Hợp tác Đức
DEUTSCHE ZUSAMMENARBEIT

Vietnam's Climate Risks and Best Practices for TCFD Disclosure

Tangible climate-related financial risk disclosure guidance for emerging and developing market participants

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On behalf of the
German Federal Ministry for Economic Cooperation and Development (BMZ)

This report reflects work conducted over 12 months in 2021, 2022 and 2023 with a number of leading banks in Vietnam. The authors are grateful for the participation of the institutions listed below.

- State Bank of Vietnam
- Vietnam Bank for Social Policies (VBSP)
- Agribank (Vietnam Bank for Agriculture and Rural Development)
- VP Bank (Vietnam Prosperity Joint Stock Commercial Bank)
- The Joint Stock Commercial Bank for Investment and Development of Vietnam (BIDV)
- HD Bank (Ho Chi Minh City Development Bank)

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Foreword

The German Federal Ministry for Economic Cooperation and Development (BMZ) has commissioned the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH to supports its objectives in the field of international cooperation for sustainable development. GIZ has provided advisory services to the Government of Vietnam for more than 30 years, and is currently engaged in forging ahead with the Just Transition, including realigning economic policies to achieve a sustainable transformation of the financial sector.

The world is transitioning away from coal – the world's most dominant and most carbon-intensive source of energy – and heading towards a low carbon and clean energy future. According to the Climate Action Tracker, as of November 2022, around 140 countries had announced or are considering net zero targets, covering close to 90% of global emissions.

Vietnam likewise announced a target to achieve net zero by 2050 during the COP26 World Leaders' Summit in 2021. Its planning to reach the target includes the development of the Vietnam Green Growth Strategy (VGGS) for the period of 2021-2030 with a vision towards 2050 and the National Climate Change Strategy, which were approved by the Prime Minister on 1st October 2021 and 26th July 2022, respectively. Finance, especially the banking system, is among the core factors deciding the success of this transition, as it mobilizes and channels capital to implement the roadmap for green growth, climate adaptation and net zero emissions.

Within the framework of GIZ's ASEAN Green Recovery regional project and "Macroeconomic Reforms/Green Growth Programme", GIZ has worked with the State Bank of Vietnam (the country's central bank) to mainstream climate action among credit institutions in Vietnam. The State Bank of Vietnam and GIZ, in collaboration with the United Nations Environment Programme Finance Initiative (UNEP FI) and the Climate Disclosure Standards Board (CDSB), has provided training and consultation to selected commercial banks, and eventually developed the "Vietnam's Climate Risks and Best Practices for TCFD Disclosure" Report, which serves as a Guide for the benefit of the participants and others in emerging markets such as Vietnam, who are grappling with the challenges of climate-related risk assessment and disclosure. It aims to enhance knowledge, improve methodologies for assessment of climate risks, and presents good practices around financial disclosure given the Task Force on Climate-related Financial Disclosures (TCFD) standards.

1. Introduction

1.1 About this Guidance report

In the face of the global economic dislocation caused by COVID-19, the green recovery prevents unintended lock-ins, strengthens resilience and supports countries to pursue goals of recovery and sustainable development simultaneously. Financial institutions have a major role to play in supporting a green recovery and promoting sustainable growth.

With climate change posing an existential threat and demanding the transformation of the global economy, an effective green recovery needs to actively address climate change. For countries and businesses to thrive in this changing world, they must have a strong understanding of the unique climate risks and opportunities they will face.

In this programme, GIZ and UNEP FI collaborated to build the capacity of Vietnamese banks to identify, assess, and disclose climate risks and opportunities. This program explored the physical and transition impacts of climate change to empower participants to manage climate risks and support mitigation, adaptation, and resilience projects.

Through a series of interactive webinars and workshops with UNEP FI as well as other climate experts, participants were introduced to good practices on disclosure and assess- ment. Participants also engaged directly with climate risk and opportunity assessment tools and explored the research on climate impacts both globally and within Vietnam.

The programme had four main aims in enhancing the capacity building of Vietnamese banks. These included:

1. Providing an understanding of Vietnam-specific physical and transition risks.
2. Recognising the role of the financial sector in supporting the green recovery and low-carbon transition.
3. Exploring good practices regarding climate disclosures and management that contribute to a comprehensive TCFD report.
4. Developing an appreciation for the range of emerging regional and global climate regulations and the steps required to meet these new reporting requirements.

Following the program, participating institutions will begin integrating climate risk into their risk management practices, considering climate in their business decisions, and reporting on their climate-related financial risks and opportunities.

This paper intends to serve as a hands-on resource to program participants and others in Vietnam. It features an overview on the climate-related financial risks and opportuni- ties in Vietnam and their impacts on different economic sectors. In conjunction with the Climate Disclosure Standards Board (CDSB)—a global leader on TCFD- and climate-re-

lated disclosures—the report also explores current good practices for each of the eleven TCFD recommended disclosures. The following sections seek to be an accessible user guide to institutions looking to take the first steps on climate risk management, assess- ment, and disclosure as well as those looking to enhance their climate practices.

In doing so, this paper serves four objectives:

1. Summarizing the main content delivered during the training program and preserv- ing it for future practitioners
2. Offering guidance as to the next steps for Vietnamese banks to develop their TCFD reports
3. Providing reference material for the State Bank of Vietnam (SBV) to develop guid- ance of climate risk disclosures
4. Enabling the scaling up of climate risk knowledge in the Vietnamese financial system and the promotion and spreading of good climate risk practice

1.2 Task Force on Climate-related Financial Disclosures (TCFD)

The G20 Financial Stability Board established the TCFD in 2015 to identify the information needed by the market to appropriately price climate risk and allocate capital to prevent financial instability. In 2017, the TCFD released their final report which included a set of voluntary disclosure recommendations (Figure 1) that are designed to elicit consistent and comparable disclosure of climate-related information in the mainstream financial report to inform decision-making and capital allocation by investors, lenders, and insurance underwriters. These recommendations are structured around four core elements—governance, strategy, risk management, metrics and targets—with eleven recommended disclosures and additional implementation guidance to support reporting organisations, including industry-specific guidance for banks.

In October 2021, the TCFD updated their implementation guidance for the first time since the recommendations were launched in 2017. Responding to market demand, this additional guidance provides further clarification on financial metrics and targets, but also introduces the concept of transition plans whereby organisations are required to describe the plans for transitioning to a low-carbon economy, including GHG emissions reduction targets (TCFD, 2021c).

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organisation's governance around climate-related risks and opportunities.	Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.	Disclose how the organisation identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-re- lated risks and oppor- tunities where such information is material.
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term.	a) Describe the organisation's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the organisation 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 risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning.	b) Describe the organisation'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 organisation'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 organisation's overall risk management.	c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.

Figure 1: TCFD recommendations and recommended disclosures.

Source: **TCFD Final Report**

Since the release of the recommendations, the TCFD have amassed over 2,700 global supporters across the market (as of December 2021), which includes corporates, inves- tors, and governments (TCFD, 2021a). In July 2021, the Finance Ministers and Central Bank Governors of the G20 released a communique which endorsed the TCFD, stating that they "will work to promote implementation of disclosure requirements or guidance, building on the FSB's Task Force on Climate-related Financial Disclosures (TCFD) frame- work, in line with domestic regulatory frameworks, to pave the way for future global coor- dination efforts, taking into account jurisdictions' circumstances, aimed at developing a baseline global reporting standard." (G20, 2021).

The TCFD released the fifth status report in October 2022, which examined the current state of reporting around the world. The overall findings of the review concluded that although disclosure has increased year-on-year, progress is still needed to achieve full disclosure. Only 4% of companies disclosed in line with all 11 recommended disclosures and only around 40% disclosed in line with at least five (TCFD, 2022).

Recommendation	Recommended Disclosure	Banking (248)[1]	Insurance (118)	Energy (223)	Materials & Buildings (353)
Governance	a) Board Oversight	33%	36%	40%	32%
	b) Management's Role	28%	31%	21%	25%
Strategy	a) Risks and Opportunities	64%	58%	73%	67%
	b) Impact on Organization	54%	46%	54%	51%
	c) Resilience of Strategy	19%	25%	18%	16%
Risk Management	a) Risk ID and Assessment Processes	47%	45%	37%	31%
	b) Risk Management Processes	47%	49%	36%	31%
	c) Integration into Overall Risk Management	49%	52%	42%	36%
Metrics and Targets	a) Climate-Related Metrics	42%	38%	51%	58%
	b) Scope 1, 2, 3 GHG Emissions	35%	33%	48%	58%
	c) Climate-Related Targets	32%	33%	56%	57%

Figure 2: Overview of TCFD disclosure by industry and specific results for banking across eleven TCFD recommendations.

Source: TCFD Status Report (2022).

As of October 2022, there are 1,539 Financial Sector Institutions that have become offi- cial supporters of the TCFD (TCFD, 2021a). Although there has been some improvement in the number of banks disclosing TCFD aligned information, the banking industry is generally behind the trend across all the TCFD recommendations compared to other industries (Figure 2), especially with noticeable gaps in the reporting of climate-related metrics and targets.

1.3 Recent developments in disclosure

The current progress in TCFD-aligned reporting has occurred primarily through voluntary disclosure of the recommendations. However, governments and regulators are heading towards mandatory climate-related reporting requirements (see Figure 3).

In September 2020, New Zealand were the first to announce plans to mandate climate-related financial disclosures, the law is currently under consideration as of February 2023. The UK has also released proposed legislation that, subject to parlia- mentary approval, will require over 1,300 large companies and financial institutions to disclose in-line with the TCFD by 2025.

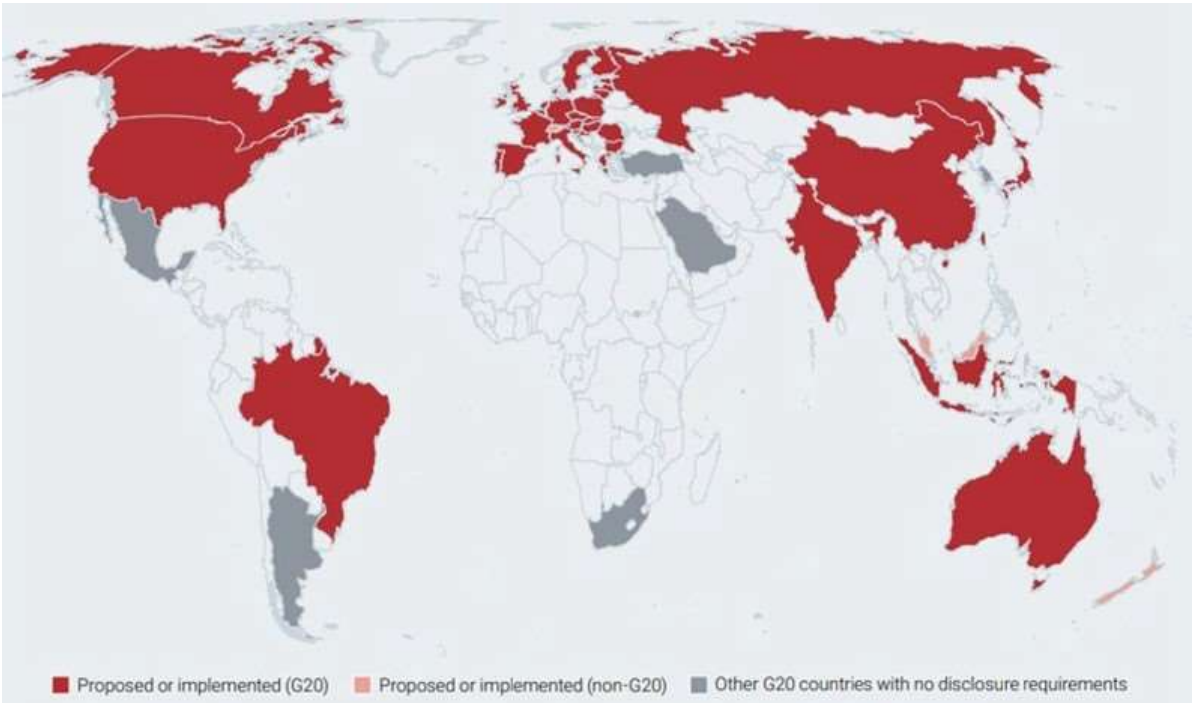

Figure 3: Status of mandatory TCFD reporting around the world.
Source: **CDP (2021)**

Through the Network for Greening the Financial System (NGFS), central banks and supervisors have started to consider their role in supporting efforts towards greening the financial system. Whilst addressing their prudential supervision and setting mone- tary policy frameworks, central banks are also beginning to complete their own climate stress tests. For example, climate stress tests have been completed by the Bank of England, Banque de France, and in the future the European Central Bank. The NGFS have also published extensive guidance on scenario analysis and have designed a suite of reference scenarios for financial institutions looking at both physical and transition risks.

The People's Bank of China has also signalled it aims to make climate-related risk disclosure mandatory, starting with a sample of financial institutions and expanding to the wider market in the future. Additionally, the Banco Central do Brasil (BCB) released for consulta- tion regulations on the disclosure of ESG information, including climate-related risks, by financial institutions that were inspired by the TCFD recommendations (BCB, 2021).

Stock Exchanges are also considering how to enforce and support the disclosure of TCFD

recommendations. The UN Sustainable Stock Exchange Initiative released their Model Guidance on Climate Disclosure in June 2021, which includes a template for exchanges to guide issuers on how to implement the TCFD recommendations. Addi- tionally, in August 2021 the Singapore Exchange Regulation proposed a roadmap for mandatory TCFD-aligned disclosure starting in 2022 with an expectation that disclosure will become mandatory for most industries by 2024.

Whilst climate-related disclosure is increasingly becoming mandatory, there has also been significant changes in the development of international reporting standards. In September 2020, the Trustees of the IFRS Foundation published a consultation paper to assess the demand for, and its role in, the development of international sustainabil- ity standards. Following extensive preparation, in November 2021 the IFRS Foundation announced the formation of the International Sustainability Standards Board (ISSB) to address and develop—in the public interest—a comprehensive global baseline of high-quality sustainability disclosure standards to meet investors' information needs (IFRS, 2021a).

To give the ISSB a head start, a Technical Readiness Working Group (TRWG) was established in March 2021. The TRWG also published a prototype for climate-related disclosures, coinciding with the announcement of the ISSB's creation.

In March 2022 the ISSB has published an exposure draft for a sustainability-related disclosure standard that outlines general requirements, alongside the proposed climate-related disclosures standard. The drafts are expected to be finalized in June 2023.

This announcement also confirmed the consolidation of the Value Reporting Founda- tion (which houses Integrated Reporting Framework and the SASB Standards), and the Climate Disclosure Standards Board (CDSB). Together with the International Accounting Standards Board (IASB), the TCFD, and the World Economic Forum (WEF), these organ- isations created two prototype standards which will inform the development of future reporting standards (IFRS 2021b). In context of the TCFD, the structure of the prototype climate standard follows and builds upon the structure and requirements of the TCFD recommendations.

1.4 Disclosure in emerging and developing markets

For the banking industry, climate-related risks are complex and often new on the risk register. Not only do banks need to mitigate risks by estimating unexpected losses, but they must also review their risk exposures and assess their opportunities in transitioning to greener investments. However, the contexts and jurisdictions in which banks operate will impact the types of physical and transition risks and opportunities that they are exposed to as well as the nature of requirements needed to manage such issues.

It is projected that emerging markets generally are already, and will continue to be, exposed to the greatest impacts of global climate change. This means that companies and financial institutions in emerging markets will likely be more exposed to the physical risks of climate change. While international focus on decarbonisation centres more immediately on the world's high-income and high-emission economies, emerging markets will also need to shift towards low-carbon alternatives to align with global agreements while simultaneously maintaining growth. This means that while many emerging markets face fewer regulatory and transition risks at present than in higher-income countries, these will inevitably grow over

time. This is particularly true for markets like Vietnam that are presently highly dependent on fossil fuels.

Corporate reporting is an essential tool for markets to manage these climate-related risks and make the most of the opportunities that decarbonisation offers in the short-, medium- and long-term. Such disclosures allow economic actors to understand how risks are developing and the outlook for various companies, evaluate the benefits of different strategies and targets, and ultimately relocate capital to ensure sustainable returns. The importance of quality disclosure is especially important when we consider the amounts of capital required to fund decarbonisation. It has been estimated by the International Energy Agency (IEA), for instance, that by the end of the 2020s over US$1trillion will need to be invested in clean energy in emerging and developing markets to put the world on course for net-zero emissions by 2050 (IEA, 2021). As with other markets, there will be challenges in developing high-quality disclosures and utilising this information. For banks and other financial institutions, this deficit is especially important given their reliance on a huge variety of reported data and information for understanding and acting on the climate-related risks and opportunities contained within their books.

Chief amongst the issues of climate-related reporting faced by banks and similar institutions are the gaps in data availability. Without mandated reporting requirements, disclosures are voluntary and as a result far sparser and often less consistent and comparable than is required for banks to properly understand their exposures to climate-related risks and opportunities. Compounding this issue of reporting quality is a lack of capacity and technical resources dedicated to assisting companies in emerging markets such as Vietnam to best understand and act on these issues. Instead, much of the technical materials to assist climate report preparers and users are designed by and for those in high-income economies. More broadly, though, the lack of a clear roadmap and accompanying policies towards decarbonisation from the Vietnamese government results in a lack of direction for the market. Weak policy signals, such as Vietnamese business lacking an emissions pathway or goal around which to develop their strategies, create an immediate impediment to developing decision-useful climate disclosures.

In terms of disclosure requirements, emerging markets may be less mature then devel- oped markets regarding climate-related financial disclosure. However, that is not to say that emerging markets do not have ESG disclosure requirements. In particular, the differ- ent characteristics of reporting requirements is not conducive to the current trends in reporting climate-related financial information in the mainstream annual report (WBCSD, 2018). However, in addition to these reporting requirements and developing norms for climate disclosure, as evidenced by the recent announcements from Singapore and Hong Kong's financial authorities, there also exists a business-to-business impediment for analysing and reporting on climate risks and opportunities around the world inde- pendent of national regulation. As more companies are mandated to disclose publicly against the TCFD, this necessitates an engagement with organisations throughout the value chain to fully appreciate their exposure to climate risks. As a key area for many elements of the world's economy, companies in Vietnam will further be part of this exercise to map and understand the impacts climate change throughout the complexities of the value chain. This reporting may also be an important source for banks in Vietnam to understand their own risks and opportunities relating to the physical impacts of climate change and efforts towards decarbonisation.

1.5 Disclosure context in Vietnam

Currently there is no specific requirement in Vietnam for financial institutions to disclose climate-related information. However, Vietnam does have some ESG reporting requirements, including:

- Circular No. 96/2020/TT-BTC of the Ministry of Finance requires listed companies to disclose information in the annual report relating to sustainable development, corpo- rate responsibility (including environmental and social), and corporate governance.
- The State Securities Commission of Vietnam have produced guidance including the Sustainability Reporting Handbook and the Vietnam Corporate Governance Manual.

The stock exchanges Ho Chi Minh Stock Exchange and Hanoi Stock Exchange are both members of the UN Sustainable Stock Exchange Initiative and are TCFD supporters (since 2017 and 2019 respectively). Both have ESG reporting requirements as a listing rule under Circular 155/2015/TT-BTC, and additional guidance to support issuers on ESG reporting. Currently, there is no listing rule or reporting guidance specifically on climate-related disclosure.

2. Climate-related risks in Vietnam

The aim of this section is to provide an overview of Vietnam's physical and transition risks. In addition to these broad categories of climate risks, their impacts and implica- tions on specific sectors will also be considered in this section. By exploring these risks, Vietnam's financial institutions will be able to identify risks within their portfolios as well as potential opportunities to support climate mitigation and adaptation within Vietnam.

With its long coastline, high population density, and location within the tropical typhoon belt, Vietnam is particularly susceptible to climate-related hazards. The people of Viet- nam are acutely aware of these risks. According to a survey by ISEAS Yusof Ishak Insti- tute, 80% of Vietnamese surveyed considered climate change "a serious and immediate threat to the well-being of [their] country" with nearly 98% considering it "an important issue that deserves to be monitored" (ISEAS, 2021).

The ISEAS survey also asked respondents to name the three most severe climate risks for Vietnam. Their answers in order of concern were floods, sea level rise, and droughts (ISEAS, 2021). The assessments of the Global Climate Risk Index and the EU's INFORM project on climate risks support the prominence of these hazards and add tropical cyclones as another hazard of concern (INFORM, 2019). In the face of these challenges, Vietnam has a significant need to develop suitable adaptation and resiliency measures.

The transition to a low-carbon economy also presents risks for Vietnam. As a rapidly indus- trializing nation, Vietnam's emissions and dependence on coal have risen rapidly in recent years. With the world aligning around the goal of net zero by 2050, Vietnam may face pressures from trade partners and its own citizens to decarbonize. Presently, Vietnam's announced nationally determined contribution (NDC) under the Paris Agreement falls short of what is needed to align with a 1.5°C world, a consequence of the tension between climate commitments and fossil fuel driven growth (Climate Action Tracker, 2021).

Vietnam's Ministry of Natural Resources and Environment (MONRE) has undertaken a number of informative assessments of national climate risks in conjunction with inter- national institutions such as the World Bank, Asian Development Bank, and Agence Française de Développement (AFD) (MONRE, 2021). At COP 26 in Glasgow, MONRE and AFD released an extensive report on the climate risks facing the nation, their impacts, and adaptation planning (MONRE & AFD, 2021). That report is referenced in this section along with a number of others that demonstrate both the physical and transition risks confronting Vietnam.

2.1 Physical Risks

Depending on the emissions pathway followed, temperatures in Vietnam could rise over 3°C by late in the 21st century (IPCC, 2018). Global warming is poised to increase the severity of the natural hazards that Vietnam already faces.

