



Shinhan Financial Group  
TCFD REPORT

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# Introduction

## Net-Zero – A Promise for The Present and Future

We all promised to take the path of net zero for future generations.

Climate change causes such natural disasters as heat and cold waves and impacts biodiversity, health, the ecosystem, food, economy, and others, thus becoming a large threat to humankind's survival and welfare. For this reason, the international community entered into the Paris Agreement in 2015 and set a goal to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels by 2100.

In 2018, the Intergovernmental Panel on Climate Change (IPCC) adopted the "Special Report on Global Warming of 1.5°C" in 2018 that specified that it will be difficult to prevent a catastrophe by holding the increase to 2°C, and presented a path that limiting the increase to 1.5°C would require globally reducing CO<sub>2</sub> emissions by at least 45% by 2030 from 2010 levels and achieving net-zero by 2050.

In its recent sixth report (2021), the IPCC forecast that the increase in the global average temperature will become 1.5°C above pre-industrial levels no later than 2040, at least 10 years earlier than previous research results, and that it will become extremely difficult to hold the increase to 1.5°C.

The path to net-zero will clearly be difficult but must be taken. Our small efforts to fight against climate change, such as using tumblers instead of disposable cups and riding bicycles instead of emitting carbon, will enable earlier achievement of this goal.

**Shinhan promises that we will fulfill our roles and responsibilities to achieve net-zero for current and future generations.**



## Zero Carbon Drive – a Tricycle for Net-Zero

In our way to net-zero, Shinhan thinks of children’s tricycles. At the very beginning, it was difficult even to make the wheels move slowly. However, the speed of “Zero Carbon Drive” by this tricycle may be faster than an electric vehicle.

### Executive Summary

#### Shinhan’s Zero Carbon Drive Together with a Tricycle

On the path towards net zero, Shinhan takes with it a map – TCFD. The creation of the TCFD in 2015 was led by the Financial Stability Board (FSB), a consultative group between G20 Finance Ministers and Central Bank Governors, for the purpose of establishing climate change-related information disclosure measures. In 2017, it set key areas for companies to respond to climate change which are governance, strategy, risk management, and metrics and targets, and developed and announced the TCFD recommendations, which are relevant information disclosure standards. In 2021, G7 Finance Ministers provided their consent to the agreement to make climate reporting mandatory in accordance with TCFD recommendations which is why it is expected to be used as a common global reporting standard. Around 2,600 organizations in 89 countries are TCFD supporters.

Shinhan Financial Group declared its support for TCFD recommendations in 2018, and has been using them as the basis to disclose the actual/potential financial impact of climate change and observing regulations to counter climate change and setting reduction goals.



## GOVERNANCE

### Established a driving system to respond to climate change

- The ESG Strategy Committee and Risk Management Committee, BOD sub-committees, perform central roles in deliberating-deciding on climate change opportunity/risk factors
- Created the ESG Implementation Committee in 2021 that is participated in by all Group subsidiary CEOs
- Appointed the Group Chief Strategy and Sustainability Officer (GCSSO) and Group Chief Risk Officer (GCRO)
- Group subsidiaries operate a council at the working group level

### Expanded the ESG management system to execute climate change opportunity factors

- Became the first financial company in Korea to create the Green IB Execution Lab under Group & Global Investment Banking (GIB)
- Established a global, advanced ESG execution organization system by forming the ESG Global Desk

## STRATEGY

### Identified climate risk and opportunity factors

- Executed the TCFD recommendations and analyzed based on the physical climate risk classification system
- Reflected identified factors in the Group's business strategies

### Established Zero Carbon Drive, climate action roadmap

- Implemented Zero Carbon Drive strategies in 2021, measuring financed emissions based on PCAF standard and moved forward with reduction goals and database construction
- Increased green finance investments with a focus on renewable energy businesses
- Created the "K-Taxonomy Task Force" to respond to the Korean green classification system (K-Taxonomy)

### Global leadership for joint cooperation regarding the climate crisis

- Participated in global initiatives, including the SBTi, Equator Principles, PCAF, NZBA, NZAMI, and NZIA
- Attended in official events of COP26 and the Korean Pavilion

## RISK MANAGEMENT

### Established a financed emissions measurement system and database

- Measured and disclosed financed emissions of the Group's assets in accordance with PCAF GHG accounting standards, using our own financed emissions calculation system
- Conducted financed emissions simulations to us the results for the screening process of new loans and investments
- Used a risk dashboard to monitor financed emissions and intensity

### Monitored significant environmental and social areas

- Conducted exposure monitoring of 12 areas that require environmental and social caution
- Reviewed impact and response measures in the event of an issue through reports to the risk management council and management

### Implemented the Equator Principles

- Reviewed potential environmental and social risks and impact of large-scale development projects

### Operated the Group climate change risk management system

- Best Practices for the Group Climate-related Risk Management

## METRICS AND TARGETS

### Established SBTi methodology-based net zero accomplishment goals

- (Internal emissions) Set a plan to reduce emissions by 42% and 84% by 2030 and 2040 respectively, and achieve net zero by 2044 based on the SBTi 1.5°C scenario
- (Financed emissions) Set a plan to reduce emissions by 38.6% by 2030 and by 69.6% by 2040 and to achieve net zero by 2050, using the Sectoral Decarbonization Approach (SDA) and Absolute Contraction Approach (ACA) based on 2°C and partial 1.5°C scenarios

### Continued to advance PCAF-based financed emissions measurement

- Increased asset groups for which financed emission measurements are taken; and upgraded the scope and level of data used for climate-related disclosures

### Set the goal for zero carbon and zero fuel

- Set a plan to change all work vehicles of the Group to pollution-free vehicles, including electric and hydrogen vehicles, by 2030

### Set a transition finance goal for climate change opportunities

- Green finance performance of KRW 30 trillion (New accumulation from 2020 to 2030)

# A Handle that Determines Net-Zero Directions

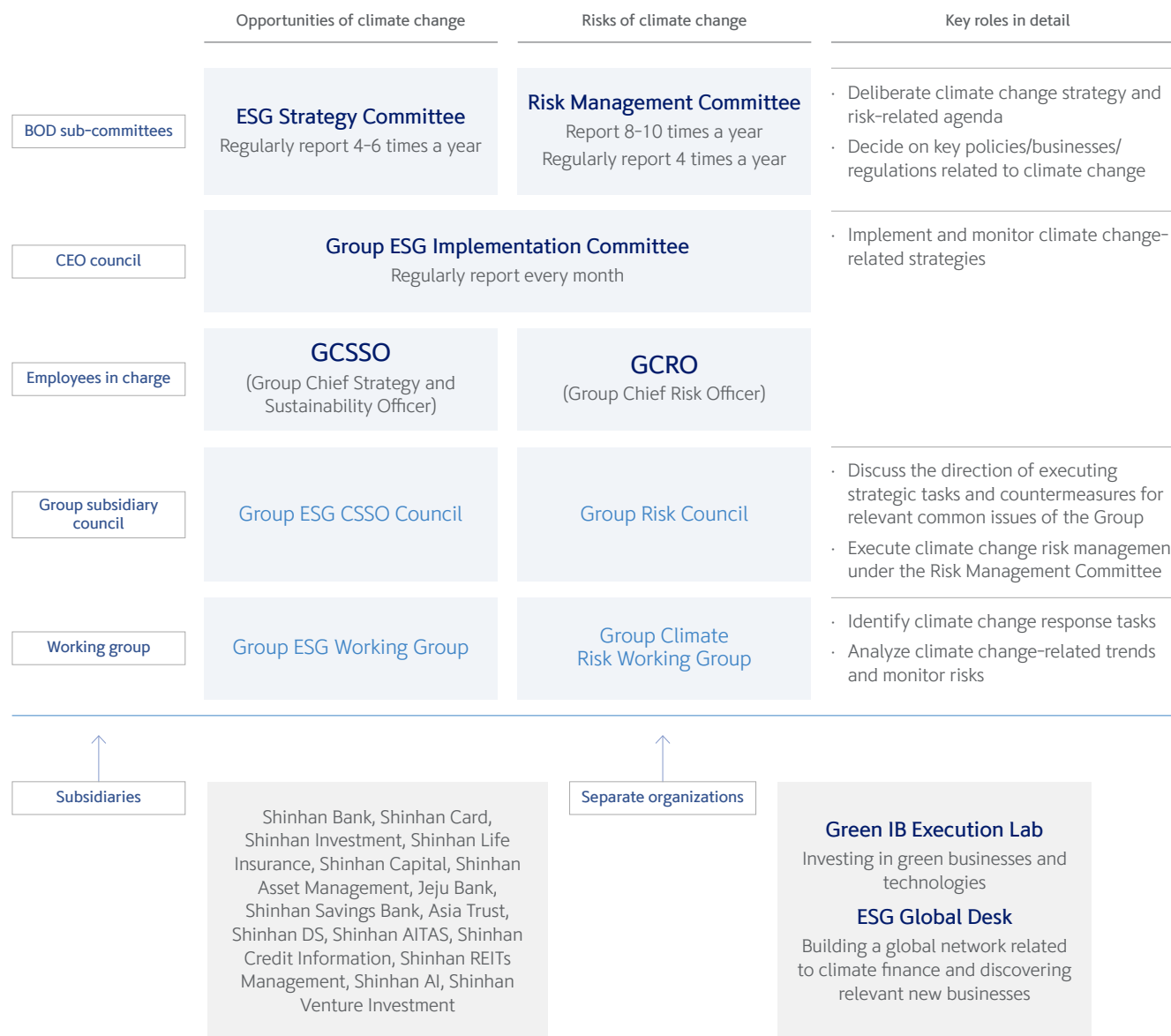
## GOVERNANCE

The most important factor in responding to climate change is “governance” that sets the direction. Transparent and reasonable climate change governance is required, above all else, to systematically respond to risks and create new business opportunities.

