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Shinhan Financial Group Climate Risk Management Code of Practice

Shinhan Financial Group

Risk Management Team

The following definitions are used in this document concerning the organizational designations to facilitate clear understanding without confusion.

1) Group (Enterprise): The entire group, including group companies and holding companies

2) Holding Company: Shinhan Financial Group

3) Affiliates: Shinhan Bank, Shinhan Card, Shinhan Financial Investment, Shinhan Life, Shinhan Asset Management, Shinhan Capital, Jeju Bank, Shinhan Savings Bank

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1. Purpose

This Code of Practice aims to improve the enterprise's resilience to climate risks by raising enterprise-wide awareness of climate risk and providing standards for the Group's climate risk management. In this Code of Practice, various external sources are cited, and relevant aspects are explained for this purpose.

This Code of Practice specifies details of climate risk management practices that are not addressed in the Group's Environmental and Social Risk Management Code of Practice.

2. What is Climate Risk?

This chapter defines climate risk, and specifies the transmission pathways, management targets, and methodologies.

2.1. Definition

Climate risk refers to the risk to the financial sector due to physical damage caused by extreme weather events or business deterioration that occurs in the course of a transition to a low-carbon economy. Climate risk is divided into transition risk and physical risk.

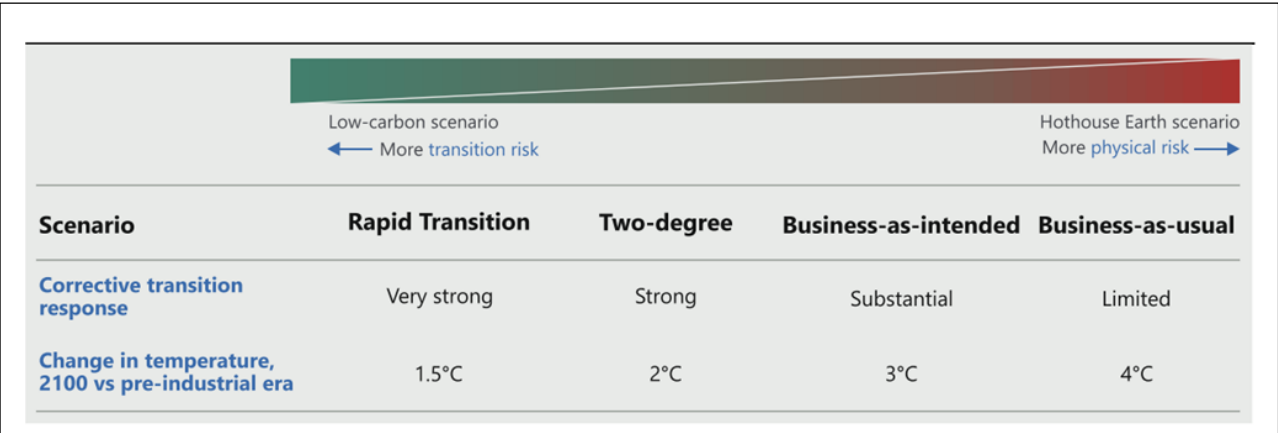
Transition risk refers to the possible financial losses from the rapid transition to a low-carbon economy and arises in the course of adjustment to a sustainable economy, such as changes in public policy, radical technology development, and changes in customer and investor preferences.

On the other hand, physical risk refers to economic costs and financial losses caused by an increase in abnormal climates such as typhoons, floods, or heat waves and changes in long-term climate patterns and arises from the effects of meteorological phenomena and extensive environmental changes.

Considering physical risk increases with the intensification of climate change while transition risk occurs in the process of preventing climate change, for example, through greenhouse gas reduction, we can find an inverse correlation between them. That is, when the physical risk increases, the transition risk decreases, and vice versa.

Regarding this relationship, BIS stated in the Green Swan of 2020, “A strong and immediate action to mitigate climate change would increase transition risks and limit physical risks, but those would remain existent. In contrast, delayed and weak action to mitigate climate change would lead to higher and potentially catastrophic physical risks, without necessarily entirely eliminating transition risks. Delayed actions followed by strong actions in an attempt to catch up would probably lead to high both physical and transition risks” The figure below illustrates this relationship.

<Figure 2-1> Relationship between Physical Risk and Transition Risk



Source: BIS (2020)

2.2. Phased Impact of Climate Risks

The world's response to climate change is a long-term task in that it aims to reduce the global average temperature increase rate by 2100. However, given the fact that the Earth's average temperature increases gradually, this task is to be implemented gradually in a short-term and medium-term task timeframe rather

than a long-term perspective. To this end, it is necessary to manage climate risk in three different phases: short-term, medium-term, and long-term. The table below summarizes forecasts of the impact of climate risk and response directions for each phase.

<Table 2-1> Phased Impact of Climate Risk

Phase	Time span	Time span definition and impact
Short-term	1-2 years	In line with the increasing global trend of carbon neutralization, risks from policy changes such as carbon tax and emission credit price rises are brought into reality earlier. The short-term impact is at least one year up to two years in that policy changes that can affect the profits of regulated companies can be realized in a short period of time and become operational and legal risks in the case of publicly traded companies (e.g., mandatory environmental information disclosure).
Mid-term	3-5 years	In addition to the financial impact on companies in the portfolio, reputational risks may arise related to the implementation of the Zero Carbon Drive initiative declared by Shinhan Financial Group. Continued financial support for high-emission industries that have failed to reduce Financed emissions or those not dedicated to a low-carbon transition will be understood as so-called "green washing," damaging the reputation. As this impact is associated with our financial products, such as passive investment and ESG-related ETFs, it immediately compromises the stock price and may pose legal risks to our shareholders and stakeholders. In this regard, we define a mid-term as 3-5 years, a time span suitable for an organization to monitor actual risks, analyze portfolios, and review exposure adjustment strategies.

Phase	Time span	Time span definition and impact
Long-term	After 10 years	From a long-term perspective, there is an inverse relationship between physical risk and transition risk depending on the degree of response to climate change. If climate change response such as greenhouse gas reduction is actively implemented, transition risk may increase, but the physical risk will decrease. In the opposite case, the physical risk further increases. Therefore, it is necessary to consider both risks together depending on the response path to climate change. The IPCC* report also set the target time for physical temperature management to 2040. For this reason, the long-term is defined as after 10 years.

* Inter-governmental Panel on Climate Change (IPCC) refers to an intergovernmental body under the United Nations (UN) aiming to assess global risks related to climate change and take countermeasures. It is composed of more than 3,000 experts, including meteorologists, oceanographers, glaciers, and economists from many countries.

2.3. The Need for Climate Risk Management

The IPCC has warned the world that if global warming continues at current levels, the rate of extreme weather events, ecosystem instability, and constraints on human activity will increase rapidly. If global warming continues business as usual, it is highly likely that the average temperature of the earth will rise by 4°C or more by 2100, which will bring an end to species, cause food insecurity, and further restrict human activities.

