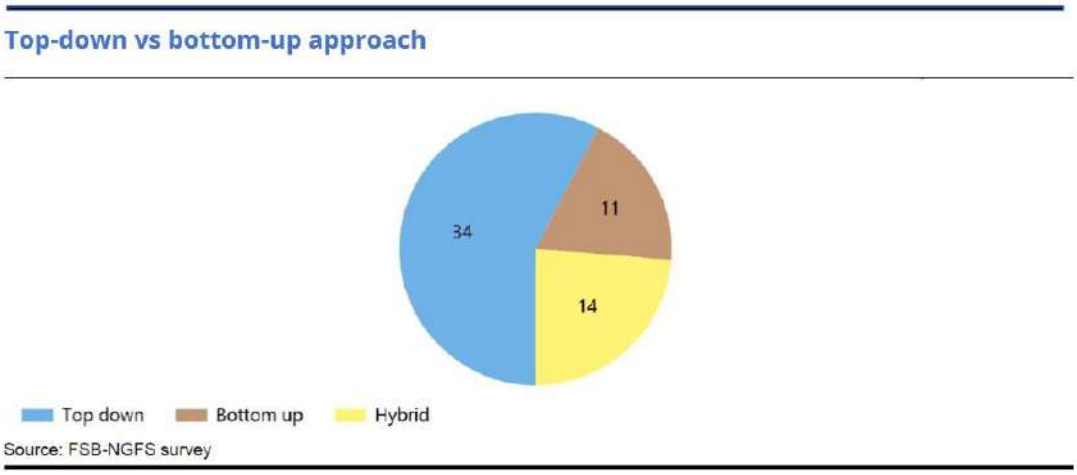


Figure 63: FSB-NGFS Survey on the types of scenario analyses conducted by authorities (FSB, 2022).

The table below further expands on these two approaches (UNEP FI, 2021):

Top-down vs. Bottom-up approach for Climate Stress Test	
Top-down • Conducted by supervisory authorities • Less resource-intensive • Premise and constraints of the tests are based on aggregate, macroeconomic assumptions	Bottom-up • Conducted by the bank themselves • Highly resource-intensive • Premise and constraints may be based on a bank's own assumptions • Data is obtained from within the firm or third parties (more granular)

Top-down vs. Bottom-up approach for Climate Stress Test	
• Data is obtained from aggregate sources (less granular) • Test results can be compared across firms (standardized methodologies)	• Test results are not able to be compared across firms

Industry Practice 38: Bottom-up approach for climate stress test

ING participated in the ECB's industry-wide climate stress test in 2022. The test was performed as a **constrained bottom-up stress test**, in which the participating banks provided their **own data submissions** and **stress test projections**, subject to a common methodology and a common set of scenarios. The test consists of three modules, namely: 1). Questionnaire 2). Peer benchmark and 3). Bottom-up stress test. The **bottom-up stress test** was based on a uniform methodology and on the scenarios of the NGFS. Banks provided projections for different scenarios and risk areas, covering both physical and transition risks. This covered (ING, 2022b):

- **Physical risk**: Drought and heat scenario and Flood risk scenario
- **Transition risk:**
  - Three different long-term (30 years) climate policy paths (dynamic balance sheet adjustments):
    - an orderly transition
    - a delayed disorderly transition
    - a 'hot house world' with unchanged policies.
  - Short-term three-year horizon (static balance sheet).

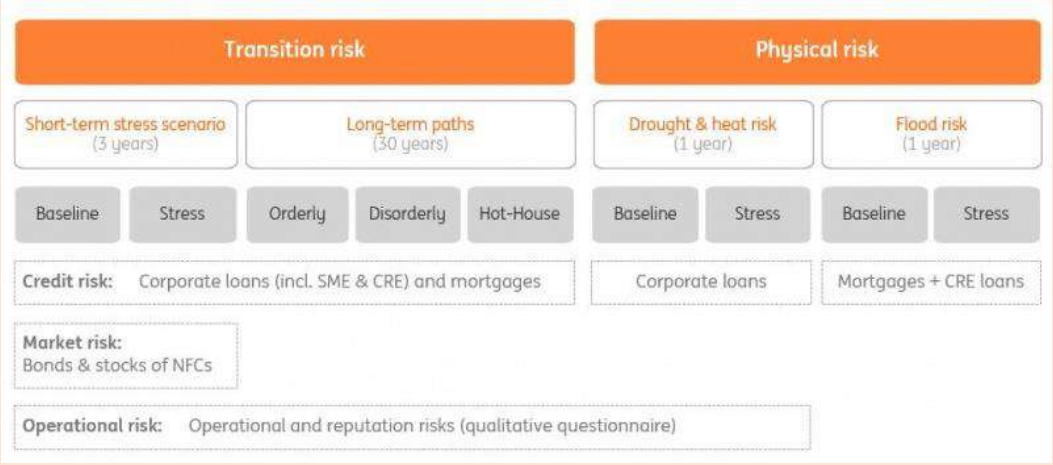


Figure 64: Scenarios and risk dimensions used in the bottom-up stress test (ING, 2022b).

C. Limitations with data & methodologies for scenario analysis and stress testing

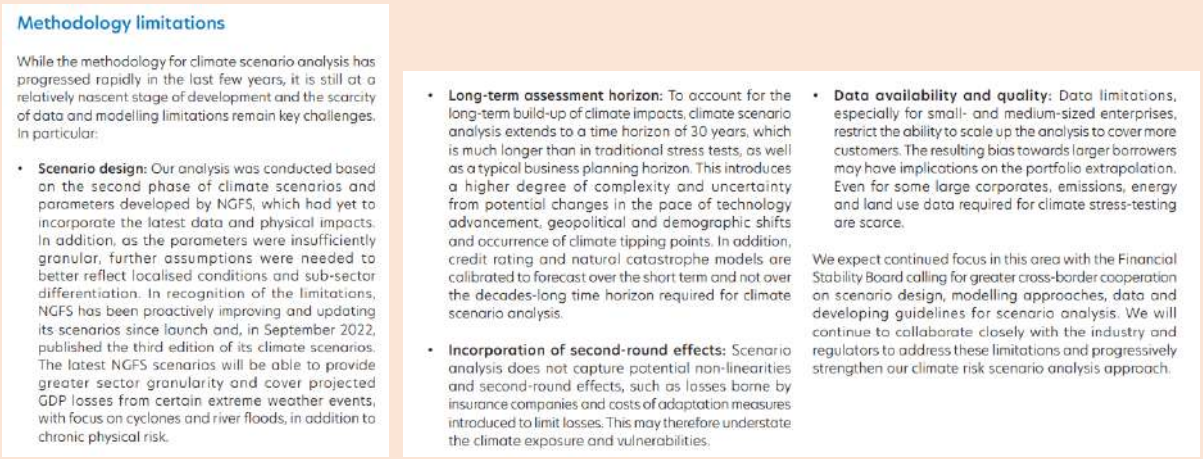
While climate scenario analysis is gaining importance as a risk management tool for banks, it is crucial to recognise that the development of climate scenario analysis is still in its premature stages. The effective use of scenario analytics relies on access to relevant underlying data, modelling capabilities to leverage that data, and technological infrastructure to integrate analytics into existing processes and decision-making. These requirements demand resources and expertise to utilize the data effectively.

Currently, there are significant gaps in terms of both data and methodologies availability, quality, and consistency, which need to be addressed before such complex analytics can provide meaningful and reliable insights across a wide range of portfolios. Efforts from policymakers, industry, and academia are underway to

address these gaps, but until these gaps are adequately filled, caution will be continually advised for banks when they rely on and use scenario analysis in relation to climate change.

Industry Practice 39: Management of data and methodology limitations

UOB has disclosed a list of key data and modelling limitations regarding climate scenario analysis. This includes limitations on scenario design due to the evolving scenario updates from the NGFS, higher complexity of long-term assessment horizon that is much longer than in traditional stress tests, lack of incorporation of potential non-linearities and second-round effects, and limitations of data availability and quality (UOB, 2023).



Methodology limitations

While the methodology for climate scenario analysis has progressed rapidly in the last few years, it is still at a relatively nascent stage of development and the scarcity of data and modelling limitations remain key challenges. In particular:

- **Scenario design:** Our analysis was conducted based on the second phase of climate scenarios and parameters developed by NGFS, which had yet to incorporate the latest data and physical impacts. In addition, as the parameters were insufficiently granular, further assumptions were needed to better reflect localised conditions and sub-sector differentiation. In recognition of the limitations, NGFS has been proactively improving and updating its scenarios since launch and, in September 2022, published the third edition of its climate scenarios. The latest NGFS scenarios will be able to provide greater sector granularity and cover projected GDP losses from certain extreme weather events, with focus on cyclones and river floods, in addition to chronic physical risk.
- **Long-term assessment horizon:** To account for the long-term build-up of climate impacts, climate scenario analysis extends to a time horizon of 30 years, which is much longer than in traditional stress tests, as well as a typical business planning horizon. This introduces a higher degree of complexity and uncertainty from potential changes in the pace of technology advancement, geopolitical and demographic shifts and occurrence of climate tipping points. In addition, credit rating and natural catastrophe models are calibrated to forecast over the short term and not over the decades-long time horizon required for climate scenario analysis.
- **Incorporation of second-round effects:** Scenario analysis does not capture potential non-linearities and second-round effects, such as losses borne by insurance companies and costs of adaptation measures introduced to limit losses. This may therefore understate the climate exposure and vulnerabilities.
- **Data availability and quality:** Data limitations, especially for small- and medium-sized enterprises, restrict the ability to scale up the analysis to cover more customers. The resulting bias towards larger borrowers may have implications on the portfolio extrapolation. Even for some large corporates, emissions, energy and land use data required for climate stress-testing are scarce.

We expect continued focus in this area with the Financial Stability Board calling for greater cross-border cooperation on scenario design, modelling approaches, data and developing guidelines for scenario analysis. We will continue to collaborate closely with the industry and regulators to address these limitations and progressively strengthen our climate risk scenario analysis approach.

Figure 65: Methodology limitations (UOB, 2023).

Meanwhile, in the absence of client-reported emissions, HSBC estimates them by using proxies based on company production and revenue figures. While proxies are a first step towards closing the availability gap, huge discrepancy across emissions data and great variability of approaches warrant further methodological reflection and guidance on how to improve estimation methods and increase reliability (HSBC, 2022).

Data and methodology limitations

Our financed emissions estimates and methodological choices are shaped by the availability of data for the sectors we analyse.

- We are members of Partnership for Carbon Accounting Financials ("PCAF"), which seeks to define and develop greenhouse gas accounting standards for financial institutions. PCAF developed the Global GHG Accounting and Reporting Standard for the Financial Industry, which focuses on measuring and reporting financed emissions. The PCAF Standard provides guidance on assigning data quality scoring per asset class, creating data transparency and encouraging improvements to data quality in the medium and long term.
- We found that data quality scores varied across the different sectors and years of our analysis, although not significantly. While we expect our data quality scores to improve over time, as companies continue to expand their disclosures to meet growing regulatory and stakeholder expectations, there may be fluctuations within sectors year on year, and/or differences between the data quality scores between sectors due to changes in data availability.
- The majority of our clients do not yet report the full scope of greenhouse gas emissions included in our analysis, in particular scope 3 emissions. In the absence of client-reported emissions, we estimate them using proxies based on company production and revenue figures, and validated key data inputs with our global relationship managers. Although we sought to minimise the use of non-company-specific data, we applied industry averages in our analysis where company-specific data was unavailable. As data improves, estimates will be replaced with reported figures. Our 2019 emissions for our oil and gas, and power and utilities sectors have been revised as a result of changes to data sources.
- Third-party data sets that feed into our analysis may have up to a two-year lag in reported emissions figures, and we are working with data providers to help reduce this.
- The methodology and data used to assess financed emissions and set targets are new and evolving, and we expect industry guidance, market practice, and regulations to continue to change. We plan to refine our analysis using appropriate data sources and current methodologies available for the sectors we analyse.
- In line with the PCAF Standard, to calculate sector-level baselines and annual updates, our portfolio-level financed emissions are weighted by the ratio of our financing in relation to the value of the financed company. We believe this introduces volatility and are assessing if portfolio weight is more appropriate. We remain conscious that the economic value used in the financed emissions calculation is sensitive to changes in drawn amounts or market fluctuations, and we plan to be transparent around drivers for change to portfolio financed emissions where possible.
- The classification of our clients into sectors is performed with inputs from subject matter experts and will also continue to evolve with improvements to data and our sector classification approach.
- The operating environment for climate analysis and portfolio alignment is also maturing. We continue to work to improve our data management processes, and are implementing steering mechanisms to align our provision of finance with the goals and timelines of the Paris Agreement.

Our methodology for financed emissions is set out in our *Financed Emissions Methodology*, which is available at www.hsbc.com/who-we-are/esg-and-responsible-business/esg-reporting-centre.

Figure 66: Data and methodology limitations (HSBC, 2022).

5.3.3c) Recommended Approach

When considering where climate scenario analysis may be most useful for a bank, it is helpful to start with the bank's business process universe and assess applicability and materiality of climate risks to the process. The table below illustrates a non-exhaustive list of relevant processes typically conducted in the banking industry, alongside high-level guidance on how climate scenario analysis might inform these processes.

Business process applicability to climate scenario analysis

Processes to consider	Relevance of climate scenario analysis outputs
Client selection, onboarding, and lifecycle management	It is important to evaluate clients and portfolios to determine their alignment with decarbonization targets and their appetite for climate-related financial risks.
Pricing	Pricing should be carefully assessed at both the client and portfolio levels, taking into account climate-related financial risks.
Product propositions and approval	The assessment of climate-related financial and non-financial risks should include an evaluation of whether these risks have been adequately analyzed and disclosed for the product structure, as appropriate.
Climate ambition setting and external commitments	When establishing Net Zero targets, it is crucial to select appropriate transition pathways based on sectors and portfolios. Incorporating scenario analysis outcomes can enhance the credibility of these external commitments.
Credit analysis and application	Scenario analysis can play a crucial role in credit decision-making by identifying potential risks and their mitigants.
Business continuity planning and location strategy	Business continuity planning can benefit from climate scenario analysis by avoiding or managing physical risk concentration across different sites and assessing physical risks at the site level over various time horizons.
Third parties and sourcing process	Strategic decision making can be informed by considering climate-related commitments of third-party suppliers, such as Net Zero targets.
Regulatory stress tests	Relevant regulatory requirements must be met, and the necessary building blocks (data, people, process) should be in place to fulfill these requirements.
Internal stress tests and sensitivity analysis	Organizations should develop capabilities for internal climate scenario analysis that are proportional to their size and complexity.
Risk reporting	Climate risk-related metrics, informed through scenario analysis, should be included in mainstream risk reporting packs.
Single name and portfolio level risk appetite	When setting exposure caps and portfolio-level risk appetite metrics, climate-related financial risks should be adequately considered.

Processes to consider	Relevance of climate scenario analysis outputs
ICAAP	Climate risks should be factored into capital adequacy assessments, comparing the Pillar 2 macroeconomic scenario with severe but plausible climate scenarios within the defined time horizon.
Internal Liquidity Adequacy Assessment Process (ILAAP)	The impact of climate-related risks on liquidity should be assessed, particularly in relation to sectoral or geographic concentrations that may affect primary sources of liquidity.
Macroeconomic forecast and Expected Credit Loss/ Impairment calculation	The bank's view on the observed transition pathway can be progressively integrated into baseline macroeconomic projections and Expected Credit Loss (ECL) calculations.
Risk modelling and quantification (e.g., PD, LGD, models, country risk ratings)	Internal risk models can incorporate climate scenario analysis findings by identifying key drivers of climate risk and exploring their inclusion in existing risk models.
Credit authorities and approval	Climate-related risks should be assessed for their impact on creditworthiness and relevant credit parameters, such as tenor and collateral type.
Corporate and financial planning (typically 3-5 years forward planning)	Climate-related risks can be gradually integrated into corporate planning, including the base view and testing the resilience of corporate plans against severe but plausible climate scenarios, adjusted according to the firm's size and complexity.
External disclosures	Climate risk scenario analysis provides an opportunity to address several recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD), such as assessing the resilience of the business strategy under different scenarios.

5.4) RISK CONTROLLING & MITIGATION

Upon identifying and assessing E&C risks, banks should set up the process to take actions to control and mitigate material E&C risks. In this chapter, risk controlling entails the development and implementation of actions to reduce risks. Meanwhile, risk mitigation focuses on the implementation of actions to reduce the likelihood and impact of those risks.

In this context, this chapter will highlight the framework for the bank’s consideration in controlling risks within its appetite, internal measure, and framework to manage such risk, and development of measures to address risk management with counterparties. Under risk mitigation, the focus is on actions the bank may take to manage risks among its counterparties in the portfolio, or to influence decreasing impacts of E&C risks on its counterparties.

5.4a) Standard Practice

Standard Practice: E&C risk controlling and mitigation *(item 3.2.3 (3.1-3.3))*

Financial institutions should have in place policies and processes to control and mitigate environmental risks to acceptable level both at **transaction and portfolio levels**. Financial institutions should:

- establish policies and processes to **reduce or avoid transactions that create severe negative environmental impact,** in line with various standards, regulations, and laws. This includes, for example, establishing an **industry exclusion list** which is continuously reviewed to align with changing situations, as well as enforcing relevant departments to strictly follow the policies and processes.
- **establish additional risk mitigation measures for high-risk client or counterparty groups.** This includes, for example, setting financial product covenants to raise the quality of clients' or counterparties' environmental operations to be in line with set indicators or environmental standards within a specified timeframe, or the integration of environmental risk as part of interest rates setting or collateral evaluation processes.
- develop **risk indicator targets** to control risk levels in line with the risk appetite. This includes, for example, setting the industry targets to increase the proportion of environmentally friendly transactions, or setting targets to reduce or control the concentration of industries that pose environmental risks (BOT,2023b).

5.4.1) RISK CONTROL & RISK MITIGATION POLICY AND PROCESS

5.4.1b) Key Actions

Key Actions 5.108: E&C Risk *Control and Mitigation*

Key Item	Short-term Actions	Long-term Actions
5.10.1 Risk Control & Mitigation policy, process, and tools	1. Banks to set up clear policy and processes to **manage (current and new) high-risk clients and projects with negative environmental impacts**. The policy and process should define the need for an appropriate risk mitigation plan, given the current risk appetite/ thresholds/ limits.	1. **Issued Exclusion list for high-impact E&C transaction and investments** (activity, industry, etc.) 2. Banks use **tools to monitor concentration of E&C risk exposures** (by sector or geography), such as metrics or heatmaps

To strengthen their risk management practices and ensure a more comprehensive approach to addressing E&C risks, banks should establish risk controlling policies and preventive measures at two levels: **1) Portfolio and sector level,** and **2) Client and transaction level.** This approach enables banks to effectively reduce the likelihood of E&C risks by considering the specific risks associated with different sectors and individual counterparties.

5.4.1c) Recommended Approach

Banks are increasingly embedding E&C considerations into the existing management frameworks of specific risks (such as credit and market risks), moving beyond viewing climate change solely as a reputational risk under the current ESG framework (HKMA, 2021).

1) Portfolio and sector levels

I. **Strategic policies**: Banks should establish sector-level policies and guidelines to effectively control risks associated with specific sectors that do not align with their climate strategy or risk appetite, especially those in the carbon-intensive sectors. This can be achieved by implementing limitations and setting lending thresholds (HKMA, 2021).

II. **Setting up concentration limits or exclusion policies**: Banks should establish concentration limits or exclusion policies that are informed by the results of risk identification and scenario analysis exercises. These measures enable banks to discontinue financing for sectors and projects that are particularly sensitive to E&C risks. Examples of such actions include implementing limits on carbon-intensive sectors or developing a ban on financing new coal-fired power plants.

However, careful consideration should be given to financial inclusion to avoid abrupt changes that could lead to unnecessary hardships for clients and impede a **seamless transition** (HKMA, 2021). In this regard, an alternative approach could involve ceasing the initiation of projects instead of immediately halting all financing activities or gradually winding down financial support to existing projects. This steady approach allows for a smoother adjustment period and minimizes disruptions for clients (HKMA, 2021).

2) Client and transaction levels

Risk controlling during client engagement: Banks should conduct thorough assessments of E&C risks within their credit risk processes, spanning across client onboarding procedures, annual credit reviews, and investment decisions. Clients or investments identified as being highly exposed to E&C risks should undergo rigorous credit approval assessments and continuous monitoring (HKMA, 2021).

a. **Clients that are currently aligned with the bank's climate strategy and risk appetite:** banks should fortify the existing relationship, extending support, and exploring collaborative opportunities or making covenants to promote consideration of E&C issues by their clients. Banks might encourage their clients in cultivating climate resiliency by providing support for their transition towards low-carbon activities. This support can be facilitated through the establishment of specific performance targets, such as enhancing energy efficiency and reducing carbon emissions. Encouraging clients to enhance their E&C disclosures is another path that banks can pursue, as it would enable them to gain valuable insights into the risks faced by their clients. By actively promoting these initiatives, banks can play an indispensable role in assisting their clients in navigating the challenges associated with climate change and fostering sustainable practices (HKMA, 2021).

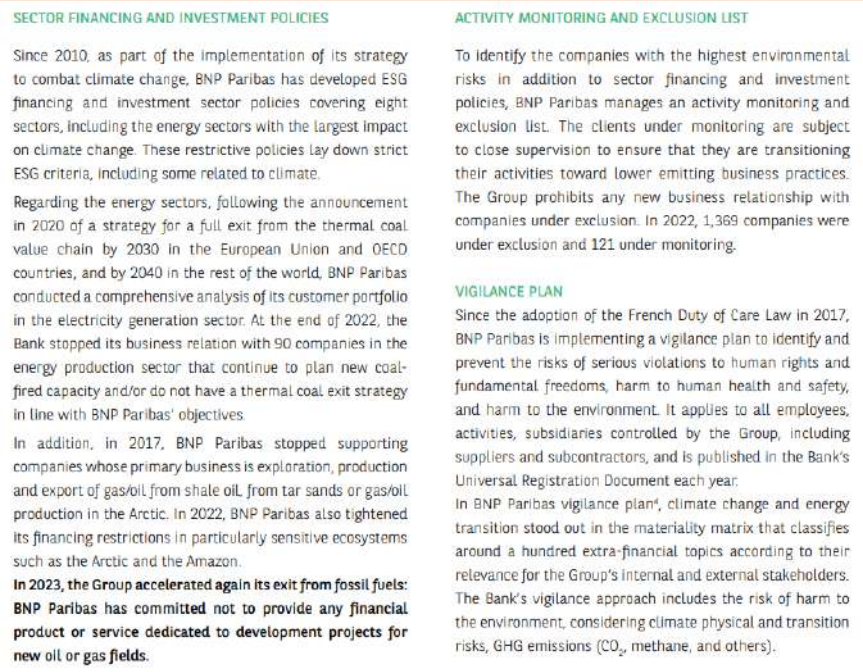
b. **Clients that do not align with the bank's climate strategy and risk appetite:** When dealing with clients that deviate from alignment, banks should carefully consider implementing risk control and mitigation measures. These measures may involve the adoption of stringent lending terms, such as shorter tenors or lower loan-to-value limits, as well as the inclusion of E&C risks in pricing considerations. Banks should reconsider business relationships with the counterparty should they fail to rectify identified concerns (HKMA, 2021).

Industry Practice 40: Exclusion approaches

"**Excluding clients that conduct activities with an adverse environmental impact:** One institution developed a set of criteria for its commercial activities to avoid involvement with entities that have a negative impact on biodiversity and ecosystems and a set of criteria to support investments and finance projects that contribute to protecting biodiversity and strengthening ecosystems. The institution assesses potential counterparties against these criteria. For example, companies must fulfil certain criteria such as sustainability certification, provide evidence of no illegal activities or meet certain thresholds in order be eligible for financing" (ECB, 2022).

Industry Practice 41: Sector-specific policies and exclusion list

BNP Paribas has established ESG financing and investment sector policies that encompass eight sectors with significant climate impacts. These sectors include coal-fired power generation, mining industry, oil & gas, nuclear energy, palm oil, wood pulp, agriculture, and defense. Additionally, the bank maintains a list of goods for which it excludes any transaction (exclusion list) due to the environmental or social risks they incur. As of 2022, a total of 1,369 companies were excluded from the bank's activities, while 121 companies were under close monitoring (BNP Paribas, n.d).



SECTOR FINANCING AND INVESTMENT POLICIES

Since 2010, as part of the implementation of its strategy to combat climate change, BNP Paribas has developed ESG financing and investment sector policies covering eight sectors, including the energy sectors with the largest impact on climate change. These restrictive policies lay down strict ESG criteria, including some related to climate.

Regarding the energy sectors, following the announcement in 2020 of a strategy for a full exit from the thermal coal value chain by 2030 in the European Union and OECD countries, and by 2040 in the rest of the world, BNP Paribas conducted a comprehensive analysis of its customer portfolio in the electricity generation sector. At the end of 2022, the Bank stopped its business relation with 90 companies in the energy production sector that continue to plan new coal-fired capacity and/or do not have a thermal coal exit strategy in line with BNP Paribas' objectives.

In addition, in 2017, BNP Paribas stopped supporting companies whose primary business is exploration, production and export of gas/oil from shale oil, from tar sands or gas/oil production in the Arctic. In 2022, BNP Paribas also tightened its financing restrictions in particularly sensitive ecosystems such as the Arctic and the Amazon.

In 2023, the Group accelerated again its exit from fossil fuels: BNP Paribas has committed not to provide any financial product or service dedicated to development projects for new oil or gas fields.

ACTIVITY MONITORING AND EXCLUSION LIST

To identify the companies with the highest environmental risks in addition to sector financing and investment policies, BNP Paribas manages an activity monitoring and exclusion list. The clients under monitoring are subject to close supervision to ensure that they are transitioning their activities toward lower emitting business practices. The Group prohibits any new business relationship with companies under exclusion. In 2022, 1,369 companies were under exclusion and 121 under monitoring.

VIGILANCE PLAN

Since the adoption of the French Duty of Care Law in 2017, BNP Paribas is implementing a vigilance plan to identify and prevent the risks of serious violations to human rights and fundamental freedoms, harm to human health and safety, and harm to the environment. It applies to all employees, activities, subsidiaries controlled by the Group, including suppliers and subcontractors, and is published in the Bank's Universal Registration Document each year.

In BNP Paribas vigilance plan[4], climate change and energy transition stood out in the materiality matrix that classifies around a hundred extra-financial topics according to their relevance for the Group's internal and external stakeholders. The Bank's vigilance approach includes the risk of harm to the environment, considering climate physical and transition risks, GHG emissions (CO_2, methane, and others).

Figure 67: Sector financing and investment policies (BNP Paribas, n.d.)

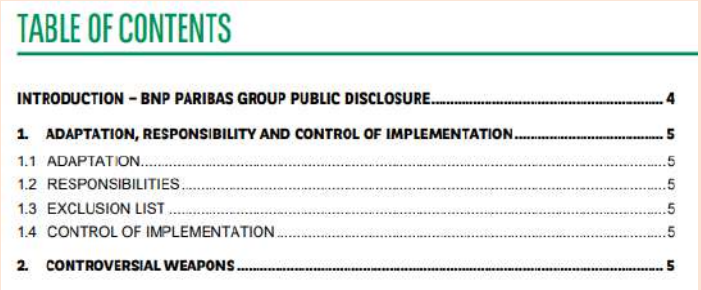


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Figure 68: An excerpt from the bank's exclusion list (BNP Paribas, n.d.)

5.4.2b) Key Actions

Key Actions 5.11: E&C risk mitigation

Key Item	Short-term Actions	Long-term Actions
5.11.1 Risk mitigation measure in high-risk clients or sectors (product & credit policies)	1. Banks set **internal limits for various types of material E&C risks** in traditional risk domain, including credit, risk profiles. The internal limit should be set **prioritizing high-risk clients and high-risk sectors.** 2. The bank's **internal limit for credit risk should reflect in product and credit policies for clients,** particularly among high-risk sectors. The bank may set additional credit risk mitigation measures to lessen exposures of the bank (e.g., updated credit underwriting criteria, loan limitation). However, these limits should be set taking into account the current risk appetite, risk thresholds and limits.	1. Banks set **internal limit for various types of material E&C risks** in traditional risk domain, including credit, market, liquidity, and operational risk profiles. The internal limit should be set **prioritizing high-risk clients and high-risk sectors.** 2. The bank's **internal limit for credit risk should reflect in product and credit policies for clients,** particularly among high-risk sectors. The bank may set additional credit risk mitigation measures to lessen exposures of the bank (e.g., updated credit underwriting criteria, loan limitation). These limits will take into account the revisions that the bank has made to its risk appetite, risk thresholds and limits (including KRIs).