Shinhan Financial Group became the first financial group in Korea to build a climate change governance system that consists of directors, management, executives in charge, and working-level employees. By creating the “Green IB Execution Lab” and “ESG Global Desk” in 2021 for systematic and detailed execution, we are expanding the ESG organization structure in the areas of investment and global business expansion, which are climate change-related opportunity factors.

### Governance to Respond to Climate Change

Shinhan Financial Group has built a climate change response system to ensure organic cooperation among the BOD, management, and working-level employees, thereby preemptively identifying and managing relevant risk and opportunity factors. In addition, a council per level participated in the CEO, CSSO, CRO, and working-level employee of each Group subsidiary is operated regularly to strengthen climate change response capabilities of the Group.



## Roles of the BOD

(ESG Strategy Committee/Risk Management Committee)

The ESG Strategy Committee and Risk Management Committee are BOD sub-committees, and they perform central roles in the Group’s setting of a strategic direction to counter climate change. They also deliberate and make final decisions on important agenda for the transition to a low-carbon economy.

In 2015, Shinhan became the first financial company in Korea to establish the CSR Committee (currently ESG Strategy Committee). The Committee oversees all major decision-making related to ESG and climate change strategies, and four ESG Strategy Committee meetings were held in 2021. The Risk Management Committee identifies, measures, monitors, and controls risks that arise from various transactions in a timely manner, and comprehensively manages them. In addition, the Committee discusses matters related to increasing climate risks.

### Roles of BOD Sub-Committees

Category	ESG Strategy Committee	Risk Management Committee
<b>Approval</b>	<ul style="list-style-type: none"> <li>· Financed emissions reduction goal from the net-zero perspective</li> <li>· Strategies on executing climate risk and opportunity factors</li> </ul>	–
<b>Reporting</b>	<ul style="list-style-type: none"> <li>· Results of implementing the financed emissions reduction goal</li> <li>· Results of implementing opportunity execution strategies</li> <li>· Major matters related to disclosure</li> </ul>	<ul style="list-style-type: none"> <li>· Results of monitoring financed emissions management</li> <li>· Results of scenario analysis</li> <li>· Physical risk impact</li> <li>· Major matters related to disclosure</li> </ul>

### Major Reported and Decided Matters of the ESG Strategy Committee in 2021

<b>Reporting</b>	<ul style="list-style-type: none"> <li>· ESG dashboard (ESG finance performance and carbon index) [Regular report]</li> <li>· Progress with implementing SBTi-approved projects [3rd]</li> <li>· Progress with regards to attending COP26 and announcing the Zero Carbon Drive strategy [4th]</li> <li>· Results of measuring carbon emissions of financial assets (Year 2020) based on Partnership for Carbon Accounting Financials (PCAF) criteria [4th]</li> <li>· SBTi reduction goal and goal management measures [4th]</li> </ul>
<b>Decisions</b>	<ul style="list-style-type: none"> <li>· Join the NZBA and Value Balancing Alliance (VBA) [2nd]</li> </ul>

### Major Reported Matters of the Risk Management Committee in 2021

<b>Reporting</b>	<ul style="list-style-type: none"> <li>· Results of monitoring significant area exposure and financed emissions [Regular report]</li> <li>· Implemented a project on building an integrated ESG risk management system [4th]</li> <li>· Education on financed emission measurement and management for climate change risk management [9th]</li> </ul>
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## Roles of the BOD

(Group ESG Implementation Committee/Group ESG CSSO Council, Group Risk Council)

By creating the ESG Implementation Committee in 2021 that is participated in by all Group subsidiary CEOs, Shinhan Financial Group built a driving system for unified ESG and climate change strategy implementation at the Group level, along with the Group ESG CSSO Council<sup>1)</sup> and Group Risk Council. In addition, the GCSO and GCRO, who are officials in charge of executing work, are respectively in charge of the overall ESG driving system and climate risk management, and report major matters to the ESG Strategy Committee and Risk Management Committee.

### Duties of Organizations in Charge of Climate Change Response

Category	Oversee overall climate change management of the Group	Oversee climate risk management
<b>Risk identification</b>	<ul style="list-style-type: none"> <li>· Discover the company’s opportunities from physical and transition risks</li> </ul>	<ul style="list-style-type: none"> <li>· Identify the source of risk occurrence</li> </ul>
<b>Risk evaluation</b>	<ul style="list-style-type: none"> <li>· Establish strategies on executing discovered opportunities</li> </ul>	<ul style="list-style-type: none"> <li>· Measure financed emissions and analyze scenarios</li> </ul>
<b>Risk management</b>	<ul style="list-style-type: none"> <li>· Set a financed emission reduction goal to achieve net-zero</li> <li>· Establish and manage strategies to achieve the reduction goal by Group subsidiary</li> </ul>	<ul style="list-style-type: none"> <li>· Manage intensity</li> <li>· Choose and manage businesses with larger carbon footprints</li> <li>· Set and manage exposure limits for Group subsidiaries/businesses/large borrowers (connect to the previous management method)</li> </ul>
<b>Respond to outside organizations</b>	<ul style="list-style-type: none"> <li>· Respond to investors and credit rating agencies</li> </ul>	<ul style="list-style-type: none"> <li>· Respond to risk-related supervisory institutions</li> </ul>
<b>Disclosure</b>	<ul style="list-style-type: none"> <li>· ESG Report, TCFD Report</li> </ul>	<ul style="list-style-type: none"> <li>· Disclose matter related to climate risks and support the disclosure</li> </ul>

### Became the first financial company in Korea to create the “Green IB Execution Lab” and “ESG Global Desk”

In January 2022, Shinhan Financial Group created the Green IB Execution Lab, which is in charge of investing in green economy activity companies and companies implementing a green company transition, under the GIB matrix organization rather than an existing organization that oversees ESG (CSSO). By doing so, we built a foundation that allows us to more systematically consider ESG from the investment perspective.

In addition, we formed the ESG Global Desk, which has a global ESG expert at Shinhan Bank’s London Branch hold an additional position within the holding company’s ESG Planning Team, thus building an organizational system for execution of global, advanced ESG. This organization will perform such roles as forming a global network in relation to climate finance, identifying climate-related new businesses, researching ESG trends, and responding to policies.

<sup>1)</sup> In 2019, Shinhan became the first financial company to appoint a Chief Strategy & Sustainability Officer (CSSO), who is an executive in charge of strategies and sustainability, at all Group subsidiaries, and also designated working-level ESG officials and operated councils.

# A Right Wheel that Leads Net-Zero STRATEGY

Shinhan Financial Group has established and implements strategies to reduce climate change risks and create new business, based on a clear understanding of climate risks and opportunities, aimed at achieving sustainable growth and a transition to a low-carbon economy. In addition, we will increase low-carbon transition investments and further expand green finance support to advance into a green future.

## Climate-related Risks and Opportunities

Transitioning to a low-carbon economy structure to respond to climate change becomes a burden to companies across overall economic activities. This is because existing facilities and technologies need to be made new. For this reason, financial institutions, which give and receive mutual influence with the overall real economy, are exposed to wider-ranged risks in comparison to other industries. To take measures, Shinhan Financial Group categorizes expected climate risk and opportunity factors based on the transition and physical climate risk classification system that is included in the TCFD recommendations and reflects them in Group business strategies as part of efforts to more effectively respond to the climate crisis.

Climate-related Risks		
Classification	Climate-related risk	Potential financial impact
Transition risk	<b>Policy and legal risk</b>	<p>Increased GHG emissions rights prices, strengthened environmental disclosure obligations, environment-related lawsuits, etc.</p> <ul style="list-style-type: none"> <li>· Increase in operation costs (Example: Rise in compliance costs, rise in insurance premiums)</li> <li>· Depreciation due to policy changes</li> <li>· Asset damage and early disposal of existing assets</li> <li>· Increase in costs owing to fines and rulings or reduction in product and service demand</li> </ul>
	<b>Technology risk</b>	<p>Transition to eco-friendly and low-carbon technologies, increased technology investments to improve energy efficiency and reduce emissions, failed new technology investments, etc.</p> <ul style="list-style-type: none"> <li>· Depreciation and early disposal of existing assets</li> <li>· Reduction in product and service demand</li> <li>· New technology and alternative technology R&amp;D costs</li> <li>· Capital investment for technology development</li> <li>· Costs incurred from adopting/distributing new practices and processes</li> </ul>
	<b>Market risk</b>	<p>Changed consumer behavior, increased raw material prices, change in supply and demand of products and services, market uncertainty, etc.</p> <ul style="list-style-type: none"> <li>· Reduction in demand for goods and services from changes in consumer preferences</li> <li>· Increase in production costs owing to raised raw material prices and waste treatment cost changes</li> <li>· Sudden, unexpected changes in energy costs</li> <li>· Reduction in sales owing to sales performance changes</li> <li>· Decrease in value owing to asset re-evaluation (Example: Amount of fossil fuel reserves, land value, stock value evaluation)</li> </ul>
Physical risk	<b>Reputation risks</b>	<p>Changed consumer and investor preferences or negative stakeholder feedback, business stigma, etc.</p> <ul style="list-style-type: none"> <li>· Decrease in profits resulting from reduced product/service demand</li> <li>· Decrease in profits owing to reduced production capacity (Example: Delay in plan approval, suspension of the supply chain)</li> <li>· Decrease in profits owing to negative impact on human resource management and plan (Example: Attracting and retaining employees)</li> <li>· Reduction in capital availability</li> </ul>
	<b>Acute physical risk</b>	<p>Increased frequency and intensity of extreme abnormal weather, including typhoon, flood, and forest fire</p> <ul style="list-style-type: none"> <li>· Reduction in productivity and operating profit from suspension of business sites, collapse of the supply chain, deteriorated worker health, etc.</li> </ul>
	<b>Chronic physical risk</b>	<p>Change in precipitation patterns and extreme volatility of weather patterns, rise in average temperatures, rise in sea levels, and other long-term change</p> <ul style="list-style-type: none"> <li>· Increase in operation costs and capital costs owing to facility damage, early disposal of existing assets, etc.</li> <li>· Increase in insurance premiums for high-risk asset groups and possibility of reduced insurance availability</li> </ul>