The IPCC is calling for a strong greenhouse gas reduction policy to keep the average temperature rise within 1.5°C, emphasizing the need for global investment and funding coordination*, cross-sectoral policies, and international cooperation

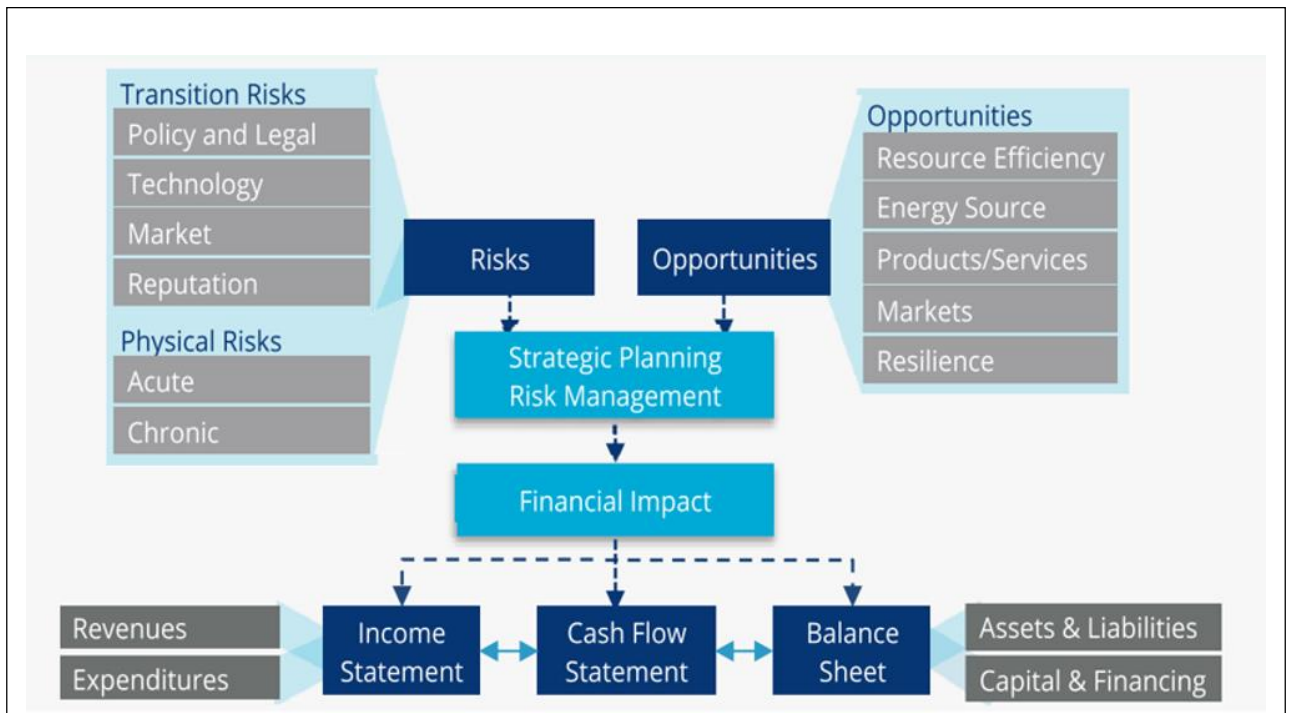
at various levels of governance.

* It was forecasted that an annual investment of USD 2.4 trillion (approximately 2.5% of global GDP) is required for the energy system transformation between 2016 and 2035 (2018).

The Bank of Korea highlighted, "Climate change is a new risk, and the transition to an eco-friendly economy in response to this challenge will have a significant impact on the real economy. The transition requires huge efforts and resources, but we need to accept it as an opportunity to expand future growth drivers for sustainable society." The below figure illustrates the risk and opportunity factors that TCFD* sees in climate changes.

* Task Force on Climate-Related Financial Disclosures (TCFD): This TCFD is an advisory body that proposes methodologies that help organizations address concerns around insufficient disclosure of climate-related risks and opportunities for businesses

<Figure 2-2> Risks and Opportunities Related to Climate Change



Source: TCFD (2017)

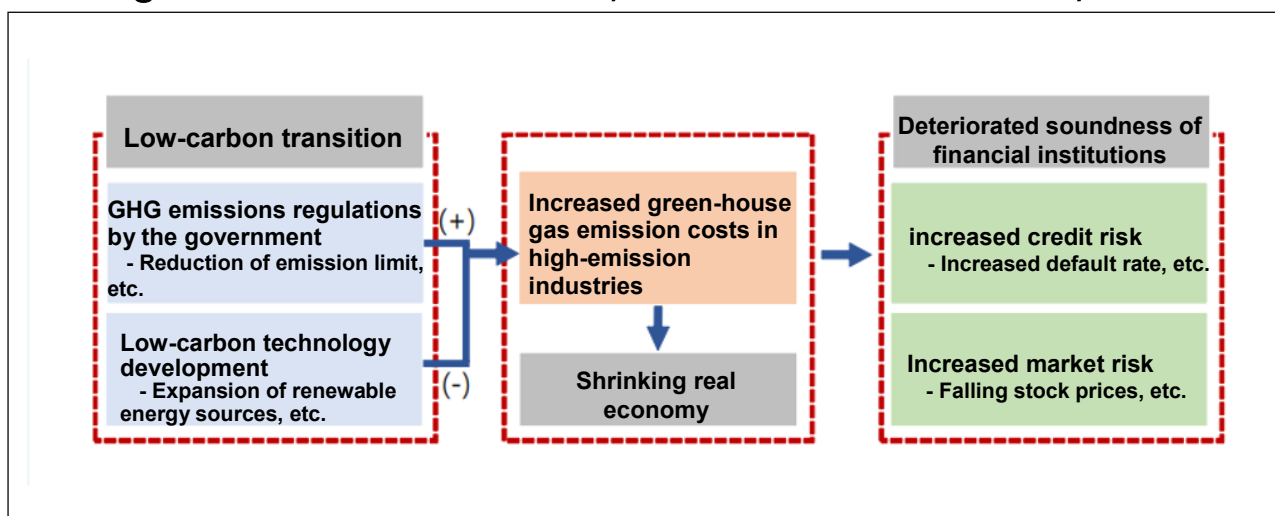
In the case of financial institutions, transition risks and physical risks due to climate change may be transferred to each financial institution through the "2.4. Climate Risk Transmission Pathway", affecting their financial and non-financial aspects. Therefore, in order for organizations to improve their resilience to climate change impacts and mitigate climate risks, it is necessary to identify, evaluate and control possible risks that may arise from these pathways.

2.4. Climate Risk Transmission Pathway

In the transition to a low-carbon economy, environmental changes such as tightened greenhouse gas emission regulations, the development of low-carbon

technologies, and changes in customer and investor preferences can increase the emission cost of high-emission industries, shrinking the real economy. This can lead to insolvency and depreciation of financial institutions, deteriorating the soundness of the finance industry as a whole. The Bank of Korea highlights the spread of this transition risk, as shown below.

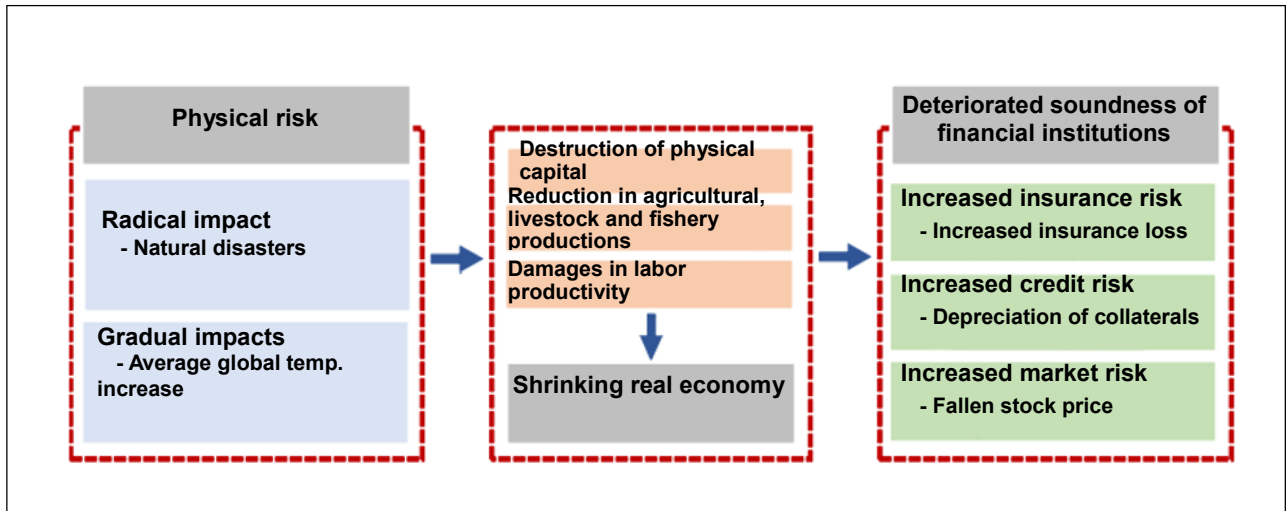
<Figure 2-3> Transmission Pathway: Transition Risk to Financial Systems



Source: Bank of Korea (2021)

Failure to transition to a low-carbon economy will lead to an increase in abnormal climate events such as natural disasters and physical damage due to long-term changes in climate patterns. This will eventually cause a depreciation of collateralized assets of financial institutions and an increase in insurance losses, which will further deteriorate the soundness of financial institutions. The Bank of Korea highlights the spread of this physical risk, as shown below.