There are various policies and processes that banks can establish to **reduce or avoid transactions that create severe negative environmental impact; of which exclusion lists** continue to be one of the most common mitigation strategies (Deloitte, 2022). This should be done with the setting of targets and align with the bank's broader strategy to ensure effective integration of climate transition into a bank's portfolios.

5.4.2c) Recommended Approach

A. Risk mitigation strategies and measures

The table below expands on the different mitigation strategies that can be utilized by banks (Deloitte, 2022):

Mitigation Strategies	
Exclusion	A policy whereby the bank will exclude certain securities or counterparties in the definition and management of portfolios for its clients. It allows de facto to focus only on the "good" companies that – as per established criteria – are aligned with the transition set by the bank.
Engagement	A framework for the bank to engage with counterparties and clients in order not to exclude them immediately (if an exclusion policy were in place and the counterparty fell in scope of the criteria set) but rather accompany them on the pathway that will allow them and the bank as a whole to fulfil the transition.

Mitigation Strategies	
New products and service	The definition of products and services that can cater to the climate neutrality transition. These can be for example products that are “ESG” as per existing regulations, labels and criteria, services that have integrated a net-zero alignment methodology, etc.
Divestment	The exit by the bank from investments that are deemed contradictory with the objective of the transition.

B. Mitigation measures by risk types

The comprehensive risk mitigation frameworks are designed to reduce impacts of the essential risks including credit risk, market risk, liquidity risk, and other potential risks from climate-related factors. These frameworks enable banks to effectively manage and reduce risks within their risk appetite levels through identification of actions and measures to be implemented through various measures, e.g., client engagement, reconsidering credit policies.

Key Risks	Possible mitigation measures (BCBS, 2022)
Credit risk	Banks can employ various credit policies to reduce the impact. This includes adjusting credit underwriting criteria, engaging with clients on a targeted basis, including of climate-related risks in pricing considerations, and implementing limitations or restrictions on loans, such as shorter tenors, lower loan-to-value limits, discounted asset valuations.
Market risk	Banks should assess the impact of climate-related risks on the pricing and hedging of their investment portfolios, which encompasses both trading and banking books and utilize weather financial derivatives or other derivative instruments for hedging purposes. These tools can effectively mitigate the risks associated with price and volatility changes from the climate-related risk factor.
Liquidity risk	Banks need to enhance their fund flow analysis by considering the impact of climate-related factors on parameters such as increased drawdowns of credit lines or accelerated deposit withdrawals. This approach enables a more realistic assessment of liquidity gaps. It is crucial for banks to incorporate climate-related risks into stress testing scenarios to evaluate the sufficiency of liquidity buffers during crisis periods. Additionally, banks should develop contingency funding plans to address potential liquidity shortages and ensure sufficient support.
Other risks	Banks should conduct a comprehensive assessment of the potential impact of climate-related factors on various risk types, including strategic risk, reputational risk, regulatory compliance risk, and operational risk. This evaluation should encompass both transition risks and physical risks associated with climate change. Integrating the impacts of these risks into business continuity planning is essential for effectively mitigating potential risks and minimizing losses resulting from climate-related incidents.

C. Risk mitigation for high-risk clients or counterparty groups.

Following the identification of risk exposure by sector and high-risk sectors, banks should identify strategic responses to increasing exposure of E&C risks through its counterparties. The table below illustrates various observed practices with regards to tackling the identified E&C risks in the concerned sectors (ECB, 2022b).

Sector	Identified E&C Risks	Strategic Response
Energy	➢ Heightened risk of assets becoming stranded in fossil fuel industries. ➢ Strategic risk linked to the rapid adoption of renewable energy sources driven by technological advancements. ➢ Clients facing higher exposure to extreme weather events, such as floods.	➢ Limitations on lending to fossil fuel industries (e.g., oil and gas) and plans for phasing out coal. ➢ Increased financing for proven renewable energy projects, with emphasis on wind, solar, smart grids, and electric vehicle charging infrastructure. ➢ Expansion of insurance offerings to cover damage caused by extreme weather events.
Transport	➢ Heightened transition risk associated with government incentives and growing market preference for electric vehicles. ➢ Heightened transition risk arising from carbon pricing and emissions regulations for transportation, as well as the planned phasing out of internal combustion engine vehicles.	➢ Engaging with transportation clients using inefficient vehicles to offer tailored business solutions. ➢ Development of credit and insurance products tailored to electric vehicles and related accessories like charging stations, solar panels, and home batteries.
Agriculture	➢ Heightened credit risk due to factors like droughts and heat waves impacting crop yields and rising sea temperatures affecting fisheries. ➢ Heightened transition risk associated with regulations and pricing mechanisms addressing air, water, and land pollution in agriculture.	➢ Incorporating geographical criteria into credit policies, restricting financing to activities which impact sensitive areas since this could prevent the deterioration of credit profile of agricultural sector. ➢ Providing advisory and financial support for sustainable investments, emphasizing more climate-resilient farming practices, adoption of new irrigation technologies, geographical diversification, and the installation of renewable energy systems.

Industry Practice 42: Managing sector-specific risks

Maybank has identified and established the group's position in high ESG-risk industries, requiring clients from such sectors to hold ESG-related external certifications or verifications (such as the RSPO, MSPO, and FSC certifications) within a specific timeframe. Maybank will not extend new financing facilities to customers that are not aligned to this stance. Clients' compliance with the Risk Appetite Statement is evaluated annually or when changes to the credit risk or terms and conditions have been made (Maybank, 2022).

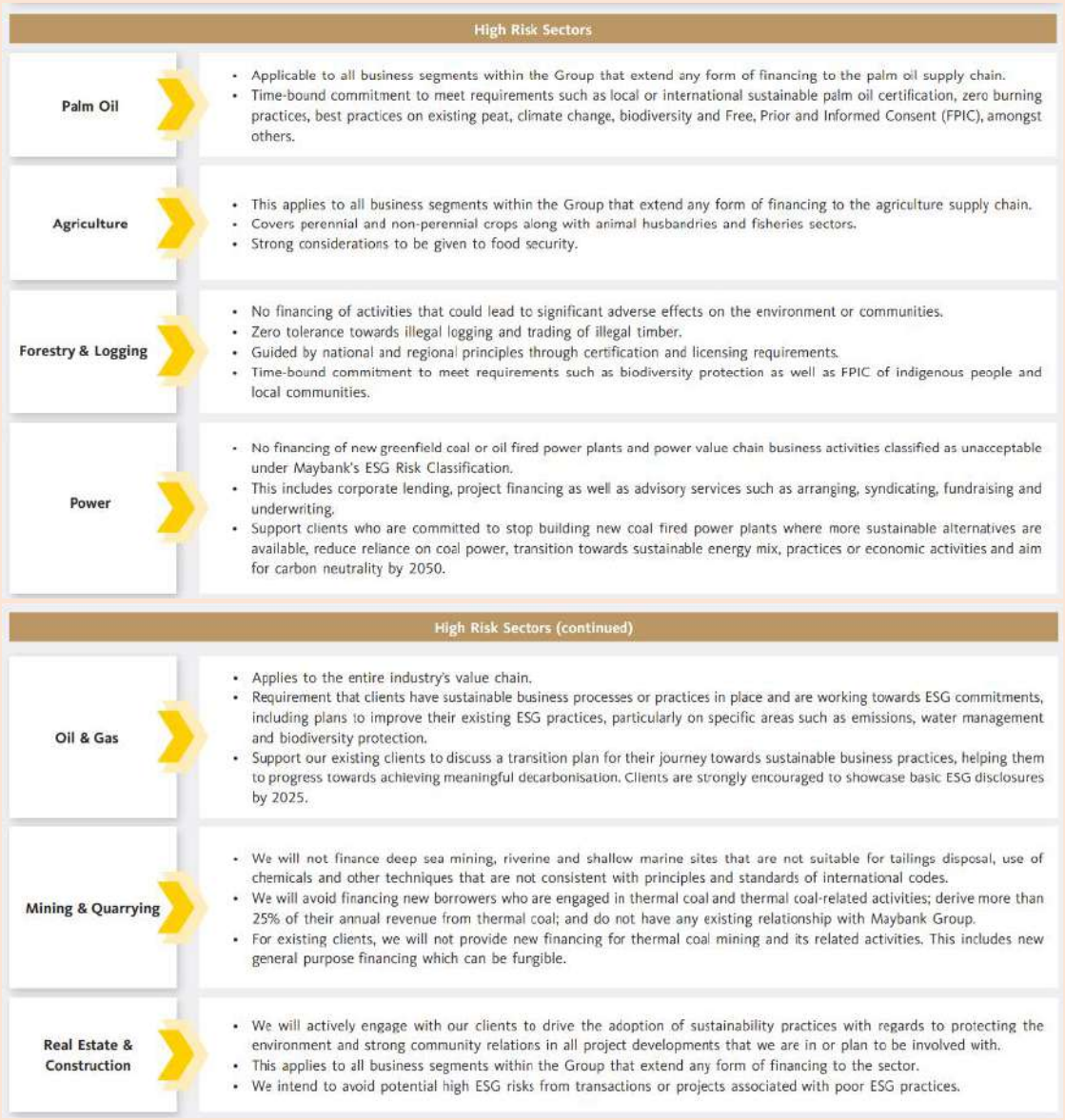


Figure 69: Group's position towards high ESG-risk sectors and activities (Maybank, 2022)

5.5) RISK MONITORING

5.5.1) RISK MONITORING PROCESSES AND POLICIES

5.5.1a) Standard Practice

Standard Practice: E&C risk monitoring *(item 3.2.3 (4, 4.1 & 4.2))*

Financial institutions should have in place policies and processes to **monitor environmental risks both at the transaction and portfolio levels** and be able to consistently report to the Board of Directors and senior management in a timely manner. Financial institutions should:

- **Establish policies and processes in monitoring and reporting** environmental risks to the Board of Directors and senior management in a consistent manner to support the review of strategies, risk appetite, risk management, and evaluation of the overall implementation plan. In this regard, the methodology and frequency for monitoring and reporting should be in line with the risk materiality and its significance to financial institutions' business position.

5.5.1b) Key Actions

Key Actions 5.12: E&C risk monitoring

Key Item	Short-term Actions	Long-term Actions
5.12.1 **Risk reporting**	1. Banks report, at the minimum, **E&C risk exposures (e.g., by sector and geography), risk concentration, and emerging risks to BoD and SM periodically** **2. Banks have developed qualitative and quantitative metrics for reporting**, in line with their existing risk limits/KRIs and risk appetite, and disclosure requirements	1. Banks report, at the minimum, **E&C risk exposures (e.g., by sector and geography), risk concentration, and emerging risks to BoD and SM periodically** against targets set **2. Banks have developed qualitative and quantitative metrics for reporting**, in line with the KRIs and their targets, and disclosure requirements
5.12.2 **Integrated E&C risk factor to current monitoring and escalation arrangement**	1. Banks' **criteria for Board notification / approval should integrate E&C risk**, focusing proportionally on material E&C Risk, using current risk appetite, risk thresholds and limits. The frequency of discussion and reporting with the Board level should increase for material E&C risks	1. Banks' **criteria for Board notification / approval should integrate E&C risk**, focusing proportionally on material E&C Risk, using revised risk appetite, risk thresholds and limits. The frequency of discussion and reporting with the Board level should increase for material E&C risks

To monitor and report E&C risks effectively, banks should integrate these risks into their existing risk monitoring and reporting. As environmental risk has unique characteristics, banks should consider capabilities

of data aggregation and ensure that banks are able to monitor and report risk materiality in a timely manner for managing potential risks arising (BCSB, 2022; and ECB, 2020). Key considerations of E&C risk monitoring policies and processes include:

- **Banks are expected to have reliable information systems** as part of data governance and IT infrastructure in monitoring and reporting for common situations and stress scenarios as well.
- **Risk exposure, concentration, and emerging risk data are necessary** to be aggregated in monitoring and reporting.
- **Collecting additional data from existing and prospective clients** to analyze their risk profiles should be considered by banks.
- **Qualitative and/or quantitative key risk indicators (KRIs) should be adopted** to develop E&C risks monitoring and reporting.

5.5.1c) Recommended Approach

Below are additional considerations banks may consider in developing E&C risk monitoring processes and policies:

- Some transition risks and physical risks may **occur suddenly**; hence banks should be aware of risk evolvement, maintain and adapt information systems to meet various requests in monitoring and reporting as usual. **IT infrastructure investment** may be considered to increase their capabilities for collecting and analyzing E&C data.
- Transition and physical risk both short- and long-term such as risk arising from low-carbon economy transition and flood in vulnerable geography should be **covered and alerted by banks** in time to reduce these risks that may impact their financial condition. Also, high **portfolio concentration in vulnerable industries** that may increase potential risk should be included in monitoring and reporting.
- As an alternative approach due to **insufficient data** from clients, banks may use **appropriate proxy** to support their business decisions. To ensure that banks have acceptable data accuracy, banks should set up clear processes that are consistent with their risk appetite and provide understanding to staffs. Monitoring and reporting should be presented in a timely manner and updated regularly.
- Provision of **early warning signs** may be used to prepare for managing relevant risks in line with the monitoring and reporting of the key risk indicators (KRIs).

5.5.2) PROCESS AND DATA REQUIREMENTS FOR RISK MONITORING AT TRANSACTIONAL AND PORTFOLIO LEVELS

5.5.2a) Standard Practice

Standard Practice: E&C risk monitoring *(item 3.2.3 (4, 4.1 & 4.2))*

Financial institutions should have in place policies and processes to **monitor environmental risks both at the transaction and portfolio levels** and be able to consistently report to the Board of Directors and senior management in a timely manner. Financial institutions should:

- **develop tools and processes to consistently monitor risks, progress, and results** of clients' or counterparties' environmental implementation plan, particularly those that have high risk, in accordance with the established policies or criteria (e.g., setting conditions for clients or counterparties to report environmental risk data, including the progress in reducing such risks on a regular basis). In addition, financial institutions may utilize sustainability data service providers to monitor such data" (BOT, 2023b).

5.5.2b) Key Actions

Key Actions 5.13: transaction and portfolio levels risk monitoring for lending activities

Key Item	Short-term Actions	Long-term Actions
5.13.1 Tools and processes to monitor client's E&C risks / performances	1. For the purpose of exposure measurement, Banks should develop **enhanced data capacity to track clients**, particularly in high-risk sectors, and to **use reasonable data proxies and assumptions**	1. Clear process on **client's E&C performance and action plan for data requests, inquiry and follow-up** 2. Process or tool to **keep track of clients' and counterparties' E&C performance and implementation plan**, and evidence that such record informs client engagement and risk consideration 3. For the purpose of monitoring performances against the bank's targets (e.g., sectoral targets), Bank's enhanced data capacity to track clients, particularly in high-risk sectors, and to use reasonable data proxies and assumptions

Both transaction level and portfolio level monitoring and reporting are important to be monitored and reported to the Board of Directors and management teams for supporting their business decision and taking action to manage E&C risks. Moreover, E&C risk impacts that banks consider investing in may be different in various sectors. Hence, portfolio management teams should integrate comprehension of E&C risks into their investment process both at the transaction level and portfolio level.

5.5.2c) Recommended Approach

A. Lending

Level of consideration	Detail
Transaction level	• Bank should develop vulnerability assessments of customers to incorporate into the credit approval process. Especially, high-risk counterparties should be monitored regularly to review and implement necessary risk controlling and mitigation appropriately. • Progress of transitional implementation by engaging with counterparties directly, in which their public sustainability documents should also be monitored by banks as well to consider for existing and forward-looking view.
Portfolio level	• Banks should focus on concentration of environmental risk at portfolio level in various sectors that may increase risks exceeding their threshold setting. • The monitoring example is carbon-related lending assets which are sensitive to transition risks in term of exposure ratio to total lending assets on balance sheet, especially non-exhaustive lists of carbon-intensive sectors such as, Oil and Gas, Chemicals, Construction and materials, transportation or portfolios that collaterals may be impacted from physical risks.

Industry Practice 43: Monitoring of emissions in the business lending portfolio

Commonwealth Bank tracks its progress towards Net Zero commitments by monitoring emissions from its business lending portfolio, which spans across various industries and geographies. In 2021, the bank disclosed its progress against the interim targets in 4 priority sectors: power generation, thermal coal mining, upstream oil extraction, and upstream gas extraction. For instance, the bank monitored its power generation portfolio's emission intensity against the 2030 interim target, which is already 60% below the selected transition pathway in 2021. This aligns with the bank's strategy of growing lending to renewable energy while supporting clients in their decarbonization journeys (Commonwealth Bank, 2022).

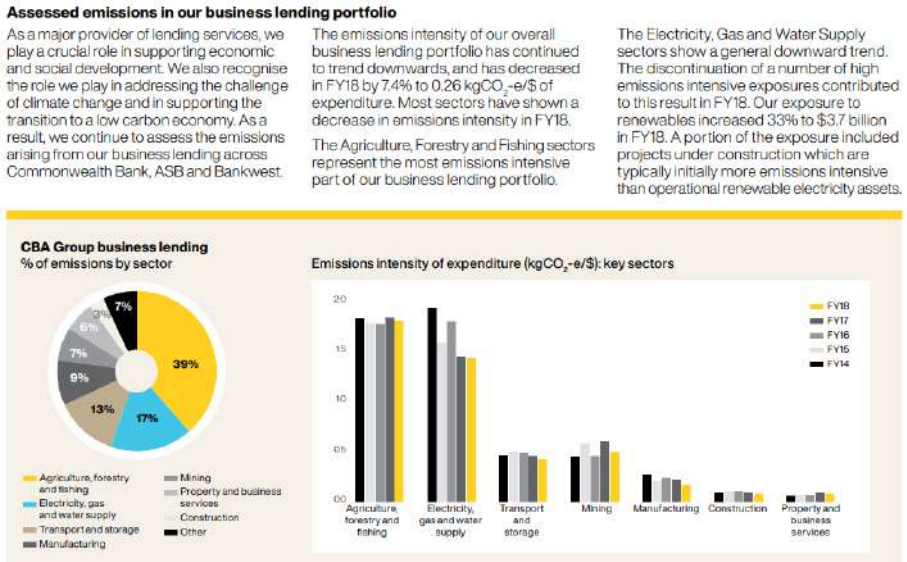


Figure 70: Assessed emissions in the business lending portfolio (Commonwealth Bank, 2019)

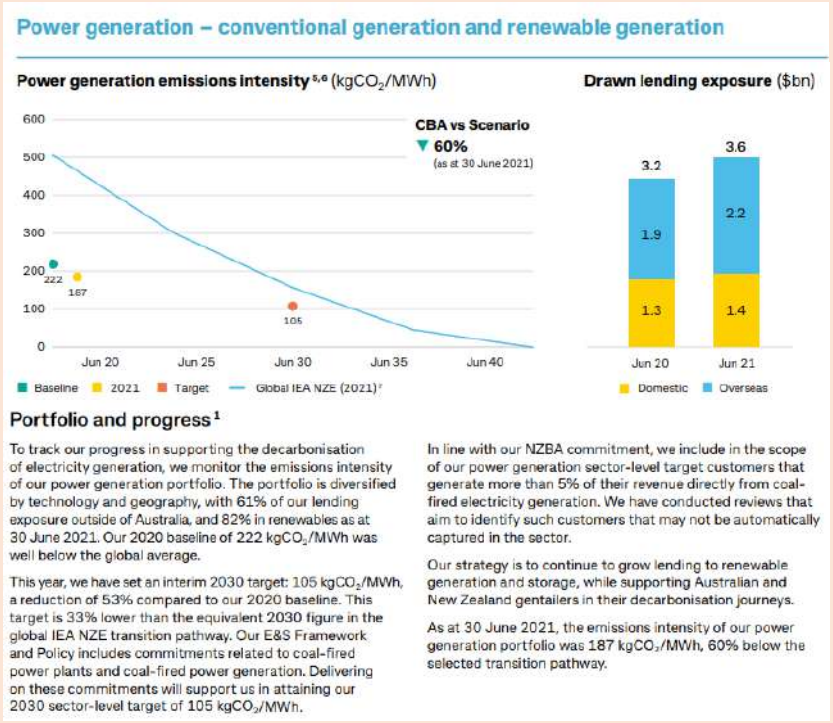


Figure 71*: Sector targets (Commonwealth Bank, 2022).*

B. Investment and Asset Management

Level of transaction	Detail
Transaction level	• The examples of topics that portfolio management teams should consider when they plan to invest are asset class, nature of business, geography, direction of business for E&C risk management. The common indicators of climate-related risk monitoring are carbon footprint, portfolio temperature, physical risk indicators which are exposure to disaster areas.
Portfolio level	• Banks may monitor carbon footprint emissions, which are the sum of a proportional amount of each portfolio company's emissions and industry. It generally may be used as proxy of environmental impacts from the company they consider investing (GFIT, 2021). • Monitoring at portfolio level of various sectors related to climate risks in term of carbon involvement should considers Asset Under Management (AUM) and ratio to all sectors, especially non-exhaustive lists of carbon-intensive sectors such as Oil and Gas, Chemicals, Construction and materials, transportation. Some indicators may be additionally monitored, such as total AUM in top sectors with highest owned absolute emissions in equities portfolio to reflect portfolio's climate-related risks (GFIT, 2021).

Apart from external research, banks may develop sustainable insights that are identified by internal research models. Portfolio management team and internal research team are encouraged to review E&C risks in their portfolio and make necessary rebalancing regularly (GFIT, 2021).

Industry Practice 44: E&C risk reporting

Internal reporting on climate-related risks: Institutions typically align their practices for internal reporting on climate-related risks with their risk appetite frameworks (e.g. they report on the institution's climate-related KRIs and limits), risk management tools (e.g. they report on the development of risk scores assigned to clients via the institution's dedicated credit risk assessment tool) and climate-related business strategy (e.g. they report on the institution's performance vis-à-vis its KPIs and targets). Moreover, institutions inform the management body of developments that may impact the institution's risk profile and business model (e.g., media reports on specific clients).

Institutions typically **integrate climate-related risk reporting in their established risk management reports and follow the regular reporting frequency**. Climate-related risk reporting to the management body typically takes place on a quarterly basis, with some internal reports being produced more frequently, for instance on a monthly basis or upon the occurrence of significant events.

Some institutions take intermediate steps to put the management body and senior managers in a (starting) position to make informed decisions. For these intermediate reporting practices, they focus on climate-related risk exposures to which they find themselves to be materially exposed and for which they have already developed risk indicators. Recipients of the reports are informed that these initial reports will be expanded with additional indicators and metrics" (ECB, 2022).

Industry Practice 45: Emissions intensity monitoring of financed assets

UOB collects baseline information of financed assets' emissions intensity to reflect its financing activities. The bank collected the 2021 emissions intensities of each of its clients in the portfolio, and established the baseline emissions intensity by taking the average intensity weighted by the exposure to the client (UOB, 2022).

Establishing baseline emissions intensity

We calculate our emissions intensity, measured in kilograms of carbon dioxide produced per megawatt-hour of energy ($kgCO_2/MWh$), by determining the emissions intensity of assets we finance through collecting baseline data at an asset level to reflect our financing. This provides us with better insights into the actions our clients are taking and the specific impact of our financing. We adopted a similar approach for equipment manufacturers with Scope 3 downstream emissions intensity that is determined based on the type of power generation assets manufactured.

Figure 72: Establishing baseline emissions intensity (UOB, 2022).

C. Project finance

Following the Equator Principles' Climate Change Risk Assessment (CCRA) framework in identifying and assessing E&C risks in project financing, as outlined in section 5.2.3c of this handbook, material risks identified within the CCRA framework should be addressed, mitigated, and monitored through project-specific management plans.

Depending on the project's type, scale, complexity and sensitivity to E&C risks, the monitoring of material project E&C risks can be addressed through stand-alone documents (encompassing both physical and transition risks) or a series of monitoring measures integrated into relevant project documentation. This may include the project management plan, design or construction documentation, emergency response plans, subject-specific management plans, and the GHG Emission Management Plan.

The diagram below illustrates the Equator Principles' Climate Change Resilience Development process aligned with the typical project financing lifecycle, starting with the initial project consideration and concluding at the end of the loan. The risk identification and assessment for project-specific E&C risks begins with the NCC compatibility review and concludes in the development of the Climate Change Risk Management Plan (CCMP).

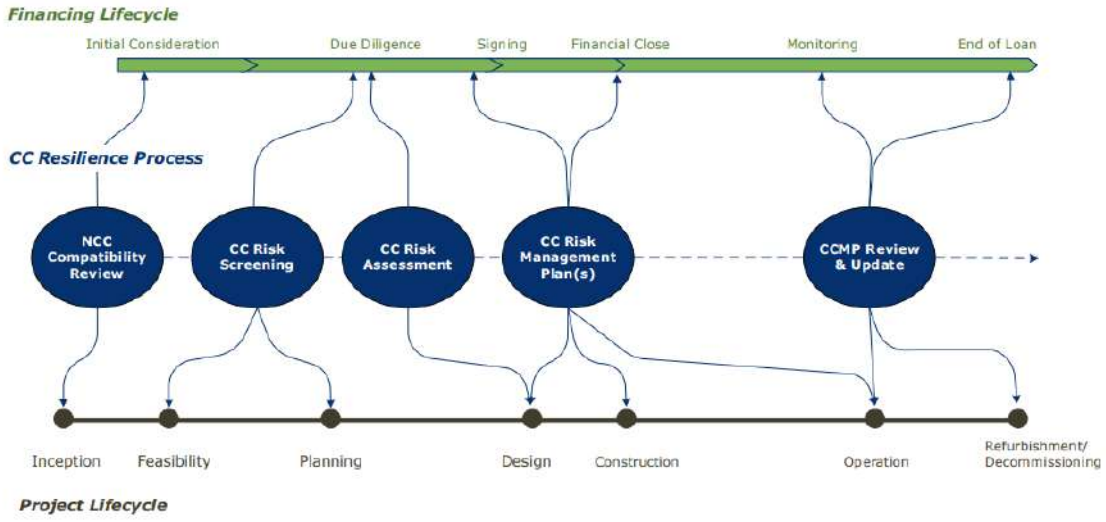


Figure 73: Project Lifecycle, financing lifecycle, and climate change resilience process timeline (Equator Principles, 2023).

The monitoring process is not regarded as a distinct phase separate from the Resilience Development lifecycle. Instead, it entails periodic reviews and updates to the CCMP throughout the project's operational, refurbishment, and decommissioning phases.

The EP Guidance Note does not outline specific actions for monitoring project-related E&C risks. These actions should be tailored to individual projects and cover both a physical management plan (for managing and monitoring physical risks) and a transition management plan (for managing and monitoring transition risks). However, key considerations and examples for designing the CCMP can be found in the Guidance Note (Equator Principles, 2023).

Industry Practice 46: Application of the Equator Principles for risk monitoring in financed projects

As an Equator Principles Financial Institution, DBS Bank applies the EP to assess large infrastructure and industrial projects. For projects falling under Category A (and Category B where appropriate), project sponsors are required to present an action plan outlining the management and mitigation measures for environmental risks associated with the project. DBS also conducts regular progress monitoring to ensure that the action plan is being implemented and that the project continues to align with the Equator Principles (DBS Bank, 2023).

Furthermore, when a project is classified as Category A (and Category B where appropriate), the project sponsor is required to demonstrate how environmental and social negative impacts are avoided or mitigated, as well as how positive ones are enhanced and maintained. During environmental and social due diligence process, it is assessed whether the sponsor provides sufficient assurance in carrying out the mitigations in the form of an action plan. We also monitor progress against the implementation of the action plan periodically as part of the environmental and social monitoring effort to ensure that the project continues to align with the Equator Principles.

Figure 74: Equator Principles Reporting (DBS Bank, 2023).

5.5.3) INDICATORS FOR RISK ASSESSMENT, MEASUREMENT, AND GUIDANCE ON METRICS AND TARGETS MONITORING

5.5.3a) Standard Practice

Standard Practice: Metrics and targets *(item 3.2.4 (1.4))*

Financial institutions should disclose **metrics and targets** which cover important environmental data for evaluation and illustration of the financial institutions' environmental actions against its target (e.g., their own greenhouse gases emissions and financed emissions in their portfolio) (BOT,2023b).