Climate-related Opportunities		
Classification	Climate-related opportunity	Potential financial impact
Resource efficiency	Increased energy and water resource efficiency, increased recycling and eco-friendly means of transportation, expansion of eco-friendly construction	<ul style="list-style-type: none"> <li>Reduction in operation costs by improving energy efficiency and curtailing costs</li> <li>Increase in profits from a rise in production capacity</li> <li>Rise in the value of fixed assets (Example: Building with a high level of energy efficiency, etc.)</li> <li>Reduction in costs resulting from advantages in human resource management and plan (Example: Health and safety improvements, employee satisfaction level improvements)</li> </ul>
Energy resources	Use of low carbon-emitting energy sources, use of government support policy incentives, carbon market participation, transition to distributed energy sources, application of new technologies	<ul style="list-style-type: none"> <li>Decrease in operation costs from reduced GHG emissions</li> <li>Reduction in exposure to future fossil fuel price increases</li> <li>Reduction in influence from GHG emissions and carbon price changes</li> <li>Return on low-carbon technology investments</li> <li>Rise in capital availability</li> <li>Positive reputation benefits from a rise in demand for products/services</li> </ul>
Products and services	Development and expansion of low carbon emissions-related products and services, climate change adaptation and insurance solutions, new services through technological innovation, business activity diversification capabilities, changes in consumer preferences	<ul style="list-style-type: none"> <li>Increase in profits based on demand for low-carbon emission products and services</li> <li>Rise in profits through new solutions (Example: Insurance risk transfer products and services) in relation to climate change adaptation needs</li> <li>Rise in profits by developing more competitiveness by reflecting changing consumer preferences</li> </ul>
Market	Expansion of new market creation and accessibility, use of public sector incentives, access to new assets and regions that require insurance application	<ul style="list-style-type: none"> <li>Increase in profits through new market access (Example: Partnerships with the government and development banks)</li> <li>Increased diversification of financial assets (green bond, infrastructure, etc.)</li> </ul>
Resilience	Increased application of renewable energy and improved energy efficiency, resource diversification and discovery of alternative resources	<ul style="list-style-type: none"> <li>Rise in market value through a restoration plan (Example: Infrastructure, land, building)</li> <li>Improvement in supply chain credibility and operation capabilities in diverse conditions</li> <li>Rise in sales through new products and services related to resilience</li> </ul>

## Impact that Climate Change Has on Shinhan

First of all, climate risk is rapidly coming into greater prominence in terms of policy aspects in accordance with the recent global net-zero trend. Matters that can influence relevant companies' profits, such as the carbon tax and emission trading system, are emerging in a short period, and such matters as mandatory environmental information disclosure by listed companies can become a risk in operation or legal aspects. Our analysis confirmed that relevant risks may have a short-term impact, and defined the period as at least one year to at most two years.

In the mid-term future, reputation risk may arise from the implementation of Zero Carbon Drive, which was declared by Shinhan Financial Group. Failure to reduce financed emissions or continued financial support for high emission businesses that have no will towards low-carbon transition can be interpreted as "green washing" and can have a negative impact on external, open evaluations. Also, these can be connected to passive investment, ESG-related ETF, and other financial products, having a direct impact on stock price decreases. There is concern that this can escalate into legal risks of shareholders and stakeholders. In this aspect, Shinhan defines the mid-term as a period of three to five years when we can conduct actual risk monitoring and analyses and review resulting exposure adjustment plans.

Lastly, in the long term, we can confirm the existence of an inverse relationship according to how physical, transition risks progress. Failure to respond to physical risks would prevent transition risk management, leading to a further increase in acute and chronic risks. As such, there is a need to review and consider all risks in both directions. For this reason, Shinhan defines the long term as 10 years later as we approach 2040, which was adopted as the physical temperature management target point in the IPCC report.

### Time Horizons



Risk type	Detailed risk definition	Impact on Shinhan	Time
Transition risk	Policy and Legal	<ul style="list-style-type: none"> <li>· In the short term, export companies, including the US/Europe, may experience a rise in export costs due to the carbon tax that will further increase and regulations on high carbon-emitting businesses. In addition, operation costs can rise in the localization process, thus having a negative financial impact.</li> <li>· In accordance with the Glasgow Climate Pact, each country will establish and implement an NDC that does not exceed 1.5°C by 2030. Drastic emission reduction targets are expected to be imposed on companies within the next five years in accordance with each country's emission reduction policy. Measures that were eased in the short term can more sharply expand in the mid-term. Unprepared companies will be increasingly burdened by a rise in emission right prices and this may connect directly with borrowers' financial soundness. This may, in turn, increase Shinhan's risk.</li> <li>· In case the process of implementing Shinhan's net-zero finance influences borrower and customer contracts, etc. or leads to the raising of an issue, such as green washing, because support was not suspended for high carbon-emitting businesses, this may lead to a legal lawsuit or can become a legal risk.</li> </ul>	Short, mid, long
	Technology	<ul style="list-style-type: none"> <li>· All companies will increase low-carbon facility and infrastructure investments. In this case, there may be an impact on profits from the mid-term perspective as costs and expenses sharply rise but the volume of production and consumption does not rise accordingly.</li> <li>· In the long term, there may be technology development risks according to whether high carbon-emitting companies transition successfully to low-carbon transition technologies. Companies that do not successfully transition can suffer a considerable impact on profits.</li> </ul>	Mid, long
	Market	<ul style="list-style-type: none"> <li>· In the capital market, companies that do not actively respond to climate change have a high possibility of being excluded from investments. If Shinhan Financial Group experiences difficulties in managing financed emissions according to its declared net-zero finance or an issue related to responding to climate change resulting from a continued increase in exposure to high carbon-emitting businesses, Shinhan may be shunned by consumers and investors may withdraw their funds. This can also connect to a drop in stock prices to have a financial impact.</li> </ul>	Mid, long
	Reputation	<ul style="list-style-type: none"> <li>· Failure to manage financed emissions may lead to the raising of the green washing issue by the media and clients, a considerable impact on Shinhan's reputation as a company that leads green finance, and customer churn. A financial company's management of Scope 1, 2, and 3 and its climate change risk management system and response can be connected to indexes of major credit rating agencies or ESG evaluation organizations, leading to the risk of a drop in the Group's overall credit rating and ESG evaluation rating.</li> </ul>	Mid, long
Physical risk	Acute Risk	<ul style="list-style-type: none"> <li>· In case of an acute risk, it impacts Shinhan's corporate clients as well as retail clients. In addition, it can serve as a significant risk to owned real estate according to such acute risks as the rainy season, heavy rainfall, typhoon, and earthquake. Shinhan can be directly influenced by operation risks that are caused by a drop in such real estate's mortgage value, damage to facilities and equipment, and reduced production capacity as well as by financial risks that arise from compensation for customers' life insurance and non-life insurance.</li> <li>· In addition, employees who suffered damages can be negatively impacted and risks may be triggered in the aspect of running the company.</li> </ul>	Short, mid
	Chronic Risk	<ul style="list-style-type: none"> <li>· In case of a chronic risk, a rise in temperatures and sea levels can lead to reduced profits of relevant businesses. For example, temperatures directly influence agricultural crops and the ocean industry, and can have a considerable impact on biodiversity and survival. In this case, borrowers that engage in such businesses as the grain business, food and beverage business, and ocean and fishing industry are financially impacted as a result of a rise in sunk costs or operation costs.</li> <li>· In addition, chronic risks raise the amount of electric power use in overall industry. This can lead to reduced operating income owing to a hit to the supply chain and logistics chain.</li> </ul>	Mid, long

## Response Strategies that Reflect Climate Risks and Opportunities

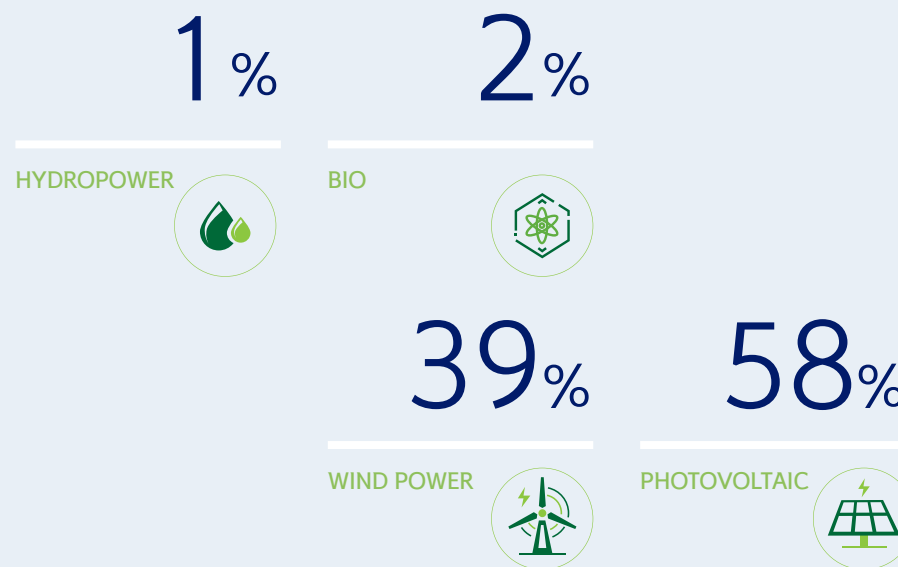
We comprehensively analyzed the impact that climate change risk and opportunity factors would have, and established response strategies in consideration of possibility of occurrence and level of financial impact of each factor. From among the various carbon-related assets owned by Shinhan Financial Group, we are focusing on establishing countermeasures for the energy industry, which has a large project size compared to other businesses and is expected to have a high level of effect in the transition to a green and low-carbon industry.