<Figure 2-4> Transmission Pathway: Physical Risk to Financial Systems



Source: Bank of Korea (2021)

2.5. Management Target, Method, and Criteria

Transition risk and physical risk can be transferred as credit risk, market risk, operational risk, insurance risk, and reputation risk of a financial institution as follows, and therefore needs to be controlled.

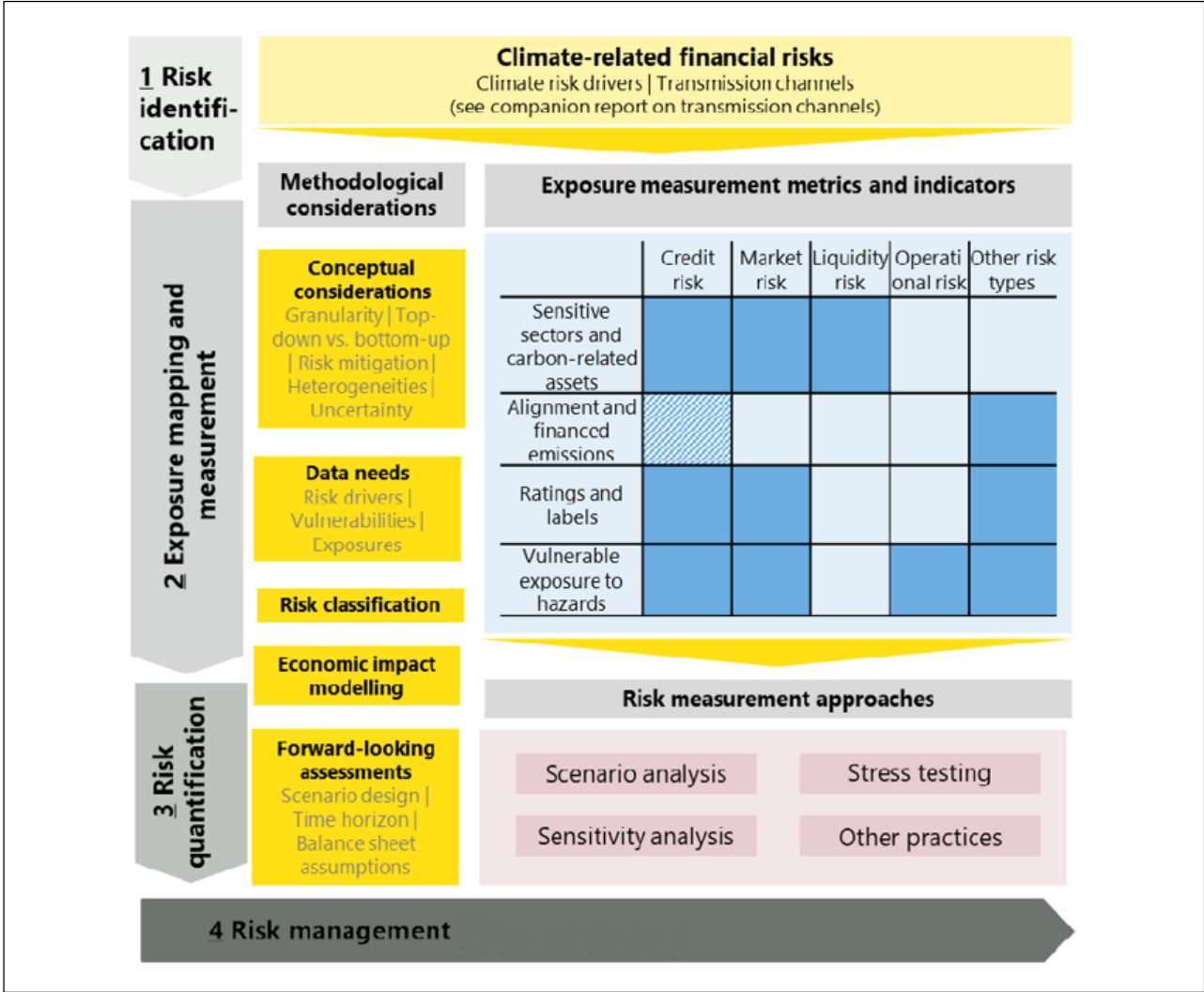
- ① Credit risk: The increased frequency and severity of extreme climate events can compromise customer assets and affect the customer's operations, profitability, and potential viability. The transition to a low-carbon economy can affect the profitability of customers in high-emission industries. These factors make it difficult for customers to repay their debts and compromise related collaterals, increasing the credit risk of financial institutions.
- ② Market risk: Financial institutions may have risks of the decreased valuation of assets they invested in high-emission companies or companies contributing to environmental degradation and be exposed to the volatility of related investments.
- ③ Liquidity risk: Natural disasters can cause extensive damage to physical property or huge costs, which will indirectly affect financial companies in the form of emergency loans, fund withdrawals, and liquidity deterioration.
- ④ Operational risk: Extreme weather events may undermine the business continuity of financial institutions by affecting their infrastructure, systems, processes, and human resources. Financial institutions may be sued for damages from parties who have suffered environmental damage and compensate for the losses for which they are liable.
- ⑤ Insurance risk: Extreme weather events can lead to excessive insurance claims and loss of underwriting. Life insurance companies can be indirectly affected by climate change through its impact on disease and mortality risk. Climate risk can pose a high-risk burden on financial institutions, such as environmental claims as per insurance contract underwriting policies and direct claims against financial companies that failed to manage climate risk.
- ⑥ Reputational risk: Financial institutions that provide funds to businesses that have a negative impact on the environment are exposed to reputational risk.

Source: Financial Supervisory Service (Climate Risk Management Guidelines, 2021)

One can expect how climate risk spreads to the financial risk, and climate risk management is an imminent challenge, but a problem keeps us moving forward: data availability. For example, data necessary for financial risk management to convert climate risks into economic risks, data that connects climate-adjusted economic risk factors and exposures, and data that converts climate-adjusted economic risks into financial risks are either unavailable or incomplete.

Nevertheless, BIS presents a conceptual frame for climate risk management of financial institutions in "Climate-related financial risk-measurement methodologies" (April 2021), as shown in the figure below.

<Figure 2-5> BIS’s Conceptual Framework of Climate Risk Management for Financial Institutions



The above frame is the ultimate goal of the climate risk management framework. However, considering the availability of climate-related data and feasible measurement strategies, we believe it is still premature to fully introduce and implement this frame. Therefore, the Group needs to carry out the entire process in a phased manner, starting from identifying and managing areas sensitive to climate risks through scenario analysis and integrated climate risk management systems.

3. Transition Risk Management

This chapter specifies criteria for identifying, evaluating, managing, monitoring, and reporting risks for transition risk management.

3.1. Risk Identification and Assessment

The Group should identify and evaluate significant transition risks at the customer and portfolio level, taking due account the transmission pathways of climate risks. The implementation risk assessment may factor in the greenhouse gas (GHG) emissions, Financed emissions, carbon intensity, reduction goals, mitigation activities, etc., of the customer and portfolio.

3.1.1. Measurement of Financed emissions

Financed emission represents the greenhouse gas emission of a financial asset, which is an essential indicator in measuring and responding to climate change impacts such as identification and evaluation of climate risks, setting of greenhouse gas reduction targets, implementation of reductions, and analysis of climate risk scenarios.