Standard Practice: E&C risk indicator targets *(item 3.2.3 (3.3))*

Financial institutions should develop **risk indicator targets** to control risk levels in line with the risk appetite. This includes, for example, setting the industry targets to increase the proportion of environmentally friendly transactions, or setting targets to reduce or control the concentration of industries that pose environmental risks (BOT,2023b).

5.5.3b) Key Actions

Key Actions 5.14*9*: KRI development and risk indicators for E&C risk monitoring

Key Item	Short-term Actions	Long-term Actions
5.14.1 KRI development	N/A	1. Banks **set E&C KRI (quantitative and qualitative) & targets to control risk level** within the banks' risk appetite. 2. **Integrate E&C risk in risk appetite statement** and set clear threshold to inform relevant levels of risk across both its lending and investment and asset management activities.
5.14.2 Client engagement tracking	1. Banks to develop **engagement strategy and communication plans for clients.**	1. Track record of **client engagement on green transition**, in line with client engagement strategy 2. Banks to develop **engagement strategy and communication plan for clients.** This requires specific focus for clients that pose **greater E&C risk due to their geography, industry, or sector,** in line with international recommendation integral to transition plan (e.g., TCFD or GFANZ).
5.14.3 Indicator selection and metrics	1. For the purpose of exposure measurements, banks select and disclose the **metrics that accurately reflect the E&C financial risks relevant to a particular portfolio and sector**, along with the reasoning behind their selection. 2. For banks with **extensive and complex assets**, the bank should **adopt a risk-based approach by prioritizing the most pertinent risk types, asset classes, industry sectors, and geographic areas**.	1. Banks select the metrics that accurately reflect the E&C financial risks to **assess solvency impact within their capital planning horizons, integral to capital adequacy assessment process (ICAAP)**.

When evaluating risks in a sector-specific manner, banks should carefully select and disclose the metrics that accurately reflect the E&C financial risks relevant to a particular portfolio and sector, along with the reasoning behind their selection. Banks with extensive and complex assets, as well as those operating in less diverse markets, should adopt a risk-based approach by prioritizing the most pertinent risk types, asset classes, industry sectors, and geographic areas.

5.5.3c) Recommended Approach

A. KRI Development

Setting up Key Risk Indicators (KRIs) in the risk appetite framework (ECB, 2022):

Global banks have been actively incorporating granular and forward-looking E&C key risk indicators (KRIs) into their risk appetite framework (RAF). They emphasize transparency by disclosing the methodologies used to develop the KRIs, including the rationale for setting quantitative limits, the factors considered, as well as the associated limitations.

These KRIs are embedded into the bank's regular monitoring processes, with well-defined escalation arrangements in case of limit breaches. Quantitative KRIs, such as sector-specific and geographic exposure limits, are increasingly being adopted by global banks. Examples of quantitative KRIs observed in global banks include:

- **KRIs derived from portfolio alignment metrics and targets**, including those that measure the emissions intensity of the bank's exposures to different sectors. These KRIs enable banks to track its alignment with the transition trajectory, with a triggering mechanism to notify KRI breach each time the emissions intensity exceeds the trajectory.
- Another type of **KRI tracks the level of financed emissions in the bank's portfolios** against its short-, medium-, and long-term targets. These targets cascade down to individual business lines.

In addition to quantitative KRIs, banks have also developed compliance KRIs that focus on monitoring the bank's adherence to E&C risk management policies across the organization. These KRIs assess the bank's introduction and level of adherence to policies, including credit risk assessment processes. Internal checks are conducted to identify cases where the bank's E&C policies have not been adhered to. Examples of non-quantitative KRIs observed in global banks include:

- KRIs aligned with the outcome of credit risk assessments for E&C risks, measuring the percentage of the portfolio without credit risk assessment coverage. Clients identified as having exposure to E&C risks will undergo appropriate client engagement efforts based on the assessment outcomes.
- Another type of KRI monitors the risk appetite breach and alignment using a red, amber, and green approach. Dedicated escalation arrangements are in place for E&C indicators, with clear documentation.

Banks can integrate a set of KRIs into their risk appetite framework to control and monitor E&C risks. Below is an overview of observed quantitative KRIs (ECB, 2022):

Indicator type	Definition	Description
Portfolio (mis)alignment	Thresholds for misalignments along transition trajectory	One bank has established KRIs based on its transition trajectory. These KRIs include misalignment thresholds that are regularly monitored and reported. The thresholds move along the transition trajectory of the relevant sectors based on the scenario the bank has used. If the sectoral portfolio exposure is above the trajectory at a given point in time, the threshold is breached, and escalation arrangements are triggered in line with the bank's established governance processes.
Financed emissions	Financed emissions in the lending and investment portfolios	One bank has included an indicator relating to its financed emissions in the lending and investment portfolios in its RAF. The methodology underlying the metric is documented.
Quantitative limit at sectoral level (absolute amount)	Credit risk exposures to sectors subject to elevated climate-related risks	One bank has established a quantitative limit for sectors subject to elevated climate-related risks. The limit is set at an absolute level (i.e., a predefined amount) and covers both transition and physical risk drivers. There are predefined attention thresholds

Indicator type	Definition	Description
		set below the limit. The methodology applied to set and calibrate the limit is documented. The bank is transparent in acknowledging that the limit does not yet integrate a longer-term risk perspective.
Quantitative limit at sectoral level (relative amount)	Credit risk exposures to sectors subject to elevated transition risks	Another bank has established a quantitative limit for sectors subject to elevated transition risk as a percentage of all corporate exposures. There are predefined attention thresholds set below the limit.
Quantitative limit at geographic level (absolute amount)	Credit risk exposures to geographies subject to elevated climate-related risks	One bank has established a quantitative limit for geographies subject to elevated climate-related risks. The limit is set at an absolute level (i.e., a predefined amount) and covers both transition and physical risk drivers. There are predefined attention thresholds set below the limit. The methodology applied to set and calibrate the limit is documented. The bank is transparent in acknowledging that the limit does not yet integrate a longer-term risk perspective.
Operational risk indicator	Physical climate event impacts on the bank's operations	One bank has established a quantitative limit focusing on the physical impact of climate change on the bank's operations. To calibrate the limit, the bank goes beyond historical losses and uses scenario analysis to assess the future impact of physical climate-related risk events on its operations.
Share of low-emitting loans	Percentage of loans to corporates with a low emissions profile	One bank has established limits and attention thresholds in the event that the loans in its corporate portfolio to companies classified as low-emitting drop below a predefined share of its overall corporate loan portfolio. The methodology for classifying loans, including the scope of emissions considered, is documented.

Industry Practice 47 : Integrating Climate Risk Considerations into the Risk Appetite Statement

Maybank introduced a qualitative ESG Risk Appetite Statement (RAS) in 2022 as part of their ongoing efforts to integrate climate-related risks into their risk appetite framework. The bank plans to enhance the framework further by incorporating quantitative RAS once data collection capabilities improve. The risk assessment process is guided by the ESG Risk Acceptance criteria, which currently covers 6 key industries associated with high ESG risk (Maybank, 2022).

Integrating Climate Risk Considerations

In 2022, as a first step towards embedding climate-related risks into the risk appetite framework of the Group, a qualitative ESG Risk Appetite Statement (RAS) was established and approved by the Board. The qualitative RAS articulates the approach towards managing ESG risk for the Group. As data collection improves, the Group aims to introduce quantitative RAS relating to climate.

Maybank's risk assessment process is guided by our ESG Risk Acceptance Criteria (RAC) for key high-ESG risk industries. The Group currently has six RACs. These RACs are sector-specific financing requirements that incorporate ESG factors into the evaluation, decision-making, and the monitoring and review processes for credit risk assessment. In 2022, we enhanced our position papers for existing high ESG risk sectors and broadened our Palm Oil position to cover the Agriculture industry. Aligned with BNM's Climate Change and Principle-based Taxonomy (CCPT), in 2022, the Group also rolled out an ESG screening document, aimed at embedding ESG considerations into the process of evaluating corporate clients.

Figure 75: Integration of climate risk considerations into the RAS (Maybank, 2022).

Integrated Risk Types	Risk Appetite Statement
Climate Risk	The Group aims to measure and manage financial and non-financial risks from climate change, and reduce emissions related to our own activities and those related to the financing of clients, in alignment with the Paris Agreement.

Figure 76: Climate risk as part of the bank's integrated risk types (Standard Chartered, 2022)

B. Risk indicators for E&C risk monitoring

Examples of indicators for risk assessment	Detail
Disclosure of Metrics (TCFD, 2021b)	• Publicly disclose the metrics utilized by the organization to evaluate climate-related risks and opportunities, aligned with its strategy and risk management process. • Disclose greenhouse gas (GHG) emissions for Scope 1, Scope 2, and where applicable, Scope 3, along with associated risks. • Provide an overview of the targets employed by the organization to manage climate-related risks and opportunities, and report on performance against these targets.
Concentration Metrics	• Measure the proportion of portfolios that have exposure to high-carbon sectors. • Assess the proportion of portfolios exposed to companies generating substantial revenues from fossil fuels. • Evaluate the proportion of portfolios highly susceptible to key indicators of physical risks, considering factors such as geography and sector. • Outline the actions and targets in place to support the transition towards a net-zero economy. • Set sector-specific targets and reduce exposures to sectors particularly vulnerable to climate risks.
Measuring Extent of Risk Assessment:	• Determine the percentage of portfolios that have undergone comprehensive assessments for both physical and transition risks.

Examples of indicators for risk assessment	Detail
	• Incorporate climate-related risks into underwriting and lending processes for a portion of underwriting activities. • Engage with a percentage of portfolios/clients to discuss their vulnerabilities and risks related to climate change, as well as their adaptation and mitigation efforts. • Assess the proportion of portfolios/clients that report against recognized disclosure standards such as CDP and TCFD. • Identify the proportion of portfolios/clients (in lending or securities underwriting) with credible and explicit climate change risk mitigation plans, which could include alignment with a transition pathway or commitment to science-based targets.

For instance, banks might initially focus on developing or utilizing metrics for sectors like oil and gas, and gradually incorporate others. It is important to provide a clear explanation for the chosen starting point. While a division of assets classified as "green" or "brown" can demonstrate the significance of high-carbon sectors for banks, it should be noted that a "green" asset does not necessarily imply low risk. The bank's definition of "green" and "brown" should be transparently communicated.

Banks may also track and disclose the extent of scenario analysis conducted, including the percentage of portfolios assessed using quantitative impairment metrics based on scenarios that consider forward-looking, location-specific models depicting environmental hazards and their potential impact on revenues, costs, and asset values. Heat maps can be employed to visually represent areas of high, medium, or low risk.

Utilising a materiality matrix can be valuable in presenting the bank's evaluation of identified risks. In the future, banks will be encouraged to track and disclose the resilience of their balance sheets and strategies in the face of various climate scenarios, including a 2°C/1.5°C warming scenario, reported through quantitative metrics and by identifying key material risks. This may involve reporting on the proportion of business with corporate clients that have science-based targets.

Industry Practice 48: Using metrics for risk monitoring & internal reporting

Standard Chartered have disclosed targets and achievements of environmental operations both qualitatively and quantitatively on a regular basis. This includes extending their financed emissions analysis and disclosure on exposure to high-carbon sectors.

Sectors are identified and grouped as per the International Standard Industrial Classification (ISIC) system and exposure numbers include all in-scope ISIC codes used for target setting among the seven high-carbon sectors (Standard Chartered, 2022).

Measurement

Measurement and progress of our financed emissions: sectoral deep dives

Sector	Absolute Financed Emissions $MtCO_2e$ 2022[1]	Absolute Financed Emissions $MtCO_2e$ 2021[6]	Intensity Financed Emissions $kgCO_2e$ 2022[1]	Intensity Financed Emissions $kgCO_2e$ 2021[6]	Change YTD 22 vs YTD 21	2030 target	Target based on
Standard Chartered Group	58.5[7]	45.2					
Oil and gas	10.2	13.7	2.8	3.0	-8.3%	-30%	Revenue Emissions Intensity
Power	6.3	7.7	2.1	3.7	-43.6%	-63%	Revenue Emissions Intensity
Coal mining	2.3	3.3			-30.3%	-85%	Absolute Emissions
Metals and mining	0.4	0.4	0.9	1.0	-7.4%	-33%	Revenue Emissions Intensity
Steel	2.7	2.7	1.9	2.2	-12.0%	-33%	Revenue Emissions Intensity
Transport	13.9	2.7	–	–	415%		
Auto Manufacturers[2]	4.3		160g CO_2e/Vkm			-49%	Production Emissions intensity[5]
Aviation[3]	2.2		1,152g CO_2e/ Rtk		NA	-34%	Production Emissions intensity[5]
Shipping[4]	7.4		+2.6% delta			0%	Production Emissions intensity[5]
Other[6]	22.7	14.7			NA		

Figure 77: Measurement and progress of financed emissions (Standard Chartered, 2022).

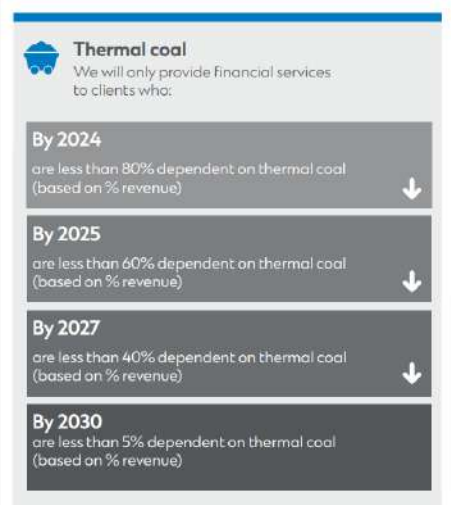


Figure 78: Example for sectoral deep-dive: Thermal coal (Standard Chartered, 2022).

CHAPTER 6: DISCLOSURE

The effective communication of E&C impacts by banks contributes to the overall resilience and sustainability of the sector. To enhance their capability on E&C disclosures, banks should ensure that their E&C risk information is disclosed in a complete and standardized structure according to this handbook, of which this chapter draws significantly from the TCFD recommendations. However, it is acknowledged that comprehensive compliance with the requirements listed out in this chapter will take time (GFIT, 2021).

In addition to the requirement set by the BOT for banks to disclose on E&C risk and performance, it is recommended that banks make key information available about their E&C risks and risk exposures in order for the public and market participants to make informed decisions. Banks have a significant role in informing and facilitating the financial services ecosystems to better grasps the concentrations of carbons related assets within the financial sector and their exposure to environment-related risk, through E&C risk disclosures. Thus, the promotion of transparency will enhance the comprehension of E&C financial impacts among institutions and investors, which are seen through more informed investment, lending, and underwriting decisions.

6.1 RELEVANT DISCLOSURE STANDARDS

The Standard Practice sets clear requirements for financial institutions on E&C information, particularly on the topics related to E&C risk management covered by the Standard Practice. It suggests that banks should disclose in accordance with various reputable international reporting frameworks such as the TCFD (Task Force on Climate-related Financial Disclosures) developed by The Financial Stability Board (FSB), and IFRS Sustainability Disclosure Standard (S2 Climate-Related Disclosures) developed by the International Sustainability Standard Board (ISSB). It should be noted here that the structure of the Standard Practice aligns with the TCFD, with added timeframe and the channels of public disclosures.

As an overview of the two standards, TCFD was framed as the recommendations on climate related financial disclosures, based on its key disclosure recommendations document *"Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures"* (TCFD, 2017). Meanwhile IFRS S2 was issued as a reporting standard, based on the standard document *"IFRS S2: Climate-related disclosures"* (ISSB, 2023b), setting the IFRS S2 to directly establish the requirements for information and metrics to be disclosed. IFRS S2 was developed based on the TCFD recommendations; therefore, the structures of reporting requirements are similar; however, as a reporting standard rather than recommendations, IFRS S2 set the clearer and wider requirements than TCFD in many parts. The alignment and comparison between the FSB's TCFD Recommendation and the ISSB's IFRS S2 are summarized in the table below in each pillar of the disclosure.

6.1.1) TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD)

6.1.1a) Standard Practice

Standard Practice: Disclosure *(item 3.2.4 (1,2))*

Financial institutions should publicly disclose climate-related information on governance, strategies, implementation plans, opportunities, and risks management, as well as metrics and targets that reflect current business operations and are in line with international standards.

(1) Disclose in line with **international reporting standards** including **TCFD** and **ISSB** covering:

- Governance
- Strategy
- Environmental opportunity and risk management
- Metric and targets

(2) Consistently **disclose information once a year** via various communication channels such as annual report, sustainability report, or website, and ensure information is up-to-date (BOT, 2023b).

6.1.1b) Key Actions

Key Actions 6.1: E&C Disclosure

Key Item	Short-term Actions	Long-term Actions
6.1.1 Public disclosure of E&C related information	1. Report **in line with TCFD and IFRS S2**, the strategy and risk management process, including the results of **forward-looking analysis (e.g., ad hoc regulatory scenario analysis and stress test), on a best endeavors basis.** 2. The principle of **comply or explain** applies.	1. Report **fully in line with TCFD and IFRS S2 with quantitative data disclosed,** the strategy and risk management process, including the result of **forward-looking analysis (e.g., scenario analysis and stress test).** 2. The principle of **comply or explain** applies.

TCFD climate-related risks, opportunities, and financial impacts framework

The framework categorizes climate reporting into 3 main categories: climate-related risks, climate-related opportunities, and financial impacts. Climate-related risks are further divided into 2 subcategories of transition and physical risks. Banks first need to identify their climate-related risks corresponding to these risk types. Transition risk, for example, can includes policy and legal risks, technology risks, and market risks. Physical risk can include risks such as acute and chronic risks (TCFD, 2021).

Banks also need to identify their climate-related opportunities that arise from managing such issues. TCFD have provides several areas that banks can focus on which are resource efficiency, energy source, product/services, markets, and resilience. This will inform banks of the specific climate-related risks and opportunities they are exposed to (TCFD, 2021).

To disclose financial impacts of climate-related issues, banks need to incorporate the risks and opportunities they have identified into the strategic planning and risk management. The financial impacts on banks are determined by the specific climate-related risks and opportunities they are exposed to, as well as their strategic and risk management decisions to manage those risks (i.e., mitigating, transferring, accepting, or controlling them). These decisions will, in turn, affect banks' financial position through the income statement, the cash flow statement, and/or the balance sheet (TCFD, 2021).

Following the consideration of climate-related risks, opportunities, and financial impacts, TCFD provides set of recommended disclosure and supporting topics under the 4 pillars of Governance, Strategy, Risk Management, and Metrics and Targets. The set of recommendations and supporting recommended disclosures are illustrated below.

Recommendations and Supporting Recommended Disclosures

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organization's governance around climate-related risks and opportunities.	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	Disclose how the organization identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
Recommended Disclosures	**Recommended Disclosures**	**Recommended Disclosures**	**Recommended Disclosures**
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	a) Describe the organization's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	b) Describe the organization's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

Figure 79: TCFD recommendations and supporting recommended disclosures. (TCFD, 2017).

6.1.1c) Recommended Approach

The TCFD has established internationally recognized voluntary sets of recommendations for consistent, comparable, and comprehensive climate-related disclosure that could impact banks' decision-making. Currently, banks are only able to partially disclose according to TCFD's four pillars of governance, strategy, risk management, and metrics/targets, while disclosing linkages to and potential impacts in financial terms (GFIT, 2021). TCFD sets for companies to look at both risk and opportunity from climate-related risks linking to development of business strategy.

Industry practice 49: Implementation of 11 TCFD recommended disclosures

ING's Climate Report contains a table that provides reference to their progress on implementing the 11 TCFD recommended disclosures, linking it to the various sections in the report.

TCFD recommendations table

The following table provides reference to ING's progress on implementing the 11 TCFD recommended disclosures covered as part of this report.

TCFD Recommended Disclosures			Section Reference	Sub-Section Reference	Page number(s)
Governance	a	Describe the board's oversight of climate-related risks and opportunities.	Governance	Governance of ESG Risks and Opportunities	14 - 15
			Governance	ESG-linked remuneration	16
	b	Describe management's role in assessing and managing climate-related risks and opportunities.	Governance	Governance of ESG Risks and Opportunities	14 - 16
			Governance	ESG-linked remuneration	16
Strategy	a	Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term.	Strategy	Managing climate and environmental risks	30 - 33
			Strategy	Finance and advise clients in line with a net-zero economy	24 - 30
			Strategy	Steer our portfolio towards net zero by 2050 or sooner	23 - 24
			Strategy	Reach net zero in our own operations	21 - 22
	b	Describe the impact of climate-related risks and opportunities on the organisation's business, strategy and financial planning.	Strategy	Managing climate and environmental risks	30 - 33
			Strategy	Finance and advise clients in line with a net-zero economy	24 - 30
			Strategy	Steer our portfolio towards net zero by 2050 or sooner	23 - 24
			Strategy	Reach net zero in our own operations	21 - 22
	c	Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a two-degree or lower scenario.	Risk Management	Our approach to managing climate risk	32 - 38
			Metrics and targets	Terra – steering our portfolio	42
Risk management	a	Describe the organisation's processes for identifying and assessing climate-related risks.	Risk Management	Summary per risk domain	39 - 40
	b	Describe the organisation's processes for managing climate-related risks.	Risk Management	Our approach to managing climate risk	37 - 38
	c	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.	Risk Management	The ESR framework	41 - 43
Metrics and targets	a	Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.	Metrics and targets	Own operations	45 - 47
			Metrics and targets	Terra - steering our portfolio	47 - 83
			Metrics and targets	Sustainable finance	83 - 85
			Metrics and targets	Climate and environmental risk	85 - 95
	b	Disclose scope 1, scope 2, and, if appropriate scope 3 GHG emissions, and the related risks.	Metrics and targets	Financed emissions	81 - 82
			Annex	Environmental programme	98
	c	Describe the targets used by the organisation to manage the climate-related risks and opportunities and performance against targets.	Metrics and targets	Own operations	45 - 47
			Metrics and targets	Terra - steering our portfolio	47 - 83
			Metrics and targets	Sustainable finance	83 - 85
			Metrics and targets	Climate and environmental risk	85 - 95

Figure 80: Example of TCFD Recommended Disclosures (ING, 2022).

Industry practice 50: Integration of TCFD Pillars to the disclosure of strategy roadmap

KB Financial group's TCFD report provide a Roadmap for the Advancement of the Strategy to respond to Climate Change, which includes key strategic actions in each TCFD pillars.

	Setting the Basis for Climate Risk Management	Advancement of Climate Strategies	Securing Climate Change Leadership
	2019 – 2021	2022 – 2024	2025 – 2030
Governance	- Establish the board-level ESG Committee - Establish ESG forums and responsible teams within subsidiaries - Incorporate ESG in the management's KPI	- Develop board-level metrics and dashboard to address climate change - Nurture climate experts and internalize capability to respond to climate change	- Demonstrate strong leadership in the corporate sector in tackling climate change
Strategy	- Develop SBTi based net-zero strategies (including net-zero strategies for operational emissions (Scope 1&2) and financed emissions (Scope 3)) - Develop strategy to expand ESG financing - Declare anti-coal financing - Analyze impact on portfolio using scenarios	- Establish carbon emissions management system - Each subsidiary to develop and execute net-zero implementation strategies - Develop a scenario analysis methodology	- Stabilize an integrated management and disclosure of financial and non-financial data - Implement strategies to strengthen climate resilience based on scenarios
Risk Management	- Develop Environmental and Social Risk Management (ESRM) Policy Framework at the Group level - Review environmental and social risks based on the Equator Principles	- Strenghthen engagement with high-emission industries - Reinforce credit reating system reflecting climate risks	- Reinforce comprehensive ESG risk management system - Fully utilize the corporate ESG risk assessment system
Metrics & Targets	- Measure and disclose greenhouse gas emissions · Operational emissions (Scope 1&2) · Financed emissions (Scope 3)	- Expand target for financed emissions (Scope 3) and set relevant targets in accordance with the development of the global measurement methodology	- Achieve the ESG finance target (by 2030) - Conduct interim check on the fulfillment of net-zero targets and update targets

Figure 81: Strategy roadmap in response to Climate Change (KB Financial Group, 2021).

6.1.2) INTERNATIONAL SUSTAINABILITY STANDARDS BOARD (ISSB)

Formed by the International Financial Reporting Standards (IFRS) Foundation following COP26 in Glasgow, the International Sustainability Standards Board (ISSB) is a standard-setting body established to develop sustainability-related financial reporting standards. It aims to develop a standard that will "result in a high-quality, comprehensive global baseline of sustainability disclosures focused on the needs of investors and the financial markets" (IFRS Foundation, 2023). It is a result of the increasing calls for companies to publicly disclose their sustainability-related risks and opportunities, and for there to be a standard that addresses the fragmented landscape of sustainability disclosures (IFRS Foundation, 2023).

ISSB adopted climate-first approach, which reflects on the issuance of the IFRS S1 (General Requirements) and S2 (Climate) as the first set of standards in June 2023. The prioritized climate-related disclosure aims to have companies focused on the climate-related performance data, which is most required among investors and financial institutions. The requirement in the first set of ISSB's reporting standards highlight that in the first-year companies should prioritize "putting in place reporting practices and structures to provide high-quality, decision-useful information about climate-related risks and opportunities", based on the concepts, structure and requirements of climate disclosures.

Figure 82: Architecture of IFRS standards (IFRS. 2021).

It should be noted that although IFRS S2 follows the same framework as the TCFD recommendations, there are key differences between IFRS S2 and the TCFD recommendations. This includes (IFRS, 2022):

- different wording to capture the same information
- the requirement of more granular information
- proposal of some additional specific disclosures.

The following sections will provide detail and recommendations of disclosures based on TCFD disclosure recommendations. The key differences between TCFD and IFRS S2, mainly additional reporting requirements set by IFRS S2, are highlighted in the summary tables provided in each pillar.

6.2 DISCLOSURE OF GOVERNANCE

6.2b) Key Actions

Key Actions 6.210: Disclosure of Governance

Key Item	Short-term Actions	Long-term Actions
6.2.1 **Disclosure of E&C Governance Data**	**A. TCFD** **1. Board's oversight of E&C risks and opportunities** 1.1 process and frequency the BoD or board committees are informed about E&C risks **2. Management's roles in assessing and managing E&C risks and opportunities** 2.1 Assigned responsibility to SM positions or committees and their reports to BoD 2.2 Associated organizational structure 2.3 Process to be informed about E&C issues 2.4 Process to monitor implementation of policy	**A. TCFD** **1. Board's oversight of E&C risks and opportunities** 1.2 Consideration of E&C risks in strategy, plans of actions, risk management policies, resource allocation, and major business decisions 1.3 Process to monitor and oversee progress against E&C targets and goals **2. Management's roles in assessing and managing E&C risks and opportunities** 2.4 Process to monitor implementation of strategy **B. IFRS 2** **1. Governance structure of E&C risks and opportunities (for both BoD and Senior Management)** 1.1 Board & SM responsibilities as reflected in terms of reference, mandates, role description, and other related policies 1.2 Skills and competencies 1.3 Cycle of reporting to BoD 1.4 Governance body's oversights on the bank strategy, major transactions, risk management processes, and related policies 1.5 Oversight of climate-related target setting **2. Management roles** 2.1 Roles delegated to management-level position or committee 2.2 Controls and procedures integrated with internal functions

For Board oversight, banks should discuss processes and frequency that the board and its committee are informed about E&C issues, whether the board consider E&C issues in their everyday roles and responsibilities, and how the board monitors and oversees the goals and targets of E&C issues.

For Management's role disclosures, banks should provide their organizational structures, demonstrate that they have assigned E&C responsibilities to their management, and detail the processes that inform the management of E&C issues and how they monitor it (e.g., through specific management committee) (TCFD, 2021).

To align with the BOT's expectation, banks should link the oversight's results, both by Board of Directors and senior management, to their E&C actions and initiatives taken within the timeline of reporting.

6.2c) Recommended Approach

Additional considerations for granular disclosures of Governance

Disclosing governance practices and policies allows external parties to evaluate the oversight and management role that the Board and/or senior managements plays in E&C risks and opportunities. Banks should start by describing their existing governance and operational arrangements to manage E&C risks. Banks should demonstrate how their E&C risks and opportunity governance structure operates, including how banks integrate E&C risk and opportunity into existing risk and strategy management processes (GFIT, 2021).

Additionally, banks may want to specify which department, the Board and especially below them, are responsible for E&C risks and opportunities. The responsibilities disclosed should include "daily management and reporting structure for these risks, training schedules, linkage to remunerations, support from external data providers, as well as timelines for the integration of climate related risks" (GFIT, 2021).