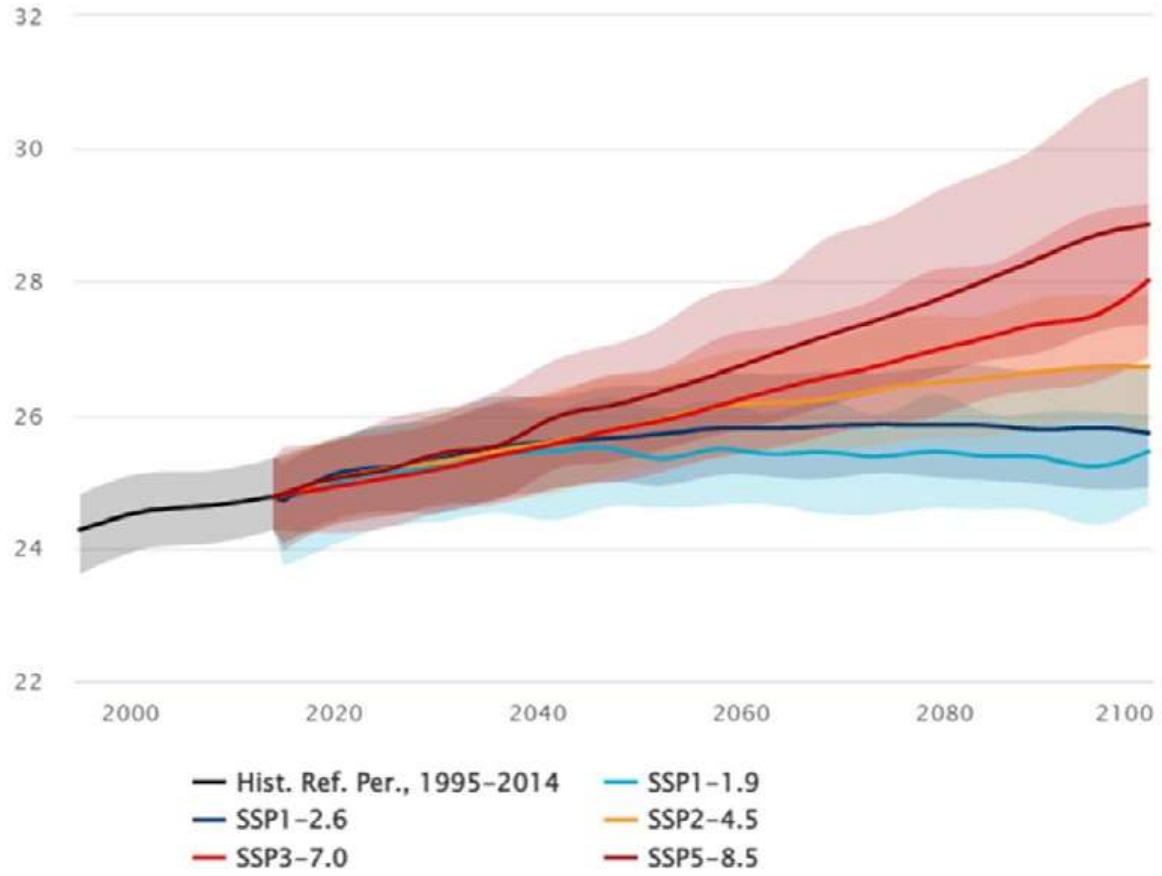

Figure 4: Average annual temperature (°C) under different emissions scenarios

During the decade of 2001–2010, typhoons, floods, droughts, and landslides claimed 9500 lives in Vietnam and caused losses equivalent to 1.5% of GDP (ClimateLinks, 2017). In a warming world, these hazards are likely to grow more severe. Rising sea levels and stronger storms can make floods more devastating. Increased temperatures may also produce consequences from productivity loss due to heat waves to the expanding range of tropical disease vectors.

According to the 2021 report of MONRE and AFD, increasing climate variability has the potential to disproportionately harm agricultural incomes, especially during times of high temperature (MONRE & AFD, 2021). In addition, the higher temperatures have been shown to reduce productivity and revenues for factories and workers, which is a non-lin- ear effect (higher temperatures have even more significant effects on the workforce) (MONRE & AFD, 2021).

The most prominent hazards are covered in more detail along with a separate discussion of their economic implications.

Flooding

Flooding represents the largest climate-related risk facing Vietnam, today accounting for an estimated 97% of average annual losses from hazards (World Bank, 2021). At present, millions of people live within flood zones, with major urban areas of Ho Chi Minh City and Haiphong barely above sea level. A visualization of Vietnam's population density in Figure 5 demonstrates why flooding has the potential to cause massive disruption (ClimateLinks, 2017).

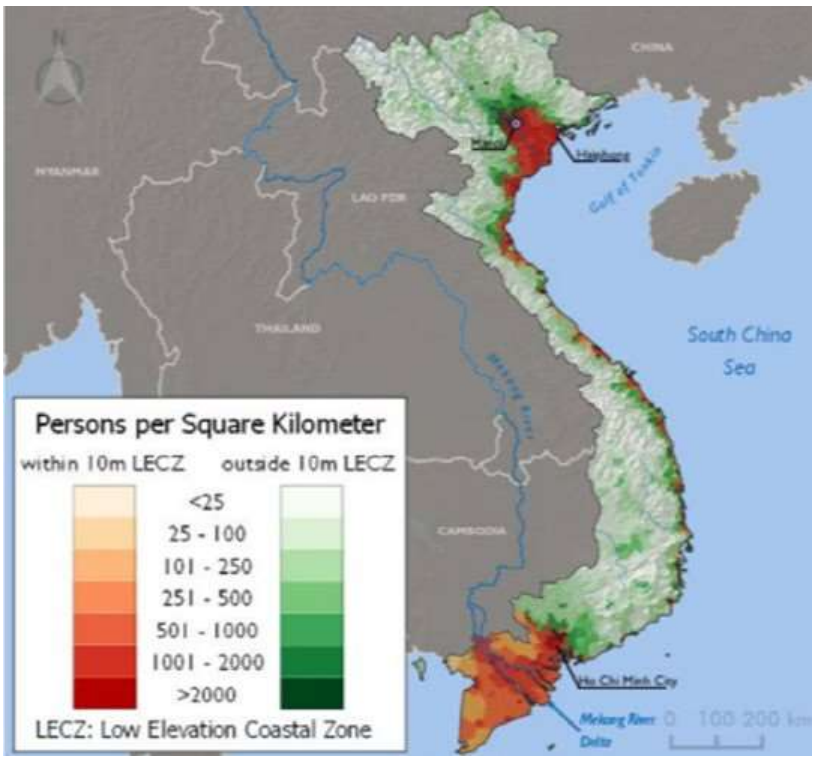

Figure 5: Population density in coastal areas

Flooding is not confined to urban areas but can also affect the Mekong Delta and Red River Delta, Vietnam's primary agricultural regions (IPCC, 2018). Riverine flooding has the potential to damage crops and drive population displacement. Without adaptation, 9% of GDP may be at risk from a 1-in-100-year flood that hits the Red River Delta (Neumann et al., 2015). The Mekong Delta is the third largest delta on Earth, is home to 17 million inhabitants, and provides over half of Vietnam's rice production (much of it exported). Disruptions in the region can have both domestic and international consequences on food availability (MONRE & AFD, 2021).

In the Mekong Delta and across the country, there is an urgent need to develop resilient infrastructure and manage the risks of catastrophic floods and climate change.

Sea level rise

Unfortunately, global warming will bring rising sea levels, with the IPCC estimating that global sea level may rise over 1 meter this century (IPCC, 2018). Rising seas will threaten the coastal cities and make current flooding significantly worse. In addition, rising sea

levels create other threats such as saltwater intrusion, where seawater can infiltrate freshwater aquifers, hurting agricultural productivity and threatening water supplies.

Tropical cyclones

Warmer sea surface temperatures increase the energy available for the formation of tropical storms and may make those storms stronger (IPCC, 2018). Cyclones are already a major cause of flood damage in Vietnam, with the nation experiencing nearly 100 storms from 1990–2020 (World Bank, 2021). Higher sea levels coupled with stron- ger storms will drive storm surges further inland. In addition, climate models suggest increased precipitation in Vietnam, which is likely to worsen the severity of damaging storms and their resultant floods (World Bank, 2021).

Heatwaves

As a tropical country, Vietnam already experiences temperatures well above the global average. The number of extremely hot days will only increase with global warming. Heat waves become more frequent under higher emissions scenarios, but even with current warming, Vietnam is likely to experience an increase in their frequency. Globally, Hanoi and Ho Chi Minh City are two of the most at-risk metropolises from experiencing heat stress (Matthews et al., 2017). Heat stress can reduce economic output, reduce agricul- tural productivity, increase energy expenditures, and threaten human health. Even small rises in average temperatures have the potential to cause higher numbers of danger- ously hot days (World Bank, 2021).

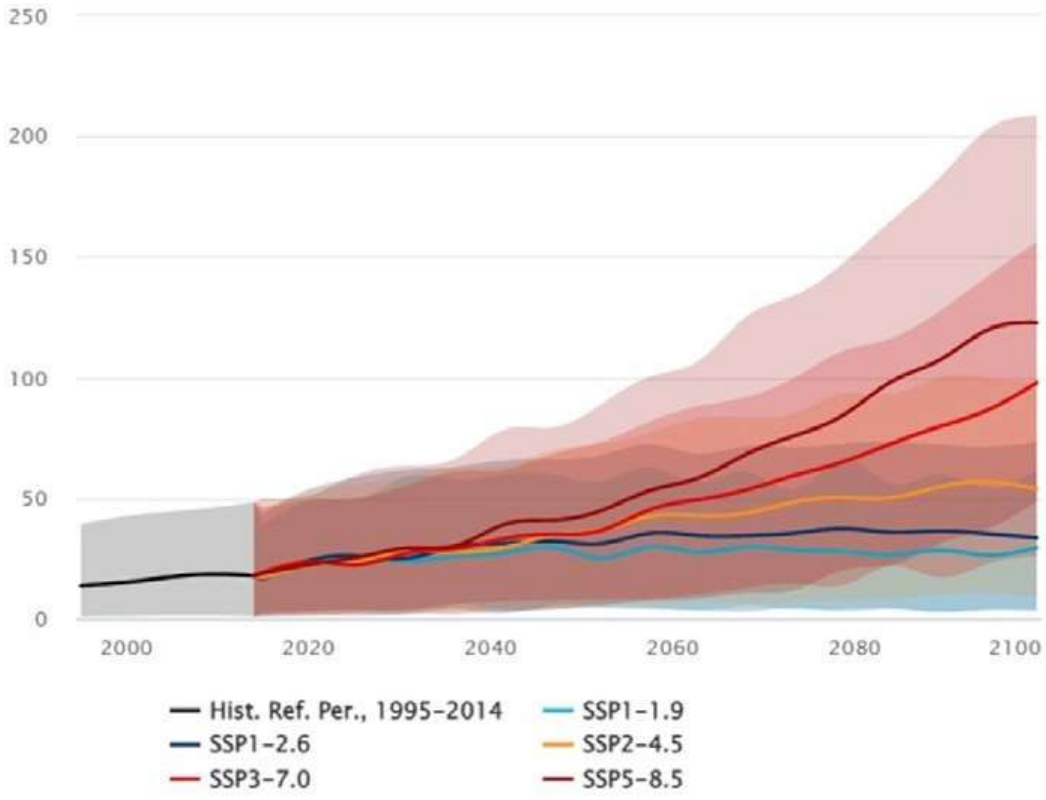

Figure 6: Number of extremely hot days (above 35°C) under different emissions scenarios

With Vietnam's humid environment, the effects of high temperatures are amplified.

Droughts

Despite high levels of precipitation, in certain parts of the country, climate change has the potential to cause increased droughts. Although climate change will cause an increase in rain overall, existing rainfall patterns may change. At higher levels of warming, certain drought events may occur more frequently than they presently do (IPCC, 2018).

Sector hazards

The climate-induced phenomena noted above have the ability to impact economic activ- ity in a variety of ways. Some of these potential effects can be seen in Figure 7, below (ClimateLinks, 2017).

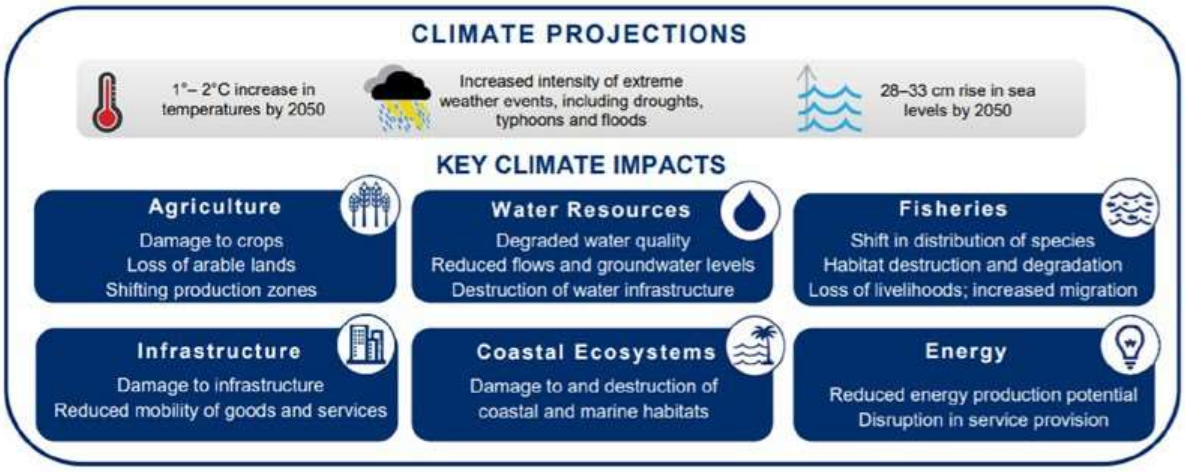

Figure 7: Climate change and sectoral impacts

Agriculture

Agriculture can be affected by rapidly evolving climatic conditions that can threaten yields. For many crops, yields will decline with rising temperatures in Vietnam. Heavier rainfall and runoff can also threaten the productivity of crops and heat waves can endan- ger farmers working in the fields. Weather-related shocks have been shown to reduce agricultural incomes (an effect that increases in magnitude at higher temperatures).

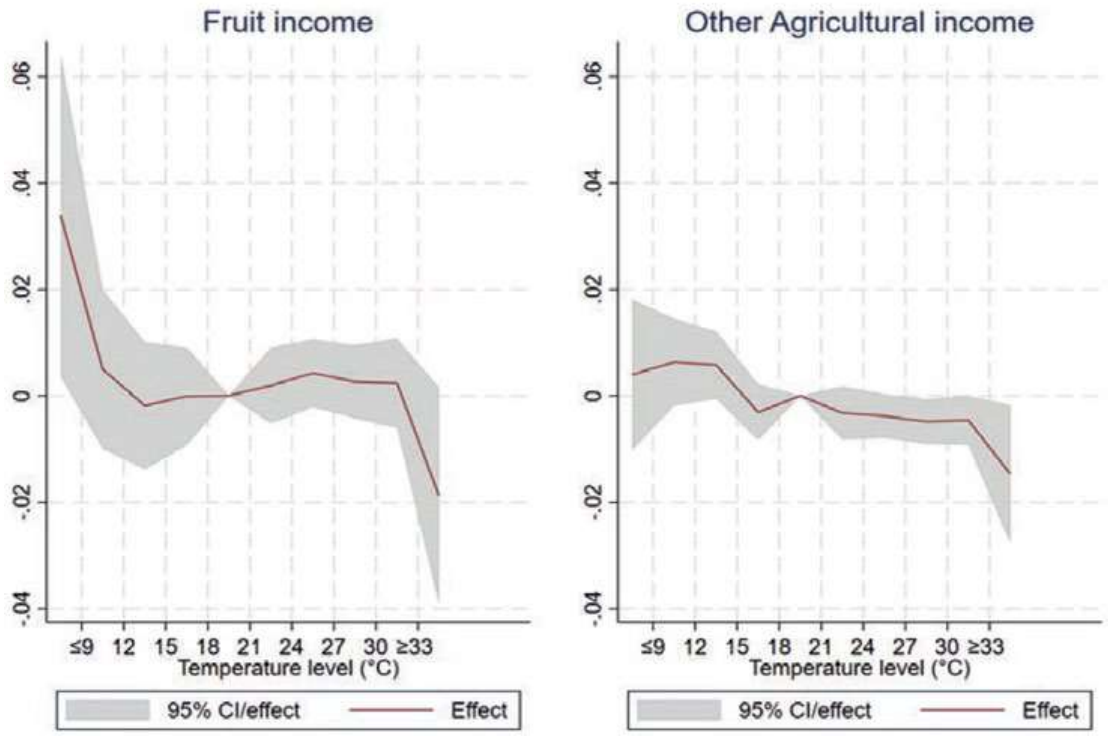

Figure 8: Effects of heat shocks on agricultural income

Source: **MONRE & AFD, 2021**

Aquaculture

Aquaculture will be affected by rising sea levels and increasingly powerful storms that can harm coastal ecosystems and hurt their productivity. Warmer water tempera- tures and ocean acidification can also reduce the productivity of these ecosystems as keystone species, such as coral, die off.

Infrastructure

Rising sea levels threaten coastal infrastructure with inundation. More powerful extreme events such as cyclones and floods can damage infrastructure across the country. The cost of maintaining viable infrastructure will increase as the climate grows more extreme.

Industrials

Industrial assets are subject to damages from extreme events such as cyclones and flooding that are expected to worsen with climate change. Climate change may also disrupt supply chains or cause changes in the availability of natural resources necessary for production processes.

Energy

Heat waves and higher overall temperatures will increase energy demand and potential stress on energy grids. In addition, certain energy sources such as hydropower may

become less productive under changing climatic conditions. Power plants that use large quantities of water may also face challenges depending on their location.

2.2 Transition Risks

Vietnam is a rapidly industrialising economy, with some of the world's highest growth rates over the past two decades. That development has seen movements from the countryside to the major urban areas, especially to the megacities of Ho Chi Minh City, Hanoi, and Haiphong. With greater economic output and higher living standards, Viet- nam has seen a rising demand for energy production. Energy production tripled from 2010 to 2020 (EIA, 2020). In addition, globalisation has seen Vietnam become a signifi- cant exporter of goods.

These developments are the hallmarks of an emerging economy, but also indicate that energy needs will continue to grow rapidly in the years ahead. Energy output is expected to double between 2020 and 2030 under current trends (EIA, 2020). Unfortunately, that may result in a significant increase in coal consumption and its accompanying air pollu- tion and climate effects.

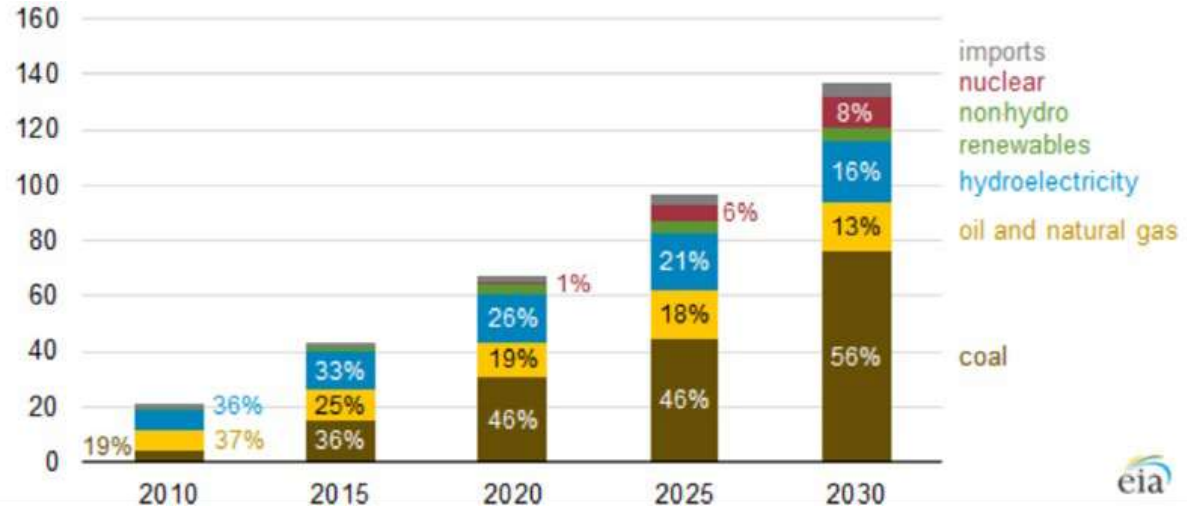

Figure 9: Vietnam's forecasted energy use

Source: **EIA, 2020**

However, the transition to a net-zero world is becoming increasingly urgent. Ever more countries are committing to net-zero targets and taking more assertive action on climate change. In the globally integrated economy, this presents challenges to rapidly growing, producer economies like Vietnam. There are a number of transition risks that firms in Vietnam will face during the transformation to a low-carbon world.

Policy risks

Vietnam is expected to raise its climate ambition in the next few years. One action that has garnered attention is the potential creation of a domestic emissions trading scheme (ETS) by 2025. ETS will limit emissions through the assignment of credits which can then be traded. For heavy industry and coal-powered energy production, the purchase of

these credits will be an additional cost to their businesses. Another policy under consid- eration is raised energy efficiency standards. For energy inefficient buildings and assets, capital expenditure on retrofits may be required to meet these new standards. These policies will also have many environmental and economic benefits, but emitters will face increasingly challenging conditions.

Technology risks

While coal use continues to grow, Vietnam's reliance on coal use and growing energy demand will put pressure on the deployment of new technologies to both decarbon- ize and meet rising needs. The falling cost of renewables means that they are increasingly cost-competitive with fossil fuels, but their deployment requires significant upfront investment. Furthermore, the early retirement of fossil fuel assets is undoubtably beneficial for the climate, but can pose challenges to major producers, their shareholders, and their lenders.

The imposition of a carbon tax both domestically and by importing nations will increas- ingly favour the use of low-carbon methods of production. In certain cases, there are opportunities to retrofit existing industrial assets for this low-carbon production, but in other cases new facilities may need to be created. The development of these new facilities may have impacts on the price of industrial goods while at the same time carbon prices may threaten the profitability of high-emitting incumbents.