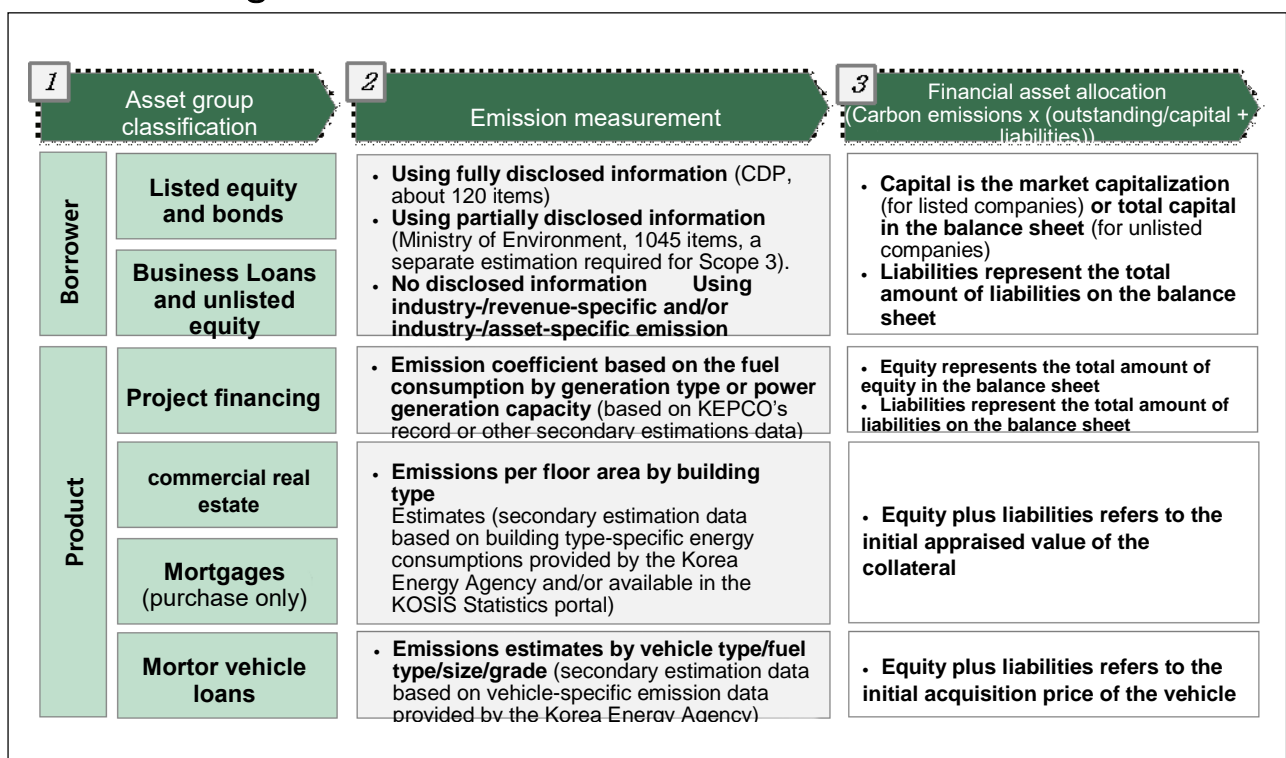
The Group's Financed emissions calculation method follows the PCAF* methodology, where the carbon emissions are measured by determining the emissions by borrower or product for 6 asset groups**, and then allocating the measurements according to the Group's financial asset balance (Financed emissions = carbon emissions x outstanding amount / total assets of the target borrower or product).

* PCAF: The Partnership for Carbon Accounting Financials

* Six asset groups: 1) Listed stocks and corporate bonds, 2) corporate loans and unlisted stocks, 3) power generation and infrastructure project finance, 4) commercial real estate development finance, 5) mortgage funds, 6) vehicle loans

The Financed emission measurement procedure is shown in the figure on the next page. For details on the definition and measurement methods and procedures of Financed emissions, refer to the "PCAF Standard Carbon Emission Measurement Requirements."

<Figure 3-1> Financed emission Measurement Procedure



3.1.2. Carbon Intensity Measurement

Financed emission is an absolute amount indicator that can increase as financial

assets increase. Therefore, to allow comparison of emissions between Affiliates, industries, borrowers, or products, we need an indicator that is not engaged with the growth in assets.

Carbon intensity is typical, and it has variants depending on the viewpoints: financial intensity (financial institutions), revenue intensity (borrower), and unit intensity.

<Table 3-1> Different Indicators

Category	Equation	Remarks
Financial Intensity	<ul style="list-style-type: none"> Financed emissions/financial assets 	<ul style="list-style-type: none"> tCO₂e per balance (KRW 100M) Comparison among industries or borrowers
Revenue Intensity	<ul style="list-style-type: none"> Carbon emissions/revenue of the borrower 	<ul style="list-style-type: none"> tCO₂e per revenue (KRW 100M) Compare the emission to revenue efficiency
Intensity per activity (unit intensity)	<ul style="list-style-type: none"> Carbon emissions / amount of activity Amount of activity: production volume, generation capacity, transportation distance, etc. 	<ul style="list-style-type: none"> tCO₂e per unit corporate activity As actual carbon emissions of company are generated from the cost of sales rather than sales, emissions attributed to the cost of sales are considered. Due to the industry dependency, activities are compared within the same industries only.

Unit intensity is an indicator derived from the corporate activity and prevents the possibility of incorrect identification of carbon emission reduction efforts* of companies where carbon emissions increase with the activity.

* Example: Assuming a steel company produced 100 million tons in 2019 with total emission of 10 million tons, and the production and emission in 2020 were 150 million tons and 11 million tons, respectively, we may conclude there was no emission reduction effort since their carbon emission increased by 1 million tons. However, based on the unit indicators, which are 0.1 (10 million tons of emission / 100 million tons of production) in 2019 and 0.073 (11 million tons of emission / 150 million tons of production) in 2020, implying their reduction effort.

However, this indicator requires the data on company activities which are not

usually managed/stored by financial institutions. This implies that the financial institution should collect and manage such data as much as possible for later use, especially against companies with high emissions and a level of exposure.

The Group basically measures customer- and portfolio-specific financial intensity indicators but also expands the scope to include the other two for future use by collecting relevant data.

3.2. Risk Management

For transition risk management, the Group establishes risk management policies and procedures to

- 1) Monitor and report climate risk management indicators,
- 2) Identify and control climate change sensitive areas,
- 3) Set and control Financed emission reduction targets,
- 4) Help customers manage climate risks, and
- 5) Control climate risks.

3.2.1. Monitoring and Reporting Climate Risk Management Indicators

The Group regularly monitors climate risk management indicators, including Financed emissions and carbon intensity, for portfolios and key climate change sensitive areas, and informs management and the BoD and its advisory groups of critical findings.

<Table 3-2> Criteria for Transition Risk Monitoring

Monitoring indicators	Report cycle	Measurement subjects	Reporting
Financed emissions Financial intensity	(At least) Quarterly	<ul style="list-style-type: none"> • Group and all Affiliates • Six asset groups • Key sensitive areas and sub-portfolios 	<ul style="list-style-type: none"> • Management and BoD committees on climate risk

3.2.2. Identifying and Controlling Climate Change-sensitive Areas

Climate change-sensitive areas, such as industries with high carbon emissions, require active control since their profitability may be compromised due largely to the increased price in the course of low-carbon transitions, deteriorating the soundness of the financial institutions.

The Group may establish climate change-sensitive areas (incl. High emission industries) to take into account Financed emissions, carbon intensity, and the industry characteristics and control them using risk dashboards, limitations, etc.