The table below provides a summary of additional requirements in governance disclosure set by IFRS S2 (IFRS, 2022 & IFRS, 2023):

TCFD Recommendation, Recommended Disclosure and Guidance		IFRS S2 Climate-related Disclosures
Governance	**Recommended Disclosure a)** Describe the board's oversight of climate-related risks and opportunities.	IFRS S2 requires the disclosure of additional information around governance, including: • **the identity of the body or individual** within a body responsible for oversight of climate-related risks and opportunities; • **how that body's responsibilities** for climate-related risks and opportunities **are reflected in the entity's terms of reference, Board mandates and other related policies**; • **how the body ensures that the appropriate skills and competencies** are available to oversee strategies designed to respond to climate-related risks and opportunities; and • **information about whether dedicated controls and procedures are applied** to management of climate-related risks and opportunities and, if so, how they are integrated with other internal functions. Additionally, IFRS S2 states that if an entity takes an integrated approach to monitor, manage and oversee its climate and sustainability-related risks and opportunities, the entity is required to avoid duplicating its governance disclosure for each sustainability-related risk and opportunity (IFRS, 2023c).
	Recommended Disclosure b) Describe management's role in assessing and managing climate-related risks and opportunities.	

Industry practice 51: Example of governance disclosure

In its 2022 Annual Report, Barclays discloses their overview of climate-related governance detailing how their Board and the Committees (along with Executive and Management Committees) are responsible for the oversight of climate-related risk and opportunities. It also outlines the specific responsibilities on climate-related oversight delegated to the management team (Barclays, 2022).

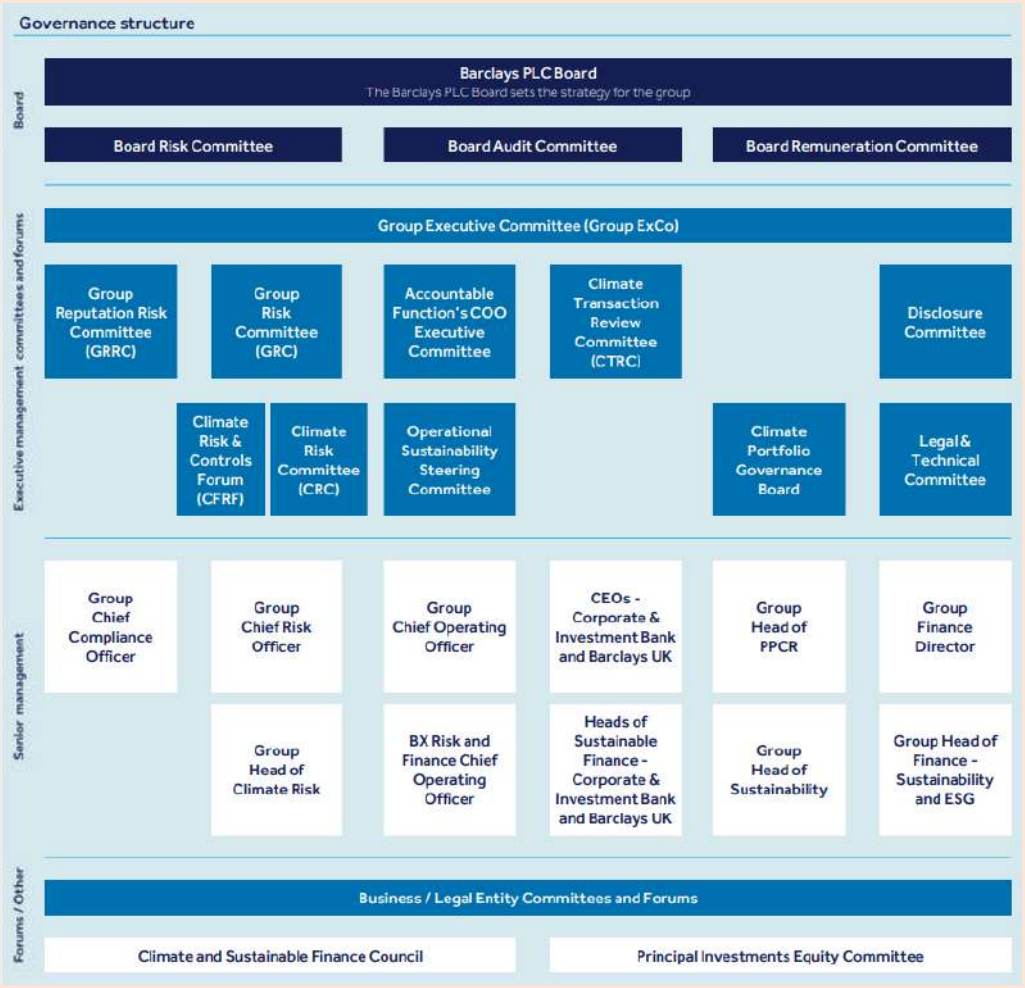


Figure 83: Climate and sustainability governance (Barclays, 2022).

6.3 DISCLOSURE OF STRATEGY

6.3b) Key Actions

Key Actions 6.311: Disclosure of Strategy

Key Item	Short-term Actions	Long-term Actions
6.3.1 **Disclosure of Strategy**	**A. TCFD** **1. E&C risks and opportunities the organization has identified over short, medium, and long term** 1.1 Significant concentrations of credit exposure to E&C assets 1.2 Consider disclosing E&C risks in lending and other financial intermediary business activities **3. Resilience of the organization's strategy, in different climate scenarios** **4. Key information from the bank's transition plan (scope 1 and scope 2)**	**A. TCFD** **2. Financial impacts and potential financial impacts of E&C risks on business, strategy, and financial planning** **4. Key information from the bank's transition plan (scope 3)** **B. IFRS S2** **2. Business model and value chain** 2.1 current and anticipated effects on business model and value chain **3. Strategy and decision-making** 3.1 Plans in responses to E&C risks and opportunities 3.2 Direct and indirect mitigation and adaptation efforts 3.3 Transition plan (emission targets and use of carbon offset) 3.4 Plan to achieve climate-related targets **5. Climate resilience** 5.1 Resilience of the bank's strategy and business model (including significant areas of uncertainty) 5.4 An entity's capacity to adjust and adapt its strategy over time

6.3c) Recommended Approach

Additional considerations for granular disclosures of Strategy

To unpack the points to be reported in line with the BOT's expectation, the following disclosures should be considered.

A. Strategy

For strategy related disclosure, banks should express how their strategy framework is set to identify, assess, and manage E&C risks and opportunities. This disclosure could include clearly defined information about E&C risks and opportunities identified over short-, medium-, and long-term horizons.

After establishing their strategy and risk management processes, banks should provide details on the impact that the risk management processes have on business decisions at an institutional level. This strategy should receive regular updates to account for changing climate scenarios over the short- and medium-term (GFIT, 2021).

B. Implementation plan

In addition to providing E&C issues that could have a material impact on the institutions over different time horizons, banks should also provide their identification processes and their term consideration for each time horizon (e.g., short-, medium-, and long-term). Banks should demonstrate how their business, strategy, and financial planning are affected by climate-related issues, which can include areas such as products and services, supply chain and/or value chain, and adaptation and mitigation activities etc.

Banks should also provide evidence of E&C risks and opportunities incorporation into their financial planning processes, time periods used and how they are prioritized. To describe their institution's resilience, banks can show how their strategies that are affected by E&C risks and opportunities, its their potential financial performance and financial position impact, and how banks are considering changing strategies to manage such risks and opportunities (TCFD, 2017).

C. Qualitative and quantitative explanation and methodology used to consider strategy and implementation formation

Banks should strengthen their E&C strategy by incorporating scenario analysis results, which explores potential impact of various E&C scenarios on banks' portfolio. As for E&C risks strategy, banks can choose to develop it either before or after its risk assessment and management process.

The table below provides a summary of additional requirements in Strategy disclosure set by IFRS S2 (IFRS, 2022 & IFRS, 2023):

<table>
<tr><th colspan="2">TCFD Recommendation, Recommended Disclosure and Guidance</th><th>IFRS S2 Climate-related Disclosures</th></tr>
<tr><td rowspan="3">Strategy</td><td>Recommended Disclosure a)

Describe the climate-related risks and opportunities the organization has identified over the short-, medium-, and long-term.</td><td rowspan="2">IFRS S2 requires additional, more granular information in describing the impact of risks and opportunities, including direct responses to risks and opportunities (e.g., changes in business model and strategy); responses to the risks through working with their customers and suppliers, resource planning for strategy and plan implementation, and expected changes in financial performances (revenue and cost) overtime.

IFRS S2 also has a slightly different approach to transition plans. Transition plans are referenced as a part of an entity's strategy, and hence subject to the strategy disclosure requirements, with explicit requirements around disclosure of emission reduction targets and use of carbon offsets.</td></tr>
<tr><td>Recommended Disclosure b)

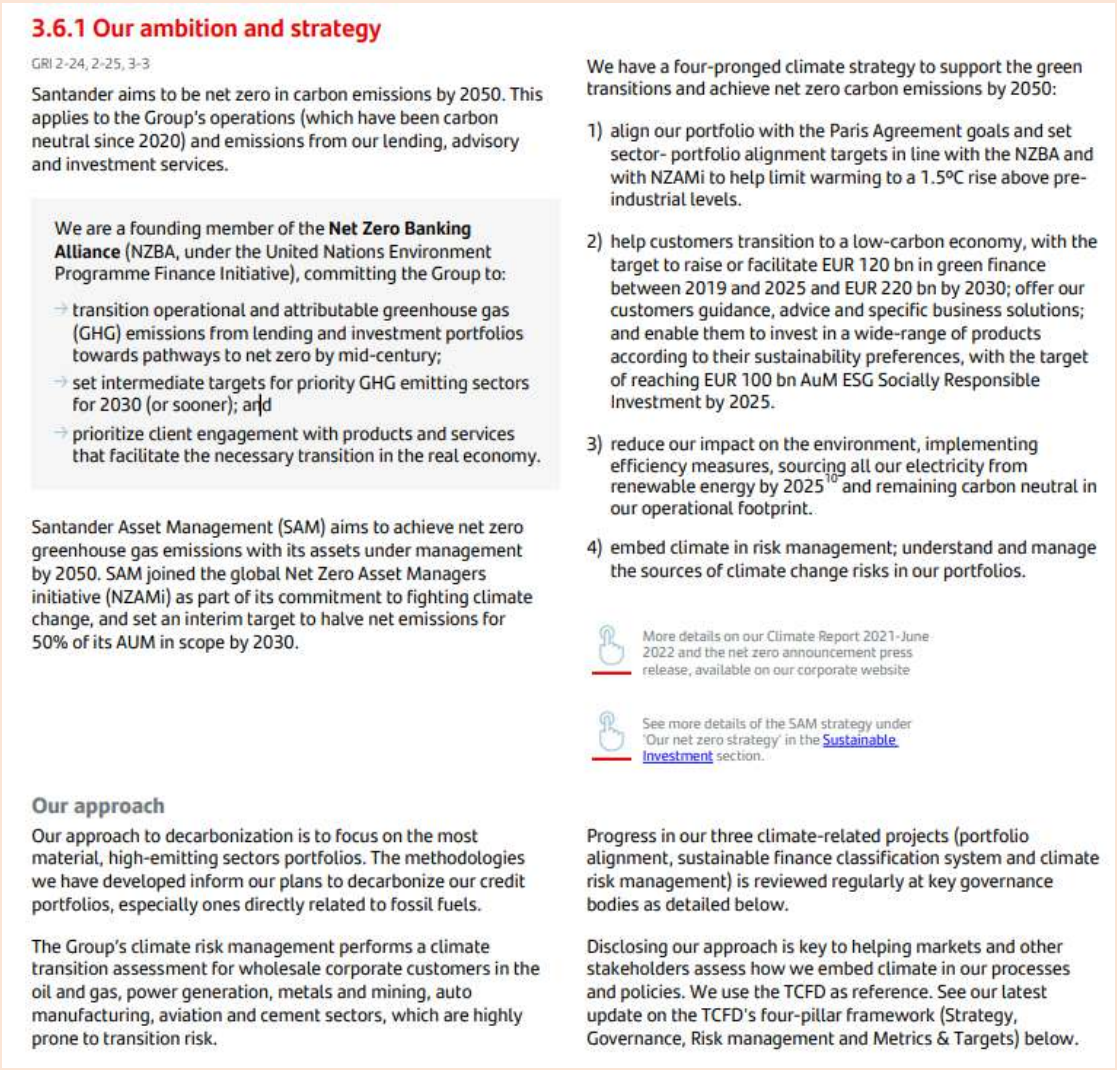
Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.</td></tr>
<tr><td>Recommended Disclosure c)

Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</td><td>IFRS S2 requires additional information regarding resiliency on:

• significant areas of uncertainty for strategy resilience;
• an entity's capacity to adjust and adapt its strategy over time; and
• details on how any resilience analysis or assessment has been conducted.</td></tr>
</table>

Industry practice 52: Example of strategy disclosure (1)

In its 2022 Annual Report, Santander discloses their net zero ambitions, a four-pronged climate strategy to support the green transitions and achieve net zero carbon emissions by 2050, and a decarbonization approach in prioritizing material, high-emitting material sectors portfolios.



3.6.1 Our ambition and strategy

GRI 2-24, 2-25, 3-3

Santander aims to be net zero in carbon emissions by 2050. This applies to the Group's operations (which have been carbon neutral since 2020) and emissions from our lending, advisory and investment services.

We are a founding member of the **Net Zero Banking Alliance** (NZBA, under the United Nations Environment Programme Finance Initiative), committing the Group to:

- transition operational and attributable greenhouse gas (GHG) emissions from lending and investment portfolios towards pathways to net zero by mid-century;
- set intermediate targets for priority GHG emitting sectors for 2030 (or sooner); and
- prioritize client engagement with products and services that facilitate the necessary transition in the real economy.

Santander Asset Management (SAM) aims to achieve net zero greenhouse gas emissions with its assets under management by 2050. SAM joined the global Net Zero Asset Managers initiative (NZAMi) as part of its commitment to fighting climate change, and set an interim target to halve net emissions for 50% of its AUM in scope by 2030.

We have a four-pronged climate strategy to support the green transitions and achieve net zero carbon emissions by 2050:

1) align our portfolio with the Paris Agreement goals and set sector- portfolio alignment targets in line with the NZBA and with NZAMi to help limit warming to a 1.5ºC rise above pre-industrial levels.

2) help customers transition to a low-carbon economy, with the target to raise or facilitate EUR 120 bn in green finance between 2019 and 2025 and EUR 220 bn by 2030; offer our customers guidance, advice and specific business solutions; and enable them to invest in a wide-range of products according to their sustainability preferences, with the target of reaching EUR 100 bn AuM ESG Socially Responsible Investment by 2025.

3) reduce our impact on the environment, implementing efficiency measures, sourcing all our electricity from renewable energy by 2025[10] and remaining carbon neutral in our operational footprint.

4) embed climate in risk management; understand and manage the sources of climate change risks in our portfolios.

More details on our Climate Report 2021-June 2022 and the net zero announcement press release, available on our corporate website

See more details of the SAM strategy under 'Our net zero strategy' in the Sustainable Investment section.

Our approach

Our approach to decarbonization is to focus on the most material, high-emitting sectors portfolios. The methodologies we have developed inform our plans to decarbonize our credit portfolios, especially ones directly related to fossil fuels.

The Group's climate risk management performs a climate transition assessment for wholesale corporate customers in the oil and gas, power generation, metals and mining, auto manufacturing, aviation and cement sectors, which are highly prone to transition risk.

Progress in our three climate-related projects (portfolio alignment, sustainable finance classification system and climate risk management) is reviewed regularly at key governance bodies as detailed below.

Disclosing our approach is key to helping markets and other stakeholders assess how we embed climate in our processes and policies. We use the TCFD as reference. See our latest update on the TCFD's four-pillar framework (Strategy, Governance, Risk management and Metrics & Targets) below.

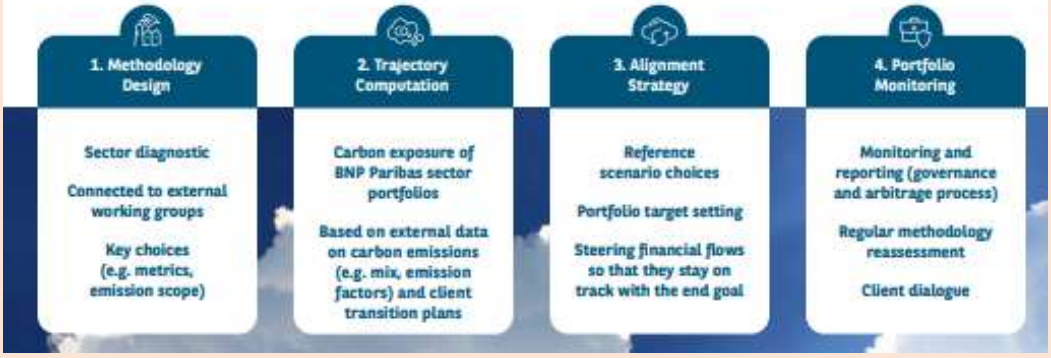
Figure 84: Example of strategy disclosure (Santander. 2022. Annual report).

Industry practice 53: Example of strategy disclosure (2)

In its 2023 Annual Report, BNP Paribas discloses their 4 step-approach at sector level to achieve net-zero by 2050. Based on PACTA initiative, the initial step of the approach assesses each sector in the bank's portfolio and determine its carbon exposure. After which, the bank can ensure their portfolio follow with net-zero 2050 vision by initiating portfolio target setting that align with chosen climate scenarios and continuously monitor each sector carbon pathways.

To ensure alignment with our net-zero commitment by 2050 and leveraging on the PACTA initiative, we have built an approach based on a 4-step process to tailor the methodology for each sector, measure trajectory, align strategy and monitor our portfolio. We built our approach on five key interconnecting principles:

BNP PARIBAS 4 STEP-APPROACH AT SECTOR LEVEL



- **Reference scenario:** our net-zero targets are benchmarked against the IEA net-zero scenarios. The IEA scenarios are updated regularly and provide amongst the best level of granularity available to date.
- **Sector-based:** each sector has its own transition pathway or technology roadmap for contributing to a low-carbon future. Our approach started with assessing the considered sectors' key business activity and emissions drivers, existing transition pathways, industry dynamics and regulatory constraints. In line with NZBA guidelines, we concentrated on the activities that are most climate relevant within each sector.
- **Financial product scope:** includes committed credit lines directly provided by BNP Paribas, i.e. overdraft credits and financial loans (drawn and undrawn) and contingent liabilities, excluding securities but including securitised assets. At this stage, we have not included any impact from finance facilitated by BNP Paribas, i.e., our Debt and Equity Capital Market activities, as the methodology to include such activities remains to be defined. We expect these activities to be part of our future publications.
- **Asset-level data:** we have opted for asset-level data as this provides the most precise and consistent information. This data is aggregated at the legal entity level and matched with our financing exposure.
- **Metric:** for each sector, we defined the output-related metrics that are most relevant, impactful, reliable and useful for decision making to foster progress towards net-zero emissions overtime. Metrics selected for each sector include an intensity based metric (e.g. gCO_2e / physical metric), as per NZBA guidelines, supported by a sector metric anchored in the economy to provide a detailed view on the progress towards the net-zero economy roadmap.

Figure 85: Example of strategy disclosure (BNP Paribas, 2023).

6.4 DISCLOSURE OF RISK MANAGEMENT

6.4b) Key Actions

Key Actions 6.412: Disclosure of risk management

Key Item	Short-term Actions	Long-term Actions
6.4.1 Risk Management Disclosure	**A. TCFD** **1. Processes for identifying and assessing E&C risks** 1.1 Characterizing E&C risk in the context of traditional banking industry risk category (credit), and considering disclosing E&C risk in the context of market, liquidity, and operational risks. **3. Processes for identifying and assessing E&C risks and how it is integrated into the overall risk management framework**	**A. TCFD** **2. Processes for managing E&C risks** **3. processes for managing E&C risks and how it is integrated into the overall risk management framework** **B. IFRS S2** **1. Process and policies to identify, assess, prioritize and monitor E&C risks, including information on** 1.1 Inputs, parameter, data source, and scope of E&C management 1.2 Climate-related scenario analysis for risk identification (based on ad hoc regulatory Scenario Analysis/stress testing) 1.3 Likelihood and magnitude of effects of risks 1.5 E&C risk monitoring 1.6 E&C integration to overall risk management process

Banks should disclose their E&C financial risks and opportunities management processes, which should include how they identified, assessed, and managed such risks. This should be integrated into their enterprise risk governance and management processes. Banks should start by explaining how they determine the relative significance (materiality) of those risks compared to other risks, the processes use to assess the scope and potential size of those risks, and what regulatory requirement do they consider when identifying and assessing E&C risks. It is also important to elaborate on the risk terminology/reference and risk framework used. To describe the E&C risk management, banks can detail how they mitigate, transfer, accept or control those risks.

Banks can also disclose their process of risk management in different financial business activities, such as the process of lending approval and investment consideration. The disclosure of actions such as procedure for client credit approval, client onboarding, and regular borrower E&C risk assessment and monitoring can reflect the robust processes the banks have established to manage E&C risks in their portfolio.

6.4c) Recommended Approach

Additional considerations for granular disclosures of Risk Management

Banks should explain how E&C risks are considered and integrated into their enterprise risk inventory, and detail the steps taken to mitigate material E&C risks. The measures for risk mitigation may apply to both operational and portfolio level mitigation, such as exclusion policies or results of client engagement efforts. Banks can also reflect on how they integrate E&C Risk in their risk appetite consideration, and linkages to their business strategy formation.

The table below provides a summary of additional requirements in Risk Management disclosure set by IFRS S2 (IFRS, 2022 & IFRS, 2023):

TCFD Recommendation, Recommended Disclosure and Guidance		IFRS S2 Climate-related Disclosures
Risk Management	**Recommended Disclosure a)** Describe the organization's processes for identifying and assessing climate-related risks.	IFRS S2 is consistent with the TCFD recommended disclosure a) with the **following additions**: • inclusion of processes used to identify and prioritize **opportunities**; • the **input parameters** it uses to identify risks (for example, data sources, the scope of operations covered and the detail used in assumptions); and • whether it has **changed the processes** used compared to the prior reporting period.
	Recommended Disclosure b) Describe the organization's processes for managing climate-related risks.	N/A
	Recommended Disclosure c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	N/A

Industry practice 54: Example of E&C-related risk integration

Below is an example of how firms can start by integrating E&C-related risk into their existing risks categories, which can then be prioritize based their current risk matrix and assessment (TCFD Guidance on Risk Management Integration and Disclosure, 2020).

Figure D5

Sample of Risk Categories, Risk Types, and Climate-Related Risks

Category	Type (Sub-Category)	Climate-Related Risks
Financial	• Credit Risk • Liquidity Risk • Tax Strategy	• Creditworthiness is eroded and interest rates rise as lenders consider escalating business risks related to climate change • Costs increase from taxes or fees on carbon emissions
Operational	• Supply Chain • Raw Material Availability • Business Continuity	• Supply chain disruptions occur because of droughts or extreme weather impacts in supplier regions • Costs increase on raw materials due to sustainable forestry practice requirements • Changing weather patterns and increased natural disasters disrupt operations
Strategic	• Competition • Changing Customer Preferences	• Shift in customer preferences toward products that are produced with lower emissions or that produce lower emissions

Figure 86: TCFD Sample of Risk Categories, Risk Types, and Climate-Related Risks (TCFD Guidance on Risk Management Integration and Disclosure, 2020).

Industry practice 55: Example of risk management disclosure

In its annual report, Standard Chartered comprehensively discloses how the bank identify, classify, and manage climate-related risks. The bank identifies climate risk as part of the group's wide risk taxonomy through the Enterprise Risk Management Framework, explains how climate risks can manifest through existing risk types, and illustrates the toolkit and processes used for identifying and assessing climate risk (Standard Chartered, 2022).

Climate Risk taxonomy

Climate Risk		The potential for financial loss and non-financial detriments arising from climate change and society's response to it.
Sub-risk types		
Physical Risk		Risks arising from increasing severity and frequency of climate- and weather-related events. These events can damage property and other infrastructure, disrupt business supply chains, and impact food production. This can reduce asset values, potentially resulting in lower profitability for companies. Indirect effects on the macroeconomic environment, such as lower output and productivity, exacerbate these direct impacts.
	Acute	Specific event-driven weather events, including increased severity of extreme weather events, such as cyclones, hurricanes, floods or wildfires.
	Chronic	Longer-term shifts in climate patterns, such as changing precipitation patterns, sea-level rise, and longer-term drought.
Transition Risk		Risk arising from the adjustment towards a carbon-neutral economy, which will require significant structural changes to the economy. These changes will prompt a reassessment of a wide range of asset values, a change in energy prices, and a fall in income and creditworthiness of some borrowers. In turn, this entails credit losses for lenders and market losses for investors.

Figure 87: Climate Risk taxonomy (Standard Chartered, 2022).

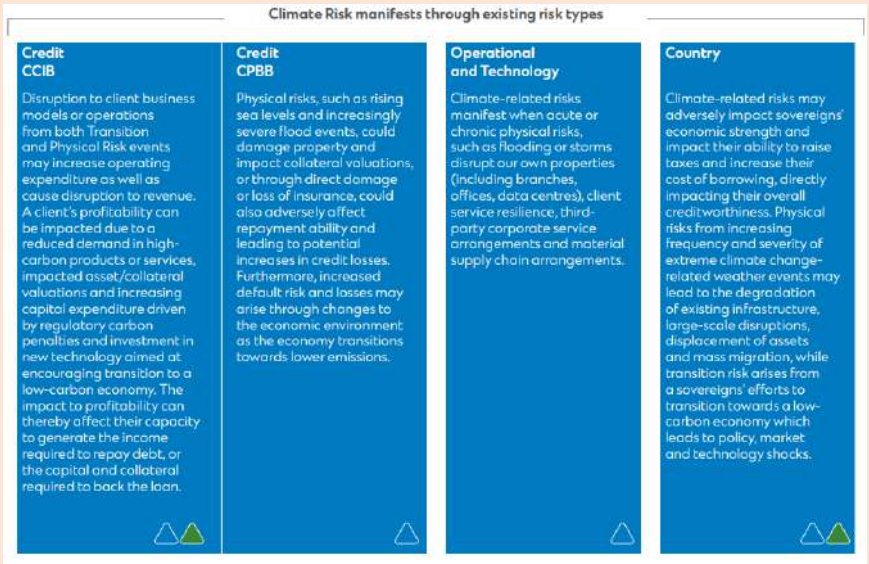
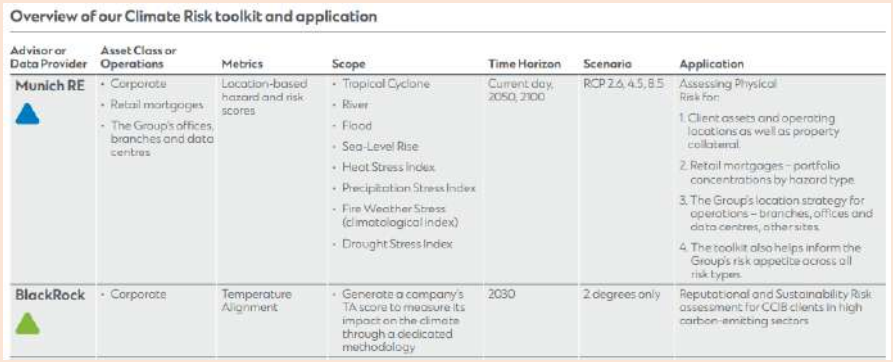


Figure 88: Existing risk classification and Climate Risk transmission channels (Standard Chartered, 2022).