Market risks

Under intensifying climate change or a disorderly transition, international relationships can be tested. Current examples are tensions between neighbouring states over the status of individuals fleeing climate impacts and increased protectionism as legacy industries face threats from the low-carbon transition. These forces can particularly affect exporter nations like Vietnam, as the rules of international trade continue to evolve. In addition, the carbon border adjustment policies of other decarbonising nations may have outsized impacts on Vietnam. Another risk comes from potential changes in inter- national investment flows as nations and institutional investors begin to restrict interna- tional funding of fossil assets.

3. Principles for disclosure

The purpose of disclosure is to provide decision-useful information to report users, which is an already established concept in corporate reporting. In terms of climate-re- lated disclosure, information is decision-useful when it is used by report users to make decisions about the reporting organisation. In particular, investors are looking for data that can inform their investment decisions allowing them to appropriately price risks and gauge opportunities so as to effectively allocate capital. To ensure information is decision-useful, reporting organisations should apply principles for effective disclosure.

Reporting frameworks include principles for effective disclosure that are designed to elicit high-quality and decision-useful disclosures that is useful to investors. In a chang- ing reporting landscape, with evolving reporting requirements and deeper understanding of the impacts of climate change, these principles establish foundational expectations that will help to maintain coherence and consistency in disclosure. When establish- ing the necessary internal structures and processes to identify, assess, manage and disclose climate-related risks and opportunities, these principles should be applied to ensure that the final information disclosed is reliable and complete.

The TCFD's principles for disclosure (Figure 10) seek to encourage the reporting of deci- sion-useful information that is clear, consistent, comparable and reliable. Together, these principles are designed to help reporting organisations connect climate-related issues to their financial reporting.

TCFD's Fundamental Principles for Effective Disclosure
Principle 1: Disclosures should present relevant information
Principle 2: Disclosures should be specific and complete
Principle 3: Disclosures should be clear, balanced, and understandable
Principle 4: Disclosures should be consistent over time
Principle 5: Disclosures should be comparable among organisations within a sector, industry, or portfolio
Principle 6: Disclosures should be reliable, verifiable, and objective
Principle 7: Disclosures should be provided on a timely basis

Figure 10: TCFD principles for disclosure

Source: **TCFD Final Report**

Transparency is an essential element of credible disclosure and information that is published should be reliable and objective, which means that it should be neutral and free from error. It should also be balanced by including success and progress, but also any negative climate impacts or lack of progress towards targets.

Disclosure also needs to be consistent and comparable. Applying a consistent approach to the collection and disclosure of data is key to achieving year-on-year comparability. For example, it would be difficult to understand the organisation's progress towards their targets if the methodologies applied to the calculation of the data is continuously updated or changed. Additionally, consistency is also expected between multiple organ- isations within a single reporting period, making them comparable within either their sector or geography. This can be achieved by using international or sectoral standards that promote consistent approaches across the market.

Additionally, data needs to be clear and understandable to the user to make it deci- sion-useful. By using plain language that is free from jargon and ensuring that reports are easy to navigate and read, organisations can effectively communicate with the intended audience.

Finally, data that is verifiable minimises the risk of misstatement or bias. Verifiable infor- mation is characterised as information that can be tested and confirmed. This can be achieved by providing supporting evidence of the data trail from source to final disclo- sure, including the systems and processes in place. By having robust and documented data structures and processes, organisations should be able to trace data to verify its accuracy and validate the conclusions.

Mainstream reporting and financial materiality

The "mainstream report", or "mainstream financial report", is the publicly avail- able annual reporting package in which organisations are required to deliver their audited financial results under the corporate, compliance or securities laws of the country in which they operate (CDSB, 2019a). The mainstream report is funda- mental to efficient capital allocation as it provides capital providers (i.e., investors and lenders) with material information about the performance, position and future prospect of an organisation.

Information as deemed material to capital providers "if omitting, misstating or obscuring it could reasonably be expected to influence decisions that the primary users of general purpose financial reports make on the basis of those reports, which provide financial information about a specific reporting entity." (IASB, 2021).

The TCFD also recommends that organisations preparing to disclose climate-re- lated financial disclosures should include this information in the mainstream report to enhance the understanding of climate-related risks and opportunities for capi- tal providers. They also note that the internal processes and controls used in the preparation and disclosure of mainstream reports should be applied to climate-re- lated information to promote rigour and credibility (TCFD, 2017).

It is therefore vital that disclosures of climate-related financial information are presented in the mainstream report alongside and connect to financial information.

4. Practical steps towards disclosure

This section provides guidance on how organisations can get started with the TCFD recommendations and each of the four core elements, including how to adjust or create internal processes, design action plans, and disclose relevant information in annual reports. Each section introduces practical actions the organisations can take, answers some frequently asked questions, and provides examples of different approaches taken by banks from around the world.

Financial institutions in Vietnam can use this guidance to build robust climate-related processes to appropriately identify and manage their exposure to the transition and physical risks outlined in Chapter 2 of this report. The suggested actions are illustrative, but it is important to note that each organisation is unique and has specific characteris- tics and context, including its size and structure. Therefore, each organisation will need to decide the best course of action and where to begin.

The table below provides an overview of the key questions that this guidance section seeks to answer. Each of the questions in the table are expanded upon with specific examples and/or detailed information to assist firms in developing their TCFD reports.

Table 1: Summary table of key questions

Sub-section or TCFD pillar	Key question
Getting started	Where should we begin?
	Who in the organisation should lead the implementation of the TCFD recommendations?
Governance	How involved should senior leadership be in this process?
	How do we engage with senior leadership on this topic?
	What does "good" corporate governance on climate-related matters look like?
Strategy	How do you identify material climate risks and opportunities?
	How do we start a scenario analysis?
	Which scenarios should be used in scenario analysis?
	What data should be used? And where can this data be found?
	Are there any resources that can help us start a scenario analysis?
	What are "transition" plans?
Risk management	What are the special characteristics of climate-related risks that need to be considered in the risk management process?

	How should climate-related risks be integrated into existing risk management processes?
	How are climate-related risks drivers of existing risks?
	Is there any guidance on climate-related risk management processes?
Metrics & targets	What metrics should we use?
	How do we collect and disclose material metrics?
	What GHG emissions should we calculate and disclose?
	What should our targets be?
	How do we obtain the data needed to report metrics and set targets?
Additional considerations	How much information should be disclosed?
	How can climate-related information be connected to financial information?
	What milestones should we follow in developing and writing our TCFD report?

4.1 Getting started

With a number of complex elements that reporting organisations need to consider in order to disclose decision-useful climate-related information, it can be difficult to know where to get started. Before meaningful climate-related information can be disclosed, an organisation must first consider the internal structures and processes and integrate climate assessment and management into its business activities. Figure 11 presents the practical steps companies might take to prepare for reporting information that is aligned with the TCFD recommendations. This diagram is based on the checklist for laying the groundwork for effective TCFD aligned disclosures—which highlights eleven preliminary steps organisations can take to integrate the TCFD recommendations and prepare for disclosure (CDSB & SASB 2019). Building on this checklist, this guidance will discuss these steps in more detail.

Figure 11: Practical steps towards implementation.

Source: **CDSB and & SASB TCFD Implementation Guide (2019).**

Where should we begin?

It is important to recognise that it will take time to implement all the elements of the TCFD recommendations, and therefore reporting organisations are not expected to complete everything immediately. Taking a phased and iterative approach towards implementation is a useful way to breakdown the elements into manageable parts, espe- cially when technical capacity and resources may be lacking. This iterative and phased approach will require a clear plan for implementation, which accounts for and manages the organisation's limitations by structuring the activities that need to happen across a defined timeframe. Ideally, this plan should be communicated in the disclosure to demonstrate where the organisation plans to address gaps in disclosure.

In many cases, an organisation is not starting from zero and they should leverage exist- ing internal structures and processes, especially if they already include climate-related matters. By completing a gap analysis of existing processes and disclosures, organisa- tions can identify what is already in place and what needs to be amended or where new systems need to be established. When completing this gap analysis, organisations may ask the following questions:

- Does the board have a delegated sustainability/CSR committee that could include climate-related risks and opportunities in its oversight mandate?
- What is the existing enterprise-wide risk management process? How can this be adapted to include climate-related risks, or does a new process need to be developed?
- Are you already capturing climate-related data? If yes, how can this data be used for the purpose of TCFD reporting?

- Do you report to CDP or other reporting frameworks? CDP has aligned their questionnaire to include the TCFD recommendations, and other reporting organisations, including the Global Reporting Initiative (GRI) and VRF, have also mapped their resources to the TCFD recommendations.

Another consideration concerns which teams will be involved in the drafting and development of the TCFD report. As the TCFD framework aims to provide perspectives on the management of climate risks and opportunities throughout an organisation, many different groups will have important inputs into the reporting process. These include senior management (discussed below), business line staff, modelling teams, and many others. However, when it comes to the drafting of the report itself, a few specific teams are typically given responsibility for its compilation. Depending on the organisation, teams responsible for drafting TCFD reports are usually part of the sustainability or the risk function. More specifically, enterprise sustainability risk management (ESRM) and climate risk functions are commonly involved in the development of the report. Where these dedicated teams are not yet established, TCFD report drafting becomes a part- time responsibility of a diverse set of sustainability and risk colleagues.

Who in the organisation should lead the implementation of the TCFD recommendations?

Climate-related matters are often characterised as an ESG issue, and therefore are placed within sustainability functions to manage. However, the TCFD recommendations cover and connect different business functions and will therefore require input across the organisation. For example, alongside the sustainability function, the finance and accounting, and risk management functions will need to be involved in implementing the TCFD recommendations. Ultimately, who "leads" on the implementation of the TCFD will depend on the organisation's structure and technical capacity and should be addressed across the organisation rather than in just one department.

Organisations should consider forming an internal working group to bring together other functions and departments. Different professional experience and skills, as well as differ- ent working knowledge of the business, are key in understanding the organisation's exposure to climate-related risks and can improve the organisation's overall approach to climate-related risk. If the organisation has different divisions, it would be prudent to also include representatives who understand each of the business units to ensure all elements of the business are considered during implementation process.

Different organisations may take different approaches to setting up internal working groups, including "top down" approaches where senior leadership direct the strategy, or "bottom-up" approaches where functions and departments come together to develop a plan. In either approach, it is important to establish a climate/TCFD "Champion", prefer- ably in senior management or on the board, who can set the tone from the top and lead on setting and approving the TCFD implementation strategy.

4.2 Governance

To demonstrate organisations are adequately addressing climate-related risks and opportunities, it is important for organisations to report the role of the board and senior management in overseeing and managing these issues, including whether they are given appropriate attention in decision-making processes. Within the recommendations, the TCFD distinguishes between climate-related oversight and management, which are both important for investors to make assessments about the level of engagement throughout the organisation.

Not only should organisations disclose how involved the board and senior management are in identifying, assessing, and managing climate-related risks and opportunities, but they should also demonstrate how these issues are incorporated when setting the busi- ness strategy, major plans, risk management policies, and annual budgets. These issues should also be incorporated when reviewing and making decisions on the organisation's performance objectives and major financial plans, including significant capital expendi- tures, acquisitions, and divestitures.

The TCFD recommendations and reporting requirements for governance are structured as follows:

Disclose the organisation's governance around climate-related risks and opportunities.	a) Describe the board's oversight of climate-related risks and opportunities.
	b) Describe management's role in assessing and managing risks and opportunities.

How involved should senior leadership be in this process?

Ultimately, senior leadership, including the board and senior management (i.e., execu- tives), is accountable to shareholders for the long-term resilience of the business, includ- ing its response to climate change.

Although the TCFD have a specific requirement for governance disclosures, setting up effective governance structures and processes is important for all elements of the recommendations. Without senior leadership "buy-in", it will be difficult for the organisa- tion to embed all the elements of the recommendations and report on the outcomes to the market.

The board may not have day-to-day management responsibilities, but there is an expec- tation that, at the very minimum, they are aware of the potential financial implications of climate change for the organisation and are regularly informed about its performance and position. This will require clearly defined information flows and oversight mechanisms between the board, senior management and the wider business functions and units. This will include the frequency for which climate-related information is shared with the board and how often climate-related matters are included in their quarterly meeting agendas.

The senior management will likely have greater management responsibilities over these matters. The organisation should identify either an individual (e.g., CEO) or delegated management committee who has responsibility to manage climate-related matters across the business. Their responsibilities should include (but not limited to) oversight of the risk management process, strategic decision-making, and approving and monitoring targets and their associated metrics.

There should also be a clear internal governance structure in place, which also covers the wider business functions and units. This internal structure may include existing committees and functions, but may also include new, dedicated bodies to address these topics. The roles and responsibilities of those in the governance structure should have climate-related matters included in their mandates, which should be documented.

Board of Directors oversight

Governance of climate-related risks takes place at various levels throughout Bank of America, with ultimate responsibility resting with our Chairman of the Board of Directors and Chief Executive Officer. The Corporate Governance, ESG, and Sustainability Committee of the Board of Directors has specific responsibility for reviewing our activities and practices relating to ESG matters, including climate change. The Enterprise Risk Committee has primary responsibility for overseeing management's handling of material risks facing the bank and the implementation of the enterprise Risk Framework.

Each quarter the Enterprise Risk Committee and the full Board receive a summary of key risks facing the bank, including emerging risks. Climate change is a risk theme that is being actively monitored as part of this process.

Figure 10: CEO, Board of Directors and Management Level Oversight [19]

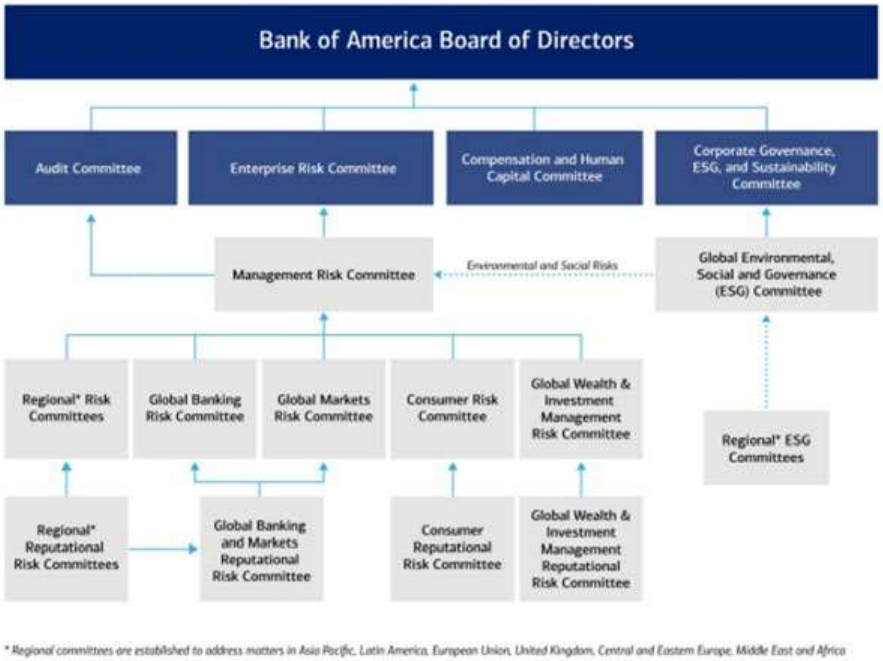

Figure 12: Example of governance structure.

Source: **Bank of America's TCFD Report (2020) on page 19.**

In their TCFD report, the Bank of America clearly state that climate-related risk is governed throughout the organization, but ultimately responsibility lies with the Chairman of the Board and the CEO. They then continue to discuss the roles and responsibilities of the Corporate Governance, ESG, and Sustainability and the Enterprise Risk Committees, in addition to details about how often the two committees receive information on key and emerging risks.

The diagram represents the entire climate governance structure, from the regional committees all the way up to the Board of Directors, with arrows to demonstrate flows of information.

How do we engage with senior leadership on this topic?

Having senior leadership involved and engaged in these processes is essential if an organisation is to successfully embed climate change into the organisation-wide governance and risk management processes.

Crucial to the engagement of senior leadership is education. At the very least, the board and senior management should be informed about the basics of climate change, its risk manifestations, and the potential implications to the business model and strategy. Given the complexity of climate change, it may not be that senior leadership become experts in this field, but it is recommended that they take the necessary steps to ensure they are sufficiently informed about the climate-related risks and opportunities that their business is exposed to.

Organisations may also decide to align incentivisation and remuneration policies with climate-related metrics and outcomes. This could entail an assessment to address where existing incentive schemes may need to be amended to ensure that they are aligned with the business-wide climate change strategy. Including climate-related matters into incentivisation and remuneration policies demonstrates the commitment and accountability of both the organisation and its senior leadership. When considering how to incorporate climate-related matters into these policies, the organisation may consider linking the incentivisation and remuneration policies to relevant benchmarks (e.g., CDP or DJSI) and the matters most pertinent to the organisation, reflecting the outcomes of its risk and opportunity identification process.

What does "good" corporate governance on climate-related matters look like?

There is already plenty of guidance to help organisations develop robust governance structures and processes on climate-related matters:

- World Economic Forum (in collaboration with PwC), How to Set Up Effective Climate Governance on Corporate Boards: Guiding principles and questions
- Commonwealth Climate Law Initiative, The climate risk reporting journey: A corporate governance primer

- World Business Council for Sustainable Development, Modernizing governance: ESG challenges and recommendations for corporate directors
- International Corporate Governance Network, ICGN Viewpoint The Board of Directors & Climate Change

4.3 Strategy

Arguably this recommendation is central to the TCFD recommendations, asking organisations to identify climate-related risks and opportunities and further report on how these issues are likely to impact the overall business, strategy and financial planning. This information is critical to be able to assess the future performance and position of the organisation over the short-, medium-, and long-term, and to understand its resil- ience against a range of plausible future events.

This recommendation asks organisations to assess the implications of climate change on the organisation's overall strategy. It may be the case that after identifying and assessing these risks and opportunities, the organisation may choose to set a climate strategy or transition plan to respond to these issues.

A key part of the TCFD recommendations, and the strategy recommendation itself, is that organisations should not only look at their past and current performance, but also the future outlook by conducting scenario analysis. Scenario analysis is a tool for stra- tegic decision-making, whereby organisations assess the resilience of their strategy against different scenarios and assumptions of the future. The results from the analysis should therefore be used to formulate mitigation and adaptation measures to ensure the organisation is prepared for a range of plausible but uncertain outcomes.

The TCFD recommendations and reporting requirements for strategy are structured as follows:

Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.	a) Describe the climate-related risks and opportunities the organi- sation has identified over the short-, medium-, and long-term.
	b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning.
	c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

How do you identify material climate risks and opportunities?

The TCFD requires organisations to identify the material climate risks and opportunities, and the financial impacts these may have on the business. To identify these risks and opportunities, the organisation may initially conduct qualitative research that considers the effects of climate change and decarbonisation within the context in which the organ- isation operates, including the geographical, regulatory and sectoral contexts that might create or exacerbate their exposure to risks and opportunities. For the banking industry this should include the geographical and sectoral composition of their lending portfolio and other financial risks. Each organisation is unique and will be exposed to specific risks and opportunities based on these contextual factors, and by identifying them at the beginning of the process, the organisation will be able to focus any assessment on the risks that are most important to the organisation.

Identifying climate-related risks and opportunities will require both an assessment of past climate-related trends, in addition to reviewing current scientific evidence of the future effects of climate change—both transition and physical risks. The TCFD cate- gorises climate-related risks into two groupings (physical and transition risks), which are further categorised (Table 2). Organisations should use these categories to identify material risks, and can use the questions in the table below as a starting point.

Table 2: Climate-related risks and key considerations.

Risk category	Risk description	Considerations for organisations
Transition risks Transition risks arise from the transition to a low-car- bon economy. This might include impacts resulting from policy, legal, technol- ogy and market changes. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of finan- cial and reputational risk.	Policy and Legal Risks These risks include policies that attempt to restrict actions that adversely contribute to climate change. For example, the introduction of carbon-pricing mechanisms could present financial risk if it significantly increases operating costs. Addi- tionally, legal risks relate to litigation actions against organ- isations that fail to manage or mitigate their contribution to climate change.	What are the national climate targets of the countries in which you operate and invest in? Are there any current, or expected, regulatory requirements or policies in the countries in which you operate? Is there any exposure to carbon pricing across the different regions in which you operate, and how will this evolve? Are you exposed to any activities, directly or through the lend- ing portfolio, that could be the target of litigation?
	Technology Risk Technological developments are crucial to meet international climate goals and to enable the transition to a low-carbon economy. This may have adverse impacts on organisations, especially in relation to the speed in which new technologies are developed and deployed.	Are you exposed to expected technological changes, espe- cially through financing activities? How will your portfolios be impacted by the cost competitive- ness of coal against renewable technologies as they continue to develop? Do you finance sectors, such as transportation and agricul- ture, that may be disrupted by increasing use of low-carbon technologies?
	Market Risk There are several ways in which markets could be affected by climate change, including shifts in supply and demand for certain commodities, products, and services.	Are the products and services you offer considered in line with international climate change commitments? How will consumer demand change, and what will this mean for your revenue streams?
	Reputation Risk Changing customer perceptions could lead to reputational risks, especially in relation to the policies and actions taken that may contribute or detract from the transition to a low-carbon economy.	How are you communicating the current and planned activi- ties you are taking towards positive climate action? What is the composition of your portfolios in relation to differ- ent sectors, and are there any that could be stigmatised?

Risk category	Risk description	Considerations for organisations
Physical risks Physical risks arise from the changes in weather patterns and long-term climate. These risks can be event driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for organisations through direct damage to assets or through impacts from supply chain disruption.	Acute Risk Acute physical risks refer to those that are event-driven, including extreme weather events, such as cyclones, hurricanes, or floods. These risks are usually seasonal events, that might increase in severity and frequency due to changes in atmospheric conditions.	What is the composition of financing portfolio in relation to geographical spread? Are there any locations that are more exposed to physical risks? How might these risks affect borrower's default risk, and is this currently being considered in lending policies?
	Chronic Risk Chronic physical risks refer to longer-term shifts in climate patterns due to global warming, which may cause sea level rise or chronic heat waves.	