Shinhan Financial Group seeks to change risk factors that may arise from fossil fuel-based power generation businesses to opportunity factors by increasing renewable energy-centered green finance investments. Increasing renewable energy-related investments has large business size and reduction effects compared to other businesses and makes it easy to estimate carbon emission-offsetting effects in advance.

<b>Background of selection</b>	<ul style="list-style-type: none"> <li>Renewable energy businesses, such as photovoltaic and wind power generation, have the effect of reducing greenhouse gases that are generated from fossil fuel-based power generation and therefore can secure carbon emission rights</li> </ul>
<b>Business size and reduction effects</b>	<ul style="list-style-type: none"> <li>Business size is big and development is progressing based on the premise of participation by financial institutions</li> <li>They have substantially higher GHG reduction effects against input costs compared to energy efficiency or fuel conversion businesses</li> </ul>
<b>Estimation of reduction effects</b>	<ul style="list-style-type: none"> <li>It is easy to estimate reduction effects since measurements can be taken and preconditions are available for estimating the carbon offset amount and investment amount</li> </ul>

### Analysis of Offset Effect Based on Size of Renewable Energy Investment

We seek to achieve the eco-friendly goal of Zero Carbon Drive by quantitatively analyzing the carbon emission-offsetting effects per financial support amount in consideration of renewable energy market growth.



\* Grounds for selecting offsetting renewable energy technologies:  
 Per KRW 100 million facility size (MW) annual power generation hours<sup>1)</sup> (h) annual power generation amount (MWh)  
 Annual power generation amount (MWh) electric power emission coefficient<sup>2)</sup> per KRW 100 million carbon emissions

<sup>1)</sup> Time in which power generation is possible in consideration of sunshine, etc.

<sup>2)</sup> Carbon emissions for 1MW production

## Analysis of Climate Change Scenarios

Risks from climate change were named “green swan” in a report by the Bank for International Settlements (BIS). Due to the complexity of their ripple routes and extensive impact, using past data to forecast and respond to the future may not be effective. For this reason, risk measurement methodologies that are based on scenario analyses are developing rather than previous statistical methodologies, and elaborate analysis methods are required since various social and economic changes have an impact.

In response, Shinhan Financial Group adopted a scenario analysis method to determine the impact of climate change on Shinhan internally and its portfolio. We conducted the scenario analysis by making a categorization into transition risk and physical risk. In case of transition risk, we performed an analysis for the first time this year by applying a top-down approach that used the Bank of Korea’s analysis results based on Shinhan Bank’s loan assets and a bottom-up approach that used an outside analysis model. In case of physical risk, we identified impact on Jeju Bank based on a report of the Korea Meteorological Administration in terms of Shinhan’s internal operations. We analyzed impact from decreases in real estate collateral value based on a climate risk model of Ewha Womans University–Financial Supervisory Service in the asset impact aspect. Shinhan Financial Group will continue to make the transition and physical scenario methodology more detailed to respond to climate change.

Transition Risk	1		2	
	Classification	Top-down	Bottom-up	
	Analysis method	Analyzed the level of impact by applying the Bank of Korea’s analysis results on transition risk impact from climate change <sup>1)</sup> (Targeting Shinhan Bank’s portfolio)	Used the S&P Global climate scenario analysis model (Climate Credit Analytics)	
Analysis results	Level of impact, including Shinhan Bank’s BIS ratio <sup>2)</sup>	Level of impact on high carbon-emitting businesses		

<sup>1)</sup> Bank of Korea (December 2021), Climate Change Transition Risk and Financial Stability

<sup>2)</sup> It is derived by dividing shareholders’ equity by risk-weighted assets and then converting it into a percentage

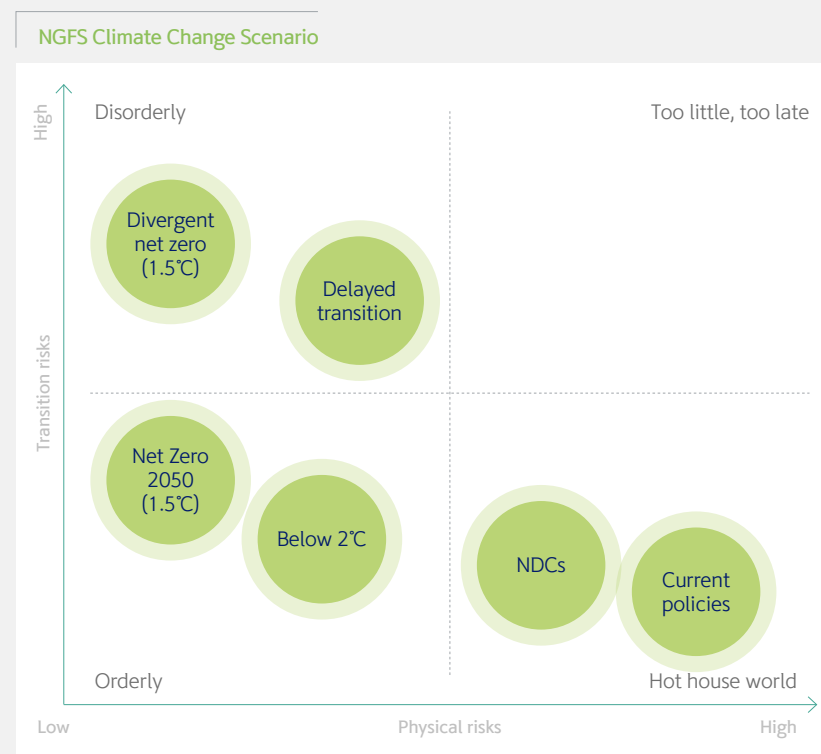
Physical Risk	3		4	
	Classification	Shinhan internal operations aspect	Asset impact aspect	
	Analysis method	South Korea’s Detailed Climate Change Forecast Report <sup>3)</sup>	Used Ewha Womans University–Financial Supervisory Service climate risk model	
Analysis results	Damage impact from suspension of operation of Jeju Bank’s branches in the Jeju area	Expect bad debt expenses from decreases in domestic real estate collateral value of Shinhan Bank’s loan assets		

<sup>3)</sup> Cited data from “South Korea’s Detailed Climate Change Forecast Report” (December 30, 2021) of the National Institute of Meteorological Sciences

### 1 Analysis Results of Top-down Approach

By analyzing transition risk impact from climate change<sup>1)</sup>, the Bank of Korea measured impact on domestic industries from transition risk (changes in the probability of default of high carbon industries, etc.) and also measured impact on financial institutions that have financial assets related to these industries (BIS ratio changes, etc.). It set the Network for Greening the Financial System(NGFS)’s below 1.5°C scenario and below 2°C scenario, and reflected strengthening of the government’s GHG reduction policies and development of low-carbon technologies to analyze impact on the value drop of relevant financial assets through which it estimated resulting BIS ratio changes of domestic banks.

Bank of Korea (2021),  
Climate Change Transition Risk and Financial Stability [🔗](#)



\* Source: NGFS

NGFS Climate Scenarios for central banks and supervisors (2020) [🔗](#)

Probability of Default<sup>1)</sup> Changes<sup>2)</sup> from Transition Risks (Unit: %p)

		2030	2040	2050
2°C scenario	High-emitting industries	3.7	6.6	10.2
	Mid- and low-emitting industries	0.0	0.0	0.1
1.5°C scenario	High-emitting industries	6.3	9.8	18.8
	Mid- and low-emitting industries	0.0	0.1	0.4

\* Source: Bank of Korea, Climate Change Transition Risk and Financial Stability, 2021

<sup>1)</sup> Probability of going bankrupt within a year from the time of measurement

<sup>2)</sup> Compared to the base scenario in which the economic structure maintains the 2020 level without climate risk shock

Shinhan applied increases in the probability of default of high-emitting and mid- and low-emitting industries in the Bank of Korea’s analysis results and reflected them in Shinhan Bank’s portfolio, and analyzed BIS ratio impact. It was assumed that the structure of financial assets was identical between the analysis target period (2021–2050) and the base point. The BIS ratio decreased 1.47%p in case of the 2°C scenario based on 2050 and 2.30%p in the 1.5°C scenario, being expected that negative impact can further increase.