Overview of our Climate Risk toolkit and application

Advisor or Data Provider	Asset Class or Operations	Metrics	Scope	Time Horizon	Scenario	Application
Munich RE	• Corporate • Retail mortgages • The Group's offices, branches and data centres	Location-based hazard and risk scores	• Tropical Cyclone • River • Flood • Sea-Level Rise • Heat Stress Index • Precipitation Stress Index • Fire Weather Stress (climatological index) • Drought Stress Index	Current day, 2050, 2100	RCP 2.6, 4.5, 8.5	Assessing Physical Risk for: 1. Client assets and operating locations as well as property collateral 2. Retail mortgages – portfolio concentrations by hazard type 3. The Group's location strategy for operations – branches, offices and data centres, other sites 4. The toolkit also helps inform the Group's risk appetite across all risk types.
BlackRock	• Corporate	Temperature Alignment	• Generate a company's TA score to measure its impact on the climate through a dedicated methodology	2030	2 degrees only	Reputational and Sustainability Risk assessment for CCIB clients in high carbon-emitting sectors

6.5 DISCLOSURE OF METRICS AND TARGETS

6.5b) Key Actions

13 Key Actions 6.5: Disclosure of Metrics and Targets

Key Item	Short-term Actions	Long-term Actions
6.5.1 Disclosure of Metrics and Targets	**A. TCFD** **1. Disclosure of scope 1, scope 2, scope 3 GHG emissions, and the related risks** 1.1 disclose GHG emissions for lending and other financial intermediary business activities where data and methodology allow. **2. Metrics used to assess E&C risks and opportunities.** The suggested metric category include: 2.1 GHG Emissions (including financed emissions for high-emission sectors, where data allows) 2.2 Transition Risks 2.3 Physical Risks 2.4 Climate-related opportunities	**A. TCFD** **2. Metrics used to assess E&C risks and opportunities in line with strategy and risk management process**. The suggested metric category include: 2.5 Capital deployment (towards addressing risk & opportunities, including capital Expenditure, financing and investment) 2.6 Internal Carbon Prices, and 2.7 Remuneration (linked to climate consideration) **B. IFRS S2** **1. Climate-related metrics** 1.1 Emissions (Scope 1 & Scope 2), and Scope 3 for high-emission sectors. **2. Climate related targets & interim targets (if available)** **3. Financed Emissions metrics (high-emission sectors, where data allows)** 3.1 Absolute gross financed emissions, disaggregated by Scope 1, Scope 2 and Scope 3 GHG emissions for each industry by asset class 3.2 Gross exposure to each industry by asset class (currency of entity's financial statements) 3.3 % of entity's gross exposure included in the financed emissions calculation 3.4 Methodology of financed emissions calculation.

A. Disclosure of metrics

For metrics disclosure, banks should disclose (TCFD, 2021):

1. **Climate-related risk metrics (associated with water, energy, land use, and waste management):** banks should disclose these metrics if the mentioned E&C risks are material, relevant and applicable to its operational and portfolio. Additionally, if the risks are material, banks should provide explanation if performance metrics are linked to their remuneration policies.
2. **Climate related opportunity:** the banks should disclose the proportion of revenue, assets, or business activities related to climate-related opportunities helps compare banks and understand their relative positions. It provides insights into potential transition paths and the potential impact on revenues and profitability in the future.

3. **GHG emissions:** TCFD recommends that banks should calculate and report their GHG emissions according to the GHG accounting methodology of the GHG protocol, to increase comparability and transparency. Industry-specific GHG efficiency ratios should also be disclosed when applicable. TCFD also provides supplemental guidance for banks to disclose GHG emissions in their "lending and other financial intermediary business activities where data and methodology allow". For this additional disclosure suggested for banks, TCFD recommends GHG emissions calculation in line with the Partnership for Carbon Accounting Financials (PCAF Standard) (TCFD, 2021).

4. **Other cross-industry climate-related metrics:**

    - Capital investment disclosure should provide insights into the potential impact on long-term of the banks' value.
    - Internal carbon prices inform risk assessment and strategy resilience. Disclosure of these prices helps the banks identify vulnerable business models and assess adaptation to transition risks.
    - Remuneration policies, the banks should provide insights into their governance and accountability for managing climate-related issues and serve as incentives for achieving goals.

Key definitions: Scope 3 Emissions

"Scope 3 emissions" is defined as all indirect emissions that occur in each bank's value chain that is not included in scope 2 emissions. Scope 3 emissions not only includes emissions from activities in the banks value chain, but also from leased assets, investments, and franchises that the company partially or wholly owns or controls.

Scope 3 can be broken down into upstream and downstream emissions following its respective activities. Upstream emissions include all emissions that occur from the production or extraction of raw materials. Downstream includes all emissions from transportation, storage, and use of the organization's products or services. (See list of 15 category of Scope 3 emissions in chapter 7).

For financial institutions including banks, scope 3 category 15 emissions, i.e., financed emissions, are often the most significant part of banks' GHG emissions inventory and should be their main priorities among other category since banks have a large number of investments that makes up a massive part of their portfolios. For other industry or sectors, scope 3 emissions will be involving more categories as they have more activities in their supply chain such as distribution, and employee transportations.

This category is applicable to investing and financial services companies. Investments fall under downstream scope 3 because the reporting firm provide services by offering capital or financing other companies. Category 15 is mainly designed for financial institutions (e.g., commercial banks), but also important for other entities with investments not included in scope 1 and scope 2.

Sources: GHG Protocol and PCAF finance emissions

B. Disclosure of targets

Banks should describe their key climate-related targets related to GHG emissions, water, energy, and waste etc. as well as the methodologies used to calculate them. These targets should align with cross-industry targets and regulatory requirements or other business goals. Banks also need to consider if the target is absolute or intensity based, the timeframe and base year in which the target applies to and is measured as well as key performance indicators for progress tracking (TCFD, 2017).

TCFD recommends several important characteristics for climate-related targets. First, it should be aligned with banks' strategy and risk management goals. Banks' climate-related targets should be set by taking their strategy and risk management processes into account, with additional input coming from scenarios analysis

and stress testing. Second, climate-related targets should be supported and linked to proper metrics so that its progress can be tracked and allows banks to continuously review and update their targets when it is necessary. Third, targets should be quantified and measurable to allow for comparability, analysis, and tracking progress (TCFD, 2021).

6.5c) Recommended Approach

A. Disclosure Metrics

To disclose these metrics, it is important for banks to disclose the methodologies used to calculate climate-related metrics. Banks should also disclose consistent climate-related metrics overtime. Consistent of historical, current, and forward-looking climate-related metric disclosures allow banks and interested parties to perform trend analysis, compare year-to-year data, and track banks overall climate-related targets progress. Disclosing forward-looking metrics may be based on methodologies such as scenario analysis, trend analysis, and sensitivity analysis.

Table below shows cross-industry, climate-related metric categories (TCFD, 2021).

Cross-industry Metric Category	Example Unit of Measure
Transition Risks The extent and vulnerability of assets or banks activities to transition risks	Amount percentage
Physical Risks The extent and vulnerability of assets or banks activities to physical risks	Amount percentage
Climate-Related Opportunities The proportion of revenue, assets, or other activities that are aligned with climate-related opportunities	Amount percentage
GHG Emissions Absolute Scope 1, Scope 2, and Scope3; emissions intensity	MT of CO_{2e}
Capital Deployment The amount of capital expenditure, financing, or investment allocated towards addressing climate-related risks and opportunities	Reporting currency
Internal Carbon Prices Internal price per ton of GHG emissions used by the banks	Price in reporting currency, per MT of CO_{2e}
Remuneration Proportion of executive management remuneration linked to climate consideration	Percentage, weighting, description, or amount in reporting currency

B. Targets

To support the disclosure of metrics and targets, the TCFD offers examples of quantified targets that align with the cross-industry climate-related metric categories. It acknowledges that the ability of organizations to establish, monitor, and disclose climate-related targets aligned with these metrics may differ based on factors such as jurisdiction, sector, and business model. The table below shows examples of cross-industry quantified targets (TCFD, 2021b).

Cross-Industry Metric Category	Example Climate-Related Target
GHG Emissions Absolute Scope 1, Scope 2, and Scope 3; emissions intensity	• Reduce net Scope 1, Scope 2, and Scope 3 GHG emissions to zero by 2050, with an interim target to cut emissions by 70% relative to a 2015 baseline by 2035
Transition Risks Amount and extent of assets or business activities vulnerable to transition risks	• Reduce percentage of asset value exposed to transition risks by 30% by 2030, relative to a 2019 baseline
Physical Risks Amount and extent of assets or business activities vulnerable to physical risks	• Reduce percentage of asset value exposed to acute and chronic physical climate-related risks by 50% by 2050 • Ensure at least 60% of flood-exposed assets have risk mitigation in place in line with the 2060 projected 100-year floodplain
Climate-Related Opportunities Proportion of revenue, assets, or other business activities aligned with climate-related opportunities	• Increase net installed renewable capacity so that it comprises 85% of total capacity by 2035
Capital Deployment Amount of capital expenditure, financing, or investment deployed toward climate-related risks and opportunities	• Invest at least 25% of annual capital expenditure into electric vehicle manufacturing • Lend at least 10% of portfolio to projects focused primarily on physical climate-related risk mitigation
Internal Carbon Prices Price on each ton of GHG emissions used internally by an organization	• Increase internal carbon price to $150 by 2030 to reflect potential changes in policy
Remuneration Proportion of executive management remuneration linked to climate considerations	• Increase amount of executive management remuneration impacted by climate considerations to 10% by 2025

The table below provides a summary of these differences in Metrics and Targets (IFRS, 2022 & IFRS, 2023):

TCFD Recommendation, Recommended Disclosure and Guidance		IFRS S2 Climate-related Disclosures
Metrics and Targets	**Recommended Disclosure a)** Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	IFRS S2 requires disclosure of **industry-based metrics** relevant to an entity's industry and activities.
	Recommended Disclosure b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions (if appropriate), and the related risks.	IFRS S2 **requires for the disclosure of Scope 3 emission**, as well as different disclosure treatment for Scope 1 and 2 emissions. This includes: • a separate disclosure of emissions for (1) the consolidated accounting group, and for

TCFD Recommendation, Recommended Disclosure and Guidance		IFRS S2 Climate-related Disclosures
		(2) associates, joint ventures, unconsolidated subsidiaries, or affiliates not included in the consolidated accounting group for Scope 1 and 2 Additionally, although the mention of weighted average carbon intensity (WACI) or the use of Partnership for Carbon Financials (PCAF) methodology is not explicitly highlighted in IFRS S2, the disclosure requirements set out in IFRS S2 regarding financed and facilitated emissions are built on PCAF methodology.
	Recommended Disclosure c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	IFRS S2 different in disclosure requirements in: • how the target compares with those created in the latest international agreement on climate change and whether it has been validated by a third party; and • whether the target was derived using a sectoral decarbonization approach.

Industry practice 56: Climate-related metrics time horizon

TCFD provides guideline to disclose the methodologies used to calculate E&C metrics by measuring the same metrics over time provides a way to track progress. For example, reporting on GHG emissions can include the previous, current amounts, and forward-looking range for future GHG emissions.

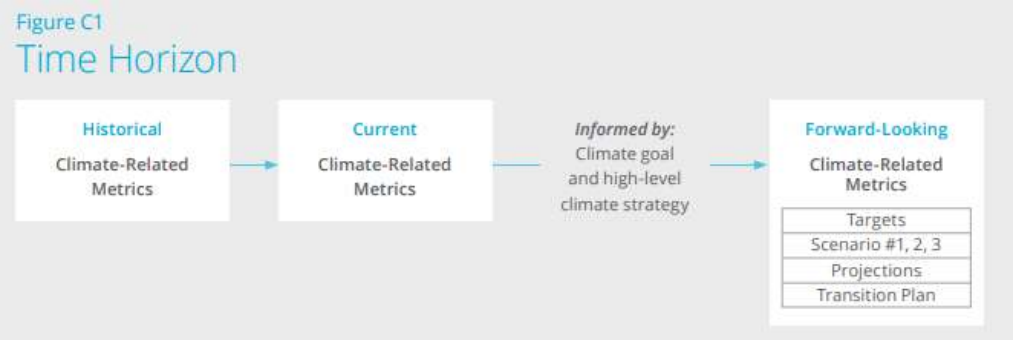


Figure 90: Climate-related Metrics Time Horizon (TCFD, 2021b).

Industry practice 57: Example of metrics and targets disclosures (1)

Banks can disclose their GHG emissions profile by relevant business line. In Barclays's 2020 ESG report, the bank presents a climate dashboard that outlines carbon limits for different sectors and tracks the bank's financed emissions against the benchmark (Barclays, 2020).

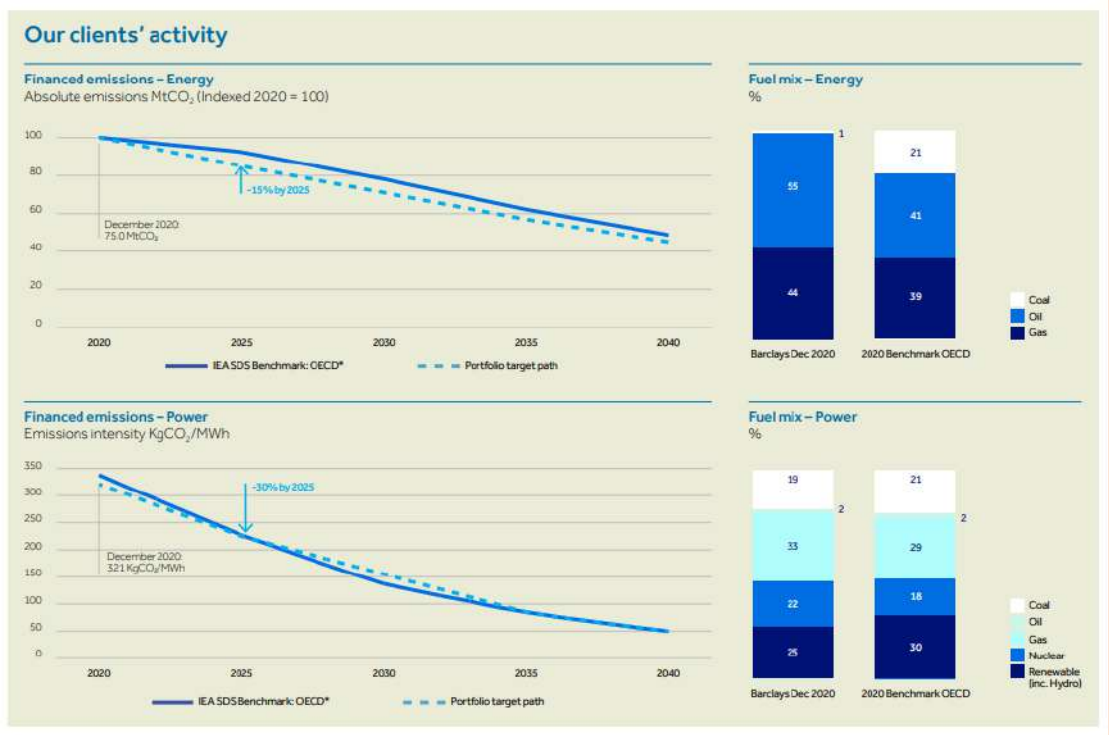


Figure 91: Example of metrics and targets disclosure (Barclays, 2020).

Industry practice 58: Example of metrics and targets disclosures (2)

HSBC has made disclosures that are consistent with the TCFD recommendations and publishes in its Annual Report. On the metrics and targets pillar, the bank discloses (a) metrics used to assess climate-related risks and opportunities, (b) scope 1, 2, and part of scope 3 greenhouse gas emissions, and (c) targets used to manage climate-related risks and opportunities and performances (HSBC, 2022).

Task Force on Climate-related Financial Disclosures ('TCFD') continued

Recommendation	Response	Disclosure location
Metrics and targets		
a) Disclose the metrics used by the organisation to assess climate-related risk and opportunities in line with its strategy and risk management process		
Metrics used to assess the impact of climate-related risks on our loan portfolio	– We continue to disclose our wholesale loan exposure to the six high transition risk sectors, which are automotive, chemicals, construction and building materials, metals and mining, oil and gas, and power and utilities. The wholesale loan exposure is used as a metric to assess impact of climate risk and help inform risk management, together with our transition risk questionnaire results.	Page 223
	– We continue to measure climate risk in our most material mortgage market, which is the UK, where the primary physical risk facing properties is flooding. We also continue to identify the current and potential EPC ratings for individual properties within the UK mortgage portfolio. For further details, see our *ESG Data Pack*.	Page 224
	– Our climate risk management information dashboard includes metrics relating to our key climate risks, and is reported to the Global Climate Risk Oversight Forum. However, we do not fully disclose metrics used to assess the impact of climate-related risks on retail lending, parts of wholesale lending and other financial intermediary business activities.	Page 423
Metrics used to assess progress against opportunities	– We continue to track our progress against our ambition to provide and facilitate $750bn to $1tn of sustainable finance and investment by 2030, aligned to our published data dictionary. The breakdown of our sustainable finance and investment progress is included in our *ESG Data Pack*.	Page 18 and 57
	– We do not currently fully disclose the proportion of revenue or proportion of assets, capital deployment or other business activities aligned with climate-related opportunities, including revenue from products and services designed for a low-carbon economy, forward-looking metrics consistent with our business or strategic planning time horizons. In addition, we do not currently disclose internal carbon prices due to transitional challenges such as data challenges. We recognise that we require enhanced systems, processes, controls, governance and new sources of data.	Page 47 and 423
Board or senior management incentives	– To help us achieve our ESG ambitions, a number of measures are included in the annual incentive and long-term incentive scorecards of the Group Chief Executive, Group Chief Financial Officer and Group Executives.	Page 16 and 286
Metrics used to assess the impact of climate risk on lending and financial intermediary business (supplemental guidance for banks)	– As part of our internal climate scenario analysis, we carried out a detailed physical risk assessment of four of our most material retail mortgage markets – the UK, Hong Kong, Singapore and Australia – which represent 73.8% of balances in our retail mortgage portfolio. In 2022, we disclose our loan maturity within the UK mortgage portfolio.	Page 224
	– We do not fully disclose metrics used to assess the impact of climate-related risks on retail lending, parts of wholesale lending and other financial intermediary business activities (specifically credit exposure, equity and debt holdings, or trading positions, each broken down by industry, geography, credit quality, average tenor).	Page 423
b) Disclose scope 1, scope 2 and, if appropriate, scope 3 greenhouse gas emissions and the related risks		
Our own operations	– We reported our scope 1, 2 and part of scope 3 greenhouse gas emissions resulting from the energy used in our buildings and employees' business travel. In 2022, we started to disclose our scope 3 supply chain emissions.	Page 18 and 63
Greenhouse gas emissions for lending and financial intermediary business (supplemental guidance for banks)	– We expanded our coverage of sectors for on-balance sheet financed emissions. We also set out the data and methodology limitations related to the calculation of scope 3 financed emissions.	Page 18 and 50
	– In 2022, HSBC Asset Management started to measure scope 1 and 2 emissions of companies in its portfolio.	Page 56
	– Future disclosure on financed emissions, and related risks is reliant on our customers publicly disclosing their carbon emissions and related risks. We aim to disclose financed emissions for additional sectors in our *Annual Report and Accounts 2023* and related disclosures.	Page 423
c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets		
Details of targets set and whether they are absolute or intensity based	– One of our strategic pillars is to support the transition to a net zero global economy. To support our ambition to align our financed emissions to achieve net zero by 2050 or sooner, we have set interim 2030 targets for on-balance sheet financed emissions for eight sectors.	Page 18
	– For financed emissions we do not plan to set 2025 targets. We set targets in line with the Net-Zero Banking Alliance ('NZBA') guidelines by setting 2030 targets. In 2022, we disclose interim 2030 targets for on-balance sheet financed emissions for eight sectors.	Page 423
	– We do not currently disclose targets used to measure and manage physical risk, or internal carbon price targets. This is due to transitional challenges and data limitations. But we considered physical risk and carbon prices as an input in the climate scenario analysis exercise. We expect to further enhance the disclosure in the medium term as more data becomes available. In addition, we do not currently disclose a target for capital deployment. In 2022, we are internally reviewing and enhancing the green bond framework, with further refinement to be undertaken in 2023. Our continued monitoring of evolving taxonomies and practices over time could result in revisions in our reporting going forward and lead to differences year-on-year as compared with prior years. We do not consider water usage to be a material target for our business and therefore we have not included a target in this year's disclosure.	
Other key performance indicators used	– We also use other indicators to assess our progress including energy consumption and percentage of renewable electricity sourced.	Page 62

Figure 92: Example of metrics and targets disclosure (HSBC, 2022).

6.6 BANKS' KEY CHALLENGES ON CLIMATE-RELATED DISCLOSURE

6.6c) Recommended Approach

A. Data collection challenges

A.1 Lack of data

The lack of and the low reliability of existing data propose a huge challenge for banks. There is simply not enough data for both physical and transition risk. For instance, scope 3 GHG indirect emissions data is crucial for many banks in oil and gas sectors to understand their E&C financial risks that they are exposed to and yet it is not comprehensive enough. It is often noted that disclosure by private companies and companies in emerging markets is either lacking or absent. However, increasing guidance on E&C financial reporting should lessen this problem. In addition to disclosing their methodologies and assumptions, banks should also disclose any input data limitations and any forward-looking intel from the data analysis (GFIT, 2021).

Other methods such as portfolio extrapolation can be used to circumvent the lack of data availability. These methods could include the estimation of emissions and/or using client questionnaires. These methods are especially useful for investment, lending, and underwriting activities to private companies, as these companies' disclosure is usually either limited or absents (GFIT, 2021).

A.2 Banks' data collection capability

Banks should ensure that they have the internal capabilities, processes, and systems in place to identify, collect, store, and combine risk data for climate-related risk assessment and reporting. Banks should also ensure that these processes and systems deliver accurate and reliable data. These could be a part of the bank's data governance or IT infrastructure. However, where reliable data is not available, banks can use appropriate proxies and assumptions for internal reporting. Proxies used should be disclosed and clearly defined. Other challenges that hinder both qualitative and/or quantitative climate risk assessment, monitoring, and reporting should be disclosed to stakeholders (BCBS, 2022).

The following table highlights the challenges in disclosing E&C related financial disclosure in line with TCFD and IFRS S2

Data challenges	Key challenges
Governance	
Methodology challenge	• Governance disclosure methodology selection and comparability are an issues as different international standards requires different disclosures.
Lack of organizational capability	• Organizations may find it hard to acquire board member or senior management with relevant E&C knowledge and experience. • Challenges in developing their initial governance and climate-related analytical processes as it is an iterative process of improvement.
Evolving data disclosure	• Banks should be aware of the evolving requirement of governance, strategy, risk management, and metrics and targets disclosures from different international standards (e.g, TCFD, IFRS S2).
Strategy	
Methodology challenge	• Challenges in disclosing the resilience of companies' strategies under different climate-related scenarios • Challenges in modelling the impact of climate-related risk and net zero roadmap over long periods and across multiple dimensions was a challenge. This challenge is due to the limitation of scenario data and pathways, client-specific data, and modelling review, etc.,
Risk Management	

Methodology challenge	• No clear methodology and how to conduct climate-related scenario analysis, including selecting relevant scenarios and identifying key inputs and parameters
Lack of organizational capability	• Challenges in developing processes for identifying, assessing, and managing climate-related risks and integrating such risks into existing processes
Metrics and targets	
Data collection	• Issues of estimating Scope 3 GHG emissions (data collection challenges from banks value chain). • Insufficient data from clients.
Data Limitation	• Low data quality
Methodology challenge	• Lack of methodologies to calculate E&C metrics as well as industry-specific E&C-related metrics
Lack of organizational capability	• Lack of organizational resources

A. 3 Challenges in Scope 3 GHG emissions (financed emissions)

TCFD also mentions several challenges such as that corporate managers face when determining Scope 3 GHG emissions. These challenges are, but not restricted to data limitation and collections, methodology challenges, and lack of organizational capability. TCFD have recommended several other initiatives to help overcome these challenges (TCFD, 2021 and TCFD, 2022) :

- The PRI's Introduction to Responsible Investment - Climate Metrics and its "Providers of Scenario Analysis and Climate Risk Metrics" website
- Basel Committee on Banking Supervision's Climate-Related Financial Risks – Measurement Methodologies
- The Institutional Investors Group on Climate Change's "Paris Aligned Investment Initiative."
- The PCAF Global GHG Accounting and Reporting Standard (for further detail, please see chapter 7)
- The CRO Forum's Carbon Foot printing Methodology for Underwriting Portfolio.

B. Evolving data disclosure standards and GHG accounting methodology

As ESG and Climate-related reporting requirements are evolving overtime, Banks should follow the development of climate-related reporting standards and the methodology of GHG accounting and calculation, particularly on financed missions and other scope 3 emissions accounting that are relevant to the bank and its other business operations. To monitor this movement for effective implementation of E&C disclosure, Banks may follow the development closely in 3 key aspects:

1. **Development and updates of reporting standards and requirements:** the standard may require more granularity of information over time, both on the management approaches and metrics. Banks should follow this movement closely along with the regulatory development, as more regulators in various jurisdictions started to establish ESG and E&C disclosure as mandatory disclosures.

2. **Development of sector-specific reporting standards:** various standards have developed sector-specific, or supplementary disclosure recommendations (e.g., TCFD supplementary recommendation for Financial Institutions). These sector-specific standards usually recommend or set requirements for banks to report on topics material to the industry, and require more granular data on management approach and targets.

3. **Development of relevant standards on E&C data calculation:** as mentioned in this paper of the two key carbon accounting standards: the GHG Protocol and PCAF (for calculation of financed emissions), the development E&C data accounting will evolve further in the future, and the banks will need to rely on the standards to translate E&C data to financial data.

CHAPTER 7: RESOURCES AND REFERENCES

7.1) KEY REFERENCE LINKS

A. Risk Management

Basel Committee on Banking Supervision (BCBS) The Basel Committee - overview (bis.org): The BCBS is a committee of banking supervisory authorities that sets the standard for the prudential regulation of banks and provides a forum for regular cooperation on banking supervisory matters. BCBS, through the Bank of International Settlements (BIS), have published various guidelines and documents to capture the supervisory development in E&C risk management and its potential integration with financial institutions' financial risk management process. The key document in this area, which is heavily referenced in this handbook, is the "Principles for the effective management and supervision of climate-related financial risks", issued in June 2022..

Network of Central Banks and Supervisors for Greening the Financial System (NGFS) (https://www.ngfs.net/en): The NGFS is the network of Central Banks and Supervisors to share the best practices and contribute to the development of environment and climate risk management in the financial sector and to mobilize mainstream finance to support the transition toward a sustainable economy. NGFS has published various guidelines, publications, and climate scenario which is among one of the key scenarios mostly used by Central Banks and commercial banks globally.

European Central Bank (ECB): the ECB has issued the Guide on climate-related and environmental risks which is one of the key references for supervisory expectation for climate risk management and disclosure for commercial banks. ECB also published various guidelines and working paper to guide the process of E&C risk management for financial institutions, such as ECB good practices for climate-related and environmental risk management issued in November 2022. The good practices share industry practices to manage E&C risks and met expectations set by ECB, to portray acceptable approach and methodology for E&C risk management.

Equator Principles (EP): The EP is a common baseline and risk management framework for financial institutions to identify, assess, and manage environmental and social risks when financing projects. The EP is applied globally to all industry sectors and is updated periodically, with the latest iteration of Equator Principles comprising 10 principles that came into effect in October 2022.

B. Strategy

Glasgow Financial Alliance for Net Zero (GFANZ) Glasgow Financial Alliance for Net Zero (gfanzero.com)**:** GFANZ was launched in April 2021 to coordinate across all sectors of the financial system to accelerate the transition to a net-zero global economy. In 2022, GFANZ released final report for recommendations and guidance on financial institution net-zero transition plans. This report presents how financial institutions across the financial system can operationalize their net-zero commitments and support the real-economy transition.

UNEP Financial Initiatives (UNEP FI): The UNEP FI, particularly under the Principle for Responsible Banking (PRB), has published many guidelines and publication to enhance the bank's capability to manage ESG risks and impacts, with various resources focusing on climate strategy and target setting. The Net Zero Banking Alliance (NZBA) is a subsequent initiative established by coalition of banks to drive actions to Net Zero. Key UNEP FI resources include Guideline for target setting for banks (2021c), and Good practice guide to climate stress testing (2021).

C. Disclosure Standards

Task Force on Climate-related Financial Disclosures (TCFD) (https://www.fsb-tcfd.org/): The TCFD was established in 2015 by the Financial Stability Board to help identify the information needed by investors, lenders, and insurance underwriters to appropriately assess and price climate-related risks and opportunities. The Recommendations of the TCFD provides useful guidance for banks to disclose their climate-related financial information.

International Sustainability Standards Board (ISSB) IFRS - International Sustainability Standards Board: The ISSB is formed by the International Financial Reporting Standards (IFRS) in November 2021 at COP26 in Glasgow. The ISSB is a standard-setting body established to develop sustainability-related financial reporting standards, and has released two exposure drafts, IFRS S1: General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2: Climate-related Disclosures, which aim to require institutions to publicly disclose information about their exposure to climate-related risks and opportunities.