Source: **Adapted from TCFD (2017)**

It is common for companies to focus primarily on risk. However, climate change and the transition to a low-carbon economy may offer opportunities that could influence busi- ness-wide strategies and financial planning processes. For banks, this may relate to the growing demand for sustainable finance products and services, including green bonds and loans, that focus on providing capital for decarbonisation technologies or low-carbon infrastructure. These products are becoming increasingly competitive, and banks can position themselves to not only benefit from these but can also influence and help client adapt to low-carbon expectations. In Vietnam, there are a number of opportunities associated with transitioning to renewable energies as demand increases for financing infrastructure projects and the development and deployment of new technologies.

Risk subtype	Risks associated with climate change	Risk description	Time horizon ST: <4 years MT: 4-10 years LT: >10 years
Legal and regulatory	Increase in the cost of CO_2 emissions	Financial risk to BBVA clients whose liquidity or earnings could be harmed from having to face higher costs or, alternatively, higher investments in emission neutralization, resulting from regulatory changes	ST
		Increased cost of direct emissions from the Bank in its operations	ST
	Increase in monitoring and tracking requirements	Increased staffing and economic resources for the study and monitoring of the Group's clients, and tracking of their compliance with environmental requirements	ST
	Changes in the regulation of existing products and services	Uncertainty for financial agents regarding changes and their implementation	ST
		Impairment of client asset positions due to the generation of stranded assets (assets that prior to the end of their economic life are no longer able to earn an economic return)	MT
		Sales drop due to adjustments to offerings, to align with new legal specifications for a product	MT
	Increase in regulatory capital requirements due to risk associated with climate change	Possibly different prudential treatment of financial assets in terms of risk-weighted assets based on their exposure to physical and transition risks	MT
		Adverse regulatory changes that may cause certain exposures on BBVA's climate change balance sheet to have higher capital consumption	ST
	Risks of environmental lawsuits	Possible lawsuits against BBVA for not complying with environmental regulations in its business or supply chain	ST
	Risk of lawsuits against third parties	Potential lawsuits for environmental crimes against BBVA clients. BBVA could be impacted by its clients' loss of solvency resulting from an increase in litigation costs	ST
Technological	Replacement of existing products and services with lower-emission alternatives	BBVA clients with a position in sectors that are outperformed by alternative technologies could suffer solvency problems and their ability to cope with their credit commitments could be diminished	ST
	Failed investment in new technologies	Clients that invest in failed technology may go through solvency difficulties and be unable to meet their credit commitments	ST
	Cost of transitioning to low-emission technology	The investments which BBVA clients need to make to change their production models can be an opportunity but they can also negatively impact the balance sheet structure or profitability of said clients if not done properly. On the other hand, the necessary R&D investments could undermine the clients' ability to meet their commitments	ST
		Costs of investing in remodeling and adapting BBVA-owned buildings	ST

Figure 13: Example of climate-related risks.

Source: **BBVA Report on TCFD (2020) on page 18.**

BBVA have identified climate-related risks in line with the categorisation set out by the TCFD recommendations. The risks have been presented in an easy to navigate table, including a description of how these risks impact the business. This table is also helpful as each risk has been mapped to a time horizon, which is clearly defined in the table heading.

How do we start a scenario analysis?

Conducting a scenario analysis is complex and will take time to complete. The ultimate goal is for organisations to use scenario analysis to assess the organisation as a whole, including the value chain. However, for those new to scenario analysis, it is often prac- tical to begin with an analysis that has a focused scope. For example, following desk- based research or suitable guidance, the initial analysis may focus on the impacts of a specific risk, geographic region, critical business unit or segment of a portfolio.

It is important to recognise that completing scenario analysis is an iterative process and organisations should expect to develop and improve the analysis on a regular basis to reflect scientific and regulatory developments, particularly as warming trajectories play out in the real-world. Initial scenarios may also begin with qualitative narrative scenar- ios to enable the organisation to explore the range of potential climate change impacts. More sophisticated analysis can then use quantitative models and datasets to begin to address the financial implications of different warming scenarios.

Which scenarios should be used in scenario analysis?

The TCFD recommend that organisations should use multiple scenarios to capture a wide range of assumptions about uncertain future outcomes. The scenarios that are chosen will depend on the scope and objective of the analysis.

In particular, organisations should include scenarios that represent different warming pathways, which might include 1.5°C, 2°C, 3°C or 4°C scenarios, across multiple time horizons. These different warming pathways may each be associated with a range of different transition pathways (e.g., steady and consistent action or delayed and drastic action). By exploring a wide variety of futures and different pathways, organisations will better understand the range of possible outcomes and therefore be able to develop the most effective and efficient strategies.

Some believe that a single scenario can be used to model all climate-related risks, includ- ing both physical and transition risks. However, this is a common misconception as these risks are distinct and will require different data inputs, and therefore should be considered independently of each other. Transition risk scenarios need to consider a wide range of data about future technological developments, energy outlook, and macroeconomic assumptions. Physical risk scenarios are equally complex as they model a large number of variables to understand changes in atmospheric conditions on a global scale.

A set of scenarios that might be particularly helpful are the suite scenarios developed by the NGFS. These scenarios are designed to provide data on both transition and physical risks, and the associated economic impacts (NGFS 2020).

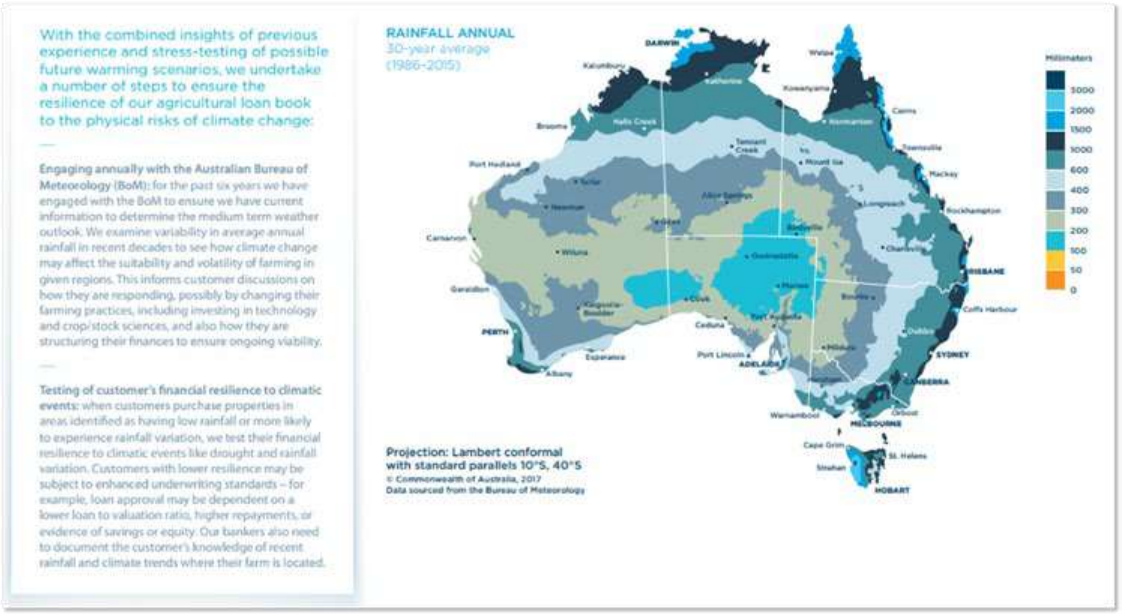

Figure 14: Example of physical scenario analysis.

Source: **ANZ Climate-Related Financial Disclosure (2020) on page 7.**

In this example, ANZ have focused the scenario analysis on the agricultural loan book and the future impact from changes in weather patterns, particularly in rela- tion to drought and rainfall variations. ANZ describe the working relationship with the Australian Bureau of Meteorology who provide the data, and how customers are evaluated in terms of financial resilience to extreme weather events.

What data should be used? And where can this data be found?

When conducting scenario analysis, decision-useful outputs depend on having good data inputs. This means organisations should consider the range of data needed to be able to conduct comprehensive risk assessments. For example, scenario data should be sourced from credible providers of climate transition scenarios, such as those used by the NGFS and included in IPCC reports. Within these scenarios, macro-level data inputs are helpful to allow the organisation to assess the risks in the context of global models, but additionally data on the impacts of climate on local areas allows organisations to obtain granularity in the assessment.

There are a number of freely available data sources which can be used to assess the future climate-related impacts. These include both sources for physical risk and transi- tion risk data at global, regional, and national levels of granularity.

Table 3: Physical risk data resources

Data Source	Physical hazards covered	Geographical Coverage
CDP Open Data Portal	Storms, extreme heat, sea water intrusion, drought, flood, forest fire	Global coverage of CDP cities
Climate Central	Extreme sea levels, storm surge data, high tide events, coastal flooding, sea levels changes and severe winds	Global
ClimateAnalytics Climate Impact Explorer	Temperature rise, seasonal precipitation, sea level rise, extreme weather events, such as floods, droughts and heat waves	Global, country level data included as well
GFDRR ThinkHazard!	Extreme heat, flood, earthquake, landslide, sea level rise, water scarcity, wildfire	Global
Google dataset search	Hurricane, sea level rise, temperature rise	Global
INFORM index	Variety of quantitative factors and resources to support physical risk assessments	Global
IPCC Assessment Report 6: Impacts, Adaptation, Vulnerability	Latest report on impacts of physical hazards, adaptation, and vulnerabilities to climate change	Global
IPCC Assessment Report 6: The Physical Science Basis	All major physical risk hazards covered in report	Global
KNMI—Climate Explorer	Temperature, droughts, cyclone, precipitation	Global
Oasis Hub	Flooding, cyclone, earthquake, extreme weather, landslide	Global
PREPdata	Temperature rise, precipitation, coastal risk, water risk and other extreme events	Global coverage with low granularity for specific countries
UNEP Global Risk Data Platform	Tropical cyclones, storm surges, drought, earthquakes, fires, floods and landslides	Global
World Bank Climate Change Knowledge Portal	Temperature rise, seasonal precipitation, sea level rise, extreme weather events, such as floods, droughts and heat waves	Global
WRI Aqueduct Water Risk Atlas	Water risks, including flood and drought risk	Global
UNFCCC Adaptation and Resiliency Resources	Database of databases on relevant adaptation and resiliency studies and measures	Global and national

Table 4: Transition risk data resources

Data Source	Transition Risks Covered	Geographical Coverage
CAIT Climate Data Explorer (by WRI)	GHG emissions, emission pathways, pledges, targets	Global
CDP Open Data Portal	GHG emissions	Global
En-ROADS simulator	Different emissions pathways and drivers of tempera- ture rise	Global
Greenhouse Gas Protocol	Product life cycle and corporate value chain (Scope 3) GHG inventories	Global
IEA Net Zero by 2050 scenario	Policy, technology, and market risks based on the IEA's net zero by 2050 scenario	Global, breakouts by region at a high level
IIASA scenario explorer	Policy, technology, and market risks based on a wide range of IPCC 1.5° C scenarios	Global, regional, and national at varying degrees of specificity
IMF World Economic Outlook	Macroeconomic forecasts/scenarios that can be used to understand potential policy, technology, and market shifts	Global, regional, and national
IPCC emissions factor database	Emission factors for various activities	Global with some regional variation
NGFS scenario portal	Policy, technology, and market risks based on the NGFS scenarios	Global, break- out into specific regions and national level downscaling
SENSES project on climate scenarios	Policy, technology, and market risks based on a wide range of IPCC 1.5° C scenarios	Global
The Carbon Moni- toring for Action (CARMA) database	GHG emissions estimates for power plants	United States, European Union, Canada, India, and South Africa and data from the Inter- national Atomic Energy Agency
The Lowdown v2.0	Coal capacity for countries	Global
UN data	Methane, Carbon dioxide, HFCs, Nitrous oxide, Nitrogen trifluoride, PFCs, Sulphur hexafluoride	43 countries however data is only available for 29 years

Are there any resources that can help us start a scenario analysis?

Literature helping institutions to conduct scenario analysis has increased greatly since the release of the TCFD recommendations. In particular, UNEP FI have produced a number of reports to assist financial institutions in conducting scenario analysis, including:

- Extending our Horizons: Assessing Credit Risk and Opportunities in a Changing Climate (Part 1: Transition-related risks and opportunities)
- Navigating a New Climate: Assessing Credit Risk and Opportunities in a Changing Climate (Part 2: Physical-related risks and opportunities)
- Charting a New Climate: State-of-the-art tools and data for banks to assess credit risks and opportunities from physical climate change impacts
- The Climate Risk Landscape: Mapping Climate-related Financial Risk Assessment Methodologies
- Pathways to Paris: A Practical Guide to Climate Transition Scenarios for Financial Professionals
- Decarbonisation and Disruption: Understanding the Financial Risks of a Disorderly Transition using Climate Scenarios

Within the Climate Risk Landscape report, UNEP FI profiled a number of third-party data providers whose tools assist financial institutions in making transition and physical risk assessments. The list of tools below is non-exhaustive.

Table 5: Selected list of physical risk tools

Service provider	Tool
BlackRock	BlackRock's Aladdin® platform
Carbon Tracker	2 Degrees of Separation
CLIMAFIN	Climate Risk Assessment Platform
ISS ESG	Physical Risk Solution
JBA Risk Management	Climate Change Flood Model
McKinsey / Planetrics	Planetrics' PlanetView Platform
Moody's/RMS	Climate Solutions
Morningstar Sustainalytics	Physical Climate Risk Metrics
MSCI Inc.	Climate Value-at-risk
Munich Re	Location Risk Intelligence
Ortec Finance	Climate PREDICT
PricewaterhouseCoopers GmbH	Climate Excellence Physical Risk
S&P (The Climate Service)	Climanomics
SAS	Climate Risk Offering
South Pole	Climate risk deep dive assessment
Sust Global	Climate Explorer
Willis Towers Watson	Bespoke Physical Risk Analytics
XDI Systems	XDI Hub
1in1000 Initiative 2°Investing Initiative and the Oxford Sustainable Finance Group at the University of Oxford	PRISK module

Table 6: Selected list of transition risk tools

Service provider	Tool
BlackRock	BlackRock's Aladdin® platform
CLIMAFIN	Climate Risk Assessment Platform
Entelligent	T-Risk
ICE	Climate Transition Analytics Platform
ISS ESG	Transition Value at Risk
McKinsey / Planetrics	Planetrics' PlanetView Platform
Moody's/RMS	Climate Solutions
Morningstar Sustainalytics	Low Carbon Transition Rating
MSCI Inc.	Climate Value-at-risk
Oliver Wyman and S&P	Climate Credit Analytics (CCA)
Ortec Finance	Climate MAPS in partnership with Cambridge Econometrics
PricewaterhouseCoopers GmbH	Climate Excellence Transition Risk
S&P (The Climate Service)	Climanomics
SAS	Climate Risk Offering
Willis Towers Watson	WTW Climate Transition Value at Risk
1in1000 Initiative 2°Investing Initiative and the Oxford Sustainable Finance Group at the University of Oxford	PRISK module

What are "transition" plans?

In the 2021 updated implementation guidance, the TCFD introduce the recommendation for organisations to produce transition plans. Where organisations have committed to reducing GHG emissions and/or have identified significant transition risks, they should describe the planned activities for meeting these commitments and transitioning to a low-carbon economy.

Connected to the organisation's overall business strategy, the transition plan should outline how the organisation plans to achieve their climate-related targets, including outlining any initiatives and activities the organisation is planning to take. Progress against these targets should be regularly monitored and communicated to the highest governing body that is responsible for approving and has oversight of the plan.

The TCFD have produced additional guidance to help organisations prepare and disclose transition plans.

4.4 Risk management

When trying to understand how an organisation oversees and manages climate-related risks, it is important to know what processes are used to identify, assess and manage these risks, and how these processes are integrated into existing organisation-wide risk management processes. This will enable investors to better understand and evaluate an organisation's overall risk profile and risk management activities.

Although climate change poses a unique risk to banks, they are expected to have a holis- tic view of climate-related risks, including how they interconnect and impact existing risk categories. It is therefore important that these risks are integrated into overall risk management processes. Without a robust and well documented approach to identify- ing, monitoring and managing climate-related risks, organisations may be unprepared for unexpected and sudden events that could impact their financial performance and position.

Where climate-related risks identification, assessment and management is new to an organisation, it might be prudent to ensure the risk function, including the governance structures that support the risk management process, have a foundational understand- ing of climate change and its potential impacts. There is no expectation that the risk function will be climate change scientists or experts, but they should obtain an appreci- ation of the complex, unique and system nature of climate change.

The TCFD recommendations and reporting requirements for risk management are struc- tured as follows:

Disclose how the organisation identifies, assesses, and manages climate-related risks.	a) Describe the organisation's processes for identifying and assessing climate-related risks.
	b) Describe the organisation's processes for managing climate-re- lated risks.
	c) Describe how processes for identifying, assessing, and manag- ing climate-related risks are integrated into the organisation's overall risk management.

What are the special characteristics of climate-related risks that need to be considered in the risk management process?

Climate change brings a unique set of special characteristics and complex variables that should be considered by the risk function as they begin to integrate climate-re- lated risks into existing risk management processes. For example, the effects of climate change are going to differ depending on the local, regional and global scales, and will also differ across different time horizons given the longer-term nature of climate change. Addressing these special characteristics when integrating climate-related risks may require organisations to adjust the existing processes and risk policies to ensure it is fully comprehended.

The table below demonstrates some of the important characteristics that risk functions should be aware of.

Table 7: Special characteristics of climate change. Source: Adapted from TCFD (2020).

Special characteristics	Impact on risk management processes
Geographical differences and business context	The manifestations of climate-related risks will occur at different local, regional, and global scales, with varying impacts depending on the geographical areas. This will also be compounded by the context in which the organisation operates, including the types of products and services it offers, the markets it operates in, location of operations, and extent of value chains. The risk management processes therefore need to be able to deal with risks that manifest across different locations and scales, whilst also addressing the organisation-specific circumstance. The organisation may also set criteria in the risk policies to identify specific business areas that are more exposed to transition and/or physical risks.
Time horizons	Climate-related risks are also expected to manifest across time horizons that go beyond traditional business planning and lending cycles. Risk management processes may need to be adapted to account for short-, medium- and long-term time horizons to fully address the impacts of climate change.
Unique and uncertain	Climate change is a dynamic and uncertain phenomenon with no prece- dent and limited historical data, which limits the ability to apply statistical and trend analysis. In addition, the impacts of mitigation responses are also complex, with uncertainties around the development of new technol- ogies, governmental policies, and changes to consumer behaviour and demands. When considering future uncertainties, the organisation should utilise scenario analysis to review the impact of risks across multiple future conditions.
Non-linear dynamics	As already noted above, climate-related risks may manifest at different scales over time, with increasing severity and scope of impacts. Climate systems may exhibit thresholds and tipping points that result in large, long-term, abrupt, and possibly irreversible changes. Additionally, sudden physical climate events may lead to abrupt and disruptive policy changes. Understanding the sensitivities of tipping points in the physical climate system, as well as in ecosystems and society, is essential for understand- ing climate-related risks. The risk function should educate themselves on the non-linear dynamics of climate change, and ensure this is part of the risk assessment.
Complex and systemic	Climate-related risks are interconnected across socioeconomic and finan- cial systems, due to knock on effects and systemic impacts. Climate-re- lated risks can have direct impacts, but also indirect impacts requiring risk management process to adopt a multidimensional perspective to assess the implications for the organisation.

How should climate-related risks be integrated into existing risk management processes?

Existing risk management processes should already address the procedures used to identify, assess, manage and report material financial risks within the limits of its risk appetite framework. The usual steps used in these processes should also be applied to climate-related risk management, rather than creating a whole new set of procedures. However, some adjustments may be needed to the policies, risk limits and risk controls to ensure these processes can be adapted to capture the global and systemic nature of climate change.

Risk management process generally include the following steps:

1. Identifying the financial risks an organisation is exposed to.
2. Measuring the risks using pre-defined metrics.
3. Managing the risks, including deciding if the risks can be mitigated or accepted.
4. Monitoring risks with a frequency proportional to the size and the speed with which they can increase.
5. Reporting risks internally through the governance process, and externally disclose decision useful information to stakeholders.

To help integrate climate-related risks into risk management processes, the organ- isation should map climate change to the existing risk taxonomy to understand where climate change presents its own specific risks, and where it is a risk driver that impacts and exacerbates existing risk categorises. Once the organisation understands how climate-related risks can be included with the existing risk taxonomy, the organ- isation then should consider updating the risk inventory. This may include providing further details about what the risk is, how it is likely to impact the organisation, the risk responses, and who within the organisation has ownership of these risks.

Additional updates and adjustments may also be required. For example, the organisation may consider adjusting its risk appetite framework to include climate-related risks, and to set limits on lending to certain sensitive sectors, businesses or geographical areas that are highly exposed to these risks.

All these considerations mean that organisations need to consider how climate change is viewed and integrated into risk management processes.

This example from HSBC Holdings describes the risk management process, includ- ing plans to integrate climate risk into the Group-wide risk management frame- work and three lines of defence model. This disclosure also includes a description of how HSBC have reviewed their risk appetite to reflect climate-related risk. In addition, HSBC provide insight into the governance and management of risks by describing the board and management oversight.

Alongside the detailed description of the risk management processes, HSBC also provide a table to illustrate how climate-related risks might manifest across their existing financial and non-financial risk types. Each risk type is connected to a climate-related risk driver, and includes the definitions for short-, medium- and long-term time horizons. Further in the report, HSBC also provide additional infor- mation about each risk type and the processes used to identify, assess, manage and report on these risks.

In November 2020, we formalised our overall approach to climate risk management and developed plans to integrate climate risk into the Group-wide risk management framework through existing policies, processes and controls for our key climate risks. This includes aligning climate risk with our three lines of defence model to ensure robust oversight of climate risk.

We have also reviewed our risk appetite to reflect the risks from climate change, setting out the measures we intend to take to support our climate ambition and our commitments to regulators, investors and stakeholders.

Our approach to climate risk management is aligned with HSBC's Group-wide risk management framework, which follows five simple steps: define and enable, identify and assess, manage, aggregate and report.

This will ensure the Board and senior management have visibility and oversight of the climate risks that could have the greatest impact on HSBC. For example, we have established a transition risk framework to improve how we identify, assess and manage our exposure to high transition risk sectors, and we continue to engage with our customers to better understand and support their low-carbon strategies.