Category	Loan assets <sup>1)</sup>	2°C scenario			1.5°C scenario		
		2030	2040	2050	2030	2040	2050
BIS ratio	18.18%	17.48% (Δ0.70%p)	17.15% (Δ1.03%p)	16.71% (Δ1.47%p)	17.18% (Δ1.00%p)	16.74% (Δ1.43%p)	15.88% (Δ2.30%p)

<sup>1)</sup> Analysis based on Shinhan Bank’s loan assets (as of the end of December 2021) (excluding stock and bond assets)

BIS Ratio Changes of Domestic Banks Due to Transition Risks<sup>1)</sup>

■ BIS ratio  
■ Decrease<sup>2)</sup>  
● BIS ratio of Shinhan



\* Source: Bank of Korea, Climate Change Transition Risk and Financial Stability Reconstituted, 2021

<sup>1)</sup> Regulation is 10.5% (D-SIB 11.5%)

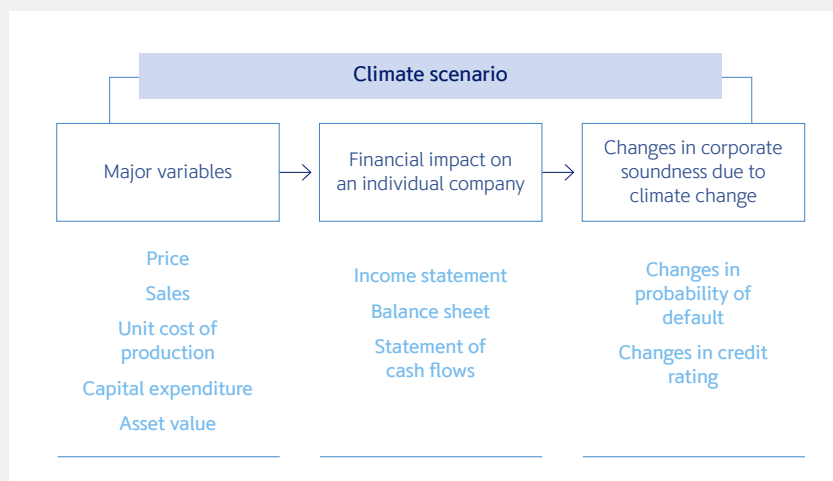
<sup>2)</sup> BIS ratio of domestic banks decreased 2.6%p in case of the 2°C scenario and 5.8%p in the 1.5°C scenario (based on 2050)

BIS ratio of commercial banks decreased 1.6%p in case of the 2°C scenario and 3.7%p in the 1.5°C scenario (based on 2050)

## 2 Analysis Results of Bottom-up Approach

The route through which climate risks transfer to financial institutions is complex, and there are diverse variables, such as policy, technology, and market changes, and perceives. Shinhan Financial Group is well aware of the need for detailed scenario-setting and analysis in consideration of these factors. In particular, we conducted a detailed scenario analysis by business, considering that there is a relatively large impact at specific areas, such as high-emitting industries identified to have high transition risks through the financed emission measurement. In case of the scenario, we used the Climate Credit Analytics model jointly developed by S&P Global and OliverWyman to ensure objectivity, and plan to conduct and disclose a more detailed scenario analysis based on this model in future TCFD reporting.

Scenario Analysis Method of Bottom-up Approach



In case of the scenario, the NGFS scenarios – consisting of six: 2050 Net Zero (1.5°C), Below 2°C, Delayed Transition, Divergent Net Zero, NDC, and Current Policies – were applied for analysis. From among companies with financial assets of KRW 10 billion or more that can have a huge impact on profitability based on the Group, two businesses with high financed emissions priority – power generation and oil & gas – were chosen to analyze financial impact. We reflected macroeconomic variable and regulation changes from climate change, the respective business’ demand/supply and investment changes, and changes in sales and profitability of individual companies in the business, and estimated individual companies’ financial condition impact and the resulting changes in the probability of default.

Among high-emitting industries, we chose industries with the highest priority – power generation and oil & gas – for analysis. In the power generation industry, the proportion of fossil fuels will decrease and that of eco-friendly energy, such as renewable energy, will rise in accordance with an energy mix transition to eco-friendliness. Although there initially will be electricity price increase pressure owing to a rise in carbon costs, there will be a decrease in eco-friendly energy prices as well as electricity price drop pressure as time passes. The unit cost of production of fossil fuel-related power generation is expected to rise in accordance with carbon cost burden, and relevant facilities and other assets will become inactive sooner to incur damage costs. In contrast, investments (capital expenditures) for the transition to eco-friendly power generation will rise.

In case of the oil & gas industry, product prices will likely rise owing to increased carbon costs, including emissions costs, but sales will drop over the long term due to a reduction in fossil fuel demand as a result of a transition to a low-carbon economy and a drop in price competitiveness. The unit cost of production per unit is expected to increase owing to carbon costs and other factors. In terms of investments (capital expenditures), fossil fuel production/refining-related expenditures will likely go down in accordance with output changes, while eco-friendly fuel transition-related expenditures are expected to rise. Assets, such as fossil fuel-related production facilities, will incur damage costs.

Results indicate that companies in the power generation business experience a drop in their credit rating compared to the base point of at least 1 rating (Current Policies) and at most 4 ratings (Divergent Net Zero) in the above six scenarios. Companies in the oil & gas business record a drop in their credit rating compared to the base point of at least 2 ratings (Current Policies) and at most 3 ratings (Divergent Net Zero). Probability of default increases at least 3 times to more than 10 times from the base point for both business types.

Shinhan Financial Group analyzes physical risk from climate change by categorizing it into mainly two types. First, we choose regions that can have an impact in Shinhan’s internal operations aspect, to identify and prevent buildings and branches that are vulnerable to acute physical risks. In a different aspect, we identify the characteristics and scope of assets that are exposed to physical risk with regard to Group-owned assets and inspect the resulting financial impact.

### 3 Shinhan’s Internal Operations Aspect

Shinhan Financial Group perceives the possibility of operating losses caused by climate change, and judges this matter as a detailed operational risk factor and strives to reflect it in emergency plans.

According to South Korea’s Detailed Climate Change Forecast Report of the National Institute of Meteorological Sciences, extreme climate indexes are defined as extreme temperature (high temperature/low temperature) and extreme precipitation indexes. Shinhan used the extreme precipitation index that can have a direct impact on branch operations as the major physical risk index. We specifically examined an increase in the number of heavy rainfall days. This refers to an increase in the number of days in a year when the daily precipitation is at least 80 mm.

South Korea’s Detailed Climate Change Forecast Report makes calculations according to the latest GHG pathways (Shared Socioeconomic Pathways, SSP) of the IPCC Sixth Assessment Report, and analyzes changes for two scenarios – SSP1-2.6 and SSP5-8.5.

In both the low carbon (SSP1-2.6) and high carbon (SSP5-8.5) scenarios, the number of days of heavy rain and the level of increase is at least two times higher than other regions in the second half of the 21st Century. At present, Jeju’s annual average number of days of heavy rainfall is measured at 4.9 days. Results of high carbon scenario analysis indicate that there is an increase of 1, 1.6, and 2.4 days in the first, middle, second half of the 21st Century, respectively, in comparison to the present.

From among Group subsidiaries, Jeju Bank’s head office and most of its branches are located on Jeju Island. Based on this data, Jeju Bank has a high possibility of physical damage from localized heavy rain compared to other regions. It is forecast that there will be a high probability of damages caused by temporary suspension of business.

We performed an analysis on potential financial impact on Shinhan by using the annual average number of days of heavy rainfall and annual operating income. Assuming that business is suspended for around 4.9 days, which is identical to the number of days of heavy rainfall, due to recovery from physical damage that is caused by localized heavy rain, we expect an operating income loss<sup>1)</sup> of around KRW 440 million. If the period increases to 7.3 days according to a rise in physical risk based on the same criteria, the amount of loss also increases to around KRW 660 million.

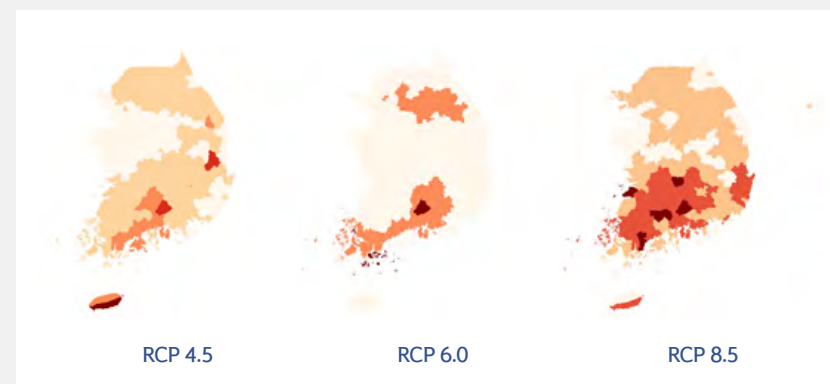
<sup>1)</sup> Assumed 250 days to be the average number of business days in a year; estimation against Jeju Bank’s operating income of 2021

### 4 Asset Impact Aspect

In the asset aspect, Shinhan Financial Group analyzes impact from direct physical damages in the real sector. This is because physical damage in the real sector can transfer to a financial institution and bring about a deterioration in the soundness or profitability of financial institution assets.

Through a climate risk model development project that we conducted together with Ewha Womans University and the Financial Supervisory Service in 2021, we analyzed heavy rainfall-related data of each administrative district in Korea and future scenario data. In this model, through heavy rainfall-level data of an administrative district per Representative Concentration Pathway (RCP) scenario, we analyzed risk regions based on a climate change scenario, financial asset size in the corresponding regions, and estimated loss amount.

Analysis results indicate that as the scenario worsens from RCP 4.5 to RCP 8.5 as of Year 2030, the range of the region with a high level of maximum precipitation expands. Especially in the southern region, maximum precipitation levels sharply increase. Shinhan Bank’s loan asset risk exposure increases from 1.15 trillion to 7.61 trillion.