Partnership for Carbon Accounting Financials (PCAF) PCAF**:** PCAF was created by Dutch financial institutions in 2015 to help financial institution assess and disclose the GHG emission in their portfolio through GHG accounting. PCAF's key focus is to set standards for banks and investors to measure and report their financed emissions (Scope 3 GHG emissions, category 15). PCAF is also developing the standard for measuring and reporting facilitated emissions and insurance-associated emissions. Today, PCAF's first standard "Financed Emissions Standard – second version", issued in 2022, is the most widely used standard for calculating and reporting financed emissions for banks and investors. (Further details in the next section)

Greenhouse Gas Protocol (GHG Protocol) GHG Protocol**:** The GHG Protocol was developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) to address the need for an international standard for corporate GHG accounting and reporting. The standards published by the GHG Protocol include Corporate Standard which helps companies to provide requirements and guidance for companies preparing a GHG emissions inventory and the Corporate Value Chain (Scope 3) which is the only internationally accepted for companies to account for Scope 3 value chain emissions, which includes 15 categories of Scope 3 activities. Category 15 is designed for private financial institutions including banks to calculate their Scope 3 emissions associated with their investments not already included in Scope 1 or 2. (Further detail in the next section)

7.2 RELEVANT GHG CALCULATION STANDARDS

7.2.1) GREENHOUSE GAS (GHG) PROTOCOL

The **Greenhouse Gas** (**GHG) Protocol** provides one of the most comprehensive and widely used frameworks for quantifying and managing greenhouse gas emissions. The *Corporate Standard*, or the GHG Protocol Corporate Accounting and Reporting Standard, provides requirements and guidance for companies preparing a corporate-level GHG emissions inventory. It covers the seven greenhouse gases covered by the Kyoto Protocol whilst also allowing companies to measure and report their Scope 2 emissions. The *Corporate Value Chain (Scope 3) Standard* is the only internationally accepted method for companies to account for Scope 3 value chain emissions. The 3 emission scopes can be defined as (GHG Protocol, n.d.c):

- **Scope 1**: Emissions from operations that are owned or controlled by the reporting company.
- **Scope 2**: Emissions from the generation of purchased or acquired electricity, steam, heating or cooling consumed by the reporting company.
- **Scope 3**: All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

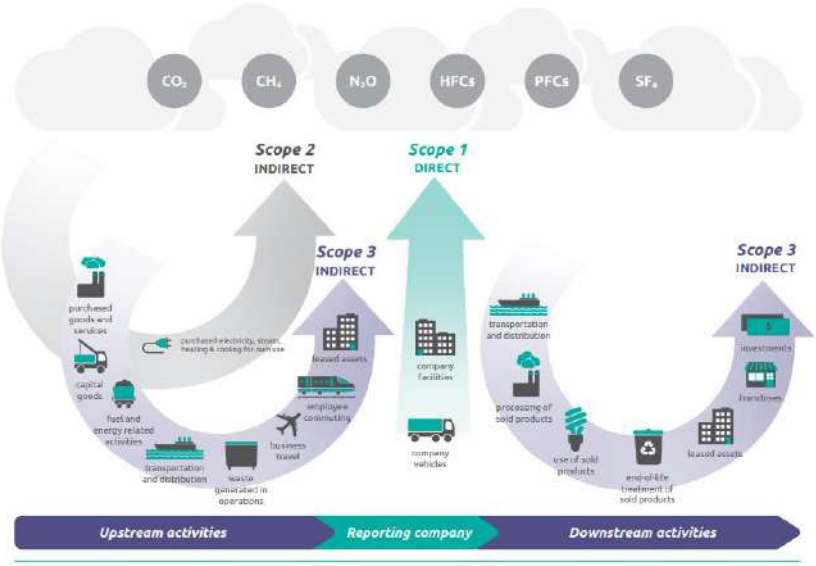


Figure 93: Overview of GHG Protocol scopes and emissions across the value chain (GHG Protocol, n.d.c).

Along with guidance and tools, it provides a methodology to measure and report emissions for companies of all sectors, with 15 categories of Scope 3 activities specified. The table below details the 15 categories (GHG Protocol, n.d.c):

Upstream Scope 3 emissions	Downstream Scope 3 emissions
1. Purchased goods and services 2. Capital goods 3. Fuel- and energy-related activities (not included in scope 1 or scope 2) 4. Upstream transportation and distribution 5. Waste generated in operations 6. Business travel 7. Employee commuting 8. Upstream leased assets	9. Downstream transportation and distribution 10. Processing of sold products 11. Use of sold products 12. End-of-life treatment of sold products 13. Downstream leased assets 14. Franchises 15. Investments

Category 15 in particular, is designed primarily for private financial institutions such as banks to calculate their Scope 3 emissions associated with their investments not already included in Scope 1 or 2 (GHG Protocol, n.d.c). As prescribed by GHG Protocol, the calculation standard of Category 15 includes equity investment, debt investments, project finance, and managed investments and client services. The measurement and calculation of Scope 3 Category 15 by asset types are further standardized by PCAF. The use of the GHG Protocol and PCAF will be necessary for banks to disclose their absolute and intensity-based emissions and related risks in line with IFRS S2: *Climate-related Disclosures*.

The ISSB's proposed disclosure standard has included the requirement for companies to disclose on their Scope 1, 2 and 3 greenhouse gas emissions, which is aligned with the current version of the GHG Protocol Corporate Standard. As part of these requirements, the ISSB has announced a series of guidance and relief provisions to help companies in applying the Scope 3 requirements, which is set by IFRS S2 as a required category (financed emissions) for banking industry. This includes, for example, a temporary exemption for a minimum of one year following the date IFRS S2: *Climate-related Disclosures* comes into effect. In addition to the incorporation of the GHG Protocol within ISSB's standards, the use of the TCFD framework as the basis for the standards will facilitate the alignment and interoperability in this aspect (IFRS, 2022c).

7.2.2) PARTNERSHIP FOR CARBON ACCOUNTING FINANCIALS (PCAF)

The **Partnership for Carbon Accounting Financial (PCAF)** aims to help financial institutions assess and disclose the GHG emission in their portfolio through GHG accounting. Created by Dutch Financial institutions in 2015 to combat global warming and allowing the financial sector to contribute to 2050 net zero vision, the PCAF has since become a global partnership of financial institution committed to provide a standardized approach to GHG accounting.

Standardized GHG accounting of financial sector increases transparency, comparability, and accountability. It also enables financial institutions to understand climate impacts from their activities, identify and manage their climate-related transition risks and opportunities, and set the baseline emissions for target-setting to align with the Paris Agreement.

Assessing and disclosing financed emission using PCAF GHG accounting is in line with the recommendation set out by TCFD. PCAF assists financial institution in achieving TCFD objective by providing them with methodologies to measure financed emissions (scope 3 category 15 emissions) in their portfolios. From this, financial institutions can identify emission-intensive asset class or sectors that are more expose to transition risk. The Global GHG Accounting and Reporting Standard developed by PCAF comprises of three parts: A, B and C. Part A provides detailed methodological guidance to measure and disclose financed emissions.

Financed emissions refers to the absolute GHG emissions of banks' portfolios (GHG emissions or climate impact associated with their loans and investments) (PCAF, 2022). The 7 asset classes, typical for banks and other financial institutions, that are covered in the standard are (PCAF, 2022):

1. List equity and corporate bonds
2. Business loans and unlisted equity
3. Project finance
4. Commercial real-estate
5. Mortgages
6. Motor vehicle loans
7. Sovereign debt

The GHG accounting methodologies for all assets classes are in conformance with the GHG protocol standards and Corporate Value Chain (Scope 3) Accounting and Reporting Standard for Category 15 investment activities. GHG protocol categorizes scope 3 emissions into 15 categories. For financial institutions, scope 3 categories 15 emissions (financed emissions) accounts for most of their GHG inventory. PCAF provides standardized methodologies to measure these emissions for the 7 mentioned asset classes.

A. Measurements

PCAF detailed that at a minimum, financial institutions should measure and disclose all GHG scope 3 category 15 emissions. It is recommended that the GHG emissions is measured using the Financed Emission Standards. This methodology calculates financed emissions by multiplying an attribution factor (specific to that asset class) by the emissions of the borrower or investee. "The attribution factor is calculated by determining the share of the outstanding amount of loans and investments of a financia (with i = borrower or investee) d debt of the company, project, etc. to which the financial institution has lent money or in which it has invested capital." (PCAF, 2020).

$$Financed\ emissions = \sum_i Attribution\ factor_i \times Emissions_i \quad (with\ i = borrower\ or\ investee)$$

$$Attribution\ factor_i = \frac{Outstanding\ amount_i}{Total\ equity + debt_i}$$

Figure 94: Equation used to calculate financed emissions (PCAF, 2020).

The table below lists the equations used to calculate financed emissions:

Asset Class	Equation to calculate financed emissions
1. List equity and corporate bonds (with c = borrower or investee company)	
For listed companies	$Attribution\ Factor_c = \frac{Outstanding\ amount_c}{Enterprise\ Value\ Including\ Cash_c}$
For bons to private companies	$Attribution\ Factor_c = \frac{Outstanding\ amount_c}{Total\ equity + debt_c}$
2. Business loans and unlisted equity (with c = borrower or investee company)	
For business loans and equity investment to/in private companies	$Financed\ emissions = \sum_c \frac{Outstanding\ amount_c}{Total\ equiyt + debt_c} \times Company\ emissions_c$
For business loans to listed companies	$Financed\ emissions = \sum_c \frac{Outstanding\ amount_c}{Enterprise\ Vakue\ Including\ Cash_c} \times Company\ emissions_c$
3. Project finance (with p = project)	
Financed emissions	$Financed\ emissions = \sum_p \frac{Outstanding\ amount_p}{Total\ equiyt + debt_p} \times Project\ emissions_p$
4. Commercial real estate (with b = building and e = energy source)	
The product of a building's energy consumption and specific emission factors for each source of energy consumed	$Financed\ emissions = \sum_{b,e} \frac{Outstanding\ amount_b}{Property\ value\ at\ origination_b} \times Energy\ emissions_{b,c} \times Emission\ factor_e$
5. Mortgages (with b = building and e =energy source)	
The product of a building's energy consumption and specific emission factor for each source of energy consumed.	$Financed\ emissions = \sum_{b,e} \frac{Outstanding\ amount_b}{Property\ value\ at\ origination_b} \times Energy\ emissions_{b,c} \times Emission\ factor_e$
6. Motor vehicle loans (with v = vehicle or vehicle fleet, f = fuel type)	

Asset Class	Equation to calculate financed emissions
The fuel efficiency of the vehicle	$Financed\ emissions = \sum_{v} \frac{Outstanding\ amount_v}{Total\ value\ at\ origination_v} \times Vehicle\ emissions_v$
The emissions factor specific to the fuel type of the vehicle	$Financed\ emissions = \sum_{v,f} \frac{Outstanding\ amount_v}{Total\ value\ at\ origination_v} \times Distance\ traveled_{\ v} \times Efficiency_{v,f} \times Emission\ factor_f$

For example, financed emissions of listed equity and corporate bonds portfolios are calculated by multiplying the attribution factor, which for this asset class is the proportional share of a company (share outstanding / Enterprise Value Including Cashes), with company emissions.

In addition to Scope 1, Scope 2, and Scope 3 reporting, PCAF encourage financial institutions to disclose other information on their GHG emission for all asset classes including seven gases under the Kyoto Protocol

- Emission avoided;
- Emission removal;
- Emission intensity;
- Carbon credit retired; and
- Carbon credit generated

B. Data Quality Score

PCAF highlights that data quality is crucial for the calculations of financed emissions for each asset class. High-quality data can be a big challenge for calculating financed emissions, particular in asset class where relevant entities have limited data disclosure.

When measuring financed emissions in each asset class, a range of data inputs is necessary to calculate both the financial institution's attribution factor and the borrower's or investee's total emissions. The data necessary to calculate an attribution factor is generally come from both the financial institution itself and its borrower or investee. Data that financial institutions use differs in quality. For example, borrowers' GHG emissions data quality varies due to assumptions and calculation methodology.

PCAF set data quality score to inform the quality of data used to calculate financed emissions when disclosed. The quality of this data can vary depending on assumptions about its assuredness, specificity, and other variables. High-quality data is often not available to the financial institution for all asset classes. When this occurs, bank should prioritize using the most reliable data according to data hierarchy.

Data quality score is specific to each asset class. The score of data ranges from 1 to 5, with the data score of 5 reflects high uncertainty of data used for calculation. For example, data calculated from economic level activity (economic activity-based emissions) have lower level of certainty comparing to reported emissions measured by the entity. Detailed data needs and equations to calculate financed emissions for each asset class can be found in the annex of The Global GHG Accounting and Reporting Standard for the Financial Industry Part A - Financed Emissions at https://carbonaccountingfinancials.com/files/downloads/PCAF-Global-GHG-Standard.pdf.

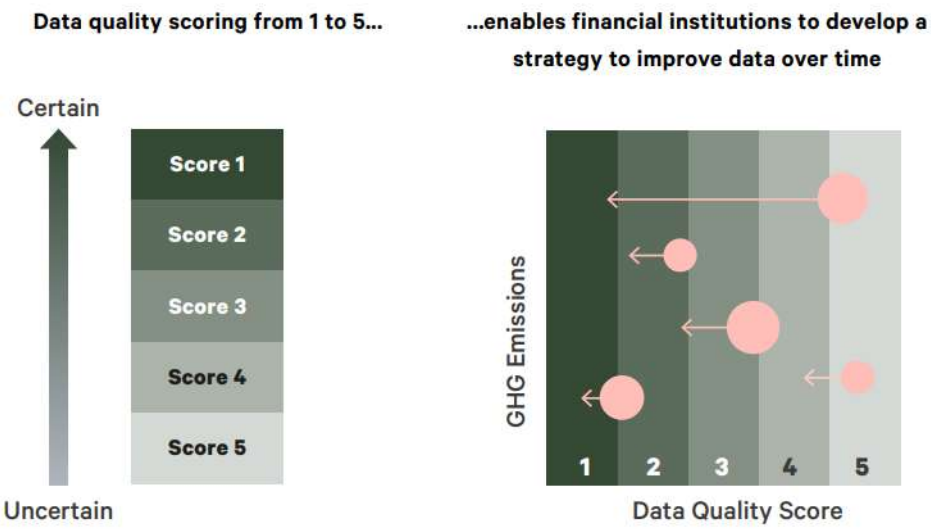


Figure 95: General approach to calculate financed emissions (PCAF, 2020).

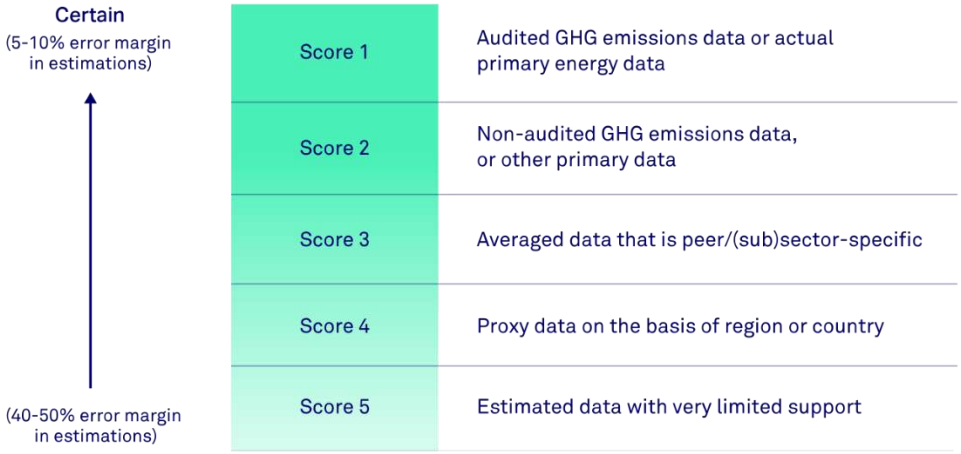


Figure 96: PCAF data quality score (Triodos Bank, n.d.).

7.3) THAILAND TAXONOMY

Given that different sectors do not yet share a common understanding of environmentally-friendly activities, efforts to mobilize environmental actions, particularly capital allocation, are not yet on-target. Consequently, this may lead to greenwashing and inadequate allocation of capital for businesses in their transitional activities (BOT, 2022).

A taxonomy aims to provide a common framework for classifying economic activities to enable stakeholders to gather investment information and mobilise green financing. The development of a national taxonomy, "Thailand Taxonomy", will facilitate the role of financial institutions in directing capital flows towards activities that deliver measurable environmental, social and governance (ESG) benefits and net zero emission targets. This taxonomy was officially released in June 2023 and serves as a multipurpose tool that can be used for a variety of objectives, which could include (BOT, 2023c):

The taxonomy recognizes transitional activities as making substantial contribution to reaching net zero by 2050, and therefore employs the Traffic light system that distinguishes green, amber (transitional), and red activities. Green activities include activities that are already at or near net-zero emissions or have a clear 1.5°C decarbonization pathway. Amber activities include interim activities that are transitioning toward green with a credible timeframe, whilst red activities are considered as stranded activities. Existing activities for amber

activities refer to the activities/assets that have existed before January 1, 2024, in which only green thresholds and criteria are applicable for all activities after this date. Thailand Taxonomy is considered a living document, thus the sunset dates, activities, metrics and thresholds may also be subject to change based on new technologies or evolving scientific views.

By utilizing the taxonomy, banks can evaluate and identify the climate impact of their investments, including financed emissions. Additionally, the taxonomy plays an integral role in guiding transition finance, allowing for banks to determine the eligibility of activities in line with climate objectives and environmentally sustainable thresholds necessary for financing. Overall, the degree of exposure to taxonomy-aligned activities can help to inform a bank's transition finance strategy whilst helping to promote transparency and consistency in the finance of green projects.

Additional resources: Thailand Taxonomy Phase 1

To explore more about Thailand Taxonomy Phase 1

- Thailand Taxonomy Phase 1(Environmental Objective: Climate Mitigation; Sector Coverage: Energy & Transportation)
- Tools and related documents published by the Thailand Taxonomy Board.

7.4) THE TASK FORCE ON NATURE-RELATED FINANCIAL DISCLOSURES (TNFD) & NATURE-RELATED RISK ASSESSMENT

Environmental issues, not limited to climate change, continue to intensify, and is expected to have significant impacts on the overall stability of the economic and financial systems. Nature loss and environmental risks such as deforestation and biodiversity loss can have both direct and indirect impacts on a financial institution's and its stakeholder's financial status and reputation (BOT, 2023). The interdependence between the economy and nature means that it is necessary for financial institutions and companies to understand and incorporate nature-related risks and opportunities into their strategic planning, risk management, and asset allocation decisions (BOT, 2023).

Following the creation of the Task Force on Climate-related Financial Disclosures (TCFD) in 2015, the Task Force on Nature-related Financial Disclosures (TNFD) was formed in 2021. The TNFD consists of 40 individual Taskforce Members with representatives from various sectors. The main objective of the TNFD is to develop and deliver a risk management and disclosure framework for organizations to report and act on nature-related risks, and to support a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes (TNFD, n.d.). It draws upon relevant standards such as the International Sustainability Standards Board (ISSB) and the Global Reporting Initiative (GRI).

The TNFD released its *Recommendations of the Taskforce on Nature-related Financial Disclosures* on September 19th, 2023. The TNFD Recommendations has a high level of alignment to the structure, language, and approach of the TCFD. The TNFD Recommendations draws upon the same pillars of Governance, Strategy, Risk Management, and Metrics & Targets and the 11 TCFD recommended disclosures. This means that banks that have already taken steps to address climate risks can use TNFD's integrated approach to simultaneously address nature-related financial risks. Financial institutions can also refer to the Sector Guidance: *Additional Guidance for Financial Institutions* released by the TNFD in September 2023.

The TNFD has developed an integrated risk and opportunity assessment approach to support internal, nature-related risk and opportunity assessments within corporates and financial institutions. Named the LEAP approach, it is a voluntary guidance to complement the set of disclosure recommendations. The guidance

publication, released in September 2023 alongside the final recommendations, is designed for use by organizations of all sizes and across all sectors and geographies. LEAP is an acronym for:

- **Locate** your interface with nature;
- **Evaluate** your dependencies and impacts;
- **Assess** your risks and opportunities; and
- **Prepare** to respond to nature-related risks and opportunities and report.

The TNFD has also developed an extended LEAP approach for financial institutions (LEAP-FI) as different entry points into the LEAP approach and a greater or lesser emphasis on different components of LEAP may be appropriate for the financial sector. These developments by the TNFD will likely facilitate the necessary move toward the incorporation of nature-related impacts, dependencies and risks, as well as integrated climate-nature disclosures.

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GLOSSARY

Terms	Definitions
Banks	In this handbook, the term banks refer to commercial banks in the Thai banking sectors that are subject to the regulatory supervision of the Bank of Thailand, and therefore following regulatory policy set by the BOT's Standard Practice, including Thai branches of foreign commercial banks.
Board of Directors	Board of Directors of the financial institution. This also refers to the management committee with similar responsibility and authority in case of foreign commercial bank branch (source: BOT. 2023. Standard Practice)
Capacity Building	The process of developing and strengthening the knowledge, skills, instincts, abilities, processes, and resources that organizations need to survive, adapt, and thrive in a fast-changing world. Such programs systematically improve the organization's practices and performance on specific ESG topics (e.g., energy efficiency, chemical management, health & safety management, working hours reduction) through training, baseline assessments, collaborative system development, and progress measurement. (source: S&P Global. CSA Handbook)
Carbon-intensive / Hard-to-abate sectors	Industrial sectors that currently account for 30% of global greenhouse gas emissions, which include Aluminum, Aviation, Chemicals, Concrete, Shipping, Steel, and Trucking, along with innovative Carbon Removal technologies. Industries that are harder to abate share several characteristics, such as having hydrocarbons as part of core manufacturing or product use, high energy requirements for core business, high capital expenditures required to maintain manufacturing and operations – which reflect how new technologies and significant R&D are required. (source: First Mover Coalition. Sectors, Deloitte US. Decarbonization for Hard-To-Abate Sectors)
Climate risk assessment	The assessment of physical and transition risks provides an in-depth understanding of climate-related risks for the company and the implications climate change has on the organization. Climate risk assessment also forms a basis for companies to plan for climate change adaptation, mitigation, implementation, monitoring and evaluation in response to those risks. (sources: S&P Global. CSA Handbook, International Organization for Standardization. ISO 14091)
Climate scenario Analysis	Process for identifying and assessing a potential range of outcomes of future events under conditions of uncertainty. In the case of climate change, for example, scenarios allow an organization to explore and develop an understanding of how the physical and transition risks of climate change may impact its businesses, strategies, and financial performance over time (source: TCFD. Final Report)
Climate stress testing	A forward-looking exercise designed to measure a financial institution's exposure to climate risks, using scenario analysis including severe climate risks, to assess the potential impact of climate change on the institution's business model. Climate stress tests may leverage significant elements of traditional capital stress testing, but also contain a number of important differences. (source: UNEP FI. Good Practice Guide to Climate Stress Testing)
Climate-related risks	The potential negative impacts of climate change on an organization (source: TCFD. Final Report) ▪ Transition risks refer to the risks that arise in transitioning to a lower-carbon economy, which may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed, and

Terms	Definitions
	focus of these changes, transition risks may pose varying levels of financial and reputational risk to organizations. ▪ Physical risks resulting from climate change can be event driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for organizations, such as direct damage to assets and indirect impacts from supply chain disruption.
Counterparties	Involved parties in financial institutions' normal business conduct such as loan, investment, and contractual obligations including non-primary business activities (e.g., procurement) that could be exposed to environmental risk materiality (source: BOT. 2023. Standard Practice)
E&C risks	In this handbook, environmental and climate-related risks are collectively referred to as E&C risks for ease of reference.
Environmental risks	Environmental risks are defined as the probability of loss to business from the issues of environmental and climate change, which includes business conduct of clients or counterparties that create negative externalities such as greenhouse gas emissions, deforestation and destroying biodiversity, polluting (air, land, and ocean), creating toxic material and waste. All of which could have both direct and indirect impacts upon the financial institution's and its stakeholder's financial status and reputation. This can be divided into "physical risk" and "transition risk" (source: BOT. 2023. Standard Practice)
Environmental topics	Including but not limited to Greenhouse Gas emissions, energy consumption, water consumption, resource efficiency, pollution, waste, or biodiversity (source: S&P Global. CSA Handbook)
Financed Emissions	Absolute emissions resulting from the loans and investments made by banks and investors. It encompasses both direct and indirect emissions associated with the financed activities. In the context of the Greenhouse Gas Protocol, these emissions fall under Scope 3 Category 15, covering investments and including direct emissions from investment operations and indirect emissions from investment lending and equity investments. The quantification of these emissions involves assessing the organization's proportional financial stake in the invested activities. As of 2022, the standard for calculating financed emissions were developed for 7 asset classes by PCAF (for further detail, please see chapter 7). (source: PCAF. 2022. The Global GHG Accounting and Reporting Standard for the Financial Industry; Greenhouse Gas Protocol. 2013 Category 15: Investments)
Greenhouse Gas (GHG) emissions	▪ Scope 1 refers to all direct GHG emissions. ▪ Scope 2 refers to indirect GHG emissions from consumption of purchased electricity, heat, or steam. Scope 3 refers to other indirect emissions not covered in Scope 2 that occur in the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 emissions could include: the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g., transmission and distribution losses), outsourced activities, and waste disposal. (source: TCFD. Final Report)
Handbook	Handbook on internalizing environmental and climate change aspects into financial institution business for Banks.

Terms	Definitions
Macroeconomic transmission channels	Macroeconomic channels are the mechanisms by which climate risk drivers affect macroeconomic factors and how these, in turn, may have an impact on banks through an effect on the economy in which banks operate. Macroeconomic channels also capture the effects on macroeconomic market variables such as risk-free interest rates, inflation, commodities, and foreign exchange rates. (source: Basel Committee on Banking Supervision. 2021. Climate-related risk drivers and their transmission channels).
Materiality assessment	An approach to identify critical economic, environmental and social issues which have a significant impact on the company's business performance (source: S&P Global. CSA Handbook)
Microeconomic transmission channels	Microeconomic channels include the causal chains by which climate risk drivers affect banks' individual counterparties, potentially resulting in climate-related financial risk to banks and to their financial system. This includes the direct effects on banks themselves, arising from impacts on their operations and their ability to fund themselves. Microeconomic channels also capture the indirect effects on name-specific financial assets held by banks (source: Basel Committee on Banking Supervision. 2021. Climate-related risk drivers and their transmission channels).
Net-zero	Net zero refers to a state when anthropogenic emissions of greenhouse gasses to the atmosphere are balanced by anthropogenic removals. Organizations are considered to have reached a state of net zero when they reduce their GHG emissions following science-based pathways, with any remaining GHG emissions attributable to that organization being fully neutralized, either within the value chain or through purchase of valid offset credits. (source: GFANZ. 2022. Recommendation and Guidance on Financial Institution Net-zero Transition Plans)
Risk Appetite	The amount and type of risk that an organization is willing to take in order to meet its strategic objectives (source: S&P Global. CSA Handbook)
Risk Proportionality Principle	Apply in accordance with organizational structure, size, business complexity, and materiality of environmental risks on their businesses (source: BOT. 2023. Standard Practice)
Senior management	Senior management is defined as senior executives, which shall include financial institution's managers, deputy managers, assistant managers and advisors who perform any duties in the capacity of a manager, deputy manager or assistant manager but holding the position as an advisor, including those who perform the similar duties but holding any other positions. (source: BOT. 2023. Bank of Thailand Re: Corporate Governance of Financial Institutions and Financial Business Groups)
Sustainable Finance	The process of taking environmental, social and governance (ESG) considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects (source: European Commission. Overview of sustainable finance) Sustainable finance products are usually in the form of sustainable debt, which is broken up into two categories: ▪ Activity-based products: Investing in a project or business with an intended environmental or social outcome. Examples of activity-based products that use sustainable debt funding include affordable housing and energy efficiency initiatives. ▪ Behavior-based products: Linking debt's financial component (e.g., loan interest rates) with a sustainability target. An example of a behavior-based sustainability target is a company going paperless to fight deforestation.