In 2020, we began reviewing our policies on sustainability risk, resilience risk and regulatory compliance to identify any gaps and help improve our understanding of how climate change is likely to impact these risks. For further details of this work, see pages 23 and 24.

A dedicated climate risk programme has been established to accelerate the integration of climate risk into risk management. The programme was approved in December 2020, and is one of the key risk investments for 2021. We will continue to embed our climate risk appetite and risk management framework across our businesses throughout 2021. An important strand of this work will involve exploring how to increase the availability and quality of data so that new metrics can be developed to strengthen how we assess and manage climate risks and opportunities.

TCFD sets out four main drivers of transition climate risk – policy and legal, technology, end-demand (market) and reputational – and two physical risk drivers – acute and chronic (see page 8 for the potential impact these may have on our customers). In the table below, we illustrate how this impact on our customers might manifest across our principle risk types, and the potential time frames involved.

Risk management framework

Risk type	Financial risks		Non-financial risk		
	Wholesale credit	Retail credit	Strategic risk (reputational)	Resilience risk	Regulatory compliance risk
Timescale	Short – long term	Medium – long term	Short – long term	Short – long term	Short – medium
Transition risk drivers					
– Policy and legal	◆	◆			◆
– Technology	◆				
– End-demand (market)	◆				
– Reputational	◆		◆		
Physical risk drivers					
– Acute – *increased severity of extreme weather*	◆	◆		◆	
– Chronic – *changes in weather patterns*	◆			◆	

1 Short term: less than one year; medium term: period to 2030; long term: period to 2050.

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Transition risk drivers					
– Policy and legal	◆	◆			◆
– Technology	◆				
– End-demand (market)	◆				
– Reputational	◆		◆		
Physical risk drivers					
– Acute – *increased severity of extreme weather*	◆	◆		◆	
– Chronic – *changes in weather patterns*	◆			◆	

1 Short term: less than one year; medium term: period to 2030; long term: period to 2050.

Figure 15: Example of risk management processes.

Source: **HSBC's TCFD Update (2020) on page 22–23.**

How are climate-related risks drivers of existing risks?

Although climate change is itself a risk, it is also a risk driver and multiplier which means that it will impact on existing financial risks. In this regard, within the existing risk management framework, organisations should ensure climate-related risks are mapped to the existing risk taxonomy and categories.

The table below demonstrates how both physical and transition risks could impact credit, market, operational and liquidity risks for banks.

Table 8: Climate change impacts on existing risk categories:

Risk categories	Effects of climate risk drivers
Credit risks	Credit risk increases if climate risk drivers reduce borrowers' ability to repay and service debt (income effect), or banks' ability to fully recover the value of a loan in the event of default (wealth effect). The probabilities of default and loss given default of exposures within sectors or geographies vulnerable to physical risk may be impacted, for example, through lower collateral valuations in real estate portfolios as a result of increased flood risk. Energy efficiency standards may trigger substantial adaptation costs and lower corporate profitability, which may lead to higher probabilities of default as well as lower collateral values.
Market risks	Reduction in financial asset values, including the potential to trigger large, sudden and negative price adjustments where climate risk is not yet incorporated into prices. Climate risk could also lead to a breakdown in correlations between assets or a change in market liquidity for particular assets, undermining risk manage- ment assumptions. Severe physical events may lead to shifts in market expectations and could result in sudden repricing, higher volatility and losses in asset values on some markets. Transition risk drivers may generate an abrupt repricing of securities and deriv- atives, for example for products associated with industries affected by asset stranding.
Operational risks	Increasing legal and regulatory compliance risk associated with climate-sensitive investments and businesses. The bank's operations may be disrupted due to physical damage to its property, branches, and data centres as a result of extreme weather events. Changing consumer sentiment regarding climate issues can also lead to reputa- tion and liability risks for the bank as a result of scandals caused by the financing of environmentally controversial activities.
Liquidity risks	Banks' access to stable sources of funding could be reduced as market condi- tions change. Climate risk drivers may cause banks' counterparties to draw down deposits and credit lines. Liquidity risk may be affected in the event of clients withdrawing money from their accounts in order to finance damage repairs. An abrupt repricing of securities, for instance due to asset stranding, may reduce the value of banks' high quality liquid assets, thereby affecting liquidity buffers.

Source: **Adapted from ECB (2020) and Basel (2021)**

For Societe Generale, climate-related risks do not form a new category of risks but constitute an aggravating factor of existing categories as credit, market, operational, insurance risks and liquidity risks. This is in line with the best practices published in 2020 by the French banking regulator (Autorité de contrôle prudentiel – ACPR)[25] and the European Central Bank *Guide on climate-related and environmental risks*[26].

Risk	Physical	Transition
Credit	Physical risk could increase customer' probability of default by directly damaging their assets in affected areas (as physical events could hit production facilities, warehouses, services and decisions centres) and indirectly impacting their business model by disturbing their supply chain, commercial routes or markets. In case of the customer default, physical risks could also make the Group ability to recover part of their commitment more difficult, for example through lower collateral valuations in real estate portfolios as a result of increased flood risk.	Transition risks, for sectors affected by low-carbon transition policies (higher price of carbon for example), could also impact customers' ability to generate revenues and meet their financial commitments if they do not take measure to adapt their business models or if they cannot finance the needed adaptations measures (as research and developments to develop low-carbon alternatives to products and services). Transition risks could also indirectly impact customers' assets valuation, for example by impacting the valuation of fossil fuels reserves such as coal or oil, whose value is expected to fall in a low-carbon economy perspective (stranded assets phenomenon). This could particularly impact collateral valuation.
Market	Severe physical events may lead to shifts in market expectations and could result in sudden repricing. For example, hurricanes impacting companies' premises in certain areas may impact market expectations on their ability to generate revenues, and so their share value.	Transition risks may generate an abrupt repricing of securities and derivatives, for example for products associated with industries affected by asset stranding.
Operational	Physical events could impact Societe Generale's own sites and the Group ability to keep on providing services to its customers.	Non-compliance with transition-related disclosure obligations could lead to legal proceedings and fines. Non-compliance with public commitments towards low-carbon economy transition could also generate a reputational risk who might stigmatize banks and generate a loss of revenues caused by customer shift. An additional reputational risk could also exist if a commitment would be perceived by external stakeholders as inappropriate or insufficient.
Insurance	Multiplication of physical events and of higher severity could impact IARD activity (*Incendies, Accidents et Risques Divers*) of which it is the object.	
	Physical and transition risks could impact the value of the assets in which insurance activities invest the money collected. As a result, a drop of those assets values because of transition risks could impact the ability of insurance activities to deal with its financial commitments.	
Liquidity	Multiplication of physical events causing physical damages to clients' properties could impact liquidity risk by pushing clients to withdraw money from their accounts in order to finance damage repairs.	The non-alignment of an institution's activities with the goals of the Paris Agreement could result in the deterioration of its extra-financial rating. Such degradation could then lead to the exclusion of its securities from the investment universe of asset managers.
	Also, sudden repricing of securities due to extreme weather events or abrupt implementation of carbon-restrictive policies may reduce the value of banks' high-quality liquid assets, thereby affecting liquidity buffers.	

Figure 16: Example of climate-related risks as drivers of financial risks.

Source: **Société Générale's Climate Disclosure Report (2020), page 27.**

Société Générale follow the guidance from the ECB to demonstrate how climate-related risk are considered an aggravating factor for existing risk categories including credit, market, operational, insurance and liquidity risks.

Is there any guidance on climate-related risk management processes?

There are a number of resources already available to provide guidance to organisations on risk management of climate-related risks. These include:

- Basel Committee on Banking Supervision, Climate-related risk drivers and their transmission channels
- Task Force on Climate-related Financial Disclosures, Guidance on Risk Management Integration and Disclosure

4.5 Metrics and targets

Metrics and targets are essential for organisations to be able to measure and monitor performance in relation to climate-related risks and opportunities. By disclosing these metrics and targets externally, organisations can demonstrate the extent of their exposure to climate-related risks and how they are managing these risks. These metrics can also facilitate consistency and comparability, especially between sectors.

Both qualitative and quantitative information is needed to ensure climate-related information is decision-useful. The disclosures under the governance, strategy and risk management core elements are often presented in narrative disclosures that describe and explain the risks and opportunities that have been identified, and the processes that were used to assess and manage these risks. However, these disclosures should be supported by figures to illustrate the extent of the risk exposure and the progress towards climate-related targets.

In the updated guidance released in October 2021, the TCFD included additional finan- cial metrics. These updates revised the guidance on metrics to include more explicit financial metrics that are cross-industry. Additional changes were made to the guidance on greenhouse gas (GHG) emissions to encourage all organisations to provide holistic disclosures. The guidance was also updated specifically for banks, requiring the disclosure of the extent to which their lending and other financial activities are aligned with 2°C (or lower) warming goals, and the disclosure of financed GHG emissions for lending and financial activities.

The TCFD recommendations and reporting requirements for metrics and targets are structured as follows:

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 green- house gas (GHG) emissions, and the related risks.
	c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.

What metrics should we use?

The TCFD recommend a set of cross-industry metrics that create a baseline for all reporting organisations (Table 9). Some may be less applicable to certain organisations, and reporting organisations are expected to identify which metrics are material to their business. Alongside these base metrics, the TCFD also provide additional metrics for the banking industry to address the impacts of climate-related matters on lending and other financial activities.

Table 9: TCFD recommended metrics, including banking sector specific metrics.

Cross-industry climate-related metrics	Example of unit of measure
GHG Emissions Absolute Scope 1, Scope 2, and Scope 3; emissions inten- sity1	MT of CO2e
Transition Risks Amount and extent of assets or business activities vulnera- ble to transition risks	Amount or percentage
Physical Risks Amount and extent of assets or business activities vulnera- ble to physical risks	Amount or percentage
Climate-Related Opportunities Proportion of revenue, assets, or other business activities aligned with climate-related opportunities	Amount or percentage
Capital Deployment Amount of capital expenditure, financing, or investment deployed toward climate-related risks and opportunities	Reporting currency
Internal Carbon Prices Price on each ton of GHG emissions used internally by an organisation	Price in reporting currency, per MT of CO2e
Remuneration Proportion of executive management remuneration linked to climate considerations	Percentage, weighting, description, or amount in reporting currency
Banking sector climate-related metrics	**Example of unit of measure**
Carbon-related assets relative to the total assets	Amount or percentage
The amount of lending and other financing connected with climate-related opportunities	Amount
The extent to which their lending and other financial inter- mediary business activities, where relevant, are aligned with a well below 2°C scenario	Implied temperature rise or warming potential

Source: **TCFD (2021c)**

The metrics that are chosen should reflect the material risks and outcomes of the scenario analysis and connect to the strategy. They should be used internally to influ- ence and monitor the strategy-setting and risk management processes, as well as be presented in the annual reports for investors to examine the organisations performance.

Climate-related metrics 2020

	For the year ended			% change from
	31.12.20	31.12.19	31.12.18	31.12.19
Risk management				
Identified significant climate-related financial risk on balance sheet[1]	None	None	None	
Carbon-related assets (USD billion)[2]	5.4	6.1	7.5	(10)
Proportion of total banking products exposure, gross (%)	*1.9*	*2.3*	*2.8*	
Total exposure to climate-sensitive sectors (USD billion)[3]	38.7	35.2	36.1	10
Proportion of total banking products exposure, gross (%)	*13.7*	*13.3*	*13.5*	
Weighted carbon intensity of Climate Aware strategies (in tonnes CO_2e per USD million of revenue)[4]	68.2	74.5	89.6	(9)
Compared to weighted carbon intensity of composite benchmark (%)[5]	*(51.0)*	*(54.0)*	*(54.0)*	
Number of climate-related shareholder resolutions voted upon[6]	50	44	43	14
Proportion of supported climate-related shareholder resolutions (%)	*88.0*	*81.8*	*88.0*	
Opportunities				
Climate-related sustainable investments (USD billion)[7]	160.8	108.0	87.5	49
Proportion of UBS clients' total invested assets (%)	*3.8*	*3.0*	*2.8*	
Total deal value in equity or debt capital market services related to climate change mitigation and adaptation (CCMA) (USD billion)[8]	69.8	52.7	31.6	32
Total deal value of financial advisory services related to CCMA (USD billion)	29.1	34.5	24.9	(16)
Number of strategic transactions in support of Switzerland's Energy Strategy 2050	11	12	8	(8)
Own operations				
GHG footprint (kilotonnes CO_2e)[9]	75	104	132	(28)
Percentage change from baseline 2004 (target: –75% by 2020) (%)	*(79.0)*	*(71.2)*	*(63.4)*	

Figure 17: Example of climate-related financial metrics.

Source: **UBS Group Annual Report (2020), page 42.**

This example from UBS Group summarizes the key metrics for both climate-related risks and opportunities in a clearly presented table. Following the guidance from the TCFD, UBS Group provide data about the carbon-related assets, total exposure to climate-sensitive sectors and weighted carbon intensity, in addition to data on the amount of climate-related sustainable investments. Data is provided for three years allowing for trend analysis and to assess the organizations performance.

How do we collect and disclose material metrics?

Whichever metrics the organisation has deemed as material, they should be prepared to collect and disclose in this information a consistent approach from year to year. Provid- ing the same metric, which is measured the same way, on a yearly basis allows for trend analysis and progress to be tracked.

Where organisations are new to climate-related financial disclosure, challenges around data collection and management need to be addressed through robust data processes, which will need to be built from collection to disclosure. Creating and maintaining rigor- ous data policies and processes is important to ensure the quality and credibility of the data. There should also be documentation that records the methodologies, processes, systems, assumptions and estimates which are used in collecting and assessing these

metrics, in addition to the internal controls and checks that ensure the data manage- ment process is robust.

When disclosing these metrics, organisation should present the data in a clear and understandable manner, but also include contextual and supporting narrative that explains the performance and the basis on which the data has been prepared. This information might include the methodologies and definitions used, the data sources, critical factors, and how the data is connected to the business-wide strategy and finan- cial performance.

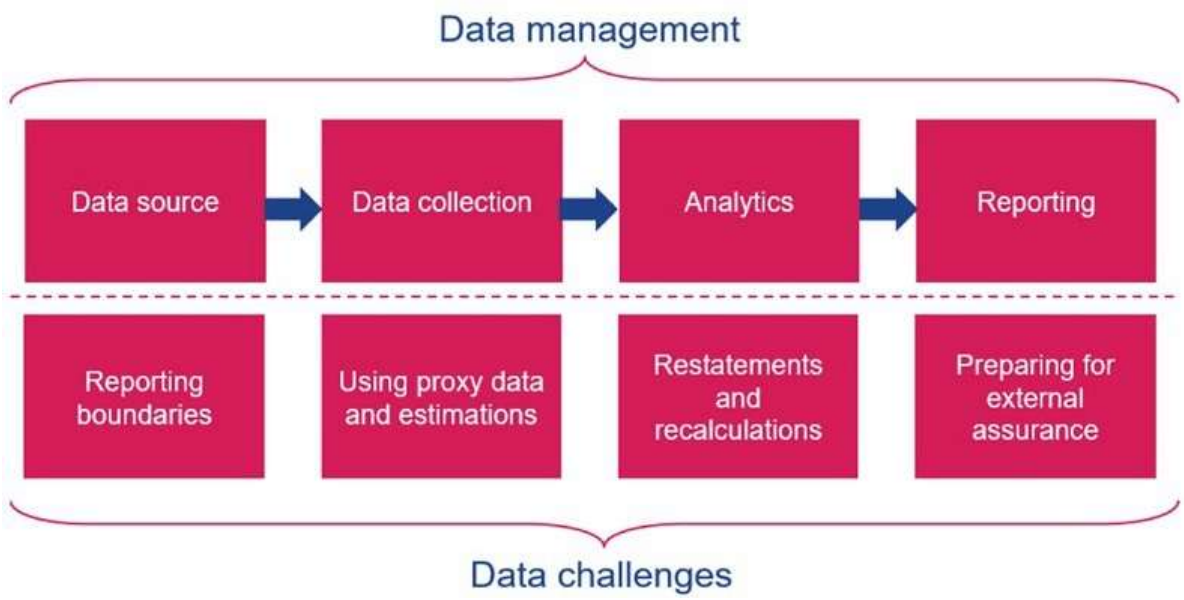

Figure 18: Key processes for data management and common data challenges for companies.

What GHG emissions should we calculate and disclose?

GHG emissions data is essential as it underpins how organisations calculate their expo- sure to both climate-related risks and opportunities. For example, organisations with high GHG emissions will likely be more impacted by transition risks. The GHG emissions data collected and calculated should include, at the very minimum, absolute emissions including the direct emissions of operations and throughout the value chain.

The GHG Protocol Corporate Accounting and Reporting Standard (originally published in 2001) is regarded as the global market standard for calculating and disclosing GHG emissions data. The standard includes guidance on how to develop a GHG emissions inventory and the calculation methods organisations should use to understand their direct and indirect emissions. In particular, the GHG Protocol differentiates between direct and indirect emissions sources through "scopes". Categorising emissions as Scope 1, 2 and 3, organisations can identify the greatest sources of emissions and ensure that multiple organisations do not account for the same emissions in the same scope (WBCSD and WRI 2004). Emissions are defined as:

- **Scope 1:** Direct emissions occur from sources that are owned or controlled by the organisation.

- **Scope 2:** Indirect emissions from the generation of purchased electricity consumed by the organisation.
- Scope 3: Other indirect emissions that are not included in Scope 2 and are a consequence of activities that occur outside the ownership or control of the company (both upstream and downstream).

Additionally, financial institutions should provide Scope 3 emissions that relate to financ- ing activities. This will not only help organisations understand the climate impact of their lending and other financing activities and whether these activities are aligned to international climate goals but will also help to identify transition risks and opportunities that the organisation is exposed to. The Partnership for Carbon Accounting Financials (PCAF) created the Global GHG Accounting and Reporting Standard for the Financial Industry (2020) to standardise the calculation approach used to assess financed emis- sions data.

Banks should use both the GHG Protocol Corporate Accounting and Reporting Standard and the PCAF Global GHG Accounting and Reporting Standard for the Financial Industry to collect and report their Scope 1, 2 and 3 emissions, including financed emissions.

Climate-related risk indicators

CTBC Holding is the first financial institution in Taiwan to join PCAF. Using the methodologies of The Global GHG Accounting and Reporting Standard by PCAF, we completed a preliminary inventory of our Scope 3 financed emission for investment and financing business; the results reveal that CTBC Holding's financed carbon emission in 2020 totaling approximately 9,916,890 tons CO_2e, with the overall data quality ranging from 1 to 2 points. The scope of inventory of CTBC Bank's corporate loans included carbon-intensive industries and major carbon emitters as listed by the Environmental Protection Administration for domestic and overseas branches, with total GHG emission of approximately 1,287,578 tons CO_2e and data quality of below 1.96. The investment portfolio covered three key subsidiaries, and the results of its comprehensive emissions inventory are provided in the accompanying table. Moving forward, we will continue to monitor the GHG emissions of our financing portfolio and set targets for their gradual reduction.

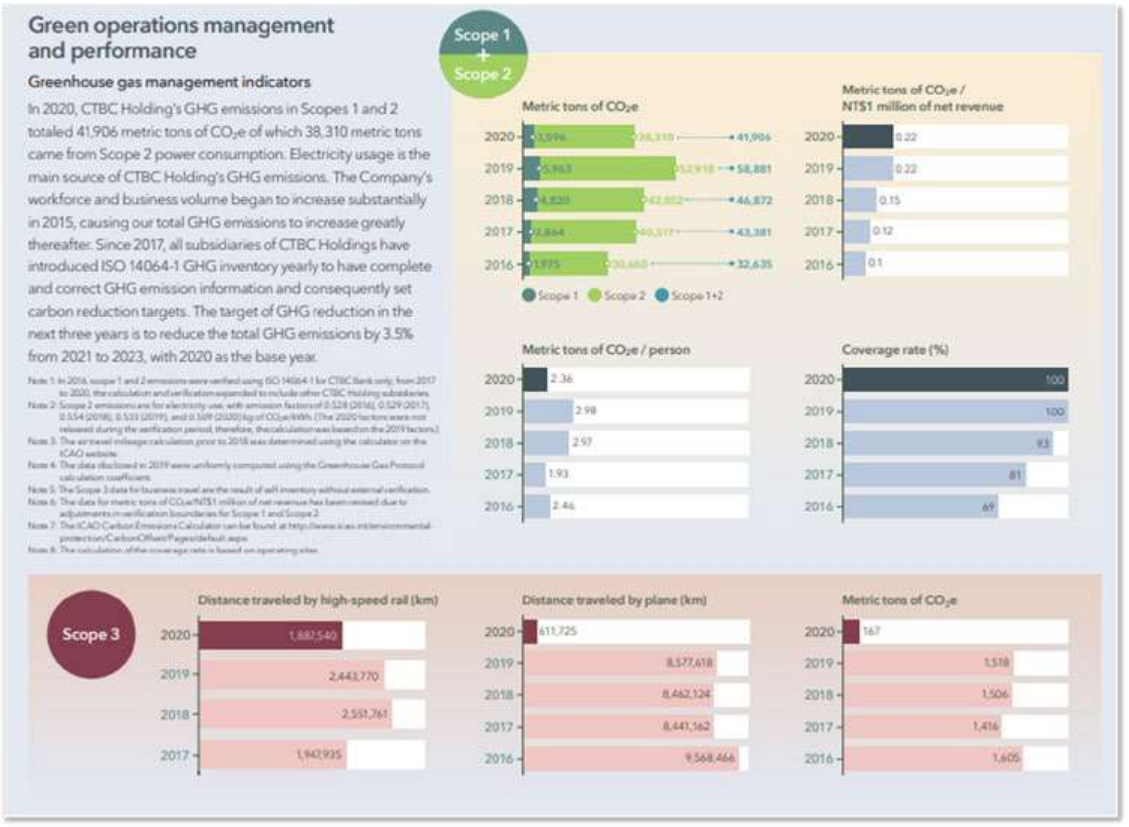

Figure 19: Example of GHG emissions data.