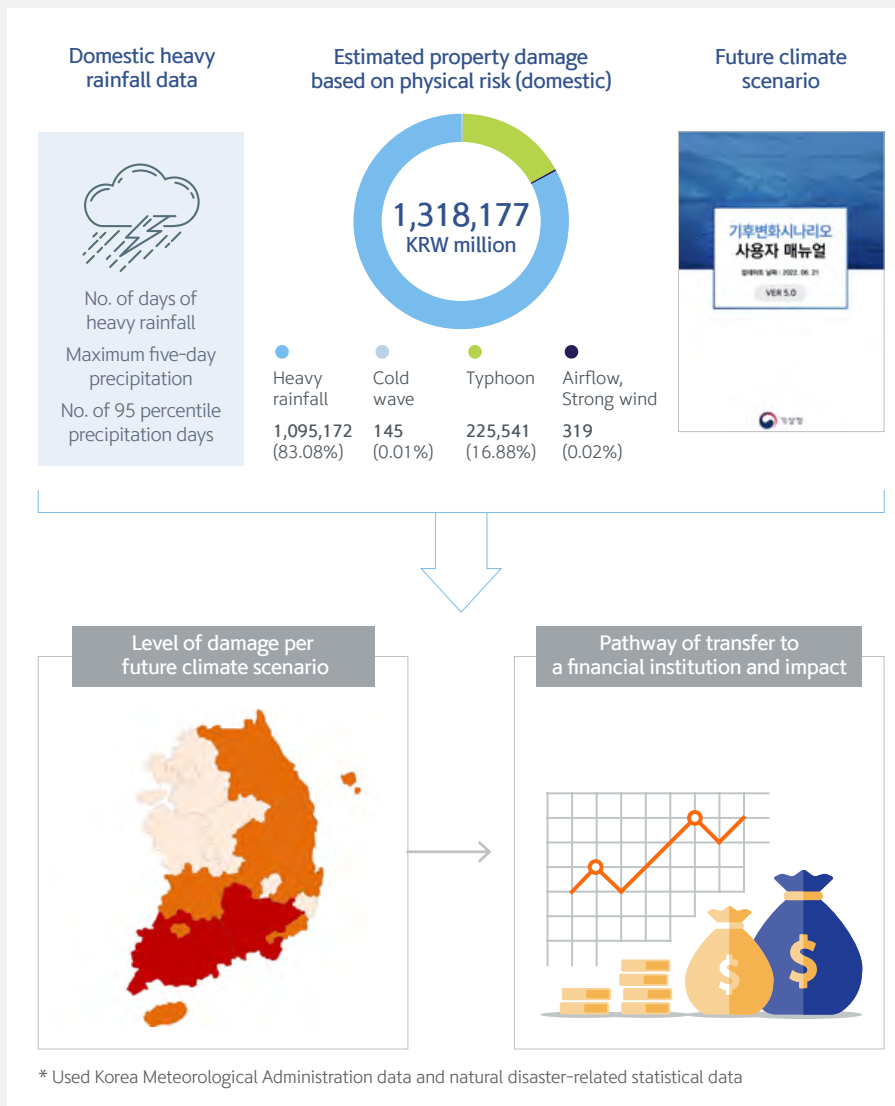


If we expand the physical risk analysis period to the Year 2050 and assume that real estate collateral value drops 10% due to precipitation damage, Shinhan's estimated loss amount is a maximum KRW 78.9 billion. A 20% decrease will likely lead to a maximum loss of KRW 175.2 billion.

In case of Jeolla Province, Gyeongsang Province, and Gangwon Province, which are forecast to suffer from larger damages as precipitation increases, the exposure level is KRW 11.1 trillion. If real estate collateral value drops 20%, we expect a maximum KRW 30 billion in losses. There will likely be bigger losses for plants and shopping districts compared to housing, including apartments. We expect risks to be relatively higher for North Gyeongsang Province, North Jeolla Province, and South Jeolla Province, where the proportion of plants and shopping districts is high.

By conducting additional analysis on project results, we will identify, in detail, the pathway through which physical risk transfers to a financial institution and also make scenario analysis more detailed.

Project Study by Ewha Womans University and the Financial Supervisory Service





## Carbon Price of Shinhan Financial Group

### Purpose of Adoption

Setting a carbon price is the approach of reducing GHG emissions by using the market mechanism of shifting emissions costs onto the emitter. Carbon price acts as an economic signal to high emitters, and can make them decide whether they will transition to low carbon based on economic incentives or pay costs.

Korea has in place the carbon emissions trading scheme and GHG target management system. According to future NDC increase, GHG regulations and management are expected to become stricter. As the global community strengthens and accelerates action to implement the Paris Agreement, it mentions<sup>1)</sup> carbon pricing as an extremely flexible, efficient approach to alleviating impact. Shinhan Financial Group recognizes that carbon price operation is an important tool used to achieve the goals of the Paris Agreement and the net zero goal by 2050.

In addition, carbon price may improve energy efficiency of internal employees and go further by inducing change in employees' action. Internal carbon price is used for financial assets' stress test and scenario analysis, which can serve as a basis for identifying and leveraging opportunities related to low carbon, including investment and financial support. It can also be easily used for customer engagement.

### Carbon Pricing

There are two forms of measuring carbon price – external and internal. Shinhan Financial Group makes a categorization into Scope 1, 2, and 3 according to GHG criteria for disclosures. We apply an external carbon price in case of Scope 1 and 2, and apply an internal carbon price for Scope 3 for analysis of financed emissions that take up most of Scope 3. In case of external price, Korea operates a national-level emissions trading scheme, and external price is set as the market price of the “emissions trading scheme” that can be offset through emissions trading.

**KAU21<sup>2)</sup> price range of KRW 20,000 – KRW 30,000 per ton**

(Referred to disclosed data of the emissions market information platform, [ets.krx.co.kr](https://ets.krx.co.kr))

In Korea, a voluntary carbon market is growing to offset GHG emissions, and Shinhan continues to monitor the matter. We will review the price provided by the voluntary carbon market and reflect it in the external carbon price. The external price serves as the basis for the amount needed to reduce GHG emissions or achieve the renewable energy target, and a criterion for measuring a department's investment effects.

Internal carbon price helps to identify climate change opportunities and crises, and should be an internally-developed carbon cost that can be reflected in contract conditions or incentives in making loan/investment decisions. Shinhan applied a total six scenarios provided by NGFS to analyze the climate change crisis. We perform analysis based on the carbon price applied in these scenarios.

(Unit: US\$/t CO<sub>2</sub>)

Scenario	Region	2025	2030	2035	2040	2045	2050
Below 2°C	World	41.5	77.3	109.1	134.8	184.4	265.8
Below 2°C	South Korea	41.5	77.3	109.1	134.8	184.4	265.8
Nationally Determined Contributions (NDCs)	World	30.1	80.1	83.2	95.8	124.3	157.2
Delayed transition	World	-	-	135.3	188.9	328.8	704.0
Delayed transition	South Korea	-	-	131.6	239.2	497.3	973.5
Divergent Net Zero	World	204.3	263.7	353.3	421.8	741.1	1,646.6
Divergent Net Zero	South Korea	198.1	314.1	419.3	499.2	905.7	1,826.2
Net Zero 2050	World	61.1	96.9	137.7	174.8	267.6	562.2
Net Zero 2050	South Korea	87.5	139.5	212.9	260.2	371.6	717.9

\* Source: NGFS Scenario Portal Data & Resource

Carbon prices provided by NGFS based on Korea are four categories – below 2°C, net zero 2050 (1.5°C), delayed transition, and divergent net zero. Shinhan monitors internal emissions price based on the scenario of net zero 2050, which is its strategic goal. We judge that costs may increase from 87.5 dollars per ton in 2025 to 717.9 dollars by 2050, and estimate potential impact on corporate customers through this virtual cost as well as insolvency rate and credit rating changes.

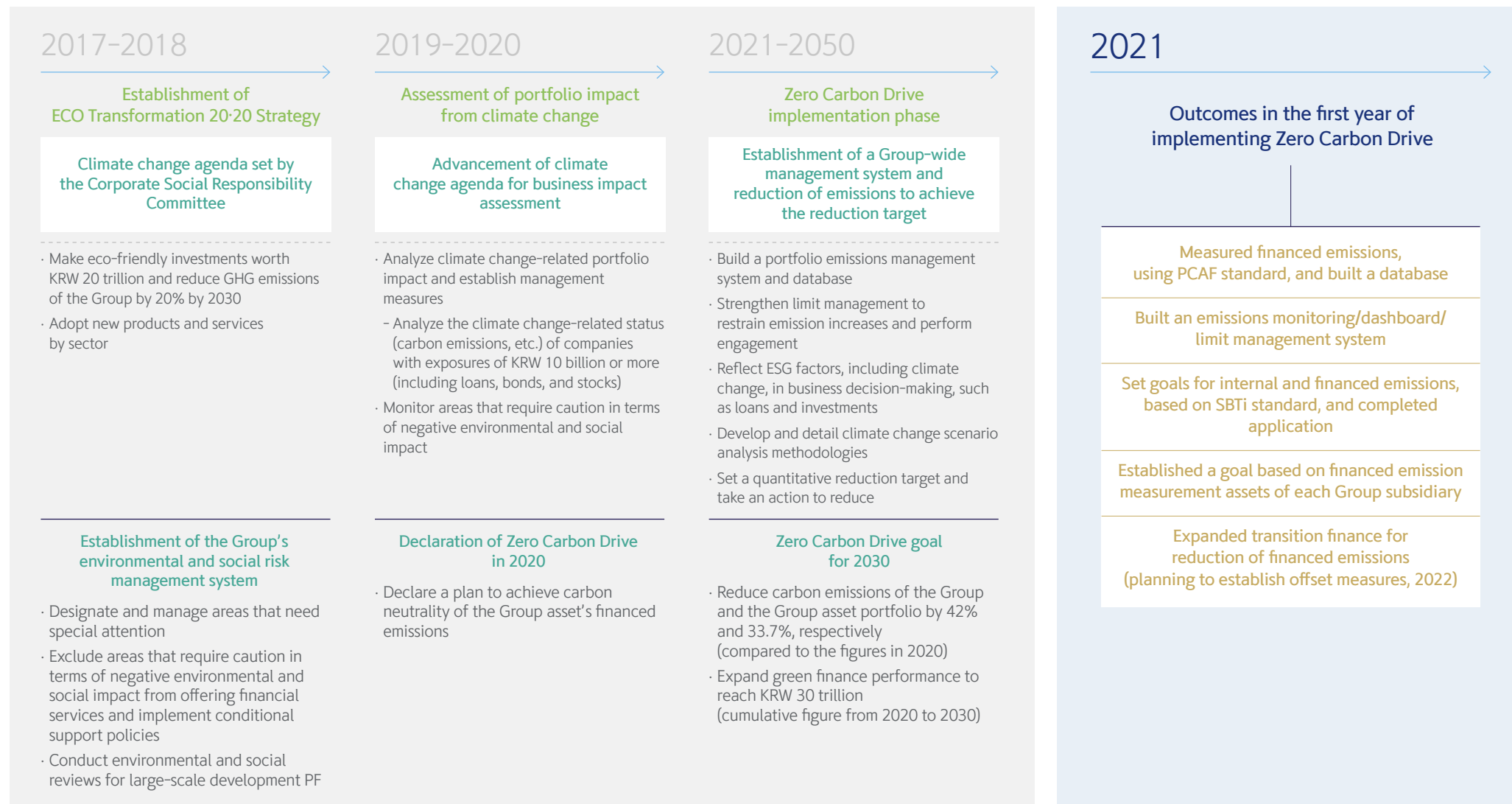
Going forward, Shinhan will make the internal price more detailed, and adopt it as a criterion for evaluation and management in reducing the financed emissions of each subsidiary, while also presenting financial impact.