Terms	Definitions
	The 6 types of sustainable debt instruments include: Green bonds, Green loans, Sustainability-linked bonds, Sustainability-linked loans, Sustainability bonds and Social bonds (source: Harvard Business School Online. 6 Types of Sustainable Debt).
Time horizon	Terminology used to describe what your 198decarbonization considers to be short-, medium- and long-term horizons (from year to year) considering the expected lifetime of the assets or activities. (source: S&P Global. CSA Handbook 2023)
Transition Finance	Finance raised or deployed by corporates to implement their net-zero transition, in line with the temperature goal of the Paris Agreement and based on a credible corporate climate transition plan. (source: OECD. 2021. OECD Guidance on Transition Finance) There are two main examples of transition financing: ▪ Transition bonds and loans – These products have been issued by a number of corporates to finance activities that reduce emissions and enable the achievement of long-term climate objectives. For credible transition bond issuance, issuers should disclose a net-zero target and a strategy for long-term 198decarbonization. Sustainability-linked bonds and loans – These products are any type of bond or loan which the financial and/or structural characteristics can vary depending on whether the issuer achieves predefined sustainability objectives thus creating an incentive for the issuer to meet those targets. This type of bond, dependent on interest-linkage which is common in revolving credit facilities, differs from green bonds as it does not specify eligible use of proceeds but rather permits funds to be used for general corporate purposes. (source: HSBC, Why transition finance is essential):
Transmission channels	The causal chains that explain how climate risk drivers give rise to financial risks that impact banks directly or indirectly through their counterparties, the assets they hold and the economy in which they operate (source: BCBS. Climate related risk drivers and their transmission channels)
1.5 degrees C-aligned pathway	A pathway of emissions of greenhouse gases and other climate forcers that provides an approximately one-in-two to two-in-three chance, given current knowledge of the climate response, of global warming either remaining below 1.5 degrees C or returning to 1.5 degrees C by around 2100 following an overshoot. Pathways giving at least 50% probability based on current knowledge of limiting global warming to below 1.5 degrees C are classified as “no overshoot,” while those limiting warming to below 1.6 degrees C and returning to 1.5 degrees C by 2100 are classified as 1.5 degrees C “low overshoot. (source: GFANZ. 2022. Recommendation and Guidance on Financial Institution Net-zero Transition Plans)

APPENDIX

A. LIST OF KEY ACTIONS

B. Key Actions

This handbook specifies the actions for all commercial banks to follow in order to meet the expectations of the BOT's Standard Practice, which have been segregated into three groups of actions. Each of these groups relate to actions over a different time horizon:

1. **Short-term actions** – The prioritized and immediate actions to be taken by the banks in accordance with their context and level of capability. These key actions will focus on establishment of governance (roles and responsibilities and Board level oversight), risk management system for the purpose of understanding the exposures (GHG emissions and current risk metrics), building required capability and data structure, and enhancing the capability for internal and regulatory reporting and disclosures.

2. **Long-term actions** – These actions specify the necessary steps that will need to be undertaken to build on the developed capabilities set by the short-term actions (above). In applying the risk proportionality principle, banks of different size and characteristics may have different challenges to achieve the long-term actions. It is therefore recommended that the timeline to achieve the long-term actions should be discussed and agreed with the BOT.

3. **End-state** – All banks should have established the capabilities across the actions for Governance, Strategy, Risk Management, and Disclosure in line with the Standard Practice. This end-state prescribes in detail what the Standard Practice would look like when applied in banks' practices. These actions should be met when the banks have implemented the actions contained in (1) and (2) above.

This handbook does not prescribe a specific timeline for implementation to meet the key actions prescribed in the content. Banks should apply these actions in accordance with their context and level of capability, as prescribed by the Standard Practice. Banks should develop their own interim timelines for their prioritized actions, which will allow for appropriate capability building for effective implementation in line with the Standard Practice. The timeline for all banks to achieve **full implementation** of the BOT's Standard Practice shall be determined by the BOT, based on **readiness** and **risk proportionality** principle applied to all banks.

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
Governance					
<u>3.2.1 Governance</u> The Board of Directors and senior management should play an important role in setting the "Tone from the top". The Board of Directors should provide strategic direction and key policies and overseeing the environmental actions, while the senior management should ensure the strategic direction and policies have been put into practices throughout the organization which includes managing opportunities and risks, as well as establishing adequate internal responsibilities and resources to support environmental actions. (1) The Board of Directors should: (1.1) **set strategic directions, risk appetite, key policies, and overall framework considering opportunities and risks which could occur from environmental changes both in the short and long term**. Furthermore, the Board of Directors should oversee the progress and outcome in this regard by **ensuring regular reporting from management** in order to review and adjust strategies to the new opportunities and risks that can	3.1.1	**Setting strategic directions / key decision-making process (a. Strategy)**	1. The BoD **sets strategic direction for E&C risk management**. The formation of strategic directions includes the **different timespan, and the risks banks are exposed to in short & long term.**	1. The BoD **sets strategic directions, oversee the inclusion of E&C risks in risk appetite and setting up of transition plan, and approve E&C-related target. The transition plan and E&C-related target must be considered for different timespan, and the risks banks are exposed to in short, medium, and long term.**	1. The BoD sets **strategic direction, risk appetite, key policies and risk management framework including E&C risks**. The formation of strategic directions **includes** the **different timespan**, **and the risks banks are exposed to in short & long term strategic direction, and target/transition alignment.**
	3.1.2	**Setting strategic directions / key decision-making process (b. Policy and framework)**	1. The BoD should review and approve overall policy and framework guiding the E&C risk management. The policy and framework should **align with the bank's material E&C risks**. Senior management should develop, review, and implement the policies in line with the guidance given by the Board.	1. The BoD should ensure all policies and risk frameworks guiding the E&C risk management are **align with the bank's E&C-related targets, and transition plan, and oversee the implementation of the policies and transition plan against the targets**. Senior management should implement and monitor of performances in line with the bank's strategy and transition plan, against the E&C-related targets.	1. The BoD should review and approve overall policy and framework guiding the E&C risk management. The policy and framework should **align with the bank's material E&C risks, E&C-related targets, and transition pla**n. Senior management should develop, review, and implement the policies in line with the guidance given by the Board.
	3.3.1	**Reporting to the BoD**	1. **The BoD should include E&C risk as a regular agenda for discussion and set cycle of reporting** from Senior management. The reporting	1. The periodical reporting **must expand to cover performances against E&C-related targets, progress in alignment with transition**	1. **The BoD should decide to include E&C risk as a regular agenda for discussion and set cycle of reporting** from SM. The reporting **must include updates on E&C Risk at transaction and portfolio level**

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
suddenly emerge in a timely manner.			**must include updates on material E&C risk at transaction and portfolio level** (including key investment and lending / project financing decisions).	**plan, and the bank's business strategy**.	(including key investment and lending / project financing decisions).
(1.2) ensure financial institution's **governance structure, roles, and responsibilities in promoting environmental actions for tangible outcome**. There should be a clear responsible authority to manage the environmental opportunities and risks within the stipulated framework and integrate these environmental issues into normal business operations. This includes, for example, strategy development, risk management, credit underwriting process, investment analysis, disclosure, and internal audit.	3.1.3	**Governance structure, roles and responsibility**	1. The BoD has the role to oversee establishment of a **clear governance structure (including roles and responsibilities) relating to E&C risk** in the organization and **approve material decisions** related to E&C concerns. 2. E&C risk framework/s, whether integrative to existing risk framework/s or considered separately, should appoint **clear mandate of BoD related to E&C risk management.** 3. E&C risk and opportunity management is **included as a key mandate in one of the BoD sub-committees.**	N/A	1. The BoD has the role to oversee establishment of a **clear governance structure (including roles and responsibilities) relating to E&C risk actions** in the organization and **approve critical material decisions** related to E&C concerns. 2. E&C risk framework, whether integrative to existing risk framework or considered separately, should appoint c**lear mandate of BoD related to E&C risk management.** 3. E&C risk and opportunity management is **included as a key mandate in one of the BoD sub-committees.**
(1.3) place importance on **adequate resource allocation** to support environmental actions to achieve the target.	3.1.4	**Resource allocation**	1. **Resource allocation and capability are clearly defined** to support bank's E&C risk actions.	1. Resource allocation and capability are clearly defined to support bank's E&C risk action**s in achieving key climate-related targets.**	1. **Resource allocation and capability are clearly defined** to support bank's E&C risk actions in achieving key climate-related targets.

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
	3.1.5	**Expertise / Capability building**	1. BoD has **enhanced expertise and capability to oversee the E&C actions in line with their responsibility, and proportional to the bank's E&C Risk exposures.**	1. BoD has **enhanced expertise and capability, reflected in E&C risk integrated in strategy formation** and **key strategic business decisions.**	1. BoD has **enhanced expertise and capability, reflected in E&C risk integrated in strategy formation** and key strategic business decisions.
(2.1) put in place **responsibility structure and allocate internal resources** to adequately support the environmental actions.	3.2.1	**SM governance / delegation**	1. **Clearly defined and appointed role** for SM position, or committee, and **delegated functions or personnel** to take responsibility of E&C risk management.	N/A	1. **Clearly defined and appointed role** for SM position, or committee, and **delegated functions or personnel** to take responsibility of E&C risk management.
(2.2) **set environmental implementation plan that includes the management of opportunities and risks**. The senior management should also **communicate the direction, policies, and implementation plans** related to environmental actions so that relevant departments are informed and can implement them tangibly.	3.2.2	**Implementation plan / Communication plan**	1. **Internal E&C implementation pla**n issued by SM 2. **Internal communication plan** on E&C risk management issued by SM.	N/A	1. **Internal E&C implementation pla**n issued by SM 2. **Internal communication plan** on E&C Risk management issued by SM.
	3.2.3	**Risk Identification and Assessment**	3. **Implement qualitative (e.g., sector-based risk management approach) and quantitative measures (e.g., integration to existing risk identification and assessment capabilities for material risks, and linkages to existing quantitative measures and KRIs)** to manage E&C risks.	1. E&C risks are **integrated in the development of key business strategy and key business operations.** 2. **Set risk thresholds/limits on financing** of specific activities within a defined timeframe, including phasing out involvement in certain industries and setting activity-based financing targets.	1. E&C risks are **integrated in the development of key business strategy and key business operations.** 2. **Set risk thresholds/limits on financing** of specific activities within a defined timeframe. 3. **Implement qualitative and quantitative measures** to manage E&C risks, including phasing out involvement in certain industries and setting activity-based financing targets.

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
(2.3) consistently **monitor progress and achievement of the implementation plan and regularly report** to the Board of Directors.	3.2.4	**Monitoring / KRI**	**1. SM to set and monitor** KRIs of material E&C risks, with regular updates and review on plans and policies for high-risk clients and sectors. Monitoring quantitative indicators in the short term **should cover quantitative carbon emission exposures for high-risk sectors, and existing quantitative risk metrics and KRIs for potential integration of E&C risks in KRIs in the short term.**	1. **SM to set and monitor** **qualitative and quantitative** KRIs of material E&C risks with regular updates and review on plans and policies for high-risk clients and sectors, **and consider inclusion of the KRIs in the bank's risk appetite.**	1. SM to monitor **KRIs of material E&C risks**, with regular updates and review on plans and policies for high-risk clients and high-risk sectors.
	3.3.2	**Communication / reporting to the BoD**	1. Regular progress updates and discussions with BoD on E&C risks, with **agenda to be discussed** including the **E&C risk profile of the bank, changes and drivers influencing the changes in the E&C risk profile, key management plan, qualitative KRIs and key quantitative indicators such as GHG emissions/exposures for high-risk sectors and existing quantitative risk metrics.**	1. Regular progress updates and discussions with BoD on **progress against climate-related targets, quantitative and qualitative KPIs and KRIs, and strategy related to E&C risk management** (e.g., progress against transition plan and E&C-related targets).	1. Regular progress updates and discussions with BoD on E&C risks, with **agenda to be discussed** including the **E&C risk profile of the bank, changes and drivers influencing the changes in the E&C risk profile, key management plan, strategy related to E&C risk management, and progress against climate-related targets, KPIs and KRIs.**
(2.4) (SM should) ensure **knowledge and capacity building for relevant staff across all levels**, particularly in terms of	3.2.5	**Resource allocation & Capacity building**	1. **Resource allocation and capability are clearly planned** to support the bank's climate	1. **Resource allocation and capability are clearly planned** to support the bank's climate	1. **Resource allocation and capability are clearly planned** to support the bank's climate actions to **achieve the key climate-related targets**

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environmental risk management, to be ready for changes and support the organization's environmental actions.			actions to **achieve the minimum level of compliance.** 2. E&C risk knowledge sharing and capacity building **set as annual required training agenda** for: a. Board of Directors b. Senior Management c. Three lines of defense d. employees (level of risk awareness, see Strategy Chapter)	actions to **achieve the key climate-related targets.**	2. E&C risk knowledge sharing and capacity building **set as annual required training agenda** for: a. Board of Directors b. Senior Management c. Three lines of defense d. employees (level of risk awareness, see Strategy Chapter).
3.2.2 Strategy Financial institutions should consider opportunities and risks from environmental stakeholders and integrate these factors as parts of the process in setting strategies, goals, as well as implementation plans that lead to the transformation of their work processes and financial products and services to support client's transition in a tangible manner. Financial institutions should: (1) **integrate environmental factors as part of the process in setting and reviewing strategic plans, risk appetite, and both short and long-term implementation plans** in	4.1.1	**Materiality assessment**	1. Banks are required to **assess material E&C risks (either based on existing risk assessment methodologies or qualitative threshold), exposures and their concentration related to industry, economic sectors and geographic regions.** Banks should also monitor **concentration of exposures to geographies and sectors with higher E&C risks** to be integrated and inform strategy formation.	1. Banks set **clear definitions and quantitative/qualitative thresholds for materiality and recognize E&C considerations in integrated firm-wide perspective on risk.** 2. Put in place **impact materiality assessment** (involving external stakeholders) and **financial materiality assessment** (internal existing process, integrating E&C risks).	1. Banks set **clear definitions and thresholds for materiality and recognize E&C considerations in integrated firm-wide perspective on risk.** 2. Put in place **impact materiality assessment** (involving external stakeholders) and **financial materiality assessment** (internal existing process, integrating E&C risks). 3. Banks are required to **assess E&C material risks and their concentration related to industry, economic sectors and geographic regions.** Banks should also monitor **concentration of exposures to geographies and sectors with higher E&C risks** to be integrated and inform strategy formation.
	4.2.1	**Sectoral targets / exposure targets**	N/A	1. Banks to **develop exposure targets, exclusion list, and sectoral targets** that align with their transition plan and	1. Banks to **develop exposure targets, exclusion list, and sectoral targets** that align with their transition plan and

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accordance with the materiality that may directly and indirectly impact the financial institutions. Furthermore, financial institutions should **have in place materiality assessment processes with relevant stakeholders** to regularly review various strategies.				climate-related targets. Banks should prioritize the sectors with high E&C risks.	climate-related targets. Banks should prioritize the sectors with high E&C risks.
	4.3.1	**Time Horizon**	2. Banks are expected to **integrate E&C risks (emerging in the short-to-medium term) in alignment with their current business planning horizon (3-5 years).** The process to inform the short-to-medium term business direction should focus on **assessing impacts on risk exposures and assess solvency and liquidity impacts period of time.**	1. Banks should **develop an E&C strategic plan (emerging across all time horizons) to address evolving physical and transition risk** [Typically: short (0-2 years), medium (2-5 years), and long term (more than 5-10 years)].	1. Banks should **develop E&C strategic plan in all time horizons** to address evolving physical and transition risk [short (0-2 years), medium (2-5 years), and long term (more than 5-10 years)] 2. Banks are expected to **integrate E&C risks in short-to-medium in alignment with their current business planning horizon (3-5 years).**
	4.4.1	**Implementation plan / transition plan**	1. Adoption of **comprehensive bank-wide transition plan (Scope 1 & 2, and Scope 3) and comprehensive sector transition plans (Scope 1, and Scope 2)** to manage E&C risk within the material sectors that the bank is exposed to, at the different time horizon (short-, medium-, and long-term), to set targets and actions within an aspect of an organization's overall business strategy to facilitate the transition towards a low-carbon economy.	1. Adoption of **comprehensive bank-wide transition plan including scope 3** (prioritizing categories most material to the bank) to manage E&C risk, at the different time horizon (short-, medium-, and long-term), to set targets and actions within an aspect of an organization's overall business strategy to facilitate the transition towards a low-carbon economy. 2. **E&C risks reflected on the business strategy** of the bank.	1. Adoption of **comprehensive transition plan** to manage E&C risk, at the different time horizon (short-, medium-, and long-term), to set targets and actions within an aspect of an organization's overall business strategy to facilitate the transition towards a low-carbon economy. 2. **E&C risks reflected on the business strategy** of the bank.

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(2) put in place an **evaluation process to measure the success of implementation plans within the organization's risk appetite framework**, including **setting clear target and key performance indicators** for effective assessment and monitoring, such as setting the target on environmentally friendly funding within the specified timeframe or science-based emission reduction targets.	4.5.1	**Targets and KPIs**	N/A	1. Banks set **climate-related targets, and interim targets (short, medium, and long term), which align with the bank's strategy and risk management goals, with results from scenario analysis and stress test considered.** 2. The KPIs and target **can be quantitative or qualitative**. However the bank should consider the KPI's suitability to effectively monitor E&C risks and performances. 3. Process for **measuring the progress** on E&C risk management, in line with the KPIs and target.	1. Banks set **climate-related targets, and interim targets (short, medium, and long term), which align with the bank's strategy and risk management goals, with results from scenario analysis and stress test considered.** 2. The KPIs and target **can be quantitative or qualitative**; however, the bank should consider the KPI's suitability to effectively monitor E&C risks and performances. 3. Process for **measuring the progress** on E&C risk management, in line with the KPIs and target.
	4.6.1	**Risk Appetite**	N/A	1. BoD and SM should **define E&C risks in the risk appetite framework.** 2. Banks should include current and forward-looking E&C risks on **the bank's risk appetite statement.** Banks should **set threshold or limit for activities related to E&C risks,** such as E&C risk concentration threshold by sector or geography. 3. Banks are expected to **incorporate portfolio**	1. BoD and SM should **define E&C risks in the risk appetite framework.** 2. Banks should include current and forward-looking E&C risks on **the bank's risk appetite statement.** - Banks should set threshold or limit for activities related to E&C risks, such as E&C risk concentration threshold by sector or geography. - Banks should set threshold or limit for activities related to E&C risks, such as E&C risk concentration threshold by sector or geography. 3. Banks are expected to **incorporate**

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				performance-related metrics, particularly financed emissions, that align with the bank's transition plan, into their risk appetite framework. 4. Define **clear escalation process when limits are breached and embed E&C KRIs** in regular monitoring process.	**portfolio performance-related metrics, particularly financed emissions, that align with the bank's transition plan, into their risk appetite framework.** 4. Define **clear escalation process when limits are breached and embed E&C KRIs** in regular monitoring process.
(3) support the economic transition towards environmental sustainability by **providing advice to raise awareness and financial products and services that create incentives for clients or counterparties** to change their business practices to be more environmentally friendly. This includes **green bonds, sustainability bonds, green loans, and sustainability-linked loans that support appropriate business transition**. These products and services should be in line with **accepted Green Taxonomies, such as the ASEAN Taxonomy for Sustainable Finance or Thailand Taxonomy**. Furthermore, the involvement of experts in the issuance and verification processes is	4.7.1	**Client engagement and awareness**	1. Clearly **defined engagement and communication strategy** with clients to promote Green financial products and services, and to understand transition strategy should the bank's clients have started to develop transition plan.	N/A	1. Clearly **defined engagement and communication strategy** with clients to promote Green financial products and services.
	4.7.2	**Counterparty engagement**	N/A	1. **Screen counterparties based on their E&C impacts and performances** and inquire counterparty to manage E&C risks or to set up implementation plan.	1. **Screen counterparties based on their E&C impacts and performances** and inquire counterparty to manage E&C risks or to set up implementation plan.
	4.7.3	**Green product frameworks**	N/A	1. **Issued green/sustainable finance product framework**, in line with accepted international standards (ICMA, LMA)	1. **Issued green/sustainable finance product framework**, in line with accepted international standards (ICMA, LMA).

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recommended to prevent potential Greenwashing.	4.8.1	**Alignment with taxonomies**	**1. Sustainable / Green finance framework sets clear alignment with accepted taxonomy (e.g., Thailand taxonomy, ASEAN taxonomy) and consider the use of external verification parties** to ensure that the bank's financial product and investments do not contribute to greenwashing	N/A	**1. Sustainable / Green finance framework sets clear alignment with accepted taxonomy and the use of external verification parties** to ensure that the bank's financial product and investments do not contribute to greenwashing.
3.2.3 Risk management (1) Financial institutions **should integrate environmental risks as part of the organizational risk culture and risk management process with regards to the Three Lines of Defense model**, as well **as having in place policies, mechanisms, and data capability** to support effective risk management. Lastly, there should be **policies and processes to identify, assess, control, monitor and report environmental risks.** Financial institutions should:	5.2.1	**Overview of the Three Lines of Defense's responsibility**	1. E&C risks are **integrated into the responsibility of the Three Lines of Defense and provided continued capability development** for the Three Lines of Defense on E&C risk identification, assessment, and management	N/A	1. E&C risks are **integrated into the responsibility of the Three Lines of Defense and provided continued capability development** for the Three Lines of Defense on E&C risk identification, assessment, and management.
	5.3.2	**E&C risk management framework**	**1. Internal E&C risk management framework issued or integrated into the existing risk management framework** with specified E&C risk assessment criteria. The impacts of E&C risks to be assessed may include, but not limited to, credit risk.	1. **Internal E&C risk management framework issued or integrated into the existing risk management framework** with specified E&C risk assessment criteria. The impacts of E&C risks to be assessed may include, but not limited to, credit risk, market risk, and liquidity risks.	1. **Internal E&C risk management framework issued or integrated into the existing risk management framework** with specified E&C risk assessment criteria. The impacts of E&C risks to be assessed may include, but not limited to, credit risk, market risk, and liquidity risks.

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	5.5.1	**Data and calculation capability**	1. **E&C risk-related data points clearly identified and collected** through a standardized template or data collection system during client onboarding. 2. **Capability to aggregate data and calculate financed emissions developed** to inform portfolio exposure analysis and portfolio-level risk management, prioritizing high-emission sectors.	1. **E&C risk-related data points clearly identified and collected** through a standardized template or data collection system for all material E&C risk drivers.	1. **E&C risk-related data points clearly identified and collected** through a standardized template or data collection system during client onboarding. 2. **Capability to aggregate data and calculate financed emissions developed** to inform portfolio exposure analysis and portfolio-level risk management.
(1.1) integrate environmental risks **as part of the risk culture, attitude, and behavior of staff** across all levels within the organization, which covering **risk awareness, risk taking, and risk management** in normal business operations, in accordance with the Bank of Thailand's Policy Statement on Financial Institutions' Risk Culture.	5.1.1	**Risk awareness and risk culture**	1. **E&C risk awareness is integrated in the risk culture training**, with enhanced capability building for E&C **risk taking and risk management** for all relevant functions	N/A	1. **E&C risk awareness is integrated in the risk culture training**, with enhanced capability building for E&C **risk taking and risk management** for all relevant functions.
(1.2.1) Business units or the **first line of defense should preliminarily evaluate and control environmental risk** to ensure that business decisions are appropriately accounted for environmental risks. This	5.2.2	**First line of defense**	1. First line of defense can assess E&C risks of new and existing clients**/products based on the client's/product's E&C risk profile.**	1. First line of defense **can make business decision** based on the client's/ product's E&C risk profile **and in alignment with the bank's transition plan.**	1. First line of defense can assess E&C risks of new and existing clients and make business **decision based on the client's E&C risk profile and alignment with the bank's transition plan.**

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includes, for example, enquiry about environmental actions and impacts as part of the **processes for accepting new clients and reviewing existing clients' risks profiles**, especially in the case of **high-risk industries**.					
(1.2.2) Second line of defense such as **risk management, compliance, and credit review units should integrate environmental risks as part of the organization's overall risk assessment** and establish risk assessment frameworks that can balance the decision-making power. This includes for example, the **right to object to the first line's decision,** and ensure that the environmental risk assessment process is **aligned with the risk appetite, other relevant regulations, and laws.**	5.2.3	**Second line of defense - credit review**	1. **E&C risks and opportunities are one of the criteria for credit approval** consideration.	1. The **clients' / product's current E&C performances and their transition plan** are considered for credit (other material risk) approval decision-making, in alignment with the bank's transition plan.	1. **E&C risks and opportunities are one of the criteria for credit approval** consideration, and the **clients' current E&C performances and their transition plan** are considered for credit approval decision-making, in alignment with the bank's transition plan.
	5.2.4	**Second line of defense - compliance**	1. Second line of defense **integrate E&C transition risks into loan approval consideration**, taking into account the E&C risks' impacts on client's business in the medium and long terms.	1. Second line of defense **integrate E&C transition risks into loan approval** (other material risk) **consideration**, taking into account the impacts on client's business in the medium and long terms, in line with **the bank's risk appetite and the bank's transition plan**.	1. Second line of defense **integrate E&C transition risks into loan approval consideration**, taking into account the impacts on client's business in the medium and long run, in line with **the bank's risk appetite and the bank's transition plan**.
(1.2.3) Internal audit units or third line of defense **should be independent in their audit of the risk management framework, internal control, and related monitoring**. This is	5.2.5	**Third line of defense**	N/A	1. Third line of defense should **review** overall **internal policies, processes and controls** to ensure that they comply with both external and internal requirements.	1. **Criteria identified for E&C risk review by internal audit.** The process and execution should be randomly selected **once a year for review** (from any key process or BUs).

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to ensure that the overall organizational conduct supports environmental risk management effectively in an end-to-end manner.					
(1.3) establish **policies and processes for systematic environmental risk management both at the transaction and portfolio levels** (details in 3.2.3 (2) (3) and (4)). This also includes communicating to relevant staffs to raise awareness and understand the guidelines. Furthermore, there should be an **appropriate and consistent review of the policies and processes in line with the materiality of environmental risk**.	5.3.1	**E&C Risk Management Policies**	1. Banks should establish **E&C risk management policies.** The policy should be integrated and applied in credit and investment activities. 2. **Major risk policies should incorporate E&C risk drivers** for their assessment, including policies and processes to manage credit risk 3. Banks should **integrate common environmental risk standards of credit and investment activities** to establish policies appropriately. 4. The policy should **consider impacts of E&C risk on all traditional risk types**, including credit risk, and other risks (but not limited to) operational risk and reputational risk, and keep record in the risk inventory). 5. The policy should **specify cycle for reviews to update**	1. Banks should establish **E&C risk management policies that align with business directions, exclusion policy, bank's E&C targets and bank's transition plan**. The policy should be integrated and applied in credit and investment activities. 2. **Major risk policies should incorporate E&C risk drivers** for their assessment, including policies and processes to manage credit risk, market risk, and liquidity risk.	1. Banks should establish **E&C risk management policies that align with business directions, exclusion policy, bank's E&C targets and bank's transition plan**. The policy should be integrated and applied in credit and investment activities. 2. **Major risk policies should incorporate E&C risk drivers** for their assessment, including policies and processes to manage credit risk, market risk, and liquidity risk. 3. Banks should **integrate common environmental risk standards of credit and investment activities** to establish policies appropriately. 4. The policy should **consider impacts of E&C risk on all traditional risk types**, including credit risk, market risk, liquidity risks, and other risk (but not limited to) operational risk and reputational risk, and keep record in the risk inventory). 5. The policy should **specify cycle for reviews to update process and the context of material risk.**

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			process and the context of material risk.		
(1.4) **assess the potential environmental impact on the business operations and risk exposures including credit, market, liquidity, operational, and other risks** such as strategic and reputational risks. Furthermore, there should be **appropriate risk management systems and adequate capital regarding the materiality of each of risk dimensions** (details as per the appendix).	5.9.2	**Capital and liquidity adequacy**	N/A	1. Banks have developed **process and assessment criteria to evaluate solvency impact using quantitative and forward-looking methodology** (within their capital planning horizons) of E&C risks and **integrate in their internal capital adequacy assessment process (ICAAP) for all short-term, medium-term, and long-term time horizons** 2. Banks have developed assessment criteria to identify impacts on cash outflows or depletion of liquidity buffers (both in BAU and stress situation, through scenario analysis and stress testing) over different time horizons and **have integrated E&C risks into their internal liquidity management processes.** **3. Banks can also utilize ad hoc scenario analysis and stress testing based on the scenario and input parameter set by regulator to inform their solvency and liquidity position.**	1. Banks have developed **process to evaluate solvency impact** (within their capital planning horizons) of E&C risks and **integrate in their internal capital adequacy assessment process (ICAAP)** **2. Banks have developed assessment criteria to identify impacts on cash outflows or depletion of liquidity buffers (both in BAU and stress situation, through scenario analysis and stress testing) over different time horizons and have integrated E&C risks into their internal liquidity management processes.**

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(1.5) **compile, store, and report necessary information for the assessment and management** of environmental opportunities and risks, such as clients and counterparties' environmental performances, as well as ensure the quality of information to be in line with the recognized environmental standards so that such information can be utilized in risk analysis and management effectively.	5.8.1	**Data collection/ management for E&C risk management**	1. For the purpose of **exposure assessment**, banks should have established **data management procedure to collect and manage clients' data**, in line with the bank's data reporting framework, and at the minimum, segregated by sector and geography. 2. **First line of defense should have an understanding of the E&C data required,** and of how to acquire relevant data for effective client's E&C risk monitoring	1. For the purpose of **financed emission data collection and sectoral targets setting**, banks should have stablished **data management procedure to collect and manage clients' data**, in line with the bank's data reporting framework, and at the minimum, segregated by sector and geography. 2. **Established data points on client's E&C performances, in line with criteria to consider E&C risks in credit policy,** to acquire key E&C data for credit decision making, and E&C risk management at portfolio level.	1. Established **data management procedure to collect and manage clients' data**, in line with the bank's data reporting framework, and at the minimum, segregated by sector and geography. 2. **Established data points on client's E&C performances, in line with criteria to consider E&C risks in credit policy,** to acquire key E&C data for credit decision making, and E&C risk management at portfolio level. 3. **First line of defense should have understandings of the E&C data required,** and understanding of how to acquire relevant data for effective client's E&C risk monitoring
(2.1) establish **policies and processes in identifying and assessing environmental risk to support the decision-making process**. This includes, for example, **inquiring environmental information from clients during loan and investment analysis** so that they can appropriately evaluate clients' and counterparties' environmental risk levels and risk management capacity. **High materiality risk transactions should be evaluated by**	5.7.1	**Policy and process for E&C risk identification and assessment (transactional & portfolio level)**	1. Established procedure for **E&C risk integrated due diligence process and portfolio risk assessment, particularly for E&C high-risk portfolios and clients in high-risk/high-emission sectors.** 2. At portfolio level, banks should use **key metrics to monitor clients/products,** such as credit exposures, credit quality, or geography to monitor E&C risks.	N/A	1. Banks should establish a procedure for **E&C risk integrated due diligence process and portfolio risk assessment, particularly for E&C high-risk portfolio and clients in high-risk sectors.** 2. At portfolio level, banks should use k**ey metrics to monitor clients,** such as credit exposures, credit quality, or geography to monitor E&C risks.