Source: **CTBC Holdings Sustainability Report (2020), pages 56 and 60.**

CTBC Holding presents their GHG emissions data for Scope 1, 2 and 3, in addition to initial data on Scope 3 financed emissions according to the PCAF methodology. They provide the total financed emissions data alongside an explanation of what was included in the inventory, and their intentions to continue to monitor and set targets in the future.

The Scope 1, 2 and 3 (except financed emissions) data is presented in graphs with multiple years data dating back to 2016. This data is disaggregated by scope and presented with absolute and intensity metrics. Alongside the quantitative data, CTBC Holding also provides a narrative that describes and explains the results, in addition to details about the methodology and emissions factors that were used in the calculation.

What should our targets be?

Climate-related targets should be set to measure performance against the organisa- tion-specific policies and strategies. These targets should focus on reducing negative elements (i.e., GHG emissions), but also proactive targets (i.e., total amount of green loans).

Financial institutes may consider setting targets in relation to climate-related risks, align- ment and financing (Table 10). Although all three may collectively be part of an organi- sation's climate strategy and overlap in some elements, they are distinct and will require different actions and metrics.

Table 10: Types of climate-related targets.

Type of target	Example
Risk target	Reducing the amount (or percentage) of assets or business activities that are considered vulnerable to climate-related transition or physical risks. Reducing the climate value-at-risk.
Alignment target	Reducing the warming potential of loan portfolios to align with the 1.5°C/2°C international goals (Paris alignment). Net-zero portfolio alignment.
Financing target	Increasing the total amount of financing deployed toward climate-related risks and opportunities (i.e., green bonds or green loans), and the proportion of these products in the whole loan portfolio.

To ensure targets are effective they should be attached to an indicator, be timebound, and include a baseline. Once the target has been set, the organisation should commu- nicate this effectively in the annual disclosure, including demonstrating progress every year. Where targets are long term (i.e., 2030 or 2050), organisations may also provide interim targets to signal progress in appropriate intervals.

5.1. Targets pertaining to risks and opportunities

In addition to our target of reducing our environmental impact, in April 2020 Mizuho set new targets pertaining to key opportunities and risks presented by climate change, based on our Environmental Policy.

- Sustainable finance & Environmental finance targets (new)
  FY2019 – FY2030 total: ¥25 trillion (of which the target for environmental finance is ¥12 trillion).
  Our FY2019 results (preliminary figures not including some investment data still being aggregated[15]) for sustainable finance were ¥2.4 trillion (of which the results for environmental finance were ¥1.1 trillion).
- Target to reduce the outstanding credit balance for coal-fired power generation facilities based on our Environmental and Social Management Policy for Financing and Investment Activity (new):
  Reduce the FY2019 amount by 50% by FY2030, and achieve an outstanding credit balance of zero by FY2050.
  Our outstanding credit balance as of the end of FY2019 was ¥299.5 billion.
- Target to reduce our own environmental footprint
  CO_2 emissions basic unit of electricity used at our offices in Japan (CO_2 emissions / total floor area)
  By FY2030 achieve a 19.0% reduction compared to FY2009 levels
  By FY2020 achieve a 10.5% reduction compared to FY2009 levels

Additionally, in FY2020 we plan to revise our target for reducing our own environmental footprint.
We are also continuing discussions on SBTs, including participating in the SBTi road testing for financial institutions where we provided opinions on issues with SBT setting methods.

Figure 20: Example of climate-related targets.

Source: **Mizuho Financial Group TCFD Report (2020), page 30.**

As part of their TCFD disclosure, Mizuho Financial Group have set three targets related to climate-related risks and opportunities in line with their Environmental Policy. This includes a financing target, alignment targets (focused on credit for coal-fired power generation), and targets to reduce their own operational GHG emissions. They are also exploring aligning their targets with the Science-Based Targets Initiative.

How do we obtain the data needed to report metrics and set targets?

Climate-related financial data is a common area where many institutions struggle. While climate risk analyses demand traditional financial data, they also require new forms of data that may initially be unfamiliar to practitioners. However, while data gaps certainly exist, there is often significant data available on a variety of factors to enable an institution to begin setting meaningful targets on climate risk, alignment, and climate finance.

Key climate-related financial data includes the following:

Table 11: Climate-related financial data (UNEP FI, 2021)

Data type	Data required
Climate hazard data	▪ Historical data on acute and chronic physical risks. ▪ Projections of future acute and chronic physical risks, including their severity and frequency. ▪ Adaptive capacity data to determine client resilience and sensitivity to climate hazards, including current adaptation strategies of clients. ▪ Climate hazard data based on geography, sector and industry, including economic losses from past climate hazards.
Data describing transition risk drivers	▪ Data on transition risk drivers including policy implementation, market shifts, technological changes and reputation.
Emissions data	▪ Energy and carbon mix of counterparties. ▪ Published or estimated GHG emissions produced by portfolios and assets of clients. ▪ GHG emission data by region, sector or industry. ▪ Energy efficiency data, for example real estate ratings like the Energy Performance Certificate Rating. ▪ Data on carbon pricing by jurisdiction.
Climate-related client data	▪ Identification of the physical assets owned by clients. ▪ Detailed and granular geographical/geo-locational data of assets.
Alignment and transition data	▪ Transition pathways set by clients in accordance with the Paris Climate Change Agreement. ▪ Science-based emission reduction targets set by clients. ▪ Climate policies and pledges of countries.

A number of open-source databases discussed above in the Strategy guidance section will be useful to firms in obtaining this data. In addition, the many of the tool providers mentioned in that same section also have data that can enable institutions to understand their climate risks and opportunities. Collecting the necessary climate-related data may vary based on where that data originates. However, structured processes can improve data collection and future data quality as discussed in the guidance below.

Gathering data through internal sources and external partnerships

Attempt to collect as much relevant climate data on the client

- Use in-house capabilities to develop internal tools

Increase stakeholder collaboration

- Collaborate with regulators, governments, municipalities and other stakeholders

Develop industry partnerships to provide the tools and support needed to clients

- Partner with technology firms to leverage the use of digital resources
- Engage with peers to identify data gaps and accelerate the development of solutions

Gathering data from clients

Facilitate open and effective communication with the client about data requirements.

- Take steps to increase communication
- Facilitate effective communication through workshops, courses and materials
- Open communication will be useful in understanding the client's current progress in disclosing data

Update current client engagement processes, such as:

- Underwriting
- Know your customer (KYC)
- Other due diligence processes
- Integrate climate stress test data requirements into these processes

Improving future data collection processes

Develop a questionnaire based on the data needed from the client

- The questionnaire should act as a guide to ensure that necessary information is collected
- The questionnaire can be provided during
- Onboarding process
- Annual review
- Due diligence process
- Ad-hoc climate related discussions

Integrate geospatial data related to clients and their assets

- Can be used to identify at-risk locations
- May require upgrades to IT infrastructure

4.6 Additional Considerations

How much information should be disclosed?

Disclosures should be clear, concise and proportional. It is important not to overwhelm report users with too much information, and therefore organisations should apply the principle of materiality to ensure the most pertinent information is easily accessible. Organisations also should consider how their disclosure on climate-related matters compares with disclosures on other financially material issues to the company to ensure that it is proportional.

Some organisations have attempted to overcome these issues by disclosing the most material information in the mainstream annual report, but also publish additional TCFD/ climate reports that can provide further details. When this approach is taken, organisa- tions should ensure that the two reports are connected, and information is appropriately cross-referenced.

It is also important that disclosures are specific to the organisation and tailored to the sectors and geographies in which it operates. Organisations that provide generic disclo- sures that can be applied to any other organisation, risk the information being inade- quate for financial decision-making.

How can climate-related information be connected to financial information?

Often climate-related information that is disclosed in annual reports focuses on the identification and management of risks and GHG emissions data but is not explicitly connected back to the financial metrics and accounts. The purpose of the TCFD is to connect climate change to financial decision-making, and therefore it is imperative that organisations provide financial metrics that are reconciled with financial accounting standards and the information presented in the organisations' financial statements.

The IFRS Foundation sets standards for financial accounting and reporting, which have been adopted by approximately 120 reporting jurisdictions. These IFRS standards can, and should, be used by organisations to prepare and include climate-related matters in financial statements. CDSB has developed guidance for accounting professional to outline how some of these standards can be used effectively (CDSB 2020).

What milestones should we follow in developing and writing our TCFD report?

It can be helpful to set internal milestones or checkpoints during the TCFD reporting process to ensure that the work receives appropriate review and buy-in from across the organisation.

1. Initial commitment

The first step in the TCFD process is the decision to write a report. This initial commit- ment should come from senior stakeholders who can mobilize the requisite resources for the drafting of a detailed report. These senior leaders should also be accountable for the content within the report.

2. Assignment of responsible teams

As discussed previously, writing a TCFD report will require inputs from across an organ- isation. However, clearly defined roles and responsibilities in the drafting process will support the production of a timely and high-quality report. Members of the sustainability and risk teams should be on point for producing the report. Executive attention to the report development process can help the report writers to obtain the data and informa- tion they may need from their colleagues. Those assigned to write the report should be clear on which portions of the report they are responsible to write and where supporting data and analyses are likely to come from. Once the primary owners of the report have been identified, they should develop a workplan for the completion of the report. The next steps will discuss considerations for this workplan.

3. Gathering key internal information

Many of the TCFD's recommended disclosures request information on internal processes around governance and risk management as well as the firm's strategic plans. Report writers should look to aggregate all the necessary internal information as they draft the report. For the governance pillar, this will relate to the climate relevant practices of the board and senior management as well as any accountability mechanisms for these leaders. For strategy, both firm-wide strategic plans and those of material busi- ness lines should be considered. Conversations with business heads should inform the ways in which climate-related risks and opportunities are incorporated into strategic decision-making. Risk management will concern internal reporting practices as well as policies and procedures around climate risk identification, assessment, and manage- ment. For metrics and targets, existing and proposed climate targets should be included. For many institutions, some of these elements may be absent at the time the report is being written. In this case, the TCFD report should indicate plans that the firm has to develop these capabilities.

4. Gather key external information

While internal information will form the bulk of the TCFD report (as the report attempts to describe a firm's response to climate risks and opportunities), information from external sources is also needed. Specifically, for scenario analysis, report writers should consider commonly used physical and transition scenarios. For transition scenarios, the inclu- sion of a 1.5°C scenario is increasingly expected by stakeholders. Many of these scenar-

ios are publicly available and are produced by well-known scientific researchers, which supports efforts to compare results across reports. A tougher challenge may be the acquisition of client data on climate-related risks and opportunities. Public companies typically report on emissions and may even have a TCFD report of their own. For smaller clients or those lacking adequate data, proxies based on location and economic activity can be helpful. For material clients, direct engagement is recommended in order to better understand their climate strategy and its implications for the financial institution.

5. Conduct relevant analyses- qualitative and quantitative

Once the necessary data is collected, both qualitative and quantitative analyses may be conducted. Qualitative analyses may include heat-mapping of physical and transition risks across sectors and regions, outcomes of recent client engagements, and anec- dotes regarding the firm's climate risk management or sustainability practices. Quanti- tative analyses may require the construction of new models, the adaptation of existing models, or the use of vendor tools. These quantitative analyses may include climate scenario analysis and associated losses for portfolios under different scenarios, the firm's financed emissions footprint, the volume of climate financing provided to specific projects and industries.

6. Complete each recommended TCFD disclosure

The four pillars of the TCFD and the associated recommended disclosures are natural checkpoints as the report is being developed. Disclosures can be compared against the TCFD guidance and against the example disclosures featured in this report. It is import- ant to recognise that many of the disclosures are interrelated and as a result, they may be completed in parallel. For example, disclosures on incorporating climate into strategy will also connect with the specific climate targets that the firm sets.

7. Submit report to senior management for signoff

Once a full draft of the report is developed, it should be shared with senior manage- ment for signoff. Earlier in the process, it can be helpful to socialise the report with relevant internal stakeholders to ensure their understanding and agreement with the key messages. As the report intends to reflect a firm's holistic practices of climate risk management, it should have buy-in from across the organisation. Returning to the gover- nance pillar, senior leadership should be accountable for the content expressed within the report, which means they must have sufficient familiarity with the disclosures being made. Many firms may have an executive committee signoff on the report, or a designated senior officer who is directly responsible. This mirrors the accountability process regarding traditional financial statements.

8. Publish

Once senior signoff is obtained, the TCFD report should be released publicly. The firm should engage with its main stakeholders to solicit feedback on the report and answer any questions about their practices. This transparency will allow both internal and exter- nal stakeholders to make the most effective use of the report.

5. Conclusion and recommended next steps for Vietnamese banks

As the global uptake of the TCFD recommendations increases, through voluntary disclo- sure and emerging regulatory requirements, it is important for organisations that haven't already started identifying, assessing, managing, and disclosing information about climate-related risks and opportunities. This paper provides useful guidance, but organ- isations should plan for a phased and iterative approach with the aim of full disclo- sure in the near future. There are several elements to the TCFD recommendations that organisations may find complex, and therefore their adoption should be accompanied by a clear implementation plan with roles and responsibilities distributed throughout the organisation.

Whilst the TCFD recommendations are ultimately a disclosure framework, they are also designed to influence and structure internal processes and decision-making within organisations. Being able to provide reliable, consistent, and comparable information requires robust governance and risk management structures, and well-established data management systems. Organisations should therefore seek to adjust existing or, where appropriate, create new internal processes so as to be prepared to disclose climate-re- lated financial information that is decision-useful to investors and other report users.

Emerging markets in particular are exposed to a number of both transition and physical risks that jeopardise their ability to create and maintain value. Whilst it is noted that there are examples of organisations in these regions that are already implementing the TCFD, further work is required to ensure these markets are resilient to any future climate-re- lated shocks.

The next two sections cover specific recommendations for Vietnam's central bank and for the banking sector overall regarding climate risk practices. These recommendations represent potential next steps in keeping with global leaders on climate risk and disclosure.

5.1 Recommendations for the State Bank of Vietnam as a financial regulator

5.1.1 Join climate-related regulatory initiatives

Over the past few years, financial supervisors around the world have worked to develop good practices regarding climate-related risk management and disclosure. The State Bank of Vietnam can benefit from the experiences of peer institutions on these topics by joining international initiatives such as the NGFS. With over 100 members, the collection of supervisors and central banks within the NGFS have worked on scenario develop- ment, climate risk supervision, and overcoming climate-related data challenges among many other topics. A recent example of this collective work is their 2021 Scenarios in Action report, which offers dozens of examples of how member institutions are apply- ing climate scenarios to assess climate risks in their financial systems (NGFS, 2021). In addition to it released the NGFS it's third vintage of the NGFS scenarios, a further mile- stone to improving the understanding of the impacts of climate change (NGFS, 2022). The ability to dialogue with peers will allow the State Bank of Vietnam to accelerate the development of its climate risk guidance.

Another international group seeking to establish supervisory best practices on climate risk is the Bank for International Settlements (BIS). The BIS's Basel Committee on Bank- ing Supervision (BCBS) published a consultation at the end of 2021 on principles for effective climate risk management and supervision of climate-related financial risks (BIS, 2021). Other regulatory initiatives work with both supervisors and supervisees. The Climate Financial Risk Forum (CFRF) convened by the Financial Conduct Authority (FCA) and Prudential Regulatory Authority (PRA) in the U.K. is a collaboration between these two regulators and a number of major U.K. financial institutions (FCA, 2021). The CFRF offers an opportunity for regulators to gain insights into the challenges that supervisees are facing regarding climate-related financial risks and enhance industry knowledge on this important topic.

5.1.2 Commit to building capacity on climate-related topics

Climate change is a cross-cutting risk, meaning that it will have implications for many of the activities that the State Bank of Vietnam undertakes. The State Bank of Vietnam should ensure that a growing share of its staff builds sufficient climate-related finan- cial risk knowledge to allow them to effectively integrate these climate risks into their current work.

Capacity-building programmes are one way that supervisors build knowledge on fast moving climate-related financial topics. These programmes can be internal seminars where those most involved with climate risk speak with their colleagues, but they can also include external training and support. The objective of these trainings should be to highlight the relevance of climate-related financial risks for different functions across the bank and provide a primer on major climate risks, global regulatory initiatives, and risk assessment methodologies.

The State Bank of Vietnam should also look to connect with other ministries with over- sight responsibilities for the Vietnamese economy to exchange knowledge. In particu- lar, engagement with MONRE will be particularly valuable in understanding the physical risks that Vietnam faces from climate change and the adaptation measures required to reduce these risks.

5.1.3 Develop a climate roadmap

The GIZ and UNEP FI programme provided information on a wide range of climate-re- lated issues. Now, the State Bank of Vietnam has the opportunity to consider how best to proceed in managing climate-related financial risks within the country. A central bank has many tools at its disposal to support financial stability and sustainability goals. A roadmap can help to determine when and how to deploy those tools and to communi- cate those plans to financial industry actors.

Climate disclosure requirements in line with the TCFD are one of the items to consider within a roadmap, and one that was covered in the greatest depth during the GIZ and UNEP FI programme. However, a comprehensive climate plan can also explore indi- vidual and systematic assessments of climate-related financial risks through climate stress testing. The nature of these stress tests can be informed by existing global initia- tives and then tailored to Vietnam's specific context. In Canada, France, and Hong Kong, climate scenario exercises with industry participants were developed by supervisors ahead of mandatory stress tests. In April 2022 the Transition Plan Taskforce (TPT) was launched by HM Treasury to develop the gold standard for private sector climate transi- tion plans applicable to the UK, but globally transferable.

The TPT published its Disclosure Framework and accompanying Implementation Guid- ance at COP27 in November 2022. Both documents are open for public consultation until 28th February 2023 (TPT, 2022)

As more governments and corporations make net-zero commitments, the State Bank of Vietnam may also be interested to develop a position on climate alignment. Supervisory policies on this topic can include requirements for firms to annual disclose progress against a specific decarbonisation target or to provide a detailed transition plan on how they intend to reach net zero. At COP 26, the U.K. announced a requirement for listed companies to produce these transition plans.

The State Bank of Vietnam should also consider the magnitude of adaptation and miti- gation financing necessary for Vietnam and look for ways to catalyze the necessary climate-resilient and low-carbon investments. Supervisors around the world have used taxonomies to define activities that contribute to climate and broader environmental goals, with the EU taxonomy and China's taxonomy being two of the best-known exam- ples. A taxonomy or other classification approach can both limit greenwashing and encourage financial institutions to increase the proportion of green financing they provide.

5.1.4 Set up climate-related financial disclosure requirements

An initial step in the State Bank of Vietnam's climate roadmap can be the establishment of climate-related financial disclosure requirements. Over the past year, supervisors from Kenya to Singapore have mandated climate-related financial disclosures from their supervisees. Depending on the jurisdiction, the exact requirements and the timing of the mandates may differ, but the underlying principles are nearly always related to the TCFD pillars. With the creation of the International Sustainability Standards Board (ISSB) and their impending guidance on global sustainability standards, supervisors will have an addi- tional point of reference in harmonising their disclosure expectations to global practices.

By developing specific disclosure expectations for Vietnam's financial sector, the State Bank of Vietnam will reap multiple benefits. First, the State Bank of Vietnam will gain a broad picture of the financial sector's preparedness for climate change and also be able to compare specific firms to each other and to the industry overall. Mandatory reporting requirements will improve the quality and standardisation of the disclosures made by financial institutions, making these disclosures more useful for stakeholders.

5.1.5 Issue a TCFD report

The State Bank of Vietnam should also look to make a disclosure of its own climate-re- lated financial risks in line with the TCFD and/or its own proposed mandatory guidance. In the past two years, a growing number of regulators have issued climate disclosures, beginning with the Bank of England's 2020 TCFD report (June, 2022). The practice of issuing a TCFD disclosure builds regulatory credibility on climate change by "walking the talk" and subjecting oneself to the same standards as other financial actors. Further- more, the exercise of developing and drafting a TCFD report will likely provide the State Bank of Vietnam with important insights about the nature of climate-related financial risks in the country and the levers it has to address them. The reporting process will also make bank staff more aware of the key areas to assess within financial institution disclosures. In addition, drafting a TCFD report will help the State Bank of Vietnam to understand the challenges that financial institutions may experience on topics of climate data and climate scenarios.

5.1.6 Conduct an assessment of climate-related systemic risks

Beyond simply issuing a climate-related financial risk disclosure, the State Bank of Viet- nam can conduct an assessment of climate-related risks within Vietnam's financial system. Similar to a stress test, such an assessment can identify the major transition and physical risks that the nation's financial sector faces. It can also provide relative magnitudes of these risks and suggest mitigation measures in order to lessen their potential impacts and improve resiliency under a variety of climate futures.

Multiple regulators have or are in the process of completing such exercises. As noted above, three examples include France, Canada, and Hong Kong. These scenario-based exercises were tailored to the specific policy and physical realities of the locations where they were undertaken. The State Bank of Vietnam can similarly use local scenarios (or adapt global scenarios to Vietnam) when conducting this assessment.

By involving participants from the financial sector, the exercises in France, Canada, and Hong Kong offered a way for financial institutions to improve their knowledge of climate risks and climate scenario analyses in tandem with the regulator. In addition, the feed- back from these exercises can be integrated into the development of climate stress tests.

5.2 Recommendations for Vietnam's financial institutions in managing and reporting on climate risks

As with the recommendations to the State Bank of Vietnam, the first three recommenda- tions for Vietnam's financial institutions center on joining climate-related financial initia- tives, building capacity on climate-related topics, and developing a climate roadmap.

5.2.1 Join climate-related financial initiatives

The number of climate-related financial initiatives is growing rapidly across the world. Development financial institutions (DFIs) are supporting the convening of regional finan- cial institutions to discuss their common climate challenges. Organisations like UNEP FI and the Principles for Responsible Investment (PRI) offer specific working groups for financial institutions looking to improve their climate risk management practices through expert consultations and peer discussions.

Vietnam's financial institutions can also come together to create a national climate work- ing group. Similar groups have been convened by national banking associations in a variety of countries. A dedicated climate-related financial working group can focus on the implementation of the TCFD recommendations and the development of effective and locally relevant climate risk management practices for Vietnam's financial sector. The working group's members can commit to issuing a TCFD report within a certain time period and then can hold implementation sessions featuring expert speakers to help the firms continue to progress in their climate risk assessment, management, and disclosure.