<sup>1)</sup> Article 6 of the Paris Agreement

<sup>2)</sup> Korean Allowance Unit 21. Refers to the Year 2021 allowance given by the state.








## Shinhan Financial Group's Climate Change Response Strategy Roadmap

Shinhan Financial Group set a new standard for green finance through its goal of making the Group asset portfolio's financed emissions "zero" by 2050. Through its distinctive Zero Carbon Drive strategy, the Group seeks to manage loans and investments for companies and industries with large carbon footprints while providing financial support for green transition, thereby performing roles for the transition to a low-carbon economy. The Group is also advancing the measurement of financed emissions by applying the criteria presented by the Partnership for Carbon Accounting Financials (PCAF) for net-zero of the Group asset portfolio and set a goal based on the SBTi methodology. As a starting point, the Group built a data system for regular management and monitoring of financed emissions in 2021.



## Participation in Global Initiatives for Joint Response to Climate Change

To resolve the global climate crisis, Shinhan Financial Group joined CDP in March 2007 which was followed by voluntary joining of various global initiatives related to joint responses to climate change, target setting, emissions measurement, management, and public disclosure, and is engaging in cooperation. By doing so, Shinhan Financial Group is actively responding to the sharply-changing climate change environment and building leadership in the eco-friendly financial ecosystem based on advanced climate strategies.

<p style="text-align: center; background-color: #76b82a; color: white; padding: 5px;"><b>Joint global response</b></p>  <p><b>Joined the UN Environmental Programme Finance Initiative (UNEP FI)</b></p> <p>Joined in January 2008</p> <p>Began to participate in Principles for Responsible Banking (PRB) in 2019 and Principles for Sustainable Insurance (PSI) in 2020</p>  <p><b>Initiatives in the Glasgow Financial Alliance for Net Zero</b></p> <p>Joined the Net-Zero Banking Alliance (NZBA) in April 2021</p> <p>Joined the Net Zero Asset Managers Initiative (NZAMI) in July 2021</p> <p>Joined the Net-Zero Insurance Alliance (NZIA) in October 2021</p>	<p style="text-align: center; background-color: #76b82a; color: white; padding: 5px;"><b>Target setting and measurement</b></p>  <p><b>Science Based Targets initiative (SBTi)</b></p> <p>Joined in November 2020</p> <p>Set the reduction targets of financial assets' carbon emissions</p>  <p><b>Partnership for Carbon Accounting Financials (PCAF)</b></p> <p>Joined in November 2020</p> <p>Measure financed emissions of the Group</p>	<p style="text-align: center; background-color: #76b82a; color: white; padding: 5px;"><b>Public disclosure</b></p>  <p><b>Task Force on Climate-related Financial Disclosures (TCFD)</b></p> <p>Announced the support for the recommendations of TCFD in 2018</p> <p>First disclosed information in the CSR Report in 2019</p> <p style="text-align: center; background-color: #76b82a; color: white; padding: 5px;"><b>Risk management</b></p>  <p><b>Equator Principles</b></p> <p>Established the process in 2019</p> <p>Joined in 2020 and applied the Principles to the projects subject to screening</p> <p style="text-align: center; background-color: #76b82a; color: white; padding: 5px;"><b>Evaluation of activities in climate response</b></p>  <p><b>Carbon Disclosure Project (CDP)</b></p> <p>Became the first financial company in Korea to join the Platinum Club of CDP Hall of Fame (Included in the Honors Club for 8 consecutive years)</p>
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● First in Korea's financial industry

### Shinhan Financial Group's Global Climate Change Leadership

In November 2021, the Group CEO Cho Yong-byoung was elected as the only Asian member of the UNEP FI Leadership Council, contributing to the global spread of sustainable finance. Previously in November 2020, CSSO Park Sung-hyun of Shinhan Financial Group was chosen as the UNEP FI Global Steering Committee Asia Pacific Banking Sector Representative.

Moreover, our net zero-strategy implementation status is recognized as a best practice that is in line with global standards. We were officially invited to the UN Climate Change Conference of the Parties (COP26) held in 2021, the Korean Pavilion that run by the government, and a Net Zero Pathway-related panel discussion organized by NZBA, sharing information on the Group's net-zero strategy and progress. We will continue to increase relevant investments and activities as an active participant leading the fight against climate change.

## Identification of Opportunities by Responding to the Korean Green Classification System (K-Taxonomy)

In response to Europe's announcement of the EU Taxonomy in April 2021, the Korean Ministry of Environment took the lead and announced the final version of K-Taxonomy in December, 2021. The Korean green classification system is a standard of economic activities that contribute to GHG reduction, adaptation to climate change, and environmental improvement, and consists of 69 detailed economic activities to contribute to six major environmental goals<sup>1)</sup> based on basic principles, which are (1) contribute to the achievement of environmental goals, (2) not cause any serious environmental damage, and (3) minimum protection systems (prohibition of child labor, forced labor, and others).

In the short term (2022), K-Taxonomy will be used as guidelines only for "green bonds" and a pilot project will be executed. Its scope will be increased to include green loans, green funds, and green project financing, and it is expected to be applied to overall disclosures of financial institutions and companies. Shinhan Financial Group preemptively established the "K-Taxonomy Task Force", which is an ad hoc network of all Group subsidiaries, and is preparing to make quick responses to policy-making authorities and to engage in collaboration. By doing so, we are drawing Group subsidiaries' attention to the Korean green classification system and listening to their opinions, and are striving to clearly designate personnel in charge and roles of each subsidiary. Through this process, we will ease risks that may arise from adopting the Korean green classification system, while actively exploring business opportunities in green finance to take the lead in spreading green finance.

<sup>1)</sup> Greenhouse gas reduction, adaptation to climate change, sustainable water conservation, recycling, pollution prevention and management, biodiversity conservation

# A Left Wheel that Leads Net-Zero RISK MANAGEMENT

We systematically defined environmental and social risks, including climate change, based on the risk classification system in the TCFD recommendations, and developed an appropriate methodology to evaluate risks. We also established a financed emissions measurement system and database as well as the Best Practices for the Group Climate-related Risk Management, through which we advanced our risk management system.

## Management Process of Major Risks

By reflecting financed emissions analysis results and recent internal and external research outcomes, Shinhan Financial Group is identifying vulnerable areas in relation to climate change and regularly monitoring the areas. We manage high-risk areas by setting limits and actively respond to climate change risks in connection with our reduction goals. We will advance the climate risk management system and reflect it in loan and investment screening processes, while continually supporting strategy adjustments to achieve the Group's Zero Carbon Drive.

### Identification, Evaluation, and Management of Climate Risks



<sup>1)</sup> Choose by comprehensively considering the Group's exposure/financed emission/carbon intensity level, definition of risk areas in TCFD (energy, transportation, raw materials and architecture, agricultural products/foods and forest products), and reports of the Bank of Korea and research institutes

## Identification of Major Risks

Shinhan Financial Group categorizes risks that may arise in the sharply-changing climate change environment based on the risk classification system in the TCFD recommendations and manages the risks.

Risk type	Financial risk			Non-financial risk			
	Credit	Market	Reputation	Regulatory	Technology	Legal	Physical
Transition risk	Policy and Legal	●	●	●		●	
	Technology	●			●	●	
	Market	●	●			●	
Physical risk	Reputation	●				●	●
	Acute	●			●		●
	Chronic	●			●		●

### FINANCIAL RISK

Credit Risk	Shinhan Financial Group measures financed emissions of its asset portfolio and conducts a scenario analysis on climate risks. We analyzed that the power generation, utility, energy, and materials sectors, which have substantial carbon emissions, will be exposed to climate change risks owing to future carbon price increases. If we change the Group's asset portfolio to low-carbon emission pathways through investments in renewable energy projects, we can look for opportunities that can generate offset credits.
Market Risk	Market risk arises from consumer behavior changes or changes in product and service supply and demand. Shinhan Financial Group conducts regular surveys and analyses to identify customer requirements as well as consumer and market trends that result from climate change. In addition, we expect increased demand for the renewable energy business in accordance with the Renewable Energy 3020 Policy, and are strengthening relevant responses.
Reputation Risk	Against the backdrop of increased consumer awareness of climate change and the environment, companies' sustainability activities in relation to climate change and the environment are influencing consumers' buying decisions. If Shinhan Financial Group fails to fulfill social responsibilities that are related to climate change and the environment, then its brand value will drop and a negative public opinion will form which can have a considerable impact on operating income. For this reason, we applied the Equator Principles and chose 12 significant environmental and social areas to minimize reputation risk.