<Table 3-3> (Example) Classification of High-emission Industries

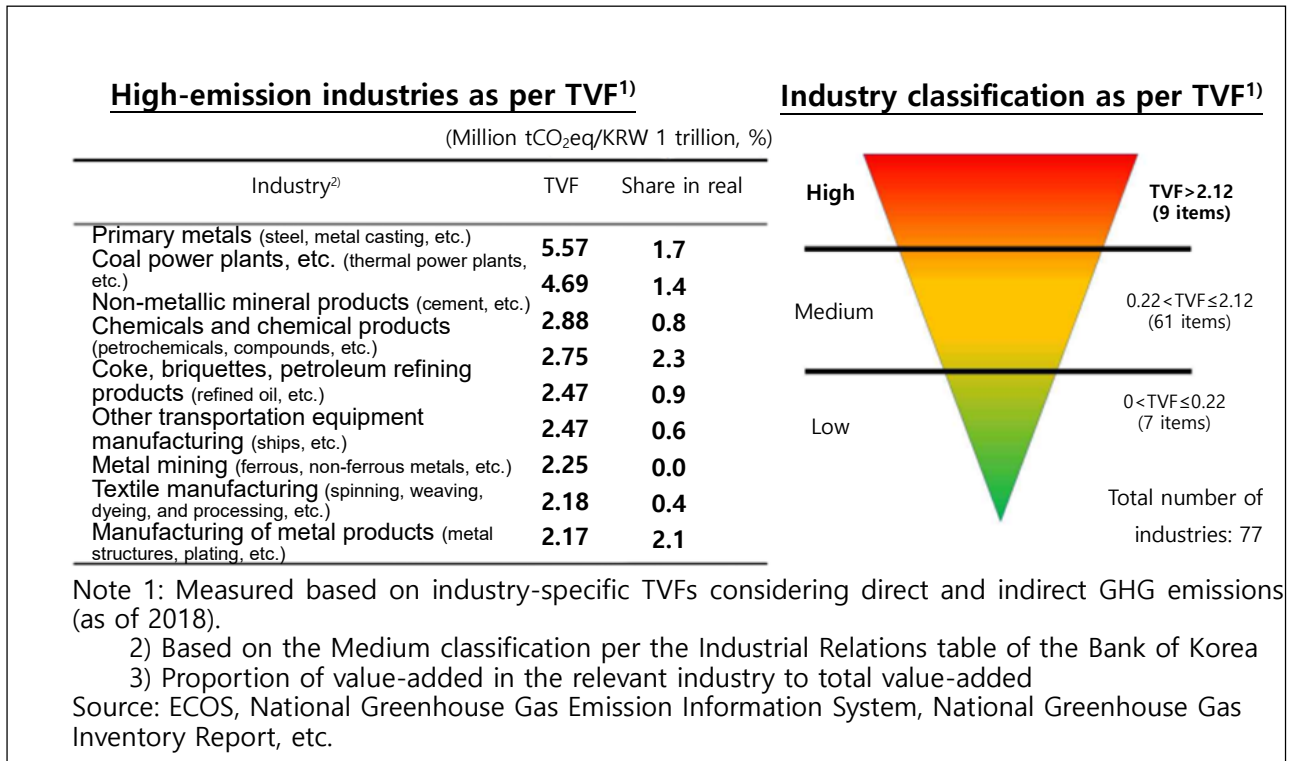
Category	Criteria	Remarks
Financial intensity > Group's average	<ul style="list-style-type: none"> • Industries with above-average financial intensity (tCO₂e per KRW 100 million) 	<ul style="list-style-type: none"> • Highly relevant to the Group's reduction target setting • For companies without disclosed emission data,

Category	Criteria	Remarks
		<p>PCAF's emission coefficient (industry-specific) is applied. (When mapped to the industry classification criteria, the characteristics of detailed domestic industries may not be reflected)</p>
TVF > 2.12*	<ul style="list-style-type: none"> • This is the classification standard of the Bank of Korea, which is the Korea-adapted version of the Dutch Central Bank's method. • TVF (Transition Vulnerability Factor) is an indicator combining industry-specific carbon emission statistics with input and output tables to represent industry-specific carbon emissions required to produce a unit of added value. 	<ul style="list-style-type: none"> • This was selected based on the carbon emission of the entire domestic industry and reflected the characteristics of the domestic industry. • As industry-specific data are publicly available only three years after its publication (i.e., data published in 2018 is available in 2021), the information is not up-to-date.

* Based on the medium category of Korea's Standard Industry Classification system and 77 TVF levels, industries are classified as "High (greater than $\mu + \sigma$)," "Medium ($\mu \pm \sigma$)," and "Low (below $\mu - \sigma$)." The High-labelled industries are considered industries with high carbon emissions (high-

emission industries).

<Figure 3-2> High Emission Industries as per Bank of Korea's TVF



3.2.3. Setting and Controlling Financed emission Reduction

Targets

In accordance with the Paris Climate Agreement (2015), international cooperation to reduce greenhouse gas emissions is being strengthened, and South Korea has finalized 2050 carbon neutrality roadmaps. The Group has also declared its 2050 Carbon Neutrality Strategy, and the Task Force on Climate-Related Financial Disclosures (TCFD), to which the Group has joined, requires its members to disclose its reduction targets. In the financial industry as a whole, it is imperative to reduce Financed emissions to respond to the demands of the times for the transition to a low-carbon system and to enhance its resilience to climate risks.

The following table shows the TCFD requirements for the disclosure of Financed emission reduction targets of financial institutions specified in “Proposed

Guidance on Climate-related Metrics, Targets, and Transition Plans” (June 2021).

<Table 3-4> TCFD’s Requirements for Financed emissions Reduction Target Disclosure

Category	Requirements
Methodology	<ul style="list-style-type: none"> • A PCAF methodology • Goals set per the guidance of the Science Based Targets initiative (SBTi) • Inclusion of Scope 1 and 2 as well as Scope 3 (Financed emissions) targets (for financial institutions)
Goals	<ul style="list-style-type: none"> • The indicators and objectives for risk management describing the objectives organizations use to manage climate-related risks and opportunities and their performance in relation to those objectives. • Units: Units of measurements: either absolute amount or the intensity • Duration: The span of time invested to achieve the target. It must be consistent across objectives and, where possible, use a harmonized tracking timeframe with climate change-related organizations or regulators (e.g., sharing the same target time frame from 2020 to 2050 for carbon neutrality). • Baseline: The reference year to track the progress from (e.g., Year 2020) • Interim target: All medium and long-term targets should include interim targets distributed at appropriate intervals (e.g., 5 to 10 years) that cover the entire investment time (e.g., 40% reduction in 10 years by 2030)

Based on the 2050 carbon neutrality scenario, the Group sets and manages GHG reduction targets as per internationally accredited methodologies such as the

Science Based Targets initiative (SBTi). However, as the enterprise-wide reduction targets are one of the responsibilities of the ESG department, so necessary support and collaboration should be made to help them set the targets.

3.2.4. Helping Customers Manage Climate Risks

As can be seen from the equation* below, a company can reduce its Financed emission by reducing its carbon emissions and adjusting its financial asset balance.

* $\text{Financed emissions} = \text{corporate carbon emissions} \times \text{group financial assets balance} / \text{total corporate assets}$

The amount of carbon emission is determined according to the degree of participation of the company in carbon emission reduction efforts. It is also determined by the implementation of the mitigation implementation path in accordance with the NDC objectives and the adjustment of the Group's financial assets (such as exposure adjustment). The former is what we call "participatory reduction," and the latter is "managed reduction."

Participatory reduction aims to manage companies, the source of Financed emissions as well as the Group's customers, to ensure they participate in carbon emission reduction efforts, to prevent them not only from being exposed to transition risks but also from transferring the risks to the Group.

Managed reduction is controllable from the point of view of financial institutions, but because it involves re-balancing the entire portfolio, simultaneous consideration of profitability and soundness is inevitable. Considering that a significant proportion of the Group's business portfolio is industries directly related to carbon emissions, reducing Financed emissions through immediate portfolio adjustments will damage the Group's profitability and spur a rapid

industry transformation, leading to the deterioration of financial soundness and causing transition risks. In this regard, managed reductions are said to be implemented in a gradual manner in conjunction with monitoring of the industry performance according to the NDC.