5.2.2 Commit to building capacity on climate-related topics

Capacity-building programmes should begin with executives and the board in order to raise awareness of the importance of climate risks and opportunities to the financial institution's future. These senior leaders should have the knowledge and understanding to support and champion climate-related initiatives for the firm.

Trainings are also critical for those expected to execute climate-related work at the firm. These include members of the sustainability and risk teams who are likely to be writing the TCFD report. Trainings for these groups should cover Vietnam's climate risks, rele- vant climate data and climate scenarios for Vietnam, global practices around climate risk identification and assessment, and guidance on writing a TCFD report. These topics were covered in many of the GIZ and UNEP FI sessions over the course of 2021 and 2022.

Beyond the core individuals working on climate, training should be extended to colleagues throughout the financial institution. As examples: business line colleagues will need to understand how climate impacts their strategy and client engagement and audit colleagues will need to know how to assess the quality of climate-related finan- cial analyses. Widespread climate awareness will allow for the effective integration of climate practices across the firm.

Firms must also be willing to commit adequate resources to enable their climate teams to be successful. Climate teams should be sufficiently staffed and should include team members with climate-specific skillsets and experience. This may require an expan- sion of current climate teams or the hiring of new colleagues. Necessary resources also include data and technical tools that allow meaningful insights to be gleaned from climate risk analysis.

5.2.3 Develop a climate roadmap

Financial institutions in Vietnam should also develop an internal climate roadmap. This roadmap should be reflective of their climate ambitions over the coming years and also adapted to incorporate regulatory requirements from the State Bank of Vietnam. A comprehensive climate roadmap should include three areas: climate risk, climate align- ment, and climate finance. Goals and targets can be associated with each area, and should be supported by specific, actionable, and time-bound initiatives.

For climate risk, the roadmap may include plans to issue a TCFD disclosure, plans to conduct an internal stress test, and plans to reduce exposures in at-risk sectors.

For climate alignment, the roadmap may include plans to calculate the firm's financed emissions, plans to create specific exclusion policies for climate-damaging activities, and plans to reduce the intensity of emissions within specific portfolios.

For climate finance, the roadmap may include plans to scale up adaptation financing in areas of the footprint most exposed to climate change, plans to increase investments in renewable energy, and plans to offer green financial products such as climate or sustain- ability-linked bonds.

5.2.4 Governance: Develop internal governance around climate

Throughout this report, the importance of senior leadership on climate has been discussed. Ensuring that the board and management are engaged in the oversight of climate-related risks and opportunities is vital. Specific policies should be developed to assign oversight responsibilities to senior leaders related to the execution of key climate objectives (e.g., issuing a TCFD report, announcing a decarbonisation target).

Boards should establish sub-committees to oversee climate-related topics. A general climate committee can be established or sub-committees for topics including climate risks and climate alignment. Boards may also benefit from the creation of a climate dash- board to provide them with insights on the firm's progress against various climate metrics.

Management should develop governance policies in order to codify the firm's response to climate change. These policies should support accountability and oversight by provid- ing clear chains of ownership for important climate-related items. Policies should also indicate which teams are involved in which aspects of climate-related risk and oppor- tunity management. Finally, they should have escalation procedures and remediation actions in cases where climate practices are not functioning optimally (e.g. the firm is taking on excessive climate risk, the firm is in danger of missing a target).

5.2.5 Strategy: Integrate climate into strategy

A firm should document the range of climate-related risks and opportunities it has iden- tified over a range of different time horizons. Then, the firm should conduct a strategic review where these risks and opportunities are considered in the context of existing firmwide strategy and the strategy of material business units.

A strategic update for the firm overall and for material business units may be required after this review process. The aim of this update is not to produce a separate "climate strategy" but to ensure that climate considerations are well-integrated into the strategies that the firm intends to pursue. Alterations to strategy may include the pursuit of specific climate goals (e.g., green financing or decarbonisation) and changes firm's desired foot- print across certain sectors or geographies among others.

In parallel with the strategic update, climate scenario analysis should be conducted to assess the resiliency of current and proposed strategies. This scenario analysis should cover both physical and transition risks as well as climate-related opportunities. Like the strategy, it should provide insights over multiple time horizons including short term, medium term, and long term. The physical scenario analysis should include scenarios that highlight the major physical hazards present in the firm's footprint under significant global warming. The transition scenario analysis should include a 1.5°C or net-zero scenario given the global consensus on the need to align to this temperature outcome. Scenario analysis may include both qualitative and quantitative measures ranging from having strategy-setters discuss the implications of the various scenario narratives to having statistical tools assess potential portfolio risks and losses using the selected scenarios.

5.2.6 Risk Management: Conduct analysis to support risk management

Risk management practices should begin with a clear inventory of the climate-related risks faced by the firm overall and in material geographies and material portfolios. Typically, a heatmapping process can be helpful in enumerating these risks and identi- fying areas of operations that are exposed to significant risks. Heatmaps should cover both physical hazards and transition risks and suggest areas for further risk analysis and assessment.

Risk management processes should be developed to address the major risks revealed in risk identification exercises. These risk management processes should be clearly assigned to specific teams and given appropriate oversight. The establishment of thresholds for normal operations and ranges of concern is necessary in order to deter- mine how well a firm is currently managing its climate-related risks. Similar to the guidance on governance, breaches of these thresholds should trigger escalation and remediation actions (e.g., halts in origination of products in high-risk areas or committee reviews of the threshold breach). Firms should also consider the range of methodologies both qualitative and quantitative that can be used to effectively manage risks and ensure they are communicated in a timely fashion. This can involve the development of internal tools or collaboration with third-party providers to obtain the risk insights necessary to effectively manage climate-related risks.

These risk management processes should be well-integrated into the firm's existing risk frameworks and risk appetite. In many cases, this may involve updating existing frame- works and risk appetite to more effectively include climate-related risks. Strong integra- tion of climate risks is evidenced by the presence of climate-related considerations in areas such as underwriting policies, borrower ratings, pricing, and credit, market, and operational risk models.

5.2.7 Metrics and Targets: Commit to climate action using metrics and targets

As noted in the suggested guidance on strategy and risk management, firms should seek to increasingly quantify the climate-related risks and opportunities they face. The measurement of these risks and opportunities can be done using metrics such as those traditionally used to calculate losses and exposures. A consideration of both the relative and absolute magnitude of these risks and opportunities will help internal and external stakeholders gain a fuller picture into the firm's climate efforts. The development of some of these metrics may involve the creation of new climate-related financial models, the adaptation of existing financial models, the use of third-party solutions, or some combination of the three.

Firms should also evaluate both their operational greenhouse gas emissions (Scopes 1 and 2) and financed emissions (Scope 3). For each scope of emissions, goals should be comprehensiveness and transparency of methodology. Data limitations may pose a challenge when it comes to obtaining financed emissions information, especially when considering small or medium-sized clients. Proxy approaches are often required and should be based on commonly used and science-based emissions assumptions for different economic activities. Emissions should be reported in both absolute and inten- sity-based terms for the firm overall and for major economic sectors and regions within the firm's footprint.

A growing number of governments, corporations, and financial institutions have made commitments to net zero by 2050. Obtaining a baseline of overall greenhouse gas emis- sions is the first step in setting an ambitious decarbonisation target. These targets should be aligned with a financial institution's business strategy and supported by a detailed transition plan. The transition plan should include information on the client engagement processes, investments, strategic initiatives, and interim targets that will enable the firm to reach its goal.

Firms should establish other climate-related targets to take advantage of emergent climate opportunities and provide adaptation and mitigation financing. These financing targets can consider new climate-related products, specific forms of adaptation finance, and the development and deployment of low-carbon technologies. In addition, goals can be set on renewable power generation, avoided emissions, and other climate positive topics. Finally, given the relationship between climate and nature, firms should consider broader nature-related goals and targets to supplement their climate ones. Nature-related goals may focus on biodiversity preservation, circularity of resource use, and reduc- tion in pollution among many others.

6. Additional regulatory and commercial bank case studies from the programme

The case studies in the following section aim to provide further examples of good prac- tices for Vietnam's financial institutions. The first subsection covers practices around developing required climate risk disclosures for the financial sector and is most relevant for the State Bank of Vietnam. The second sub-section features specific TCFD reports whose authors presented to the participating banks in the programme. While these reports differ in structure, each of them offers insights into effective disclosures from mature climate risk and sustainability teams.

6.1 Regulatory case studies

As part of the programme, participants heard from regulators at the Bank of England and Banque de France, important members of the NGFS. These supervisors spoke about their practices and discussed the climate scenarios that they have included in their requirements for supervisees. With UNEP FI's guidance participating banks also evaluated the range of regulatory practices that have been developed based on the TCFD, which has become a de facto global supervisory standard (as noted in section 1.3). Beyond simply exploring the emerging regulatory guidance, the programme highlighted some specific examples of disclosure requirements that may inform future regulatory expectations within Vietnam. Case studies of leading global supervisory expectations are shown below and provide a guide for the State Bank of Vietnam in considering peer regulatory practices. These case studies are drawn from the work of the Financial Stabil- ity Board (FSB) in 2021 (Financial Stability Board, 2021).

UK case study

Overall strategy

The UK has been closely involved with the TCFD since it was established in 2015 with the support of the FSB, chaired at the time by Mark Carney, then Governor of the Bank of England. The UK was one of the first FSB jurisdictions to publicly endorse the TCFD Recommendations, and the first G7 nation to pass legislation requiring reduction of net greenhouse gas emissions by 100% relative to 1990 levels by 2050.

Coordination between UK authorities

In 2019, the UK Government announced that the implementation of these recommenda- tions would be a central feature of its Green Finance Strategy and confirmed the creation a new Taskforce to deliver this commitment. This Taskforce, established by HM Treasury, includes representatives from across UK government departments and financial regula- tors, reflecting the fact that no one body has remit over all organisations envisaged in the Green Finance Strategy. The Taskforce has two primary forums: a senior, executive-level body to provide strategic input and approval of key milestones and publications; and a working level group to exchange views on policy development and ensure alignment of approaches. This detailed policy discussion has proven particularly useful where organ- isations had overlapping remits such as the Financial Conduct Authority (FCA) and the Department for Business Energy and Industrial Strategy (BEIS) both of whom need to consider how listed companies should disclose.

Actions towards mandatory TCFD-based disclosures

In November 2020, the Taskforce published an Interim Report and Roadmap charting a path towards mandatory TCFD-based disclosures across the UK economy. The Interim Report describes the UK's phased approach to delivering mandatory TCFD-aligned disclosures by 2025, with most of the measures to be introduced by 2023. Combined with the Roadmap, the report sets a clear expectation that organisations across the economy should start preparing now for mandatory climate-related disclosures. The Roadmap itself sets out indicative measures to be taken by government and regulators at the sectoral level and an indicative implementation path across seven organisation types: listed commercial companies; UK-registered companies (including large private companies); banks and building societies; insurance companies; asset managers; life insurers and FCA-regulated pension schemes; and occupational pension schemes.

Banks, building societies and (life and non-life) insurance companies

In April 2019, the Bank of England's Prudential Regulatory Authority (PRA) published supervisory expectations for how banks and insurers should enhance their approaches to managing the financial risks from climate change. Among other elements expecta- tions set out how firms should consider climate change in their disclosures, encouraging firms to engage with the TCFD Recommendations. This was followed in July 2020 by a letter from the PRA's CEO to firms, which included sector-wide feedback on progress against SS3/19 implementation and set a 31 December 2021 deadline for fully embed- ding the supervisory expectations.

The PRA is working to optimise Pillar 3 disclosures by supporting firms in building their risk identification and assessment capabilities.

The UK government and financial regulators issued a statement of support in response to the IFRS Foundation, noting that the current work on TCFD implementation should represent a stepping-stone to a wider corporate reporting standard that is being devel- oped by the IFRS Foundation. The UK considers that the work to implement the TCFD Recommendations is of significant importance, and that the establishment of an ISSB alongside the IASB will promote the integration of financial and non-financial reporting within a common architecture.

EU case study

Overall strategy

Over the past years, the EU has taken major steps to build a sustainable finance ecosys- tem, which contributes to the transition towards a climate-neutral Europe. In 2014, the EU established corporate disclosures on environmental, social and governance infor- mation, including climate-related disclosures. In April 2021, the European Commission proposed a revision to the existing reporting rules, with the objective to ensure a consis- tent flow of sustainability information through the financial value chain and to other stakeholders. The core element of the Commission's proposal is the development of European sustainability reporting standards in 2022, building on the TCFD and other existing initiatives. The aim of the EU strategy is not only to address climate-related risks, but also to allow all financial actors to reliably direct financial flows towards sustainable economic activities. The corporate disclosure framework is complemented by sectoral prudential Pillar III disclosure requirements, which explicitly incorporate ESG risks, as well as entity and product-based disclosures for financial markets participants under the SFDR. On 29 April 2022, EFRAG launched a public consultation on the Draft EU Sustain- ability Reporting Standards Exposure Drafts.

The different EU initiatives all aim to ensure in a coherent way that companies report the information that investors and other financial market participants need. EU rules aim at providing the complete financial value chain and further stakeholders with mate- rial, consistent and reliable sustainability information. It builds a coherent set of disclo- sures based on information by nonfinancial corporates, which encompasses also the sector-specific needs of financial institutions.

Adoption of NFRD and guidelines

One first major step toward an EU sustainable finance ecosystem was the adoption of the NFRD in 2014. The NFRD established corporate disclosures of sustainability infor- mation, including climate-related information. It requires about 11,000 large public inter- est entities with more than 500 employees to report sustainability information on an annual basis since 2018. Public interest entities comprise large listed companies, banks and insurers. According to the 'double materiality perspective', these companies have to report (i) how sustainability issues affect their business (the "outside-in" perspective) and (ii) how their business impacts on society and the environment (the "inside-out"

perspective). The double materiality perspective aims to provide information to a wider set of stakeholders and investors. It also takes account of international climate and envi- ronmental commitments, for example the ones set in the Paris agreement.

Given that the NFRD leaves companies a high amount of flexibility in their sustainability reporting, the European Commission published Non-Binding Guidelines in 2017 to help companies disclose relevant sustainability information more consistently and compara- bly. In particular, the NFRD does not require companies to use a certain reporting stan- dard or framework, nor does it impose detailed disclosure requirements.

Also in 2017, the TCFD issued its recommendations and Additional Non-Binding Guide- lines on climate-related disclosures, published in June 2019, integrated the TCFD Recommendations into the EU framework. These guidelines show EU companies how to meet the TCFD Recommendations while complying with the NFRD. Furthermore, in November 2020 ECB Banking Supervision formulated expectations to credit institutions on disclosures of climate-related and environmental risks, relying on the NFRD and the TCFD Recommendations to incorporate disclosure requirements into the supervisory framework. It also published a report on institutions' climate-related and environmental disclosures concluding that, in general, institutions did not yet comprehensively disclose their risk profile. The ECB assessed that almost none of the institutions in scope met the minimum level of disclosures set out in the 'ECB Guide on climate-related and environ- mental risks', and in the related recommendations in the European Commission's 'Guide- lines on non-financial reporting: Supplement on reporting climate-related information', or the TCFD Recommendations. In November 2022, the ECB has identified a set of good practices originating from a range of institutions across various business models and sizes to meet the supervisory expectations set out in the Guide (ECB, 2022).

Alignment with TCFD recommendations and international initiatives

The CSRD proposal integrates all the key concepts of the TCFD Recommendations and specifies that EU standards will take account of existing international initiatives. The EU sustainability reporting standards would build on and contribute to standardisation initiatives at the global level. This requires constructive two-way cooperation and sharing of ideas between the EU (especially EFRAG) and relevant international institutions. The EU supports initiatives by the G20, the G7, the FSB and others to encourage the devel- opment of a baseline of global sustainability reporting standards building on the recom- mendations of the TCFD and other existing frameworks and standards.

Japan case study

Overall strategy

Japan announced a transition to a carbon-neutral economy by 2050 in October 2020, followed by a subsequent commitment in April 2021 to reach an interim target of 46% reduction of GHG emissions by 2030 compared to 2013.

The JFSA views its mission as to protect national welfare by enabling sustainable growth of the economy through safeguarding critical functions of the financial system. The JFSA has published its strategy for developing well-functioning financial markets to finance Sustainable Development Goals (SDGs), on the basis that addressing environ- mental and societal negative externalities through promoting SDGs in finance will serve the JFSA's ultimate mandate. In addition, the JFSA set out its plan for implementing its strategy on Sustainable Finance in its annual policy strategy and priorities.

Coordination between Japanese authorities

Climate change and ESG are relevant to a wide range of stakeholders from both public and private sectors, and it has been necessary for the private sector and relevant minis- tries and agencies to work together. The JFSA supports industry-led initiatives and coor- dinates with the Ministry of Economy, Trade and Industry (METI) who are responsible for industrial policy and the Ministry of the Environment (MOE) who are responsible for environmental policy, when implementing policies and tools regarding climate change and ESG.

Alignment with TCFD Recommendations

Notably, the JFSA, together with METI and MOE, supported the foundation of the TCFD Consortium of Japan in May 2019, a platform to facilitate spontaneous efforts by the corporate and financial sectors to improve climate-related disclosures aligned with the recommendations of the TCFD. The Consortium also published supplemental guid- ance on TCFD Recommendations, which illustrates how to publish and how to read the climate-related disclosure based on TCFD framework for corporates and inves- tors, respectively. In 2020, the revised TCFD Guidance ("TCFD Guidance 2.0") expands sector-specific guidance including banking, life insurance and non-life insurance sectors.

These developments promoted more clarity and transparency for the disclosure. As these initiatives have been well received, more than 300 Japanese enterprises, espe- cially most of large enterprises, are now supporting the TCFD. The number is the largest in the world.

Further actions to strengthen disclosures: towards an expanded scope and mandatory TCFD-based disclosures

To achieve Japan's GHG emissions targets, the JFSA is exploring ways to gradually expand the scope of TCFD-based disclosures to SMEs, including by encouraging finan- cial institutions to engage with SMEs. The JFSA has held discussions with the Expert Panel on Sustainable Finance (EPSF), composed of sustainability experts and practi-

tioners from the financial and corporate sectors, on ways to enhance climate-related disclosures by both financial and nonfinancial corporates. The EPSF plans to publish a report detailing policy recommendations for the JFSA by early summer this year.

In parallel, the JFSA has taken further actions to introduce mandatory TCFD–based disclosures on a 'comply or explain' basis. In April 2021, the JFSA, along with Tokyo Stock Exchange (TSE), published the draft revision of Japan's Corporate Governance Code requiring companies listed on the 'Prime Market' to disclose TCFD-based infor- mation on comply or explain basis. The revised code will be finalized in June after the public consultation. Since the companies listed in the Prime Market are estimated to be more than 90% of listed companies in Japan on market capitalization basis, the code will require mandatory TCFD disclosure to almost all of major enterprises in Japan.

6.2 Commercial bank case studies

As part of the programme, representatives from three leading international commer- cial banks (Barclays, Standard Chartered, and National Australia Bank) presented to the participants in a workshop. Each of the presenting institutions had been involved in at least one phase of UNEP FI's TCFD programme and has issued multiple TCFD reports. The workshop featured an overview of their current TCFD reports, the history and devel- opment of their climate risk disclosures, and guidance on getting started in making a first TCFD disclosure. Vietnamese participants were also able to ask questions of the presenters about their institutional practices and each of the reports discussed.

The case studies from the presented reports aspire to give readers an overview of the key elements of the reports, while also providing explanations into what makes the report effective. Readers interested in obtaining further guidance from the reports are encouraged to freely download the full versions and consult them directly.

Barclays case study

Full report (Barclays PLC, 2020)

Overview

Barclays TCFD report is divided into sub-sections based on the TCFD disclosure pillars. This structure allows for a reader to understand how Barclays reports on each of the 11 TCFD disclosures and the progress made on each one of them. In the executive summary, an overview of the progress against each pillar is clearly stated that is expanded upon within the relevant sub-sections.

TCFD theme	*Progress and enhancements in 2020*
Governance	1) Further information on the Board's approach to overseeing social and environmental matters, including our approach to climate change. 2) A new role of Group Head of Public Policy and Corporate Responsibility, who is also a Group Executive Committee (Group ExCo) member, was created. The role is responsible for leading Barclays' efforts in tackling climate change. 3) The Chief Risk Officer maintained responsibility for climate-related financial risk under the Senior Managers Regime.
Strategy	1) Barclays announced an ambition to be a net zero bank by 2050, across all our direct and indirect emissions and across all sectors, and we committed to aligning our financing activities to the goals of the Paris Agreement. 2) Undertook climate internal stress test in preparation of Bank of England's climate biennial exploratory scenario (Climate BES) in 2021. Disclosure of scenario, models, results and management actions.
Risk management	1) Each Principal Risk has continued to evolve its approach through implementation of the Climate Change Financial and Operational Risk Policy and ongoing requirement to meet the PRA Supervisory Statement on financial risks of climate change. 2) A new role of Head of Climate Risk was created with responsibility for developing our climate risk methodologies and managing climate risk in our portfolio. 3) Integrated our enhanced due diligence approach to include clients in the additional energy sub-sectors that became in scope of our Climate Change Statement.
Metrics and targets	1) Progress against Paris Agreement targets set across our Energy and Power portfolios. 2) Disclosure of 2020 and 2019 figures for key metrics to provide year on year comparison – elevated risk sectors, carbon-related assets and capital markets financing.