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environmental experts with no conflict of interests in such transactions.	5.7.2	**Loan and investment analysis**	1. **Lending and investment policy should incorporate E&C risks perspectives.**	1. Set **exclusion criteria and phase out criteria as assessment criteria in lending and investment policy**, in alignment with the bank's transition plan 2. **Banks to issue exclusion policy by activity or sector**, to prevent high E&C risk transactions and investment	1. **Lending and investment policy should incorporate E&C risks perspectives,** and set the criteria for assessment, such as exclusion criteria and phase out criteria. 2. **Banks to issue exclusion policy by activity or sector**, to prevent high E&C risk transactions and investment.
(2.2) develop **tools and processes in identifying and assessing environmental risks** such as setting up portfolio **heatmaps and risk indicator indexes** to categorize clients or counterparties in accordance with their level of environmental risks to ease overall risks monitoring. Financial institutions may reference guidelines from environmental certification or international environmental standards such as the International Finance Corporation (IFC) Performance Standards. Furthermore, financial institutions should **establish additional practices for loan, investment, and other contractual obligations in high-risk industries or business sectors** (e.g. requiring approval by higher-level management).	5.8.2	**Tools for E&C risk assessment (transaction & portfolio)**	1. Banks should establish **tools and processes for risk identification and record of the E&C risk assessment** (in form of qualitative and quantitative approaches). 2. The **risk assessment should be done by sector, and by clients** or counterparties, prioritizing high-emission sectors. 3. Banks should establish **additional consideration for transactions and credit activities with high-risk sectors**. At the minimum, loans and investment in high-risk sector should be noted and monitored by high-level management using current/existing risk appetite, risk thresholds and limits.	1. Banks should establish tools and processes for risk identification and record of the E&C risk assessment (in form of qualitative and quantitative approaches), with **identified indicators used for assessment in line with the bank's climate-related KRIs.** 2. Banks should establish **additional consideration for transactions and credit activities with high-risk sectors.** At the minimum, loans and investment in high-risk sector should be approved by senior/executive management, with key information on E&C risks **clearly defined for decision-making.** 3. Banks should establish **an internal policy for E&C risk at**	1. Banks should establish **tools and processes for risk identification and record of the E&C risk assessment** (in form of qualitative and quantitative), with identified indicators used for assessment. 2. The **risk assessment should be done by sector, and by clients** or counterparties where the bank sees appropriate. 3. Banks should establish **additional consideration for transactions and credit activities with high-risk sectors.** At the minimum, loans and investment in high-risk sector should be approved by high-level management, with key information on E&C risks clearly defined for decision-making. 4. Banks should establish **an internal policy for E&C risk at transaction & portfolio level.** This can be integral to

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				transaction & portfolio level. This can be integral to transition plan, exclusion list, or established risk appetite threshold.	transition plan, exclusion list, or established risk appetite threshold.
(2.3) **assess and review environmental risks and impact that may result in financial risks regularly**, using **forward-looking method, both quantitatively and qualitatively**. This includes, for example, considering environmental factors when conducting **scenario analysis and stress testing and use the results as part of developing business strategy, risk management, internal capital adequacy assessment process**, and financial performance reporting. In this regard, financial institutions should decide the **frequency of risk assessment and review** in line with clients' and counterparties' **risk materiality, sectors, type of transactions or portfolios**.	5.9.1	**Scenario Analysis & Stress testing**	For the ad hoc regulatory stress-testing exercise/s to be undertaken by the banks: 1. Banks should **determine the objective they are seeking to achieve through the use of scenario analysis or stress-testing exercise.** The objective of E&C stress test may include identifying vulnerabilities to material risks (including both physical and transition risks), assessing the E&C impacts, testing strategies and determining risk appetite/tolerances. **Stress testing objectives will determine the approach and complexity of the methodology.** The results of the E&C scenario analysis and stress tests should be incorporated into the bank's risk management and risk appetite process. 2. Banks with material E&C risks are required to	1. Climate stress test should be **integrated in the bank's periodic stress testing framework/s**.	1. Banks should **determine the objective they are seeking to achieve through the use of scenario analysis or stress-testing exercise.** The objective of E&C stress test may include identifying vulnerabilities to material risks (including both physical and transition risks), assessing the E&C impacts, testing strategies and determining risk appetite/tolerances. **Stress testing objectives will determine the approach and complexity of the methodology.** The results of the E&C scenario analysis and stress tests should be incorporated into the bank's risk management and risk appetite process. 2. Banks with material E&C risks are required to **incorporate the material E&C risks into their E&C scenario analysis and stress testing processes** (for both baseline and adverse scenarios). 3. The E&C stress tests should form part of the bank's stress testing framework and should cover both economic and normative aspects. **The normative perspective should extend at least 3 years and the economic perspective should consider a longer time horizon.**

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			incorporate the material E&C risks into their E&C scenario analysis and stress testing processes (for both baseline and adverse scenarios). 3. The E&C stress tests should form part of the bank's stress testing framework and should cover both economic and normative aspects. **The normative perspective should extend at least 3 years and the economic perspective should consider a longer time horizon.** 4. When performing scenario analysis and stress testing of E&C risks, it is essential to consider the following factors from both an economic and normative perspective: i) Assess the **potential impact of both physical and transition risk** ii) Evaluate the evolution of **E&C risks in different climate scenarios recognizing that these risks may not be adequately represented in historical data.** iii) Understand how E&C risks may manifest in the **short-, medium- and long-term,**		4. When performing scenario analysis and stress testing of E&C risks, it is essential to consider the following factors from both an economic and normative perspective: i) Assess the **potential impact of both physical and transition risk** ii) Evaluate the evolution of **E&C risks in different climate scenarios recognizing that these risks may not be adequately represented in historical data.** iii) Understand how E&C risks may manifest in the **short-, medium- and long-term,** depending on the specific scenarios being considered.

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			depending on the specific scenarios being considered.		
(3.1) establish **policies and processes to reduce or avoid transactions that create severe negative environmental impact**, in line with various standards, regulations, and laws. This includes, for example, establishing an **industry exclusion list** which is continuously reviewed to align with changing situations, as well as enforcing relevant departments to strictly follow the policies and processes.	5.10.1	**Risk Control & Mitigation policy, process, and tools**	1. Banks to set up clear policy and processes to **manage (current and new) high-risk clients and projects with negative environmental impacts**. The policy and process should define the need for an appropriate risk mitigation plan, given the current risk appetite/ thresholds/ limits.	1. **Issued Exclusion list for high-impact E&C transaction and investments** (activity, industry, etc.). 2. Banks use **tools to monitor concentration of E&C risk exposures** (by sector or geography), such as metrics or heatmaps.	1. Banks to set up clear policy and processes to **manage (current and new) high-risk clients and projects with negative environmental impacts**. The policy and process should imply the need for, at the minimum, inquiring mitigation plan. 2. **Issued Exclusion list for with clear high-impact E&C transaction and investments** (activity, industry, etc.) 3. Banks use **tools to monitor concentration of E&C risk exposures** (by sector or geography), such as metrics or heatmaps.
(3.2) establish **additional risk mitigation measures for high-risk client or counterparty groups**. This includes, for example, setting **financial product covenants to raise the quality of clients' or counterparties' environmental operations** to be in line with set indicators or environmental standards within a specified timeframe, or the **integration of environmental risk as part of interest rates setting or collateral evaluation processes.**	5.11.1	**Risk mitigation measure in high-risk clients or sectors (product & credit policies)**	1. Banks set **internal limits for various types of material E&C risks** in traditional risk domain, including credit risk profiles. The internal limit should be set **prioritizing high-risk clients and high-risk sectors.** 2. The bank's **internal limit for credit risk should reflect in product and credit policies for clients,** particularly among high-risk sectors. The bank may set additional credit risk mitigation measures to lessen	1. Banks set **internal limit for various types of material E&C risks** in traditional risk domain, including credit, market, liquidity, and operational risk profiles. The internal limit should be set **prioritizing high-risk clients and high-risk sectors.** 2. The bank's **internal limit for credit risk should reflect in product and credit policies for clients,** particularly among high-risk sectors. The bank	1. Banks set **internal limit for various types of material E&C risks** in traditional risk domain, including credit, market, liquidity, and operational risk profiles. The internal limit should be set **prioritizing high-risk clients and high-risk sectors.** 2. The bank's **internal limit for credit risk should reflect in product and credit policies for clients,** particularly among high-risk sectors. The bank may set additional credit risk mitigation measures to lessen exposures of the

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
			exposures of the bank (e.g., updated credit underwriting criteria, loan limitation). However, these limits should be set taking into account the current risk appetite, risk thresholds and limits.	may set additional credit risk mitigation measures to lessen exposures of the bank (e.g., updated credit underwriting criteria, loan limitation). These limits will take into account the revisions that the bank has made to its risk appetite, risk thresholds and limits (including KRIs).	bank (e.g., updated credit underwriting criteria, loan limitation).
(3.3) develop **risk indicator targets to control risk levels in line with the risk appetite**. This includes, for example, setting the **industry targets** to increase the proportion of environmentally friendly transactions, or setting targets to reduce or control the concentration of industries that pose environmental risks. In this regard, financial institutions' environmental risk control and mitigation as mentioned above should also consider and **support clients' or counterparties' phase out of environmentally unfriendly activities.**	5.14.1	**KRI development**	N/A	1. Banks **set E&C KRI (quantitative and qualitative) & target to control risk level** within the bank's risk appetite. 2. **Integrate E&C risk in risk appetite statement** and set clear threshold to inform relevant levels of risk across both its lending and investment and asset management activities.	1. Banks **set E&C KRI (quantitative and qualitative) & target to control risk level** within the risk appetite level. 2. **Integrate E&C risk in risk appetite statement** and set clear threshold to inform relevant levels of risk across both its lending and investment and asset management activities.
	5.14.2	**Client engagement tracking**	1. Banks to develop **engagement strategy and communication plan for clients.**	1. Track record of **client engagement on green transition**, in line with client engagement strategy. 2. Banks to develop **engagement strategy and communication plan for clients.** This requires specific focus for clients that pose **greater E&C risk due to their geography, industry, or**	1. Track record of **client engagement on green transition**, in line with client engagement strategy. 2. Banks to develop **engagement strategy and communication plan for clients**. This requires specific focus for clients that pose **greater E&C risk due to their geography, industry, or sector**, in line with international recommendation

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
				sector, in line with international recommendation integral to transition plan (e.g., TCFD or GFANZ).	integral to transition plan (e.g., TCFD or GFANZ).
(4.1) establish **policies and processes in monitoring and reporting environmental risks to the Board of Directors and senior management** in a consistent manner to support the review of strategies, risk appetite, risk management, and evaluation of the overall implementation plan. In this regard, the **methodology and frequency for monitoring and reporting should be in line with the risk materiality and its significance to financial institutions' business position.**	5.12.1	**Risk Reporting**	1. Banks report, at the minimum, **E&C risk exposures (e.g., by sector and geography), risk concentration, and emerging risks to BoD and SM periodically.** **2. Banks have developed qualitative and quantitative metrics for reporting**, in line with their existing risk limits/KRIs and risk appetite, and disclosure requirements.	1. Banks report, at the minimum, **E&C risk exposures (e.g., by sector and geography), risk concentration, and emerging risks to BoD and SM periodically** against targets set. **2. Banks have developed qualitative and quantitative metrics for reporting**, in line with the KRIs and their targets, and disclosure requirements.	1. Banks report, at the minimum, **E&C risk exposures (e.g., by sector and geography), risk concentration, and emerging risks to BoD and SM periodically.** **2. Banks have developed qualitative and quantitative metrics for reporting**, in line with the KRIs and their targets, and disclosure requirements.
	5.12.2	**Integrated E&C risk factor to current monitoring and escalation arrangement**	1. Banks' **criteria for Board notification / approval should integrate E&C risk**, focusing proportionally on material E&C Risk, using current risk appetite, risk thresholds and limits. The frequency of discussion and reporting with the Board level should increase for material E&C risks.	1. . Banks' **criteria for Board notification / approval should integrate E&C risk**, focusing proportionally on material E&C Risk, using revised risk appetite, risk thresholds and limits. The frequency of discussion and reporting with the Board level should increase for material E&C risks.	1. Banks' **criteria for Board notification / approval should integrate E&C Risk**, focusing proportionally on material E&C Risk. The frequency of discussion and reporting with the Board level should increase for material E&C risks
(4.2) develop **tools and processes to consistently monitor risks,**	5.14.3	**Indicator selection and metrics**	1. For the purpose of exposure measurements, banks select	1. Banks select the metrics that accurately reflect the E&C	1. Banks select and disclose the **metrics that accurately reflect the E&C financial**

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progress, and results of clients' or counterparties' environmental implementation plan, particularly those that have **high risk**, in accordance with the **established policies or criteria** (e.g., setting conditions for clients or counterparties to report environmental risk data, including the progress in reducing such risks on a regular basis). In addition, financial institutions may utilize sustainability data service providers to monitor such data.			and disclose the **metrics that accurately reflect the E&C financial risks relevant to a particular portfolio and sector**, along with the reasoning behind their selection. 2. For banks with **extensive and complex assets**, the bank should **adopt a risk-based approach by prioritizing the most pertinent risk types, asset classes, industry sectors, and geographic areas**.	financial risks to **assess solvency impact within their capital planning horizons, integral to capital adequacy assessment process (ICAAP)**.	**risks relevant to a particular portfolio and sector**, along with the reasoning behind their selection. 2. For banks with **extensive and complex assets**, the bank should **adopt a risk-based approach by prioritizing the most pertinent risk types, asset classes, industry sectors, and geographic areas**.
	5.13.1	**Tools and process to monitor client's E&C risks / performances**	1. For the purpose of exposure measurement, Banks should develop **enhanced data capacity to track clients**, particularly in high-risk sectors, and to **use reasonable data proxies and assumptions.**	1. Clear process on **client's E&C performance and action plan for data requests, inquiry and follow-up.** 2. Process or tool to **keep track of clients' and counterparties' E&C performance and implementation plan,** and evidence that such record informs client engagement and risk consideration. 3. For the purpose of monitoring performances against the bank's targets (e.g., sectoral targets), Bank's enhanced data capacity to track clients, particularly in high-risk sectors, and to use	1. Clear process on **client's E&C performance and action plan data inquiry and follow-up.** 2. Process or tool to **keep track of clients' and counterparties' E&C performance and implementation plan,** and evidence that such record informs client engagement and credit consideration. 3. **Bank's enhanced data capacity to track clients,** particularly in high-risk sectors, and to **use reasonable data proxies and assumptions.**

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
				reasonable data proxies and assumptions*.	
3.2.4 Disclosure Financial institutions should **publicly disclose climate-related information** on governance, strategies, implementation plans, opportunities and risks management, as well as metrics and targets that reflect current business operations and are in line with international standards. Financial institutions should: (1) disclose climate-related information that is in line with internationally accepted regulations or standards such as the recommendations of **the Task Force on Climate-related Financial Disclosures (TCFD)** or the guidelines from the **International Sustainability Standards Board (ISSB).** The disclosure should cover the following information.	6.1.1	**Public disclosure of E&C related information**	1. Report **in line with TCFD and IFRS S2**, the strategy and risk management process, including the result of **forward-looking analysis (e.g., ad hoc regulatory scenario analysis and stress test), on a best endeavor basis.** 2. The principle of **comply or explain** applies.	1. Report **fully in line with TCFD and IFRS S2 with quantitative data disclosed,** the strategy and risk management process, including include the result of **forward-looking analysis (e.g., scenario analysis and stress test).** 2. The principle of **comply or explain** applies.	1. Report **fully in line with TCFD and IFRS S2, with quantitative data disclosed**, and strategy and risk management process should include the result of **forward-looking analysis, such as scenario analysis and stress test.** 2. The principle of **comply or explain** applies.
(1.1) Governance structure and the **roles of the Board of Directors and senior management** with regards to overseeing environmental actions.	6.2.1	**Disclosure of Governance Data**	**A. TCFD** **1. Board's oversight of E&C risks and opportunities** 1.1 process and frequency the BoD or board committees are informed about E&C risks **2. Management's roles in assessing and managing E&C**	**A. TCFD** **1. Board's oversight of E&C risks and opportunities** 1.1 Consideration of E&C risks in strategy, plans of actions, risk management policies, resource allocation, and major business decisions	**A. TCFD** **1. BoD's oversight of E&C risks and opportunities** 1.1 Process and frequency the BoD or board committees are informed about E&C risks 1.2 Consideration of E&C risks in strategy, plans of actions, risk

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
			risks and opportunities 2.1 Assigned responsibility to SM positions or committees and their reports to BoD 2.2 Associated organizational structure 2.3 Process to be informed about E&C issues 2.4 Process to monitor implementation of policy	1.2 Process to monitor and oversee progress against E&C targets and goals **2. Management's roles in assessing and managing E&C risks and opportunities** 2.1 Process to monitor implementation of strategy **B. IFRS S2** **1. Governance structure of E&C risks and opportunities (for both BoD and Senior Management)** 1.1 Board & SM responsibilities as reflected in terms of reference, mandates, role description, and other related policies 1.2 Skills and competencies 1.3 Cycle of reporting to BoD 1.4 Governance body's oversights on the bank strategy, major transactions, risk management processes, and related policies 1.5 Oversight of climate-related target setting **2. Management roles** 2.1 Roles delegated to management-level position or committee 2.2 Controls and procedures	management policies, resource allocation, and major business decisions 1.3 Process to monitor and oversee progress against E&C targets and goals **2. Management's roles in assessing and managing E&C risks and opportunities** 2.1 Assigned responsibility to SM positions or committees and their reports to BoD 2.2 Associated organizational structure 2.3 Process to be informed about E&C issues 2.4 Process to monitor implementation of policy and strategy **B. IFRS S2** **1. Governance structure of E&C risks and opportunities (for both BoD and Senior Management)** 1.1 Board & SM responsibilities as reflected in terms of reference, mandates, role description, and other related policies 1.2 Skills and competencies 1.3 Cycle of reporting to BoD 1.4 Governance body's oversights on the bank strategy, major transactions, risk management processes, and related policies 1.5 Oversight of climate-related target setting

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
				integrated with internal functions	**2. Management roles** 2.1 Roles delegated to management-level position or committee 2.2 Controls and procedures integrated with internal functions
(1.2) **Strategy and implementation plan** including desired results and achievement of the environmental actions in **qualitative and quantitative terms.**	6.3.1	**Disclosure of Strategy**	**A. TCFD** **1. E&C risks and opportunities the organization has been identified over short, medium, and long term** 1.1 Significant concentrations of credit exposure to E&C assets 1.2 Consider disclosing E&C risks in lending and other financial intermediary business activities **3. Resilience of the organization's strategy, in different climate scenarios** **4. Key information from the bank's transition plan (scope 1 and scope 2)**	**A. TCFD** **2. Financial impacts and potential financial impacts of E&C risks on business, strategy, and financial planning** **4. Key information from the bank's transition plan (scope 3)** **B. IFRS S2** **2. Business model and value chain** 2.1 Current and anticipated effects on business model and value chain **3. Strategy and decision-making** 3.1 Plans in responses to E&C risks and opportunities 3.2 Direct and indirect mitigation and adaptation efforts 3.3 Transition plan (emission targets and use of carbon offset) 3.4 Plan to achieve climate-	**A. TCFD** **1. E&C risks and opportunities the organization has identified over short, medium, and long term** 1.1 Significant concentrations of credit exposure to E&C assets 1.2 Consider disclosing E7C risks in lending and other financial intermediary business activities **2. Financial impacts and potential financial impacts of E&C risks on business, strategy, and financial planning** **3. Resilience of the organization's strategy, in different climate scenarios** **4. Key information from the bank's transition plan** **B. IFRS S2** **1. Climate-related risks and opportunities** 1.1 E&C risk and opportunities (both physical and transition risks) in short, medium, and long term

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
				related targets **5. Climate resilience** 5.1 Resilience of the bank's strategy and business model (including significant areas of uncertainty) 5.2 An entity's capacity to adjust and adapt its strategy over time	**2. Business model and value chain** 2.1 current and anticipated effects on business model and value chain 2.2 Risk concentration (geographical, types of assets, sectors) **3. Strategy and decision-making** 3.1 Plans in responses to E&C risk and opportunities 3.2 Direct and indirect mitigation and adaptation efforts 3.3 Transition plan (emission targets and use of carbon offset) 3.4 Plan to achieve climate-related targets **4. Financial position, financial performance, and cash flows** 4.1 Effects of E&C risk and opportunity on financial position, financial performance, and cash flows in short, medium, and long term **5. Climate resilience** 5.1 Resilience of the bank's strategy and business model (incl. significant areas of uncertainty) 5.2 Climate-related scenario analysis in resilience assessment 5.3 Key assumption used in scenario analysis 5.4 An entity's capacity to adjust and adapt its strategy over time

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
(1.3) **Environmental opportunity and risk management** including operation and framework for risk management.	6.4.1	**Disclosure of Risk Management**	**A. TCFD** **1. Processes for identifying and assessing E&C risks** 1.1 Characterizing E&C risk in the context of traditional banking industry risk category (credit), and considering disclosing E&C risk in the context of market, liquidity, and operational risks. 1.4 Prioritization of E&C risks relative to other risks **3. Processes for identifying and assessing E&C risks and how it is integrated into the overall risk management framework**	**A. TCFD** **2. Processes for managing E&C risks** **3. processes for managing E&C risks and how it is integrated into the overall risk management framework** **B. IFRS S2** **1. Process and policies to identify, assess, prioritize and monitor E&C risks, including information on** 1.1 Inputs, parameter, data source, and scope of E&C management 1.2 Climate-related scenario analysis for risk identification (based on ad hoc regulatory Scenario Analysis/stress testing) 1.3 Likelihood and magnitude of effects of risks 1.5 E&C risk monitoring 1.6 E&C integration to overall risk management process	**A. TCFD** **1. Processes for identifying and assessing E&C risks** 1.1 Characterizing E&C risk in the context of traditional banking industry risk category (credit, market, liquidity, operational risks) **2. Processes for managing E&C risks** **3. processes for identifying, assessing, and managing E&C risks and how it is integrated into the overall risk management framework** **B. IFRS S2** **1. Process and policies to identify, assess, prioritize and monitor E&C risks, including information on** 1.1 Inputs, parameter, data source, and scope of E&C management 1.2 Climate-related scenario analysis for risk identification (if any) 1.3 Likelihood and magnitude of effects of risks 1.4 Prioritization of E&C risks relative to other risks 1.5 E&C risk monitoring 1.6 E&C integration to overall risk management process

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
(1.4) **Metrics and targets** which cover important environmental data for evaluation and illustration of the financial institutions' environmental actions against its target (e.g. their own greenhouse gases emissions and financed emissions in their portfolio).	6.5.1	**Disclosure of Metrics and Targets**	**A. TCFD** **1. Disclosure of scope 1, scope 2. scope 3 GHG emissions, and the related risks** 1.1 disclose GHG emissions for lending and other financial intermediary business activities where data and methodology allow. **2. Metrics used to assess E&C risks and opportunities.** The suggested metric category include: 2.1 GHG Emissions (including financed emissions for high-emission sectors, where data allows) 2.2 Transition Risks 2.3 Physical Risks 2.4 Climate-related opportunities	**A. TCFD** **2. Metrics used to assess E&C risks and opportunities in line with strategy and risk management process**. The suggested metric category include: 2.5 Capital deployment (towards addressing risk & opportunities, including capital Expenditure, financing and investment) 2.6 Internal Carbon Prices, and 2.7 Remuneration (linked to climate consideration) **B. IFRS S2** **1. Climate-related metrics** 1.1 Emissions (Scope 1 & Scope 2), and Scope 3 for high-emission sectors. **2. Climate related targets & interim targets (if available)** **3. Financed Emissions metrics (high-emission sectors, where data allows)** 3.1 Absolute gross financed emissions, disaggregated by Scope 1, Scope 2 and Scope 3 GHG emissions for each industry by asset class	**A. TCFD** **1. Disclosure of scope 1, scope 2, scope 3 GHG emissions, and the related risks** 1.1 disclose GHG emissions for lending and other financial intermediary business activities where data and methodology allow **2. Metrics used to assess E&C risks and opportunities in line with strategy and risk management process. The suggested metric category include:** 2.1 GHG Emissions 2.2 Transition Risks 2.3 Physical Risks 2.4 Climate-related opportunities 2.5 Capital deployment (towards addressing risk & opportunities, including capital Expenditure, financing and investment) 2.6 Internal Carbon Prices, and 2.7 Remuneration (linked to climate consideration) **3. Describe E&C target and performance against targets** **B. IFRS S2** **1. Climate-related metrics** 1.1 Emissions (Scope 1, 2, and 3) 1.2 Financed Emissions calculation methodology (comply or explain)

Standard Practice	No.	Topic	Short-term Actions	Long-term Actions	End-state
				3.2 Gross exposure to each industry by asset class (currency of entity's financial statements) 3.3 % of entity's gross exposure included in the financed emissions calculation 3.4 Methodology of financed emissions calculation.	**2. Climate related targets & interim targets (if available)** **3. Financed Emissions** 3.1 Absolute gross financed emissions, disaggregated by Scope 1, Scope 2 and Scope 3 GHG emissions for each industry by asset class 3.2 Gross exposure to each industry by asset class (currency of entity's financial statements) 3.3 % of entity's gross exposure included in the financed emissions calculation 3.4 Methodology of financed emissions calculation
(2) consistently disclose the above information **at least once a year via various communication channels** such as annual report, sustainability report, or website. Furthermore, financial institutions should ensure that information are consistently updated in line with the financial institutions' current policies.			1. Publicly disclose E&C information **at least once a year via various communication channels** and ensure that information is consistently updated in line with the financial institutions' current policies.	1. Publicly disclose E&C information **at least once a year via various communication channels** and ensure that information is consistently updated in line with the financial institutions' current policies.	1. Information is publicly disclosed in any from on a yearly basis, with clear references to TCFD and IFRS S2