Therefore, the Group should implement a balanced mix of these two reduction strategies by taking into account the level of climate-related regulations, the level of response to climate change of other companies, the degree of technological development, and the current climate change portfolio.

Examples of participatory reduction efforts include encouraging companies in high-emission industries to participate in reduction efforts, investment in new facilities and energy sources to respond to stranded assets*, new technologies in the eco-friendly sector (incl., CCUS, hydrogen-reduced steel, innovative materials, etc.), investment on and expansion of green finance, and monitoring of intensity per unit of business and intensity per sales.

* Refers to assets that are converted into liabilities or losses before their useful life due to a decrease in value (or disposal) due to climate risk, etc. For example, if a coal power plant is prematurely closed or replaced as a result of early decarbonization, the coal power plant is referred to as a stranded asset.

Management reduction efforts include limit control for companies and high-emission industries or limit control for exposures, limit control for intensities, etc.

3.2.5. Controlling Climate Risks

The Group can identify customers or transactions to eye on through climate risk measurement and evaluation and establish a separate control and approval procedures to control these customers and transactions based on the size of the transaction, the level of climate risk, and the customer's efforts, capabilities, and willingness to manage and mitigate risks. In addition, depending on the customer's

climate risk control level, the Group can induce customers to a full-fledged climate risk management using carrots and sticks, including cost reduction incentives or penalties.

4. Physical Risk Management

This chapter specifies criteria for the identification, evaluation, management, monitoring, and reporting of physical risks.

4.1. Risk Identification and Assessment

The Group identifies and evaluates critical physical risks at the customer and portfolio level, taking into account possible damages by the increase in abnormal weather events such as typhoons, floods, or heat waves and changes in long-term climate patterns. Physical risk assessment uses both historical climate observation data and future climate forecast data and must take into account the industry, geographic location, and asset characteristics of customers and portfolios.

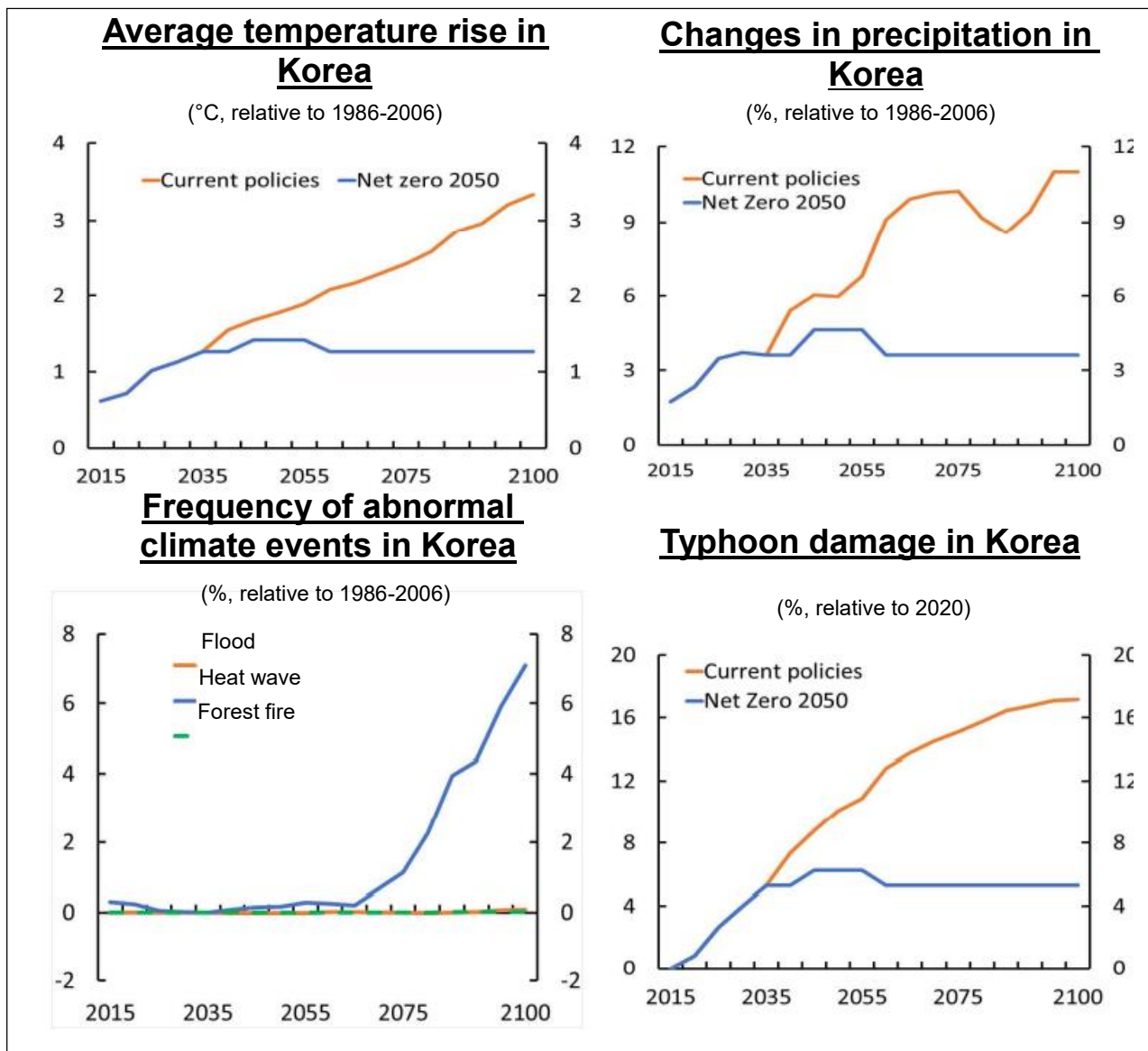
4.1.1. Climate Events Subject to Physical Risk Analysis

Abnormal climatic phenomena due to climate change appear in various forms, such as typhoons, floods, forest fires, heat waves, sea-level rise, air pollution, and water shortages. However, **given the fact that a significant proportion of group exposure is limited to Korea, only abnormal climatic phenomena to which Korea is prone, such as typhoons, floods, heat waves, and sea-level rise, are set as the subject events of the physical risk analysis.**

The Network for Greening the Financial System (NGFS) has predicted the following abnormal climate events for the "business as usual" and "carbon neutrality in

2050" scenarios.

<Figure 4-1> Comparison of Scenarios: Carbon Neutrality in 2050 vs. Business as Usual (Without Any Efforts for Reduction)



4.1.2. Measuring Physical Risks

Physical risk is determined by estimating expected losses at the customer or portfolio level, taking into account industry-specific susceptibility for specific weather events, regional risk levels, etc. However, due to the lack of data that can estimate the amount of loss caused by a specific weather event and the analysis method is still immature, the risk measurement method needs to be continuously refined according to the advancement of data and analysis method.

For the physical risk measurement, the Group identifies the status of exposure by region and industry exposed to abnormal climate events in the initial stage. Then, as per the advanced data and analysis methods available, the Group expands the analysis to estimate the loss of customers and portfolios due to abnormal weather is measured. In this process, the Group can collect climate data is collected and built it into a database for its own loss measurement modeling. If necessary, external climate data and loss measurement models may be used.

4.2. Risk Management

Physical risk is assumed to occur when the economy transition to a low-carbon economy fails, but it is also applied to business locations, real estate collaterals, insurance underwritings, etc., in that it is also a consequence of natural disasters or sea-level rise.

<Table 4-1> Management by Physical Risk Impact

Category	Business locations	Real estate collaterals	Insurance underwritings
Heat wave	-	-	<ul style="list-style-type: none"> • Classification and management of products related to heat wave damage (e.g., crops) among underwritings
Flood/ Typhoon	<ul style="list-style-type: none"> • Classification management of flood- and typhoon-prone areas (KMA) 	<ul style="list-style-type: none"> • Inspection of possible damages to collaterals in case of flood or typhoon 	<ul style="list-style-type: none"> • Classification and management of products related to flood and typhoon damages (e.g., crops, automobiles, etc.)
Sea-level rise	<ul style="list-style-type: none"> • Classification management of countries and regions prone to sea-level rise • Beware of riverside as well 	<ul style="list-style-type: none"> • Inspection of possible damage to collaterals due to sea-level rise 	<ul style="list-style-type: none"> • Classification management of countries and regions prone to sea-level rise

4.3. Monitoring and Reporting

The group regularly monitors physical risk management indicators, such as climate events subject to physical risk and exposure level by risk area and communicates key findings to the management and board committees. In the future, as per the advanced data and analysis methods available, the Group will expand the scope of indicators.