Figure 22: Barclays overview of 2020 progress and enhancements

Report highlights

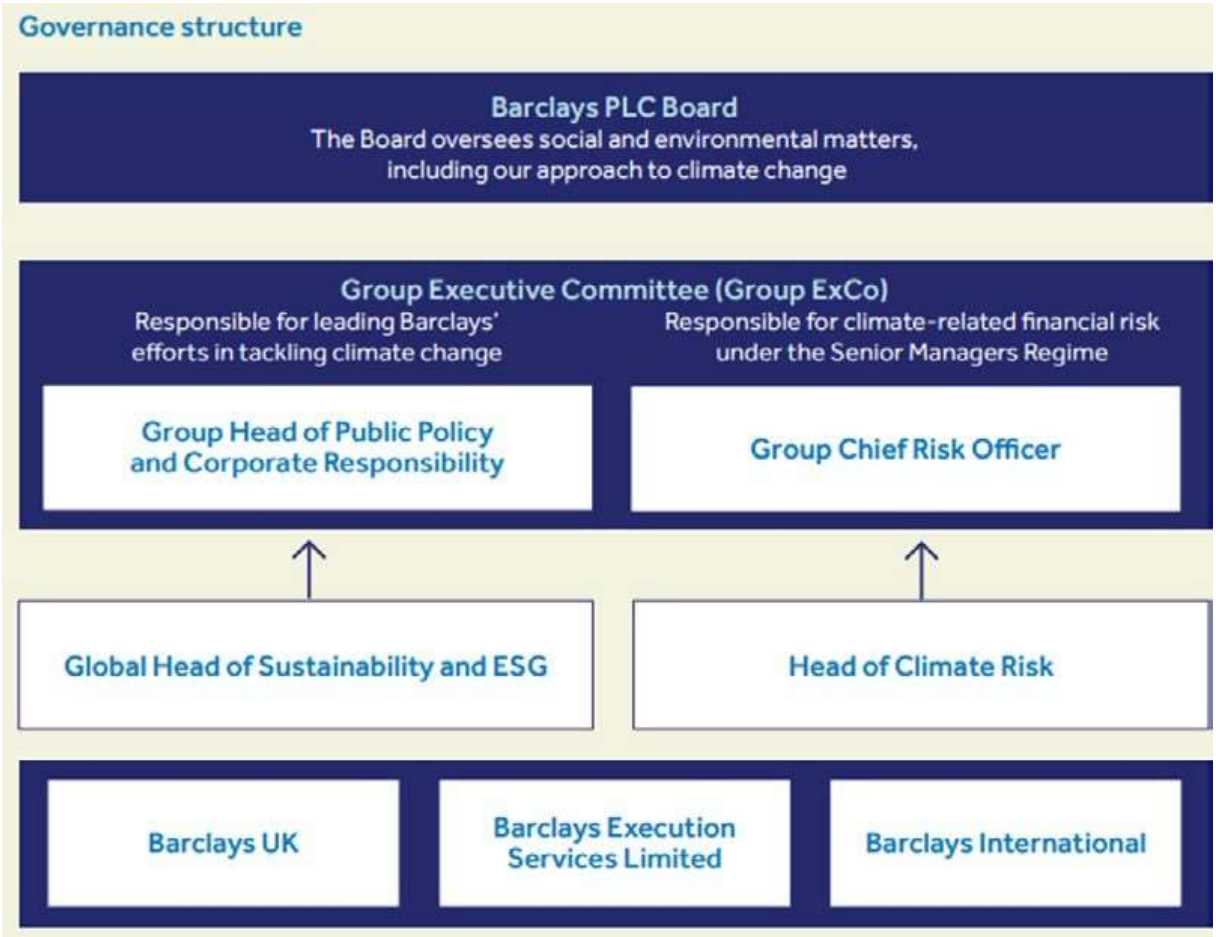

Figure 23: Barclays climate risk governance structure

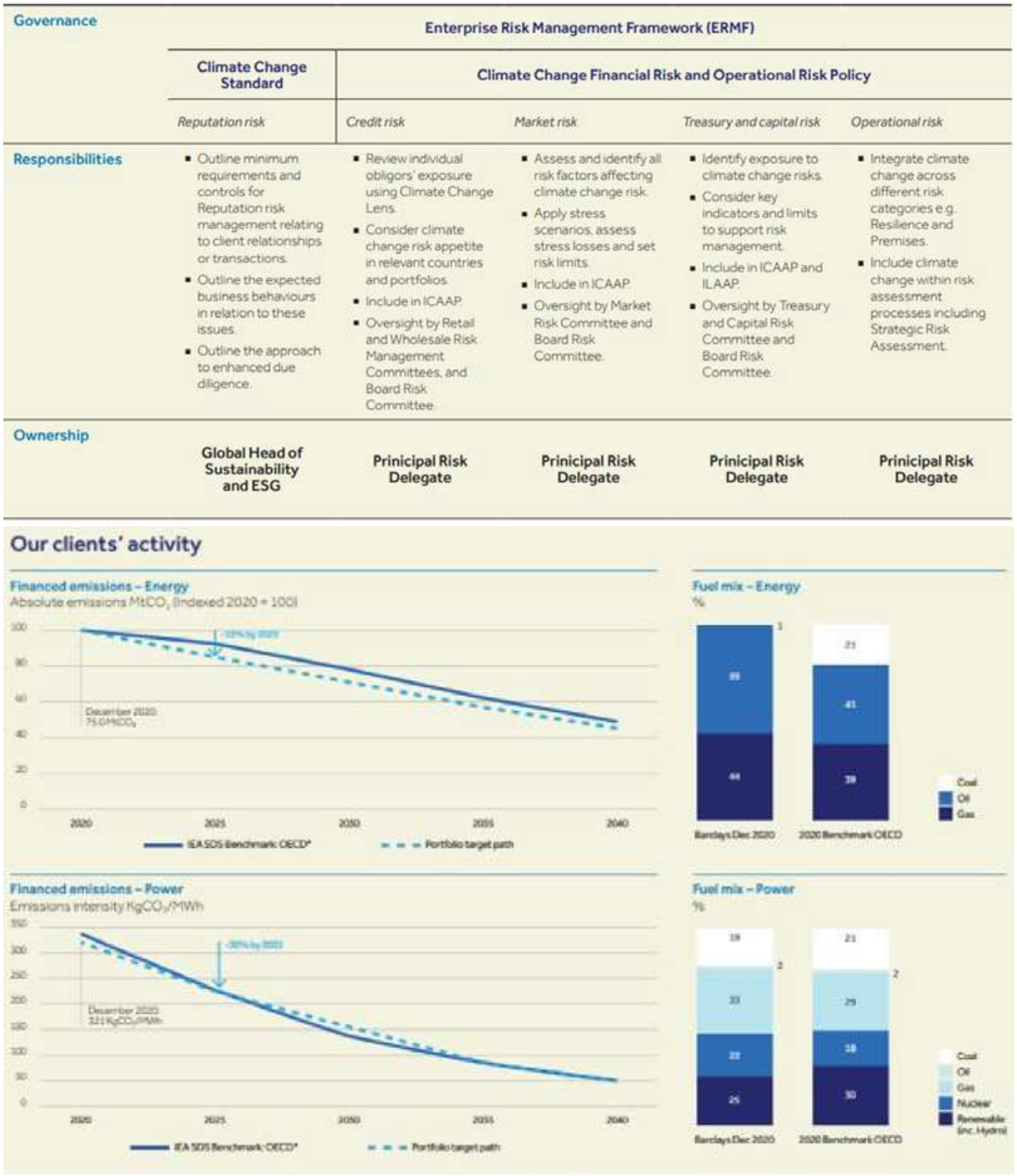

Figure 24: Barclays climate dashboard

Standard Chartered (SC) case study

[Full report (Standard Chartered PLC, 2021)]

Overview

Report highlights

Governance		
Board oversight of climate-related risks and opportunities	**Current status** • In 2021, we held Board-level and Management Team training on our approach to net zero and Board-level training, delivered by Imperial College London, on climate scenarios to support the Board with their review and challenge of climate related regulatory stress testing. • The Board reviewed and approved our approach to reaching net zero carbon emissions from our financing by 2050 and associated interim targets. • The Board received regular Climate Risk updates via the Board Risk Committee (BRC) and reports from the Group Chief Risk Officer. • First-generation Climate Risk reporting and Management Level Risk Appetite metrics were shared with the BRC and approved by the Group Risk Committee which has oversight of Climate Risk.	**Future priorities** • We aim to enhance Climate Risk training to our subsidiary boards, building on initial training delivered in 2020. • Results of management stress tests will be reviewed and challenged by the BRC and will strengthen the Board's oversight of the impact from Climate Risk on our business, financial performance and operations and strengthen business strategy and financial planning.
Management's role in assessing and managing climate related risks and opportunities	**Current status** • The Group Chief Risk Officer (CRO) has Senior Management Responsibility for Climate Risk and is supported by the Global Head, Enterprise Risk Management who has day-to-day oversight, and has appointed the Climate Risk Management Forum that oversees the delivery of the Group's commitment to manage climate related financial and non-financial risks. • In 2021, we established a robust governance structure to support our net-zero approach through the Net Zero Steering Group chaired by the Group Head, Conduct, Financial Crime & Compliance. • We aim to strengthen business segment, country, and regional Climate Risk governance and continue to keep the Management Team updated through the Group CRO reports and Management Information report to the GRC.	**Future priorities** • We will continue to exercise appropriate oversight and governance of our approach to net zero at Board and Management Team level. • We aim to strengthen business segment, market, and regional Climate Risk governance and continue to keep the Management Team updated through the Group CRO reports and Management Information report to the GRC.

Figure 25: SC Governance progress and future priorities

Strategy		
Climate-related risks and opportunities identified over the short, medium and long term	**Current status** • We have assessed the impact of Climate Risk to the banking book under three transition scenarios over a 30-year time horizon, which has enabled us to identify climate risks, strategies to mitigate risk as well as climate opportunities. • In 2021, we identified climate-related opportunities linked to the Bank's net zero in financed emissions approach including aiming to: – mobilise $300 billion in green and transition finance – reduce absolute financed thermal coal mining emissions by 85% – reduce emissions intensity in other high carbon sectors with the interim 2030 targets including power (-63% emissions intensity), steel and mining (– 33% emissions intensity respectively), and oil and gas (-30% emissions intensity). • We use quantitative and bottom up tools and methodologies to assess transition and physical Climate Risk and we apply these to our clients, portfolios, and our own operations.	**Future priorities** • We will continue to develop and enhance our Climate Risk/opportunity identification, interplay and modelling capabilities to strengthen Climate Risk quantification. This includes consistency and where possible, uniformity of time horizons. • We aim to disclose annually the progress we are making against our $300 billion and other net-zero targets and build out our client capability to achieve our net zero through: – our newly developed Transition Acceleration Team – reporting mortgage emissions with a view to setting targets by 2023 – doubling our sustainable investing assets under management – launching and growing sustainable products including Universal Climate Finance Loans, green mortgages and sustainable investing offerings while integrating ESG considerations in our wealth management advisory activities.
Impact of climate risks and opportunities on business, strategy and planning	**Current status** • Sustainability has been elevated to become a pillar of the Group's strategy. • We continue to restrict financing of thermal coal mining and reduce emissions intensity in other carbon intensive sectors. Where clients do not show a sufficient level of commitment to the transition, we reserve the right to cease providing them with our services. • In 2021, we engaged with approximately 2,000 of our clients, to help understand their exposure to Climate Risk and identify climate opportunities. • To make our business model more resilient to Climate Risk we are already reducing appetite for selected high-carbon sectors such as coal, in support of our plan to reach net zero in our financing by 2050, whilst balancing Transition Risk and opportunity with ambitious interim targets to substantially reduce our financed carbon emissions intensity by 2030.	**Future priorities** • We will develop Climate Risk management scenarios, which will further inform us of the potential impact from Climate Risk on our business, financial performance and operations and strengthen business strategy and financial planning.
Climate-related scenario analysis	**Current status** • Our climate-related scenario analysis, based on those from the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), includes orderly, disorderly and hot-house world scenarios.	**Future priorities** • We will develop management scenarios that will strengthen considerations of Climate Risk in into the Group's corporate plan and net-zero strategy.

Figure 26: SC Strategy progress and future priorities

Risk management		
Identifying and assessing climate-related risks	**Current status** • We identify physical and Transition Risk as part of client, portfolio and own property assessments and consider: – Physical Risk: current day and longer term time horizons for acute weather events (storm, flood, wildfire, earthquakes) and chronic sea level rise. – Transition Risk: financial impact at a client level under a range of NGFS based scenarios. – Temperature alignment: provides a temperature score to indicate client and portfolio level global warming potential up to 2030. • Climate Risk is recognised in our central Enterprise Risk Management Framework (ERMF) as an integrated risk type and is managed in-line with the Principal Risk Type (PRT) impacted e.g. Credit, Market, Operational. • Climate Risk is assessed as part of regulatory stress testing through the annual Internal Capital Adequacy Assessment Process (ICAAP), the 2021 Bank of England Climate Biennial Exploratory Scenario (CBES), and local country regulatory stress tests. • In 2021 client engagement has improved the coverage of data that informs the climate client level risk assessments being integrated into the credit underwriting process.	**Future priorities** • Further embedding of Climate Risk management across PRTs, consideration of risk mitigation over time as methodologies mature and expanding coverage across products and markets.
Managing climate-related risks	**Current status** • Climate Risk is managed in accordance with the Principal Risk Type (PRT) through which it manifests. Depending on the PRT framework, it is applied at a client, location or portfolio level as part of transactional, portfolio or operational level analysis for prioritised areas. • There is a Risk Appetite (RA) Statement that is accompanied by RA metrics that are based on potential losses under different climate scenarios and these RA metrics are reported to the GRC.	**Future priorities** • Risk Appetite thresholds become effective in 2022.
Integrating into the organisation's overall risk management	**Current status** • Climate Risk is integrated into and managed as part of existing PRTs: – Credit Risk: Climate Risk (physical and transition) assessments are being incorporated into the credit underwriting process for CCIB clients. For our CPBB sector, Physical Risk considerations inform credit portfolio quarterly reviews for over 90% of the retail mortgage portfolio. – Operational and Technology Risk: all new property sites are assessed for Physical Risk vulnerabilities. – Traded Risk: a Physical Risk-based scenario is included as part of the Traded Risk stress testing framework. – Country Risk: the setting of Country Risk limits include Climate Risk as a factor and regional Country Risk reviews for sovereign credit grades continue to include Climate Risk considerations. – Reputational and Sustainability Risk: for prioritised high-carbon clients and transactions a Climate Risk overlay assessment is applied (in addition to Environmental and Social Risk Management and restrictive policies). – Compliance: a process has been established for tracking various Climate Risk-related regulations. – Treasury Risk: Climate Risk was considered as part of the 2020 and 2021 ICAAPs.	**Future priorities** • Continue to embed Climate Risk considerations within PRTs, including expanding CCIB coverage.

Figure 27: SC Risk Management progress and future priorities

Metrics and Targets		
Metrics used to assess and manage climate-related risk and opportunities in line with strategy and risk management processes	**Current status** • Early stage risk management metrics are used for quantifying transition and Physical Risk at a client and portfolio level, and for our own operations. These are used for different processes such as regulatory stress testing, monitoring Climate Risk as part of Risk Appetite reporting, and to inform the assessments being integrated into existing transactional risk processes and client reviews. Some metrics we use include: – financial impact of various transition scenarios up to 2050, expressed as weighted average probability of default – outstanding exposure of retail mortgage portfolios to current and forward looking Physical Risk events (flooding, storm, wildfire, future sea level rise) – percentage of our own offices, branches and data centres in locations at extreme gross Physical Risk events – Country-Climate Risk index ranking countries by physical and Transition Risk. • In 2021, we expanded our disclosures to include: – the financial impact on exposure to high-carbon sectors loans and advances.	**Future priorities** • Continue to refine and enhance coverage and application of Climate Risk related metrics as our tools and methodologies mature, with a greater focus on developing internal climate modelling capabilities and assessing the implications of an internal carbon price where possible.
Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 greenhouse gas emissions and the related risks	**Current status** • Our 2021, our Scope 1 emissions were 2,902 tonnes carbon dioxide equivalent (tCO_2e), a reduction of 27 per cent from 2020, and Scope 2 emissions were 82,761 tCO_2e, a reduction of 27 per cent from 2020. • In 2021, our Scope 3 air travel emissions were 3,654 tCO_2e, a reduction of 89 per cent from 2020. • In 2021, we baselined and estimated our 2020 Scope 3 supply chain emissions (vendors), using spend data. As a result of this exercise we estimate these emissions as 365,911 tCO_2e. • We measured the absolute financed emissions baseline of our corporate lending portfolio as of 2020-year end, focusing on $74.8 billion of assets (equating to a coverage of 77 per cent of our in-scope assets of $97.3 billion, equal to 45.2 million metric (Mt) CO_2e). There is currently insufficient available data to accurately reflect the financed emissions of the remaining 23 per cent of our in-scope assets. A linear extrapolation would translate to an overall baseline of up to approximately 59Mt CO_2e. • In 2021, we offset our Scope 1-3 (flights and data centres) through high quality and verifiable carbon credits at a cost of $7.65/tonne.	**Future priorities** • We will continue to extend our Scope 3 financed emissions measurement capabilities, targeting additional sectors and incorporating additional financial products as methodologies allow. For 2022, a specific priority will be baselining the emissions from our residential mortgage lending.
Targets used by the organisation to manage climate related risks and opportunities and performance against targets	**Current status** • We have continued to evolve and challenge our existing Sustainability Aspirations including setting interim and long-term targets to reach net zero in our operations by 2025 and net zero in our financed emissions by 2050. • In 2021, we facilitated $9.6 billion towards sustainable infrastructure and $22 billion towards renewable energy services. • In 2021, metrics and targets developed and disclosed include: – plan to mobilise $300 billion aligned to our Green and Sustainable Product Framework and Transition Finance Framework – measuring, managing and reducing emissions associated with our financing of clients to support our objective to achieve net zero by 2050.	**Future priorities** • We will annually disclose against our 2050 net zero in financing targets. • We will continue to drive consistency of use of targets across the Group's functions and build our knowledge of the interrelation between targets.

Figure 28: SC Metrics and Targets progress and future priorities

National Australia Bank (NAB) case study

Full report (National Australia Bank, 2021)

Overview

Report highlights

Building climate-related capability

To support better understanding and implementation of climate risk management and identification and execution of climate-related opportunities, the Group has developed and rolled out a series of climate-related training opportunities for colleagues.

In 2021, the Board incorporated two climate change sessions into its development agenda. Session one covered: (1) best practice climate risk management in banking; and (2) the changing regulatory and supervisory response to climate change risk. Session two covered: (1) evolving international practice by peer banks in implementing climate commitments and the recommendations of the TFCD; (2) key findings from IEA's Net Zero by 2050: A Roadmap for the Global Energy Sector Report; (3) climate and environ- ment-related litigation risks; and (4) the Group's Corporate and Institutional Bank's 'Bank for Transition' initiative and the Group's Project Carbon partnership.

The Group's 2021 annual Risk Awareness training included a refreshed climate risk module to help colleagues understand:

- Highlights from the latest climate science.
- The goals of the Paris Agreement.
- The key elements of the TCFD's framework for managing climate risk.
- Actions being taken by the Group to address climate change.

The training also provided examples of climate-related physical and transition risks to help colleagues understand the impacts of climate change on our business, customers and the communities in which the Group operates.

Additionally, in 2021, the Group engaged Melbourne Business School (MBS) to help develop and deliver targeted climate training for colleagues supporting the low-carbon transition plans of the Group's biggest greenhouse-gas emitting customers. The training is expected to help bankers to identify climate-related risks and understand transition planning so they can better work with and support customers. During 2021, 75 relation- ship management bankers completed or commenced this training.

Following its release in May 2021, the Group also arranged for a specific session to be conducted by the International Energy Agency (IEA) with the Group's Executive Lead- ership Team to discuss the IEA's Net Zero by 2050: A Roadmap for the Global Energy Sector Report.

Phased review of carbon intensive, climate sensitive and low-carbon sectors The Group's phased review of carbon intensive, climate sensitive and low-carbon sectors commenced in 2017 and is ongoing. These reviews consider a range of factors including: (i) various climate change scenarios for both transition and physical risk; (ii) customer strategies and plans and their alignment to the Paris Agreement temperature goals; (iii) industry trends; and (iv) trends in Group exposures to these sectors. To date, this review process has led to implementation of the following ESG- related credit policy and risk settings. The Group will not finance:

- New thermal coal mining projects or new-to-bank thermal coal mining customers.
- Oil/tar sands extraction projects.
- Oil and gas projects within or impacting the Arctic National Wildlife Refuge area and any similar Antarctic Refuge.
- New, or material expansions of, coal-fired power generation facilities.

Emissions reporting

	London Branch		Group (excluding London Branch)	
	2021	2020	2021	2020[2]
Energy from gas consumption (KWh)	64,131	377,813	16,773,264	41,484,826
Energy from vehicle fleet fuel use (KWh)	0	0	23,261,807	27,568,578
Energy from electricity consumption (KWh)	355,536	870,922	96,216,129	100,977,908
Total energy for SECR reporting (KWh) (tCO_2-e)[3]	419,667	1,248,735	136,251,200	170,031,312
GHG emissions from energy use (Scope 1 – Gas) (tCO_2-e)	12	70	3,118	7,701
GHG emissions from vehicle fleet (Scope 1) (tCO_2-e)	0	0	5,818	6,885
GHG emissions from energy use (Scope 2, location-based – electricity) (tCO_2-e)	75	203	74,774	79,508
Total gross Scope 1 & 2 GHG emissions for SECR reporting (tCO_2-e)[3]	87	273	83,710	94,094
Total gross Scope 3 emissions (tCO_2-e)	477	1,975	45,438	59,676
Intensity ratio: Energy (KWh)/$ Financial metric[4]	0.0014	0.004	0.016	0.022
Intensity ratio: Gross Scope 1 & 2 GHG (tCO_2-e)/ $ Financial Metric[4]	0.0000003	0.000001	0.00001	0.000012
Intensity ratio: Energy (KWh)/ m^2	144	236	195	246
Intensity ratio: GHG (tCO_2-e)/ m^2	0.03	0.05	0.12	0.14
Intensity ratio: Energy (KWh)/ FTE	1,506	4,024	3,906	4,919
Intensity ratio: GHG (tCO_2-e)/ FTE	0.31	0.88	2.40	2.72
Emissions from electricity use (Scope 2, market-based – electricity) (tCO_2-e)	0	0	57,287	71,938
Total net Scope 1,2 and 3 GHG emissions (after accounting for UK and Australian renewable energy)[3]	339	2,253	110,595	147,226
Carbon Offsets Retired	339	2,253	110,595	147,226
Net carbon emissions (carbon neutral)	0	0	0	0

Figure 29: NAB Key GHG emissions and energy use 2021

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