<Table 4-2> Criteria for Physical Risk Monitoring

Monitoring indicators	Report cycle	Measurement subjects	Reporting
Exposure level by climate phenomena/risk areas	Annual (minimum)	<ul style="list-style-type: none"> • Corporate loan assets • Real estate financial assets, etc. (if necessary) 	<ul style="list-style-type: none"> • Management and BoD committees on climate risk

5. Climate Risk Scenario Analysis

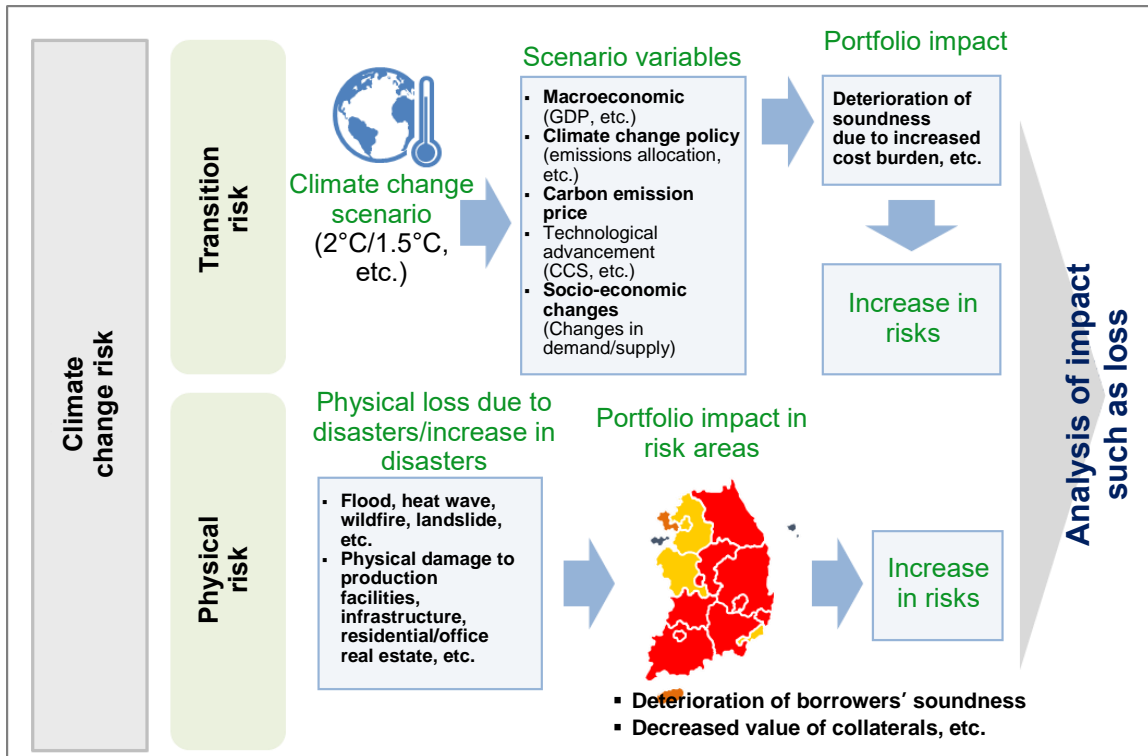
This chapter defines climate risk scenario analysis and explains the analysis method. Since the climate risk scenario analysis is the field where the model methodology has not been established, this chapter will focus on the Group's future application and utilization plans.

5.1. Climate Risk Scenario Analysis - Definition

Climate risk scenario analysis aims to measure the impact of physical risks on the real economy, etc., through the transmission pathways if the applicable climate change scenario is followed. Scenario analysis allows financial institutions to measure the impact of their portfolios on climate change, identify vulnerable areas, and take advantage of them for future response strategies.

- * The climate risk scenario analysis methodology is currently under development, and climate data and analysis methods are not available for physical risk. Therefore, we only focus on the implementation risk aspects.

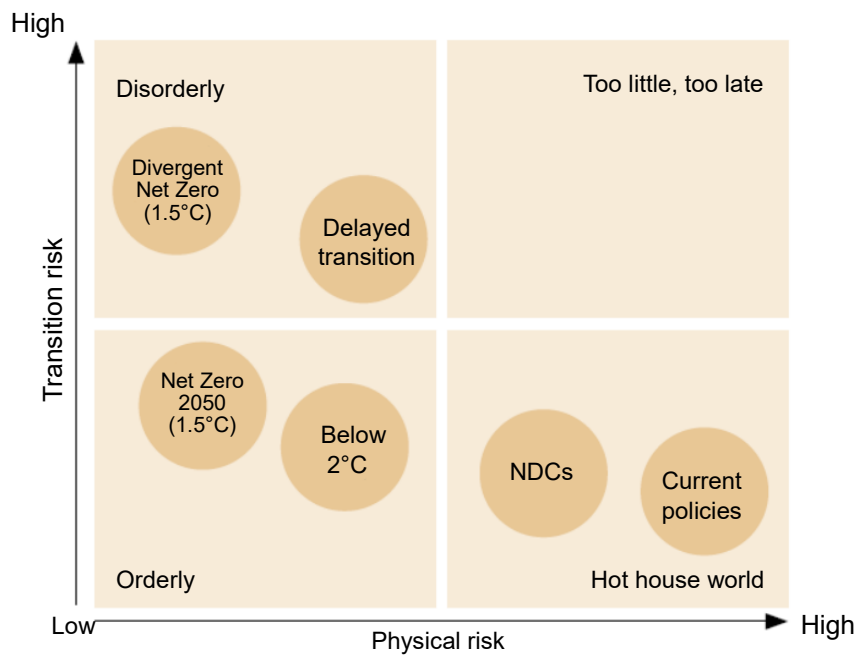
<Figure 5-1> The Concept of Climate Change Scenarios



5.2. Climate Change Scenarios

The climate change scenario consists of variables that are affected by low-carbon implementation, such as the greenhouse gas reduction path and the cost of marginal reduction of greenhouse gases. The NGFS presented six scenarios for climate change as follows.

<Figure 5-2> Climate Change Scenarios by NGFS



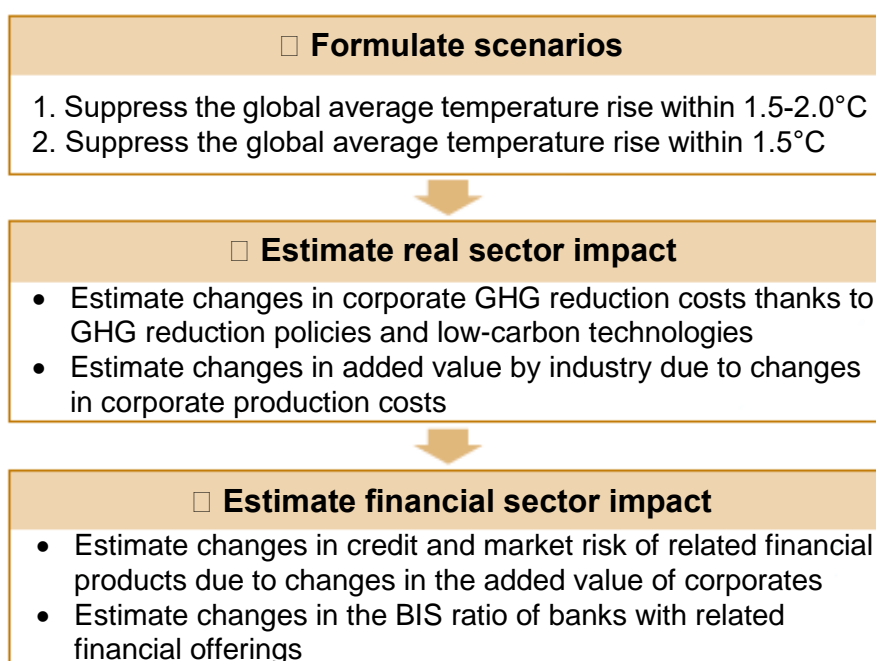
Among the orderly implementation scenarios, the "Below 2°C" scenario assumes the greenhouse gas reduction policy enforcement starting from 2021 to limit the increase in the global average temperature to 2°C or below compared to the pre-industrial level by 2050. In the "Net Zero 2050" scenario, a stronger emission reduction policy is enforced from 2021 compared to the "Below 2°C" scenario to achieve carbon neutrality around 2050 and suppress the increase in the global average temperature to 1.5°C or less compared to the pre-industrial level.

The "Delayed transition" scenario under the "Disorderly" category does not put any effort for greenhouse gas reduction by 2030 but only adopts a radical reduction policy from 2030 to limit the increase in the global average temperature to 2°C or less by 2050. In the case of the "Current policies" of the "Hot house world" scenario group, no additional implementation policy is introduced, so there is no change in greenhouse gas emissions, and the physical damage caused by climate change is maximized.

5.3. Climate Risk Scenario Analysis – Methodology

For the analysis, the Group 1) establishes a comprehensive climate change scenario, including global average temperature change, greenhouse gas reduction policies, and pathways, and low-carbon technology development, 2) estimates the impact on the real sector, such as changes in corporate greenhouse gas costs, and 3) based on the estimates, determine the impact on financial institutions. The figure below shows the analysis procedure presented by the Bank of Korea.

<Figure 5-3> Stress Test Procedure



5.4. The Group’s Strategies for Climate Risk Scenario Analysis

As transition risks due to climate change are expected to affect the stability of

finance, research efforts from European central banks are exerted to develop a standard scenario analysis model. Also, institutions such as climate change-related initiatives, major financial institutions, and credit rating agencies are collaborating on research and development projects. Still, the standard evaluation modeling has not been reported.

In this regard, the Group will actively collaborate with relevant entities, including supervisory agencies, academia, and external companies, to research and develop climate risk scenario analysis models. In addition, if necessary, the Group may adopt any external scenario analysis models to evaluate its own portfolio impacts. The Group will also keep up with the advancements in the field of climate change scenario modeling to inform and expand/refine its scenario analysis framework.

5.5. Internal Capital Adequacy Assessment of Climate

Risks

The Group can quantify financial risks through the identification, measurement, assessment, and scenario analysis of climate risks and integrate the assorted critical risks into the internal capital adequacy assessment processes.

6. Climate Risk Management Organizations and Roles

This chapter specifies the criteria for 1) risk management organization, 2) roles of the board of directors and responsible officers, and 3) roles of Holding Company and Affiliates for climate risk management.

The board of directors and the responsible officers should evaluate the impact of the Group's strategies, business plan, and risk management strategy. Also, they should ensure the Group's objectives are in line with relevant international agreements or government policies and oversees the Group's climate risk management and disclosure practices.

6.1. Risk Management Organizations

Considering that the Group's climate risks are managed in the sustainable management (ESG) system, the ESG management organization should be involved in the existing risk management organization.

<Table 6-1> Climate Change Response Organizations

Category	Climate risk control	Enterprise-wide climate change management
Dedicated team	<ul style="list-style-type: none"> (Holding company) Risk Management Team 	<ul style="list-style-type: none"> (Holding company) ESG Planning Team
Business Execution	<ul style="list-style-type: none"> GCRO (Group Chief Risk Officer) 	<ul style="list-style-type: none"> GCSSO (Group Chief Strategy & Sustainability Officer)

Category	Climate risk control	Enterprise-wide climate change management
Working groups	<ul style="list-style-type: none"> Working Committee on Group Climate Risks 	<ul style="list-style-type: none"> Working Committee on Group ESG
Committee of Affiliates	<ul style="list-style-type: none"> Group Risk Committee 	<ul style="list-style-type: none"> Group ESG CSSO Committees
CEO Committee	Group ESG Committee	
BoD Committees	<ul style="list-style-type: none"> Risk Management Committee 	<ul style="list-style-type: none"> ESG Strategy Committees

The table below shows the overall climate risk management organization and the overall climate change management practices.

<Table 6-2> Risk Management Organizations: Roles & Responsibilities

Category	Climate risk control	Enterprise-wide climate change management
Risk identification	<ul style="list-style-type: none"> Identification of risk sources 	<ul style="list-style-type: none"> Identification of corporate opportunities from physical and transition risks
Risk assessment	<ul style="list-style-type: none"> Financed emission measurement and scenario analysis Internal capital measurement (if necessary) Regulatory capital measurement (if enforced by regulation) 	<ul style="list-style-type: none"> Establishment of strategies to implement opportunities

Category	Climate risk control	Enterprise-wide climate change management
Risk management	<ul style="list-style-type: none"> • Intensity management • Selection and management of high-carbon industries • Establishment and control of exposure limits for Affiliates/industries/large borrowers (linked to the existing management method) 	<ul style="list-style-type: none"> • Establishment of Financed emission reduction targets to achieve carbon neutrality • Establishment and management of strategies to achieve reduction goals for Affiliates
Response to external organizations	<ul style="list-style-type: none"> • Response to risk-related supervisory authorities 	<ul style="list-style-type: none"> • Response to investors and credit rating agencies
Disclosure and public offering	<ul style="list-style-type: none"> • Risk disclosure (if requested by supervisory authorities) • Open task support 	<ul style="list-style-type: none"> • Sustainability Report (ESG Report), TCFD Report

6.2. The Roles of the Board of Directors and Responsible Officers

The board of directors consists of the Risk Management Committee, the ESG Strategy Committee, and the responsible officers refer to the GCRO and GCSO.

<Table 6-3> Roles of Committees

Category	Risk Management Committee	ESG Strategy Committee
Approval rights	<ul style="list-style-type: none"> • Climate risk management system • Climate risk management policy (for internal capital and regulatory capital measurements) • Limits for the implementation of reduction targets (if established) 	<ul style="list-style-type: none"> • Financed emission reduction target from a carbon-neutral perspective • Implementation strategies for climate risk opportunities
Reports	<ul style="list-style-type: none"> • Financed emission monitoring result • Scenario analysis (if necessary) • Impact of physical risks (if necessary) • Matters related to disclosure (if necessary) 	<ul style="list-style-type: none"> • Financed emissions reduction performance • Opportunity implementation performance • Matters related to the public offering

The GCRO oversees climate risk management (climate risk manager), and the GCSSO oversees the ESG drive system. If necessary, the GCRO may report to the ESG Strategy Committee, and the GCSSO may report to the Risk Management Committee.

6.3. Roles of Holding Company and Affiliates

The Holding Company is in charge of the Group's climate risk management standards, management system, policies, and strategies. Group companies prepare

and implement detailed action plans for each group company for the matters established by the Holding Company.

In addition, Affiliates should have climate risk roles and ESG drive system responsibilities in place as per "6.1. Risk Management Organization" and "6.2. Roles of the Board of Directors and Responsible Officers."

6.4. Collecting Climate Risk Data

The Group strives to induce customers to disclose climate risk-related data for climate risk mitigation and management, collect relevant data, and improve data quality. The Group utilizes publicly available climate risk data and its own data or hires external experts when necessary to expand the scope of data use and improve data quality.

6.5. Enhancing Climate Risk Capabilities

The Risk Management Committee and ESG Strategy Committee provide education to ensure directors are keeping up with climate risks and responsible officers have the necessary expertise to deal with climate risk management.

Through regular training programs on climate risk management, etc., the Group supports its employees to build and improve and enhance their climate risk management capabilities and expertise.