### NON-FINANCIAL RISK

Regulatory Risk	Under the emission trading scheme, a company needs to purchase excessive permits if allowances go down, and additional costs may arise to reduce emissions. The Group's clients may also experience a decrease in their debt repayment ability owing to purchasing of permits or investments in efficient facilities. If current regulations are strengthened as climate change gains speed, permit prices go up and the possibility of unexpected losses increases. As a measure, Shinhan Financial Group developed a financed emission measurement system and is systematically managing the Group's and companies' emissions.
Technology Risk	New low-carbon, eco-friendly technologies are being developed to achieve climate change-related and net zero goals. Sales may drop when financial products that include new technologies and innovation are not expanded/developed. Shinhan Financial Group identifies risks and opportunities by regularly surveying/analyzing climate-related technology development and market trends as well as customer demand. We also manage products that are related to building energy, such as Green Energy Factoring, Second Green Remodeling Loan, and New and Renewable Energy Fund. We plan to expand relevant financial products according to areas and speed of technology development.
Legal Risk	This refers to current or expected financial position and resilience-related risk that arises from a violation of laws, rules, or regulations or failure to observe stipulated customs, internal policies, processes, or ethical standards by a company or a project for which an investment was made. If a lawsuit is filed due to a climate issue and the business owner becomes subject to legal punishment, this may damage brand value and financial soundness. By using the environmental and social risk management system, Shinhan Financial Group determines whether to make an investment by evaluating financial impact on an investment company or project. If needed, the Group provides conditional financial support that obligates the reflection of measures to reduce environmental impact.
Physical Risk	Abnormal weather phenomena caused by climate change can directly damage assets owned by Shinhan Financial Group. In particular, bank branches that are located in mountainous areas have a relatively high possibility of suffering physical damages from localized heavy rain, and the resulting temporary business suspension may cause massive damages to business. Furthermore, average temperature rises in the summer raise the amount of electric power and tap water usage and also decrease labor productivity. Shinhan Financial Group pre-determines buildings and branches that are vulnerable to climate change and strives to prevent damages.

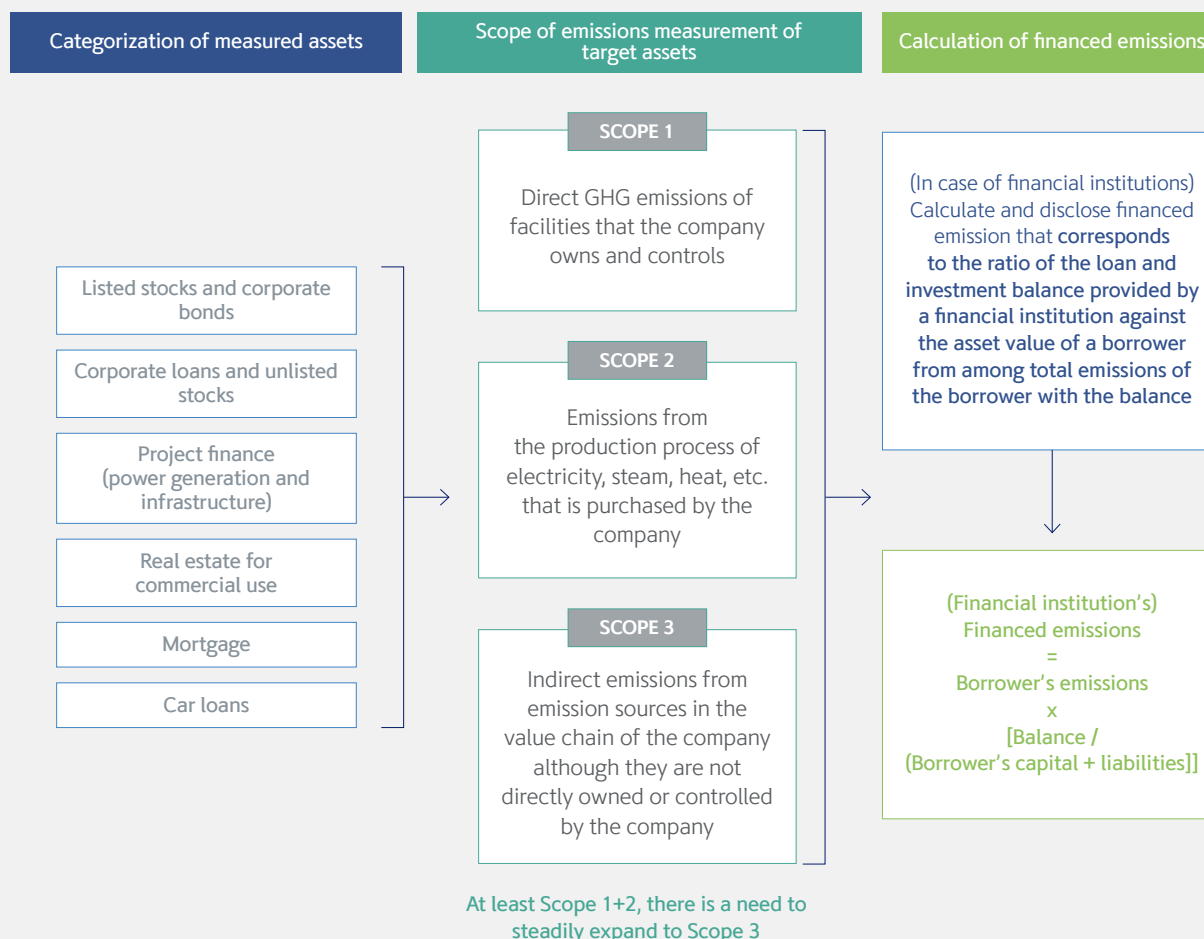
## Evaluation and Management of Major Risks

To systematically evaluate and manage the aforementioned major risks, we developed our own financed emission measurement system and systematically monitor the Group's total GHG emissions, which is shared at the Group level through the financed emissions dashboard system. In addition, we preemptively prevent potential risks by choosing 12 environmental and social significant areas. We became the first from among financial companies in Korea to apply the Equator Principles in September 2020 for project financing. In March 2022, Shinhan became the first financial company in Korea to establish the "Best Practices for the Group Climate-related Risk Management".

### Establishment of a Financed Emission Measurement System and Database

To respond to climate change and achieve the Group's 2050 Net Zero goal, we developed and are operating the "financed emission calculation system" that can regularly measure the Group's financed emissions. This system can calculate and monitor financed emissions by collecting loan and investment balances of financial subsidiaries of the Group as well as data related to financed emission calculation. It calculates and discloses financed emissions for the Group's owned assets (six asset groups) in accordance with PCAF GHG accounting standards.

### Financed Emission Calculation Method



## Financed Emission Simulation

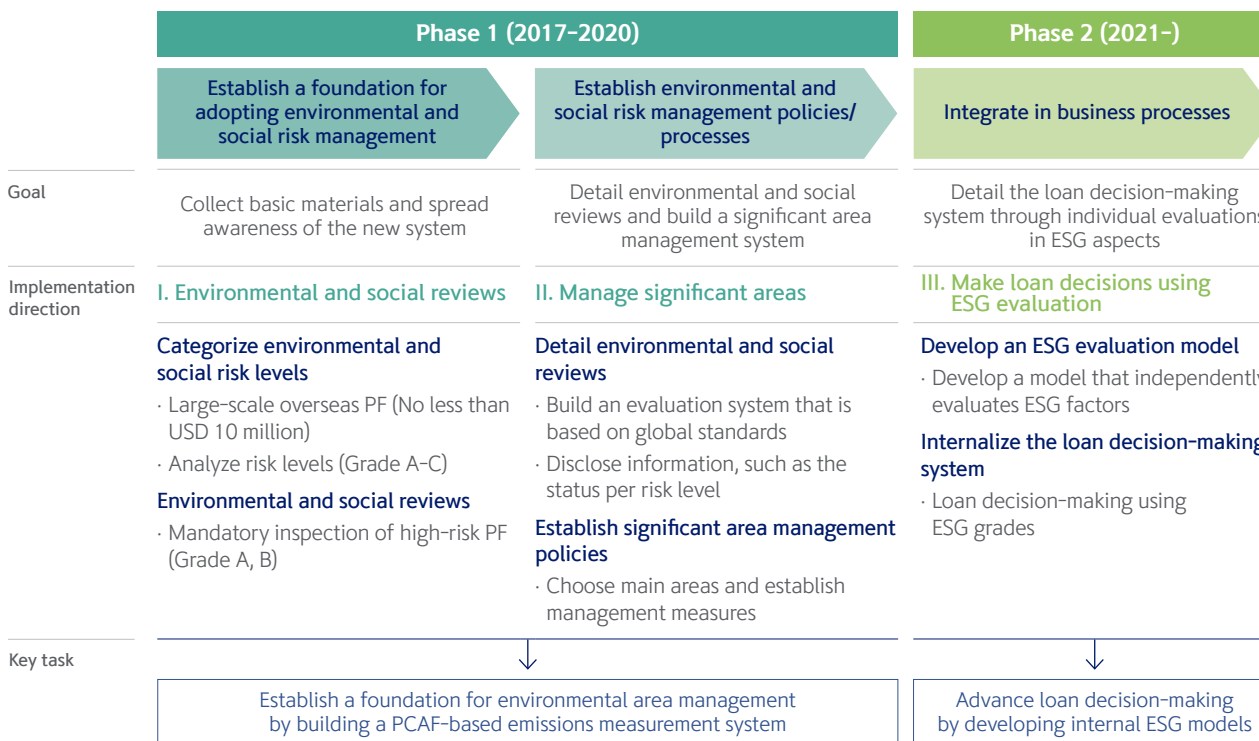
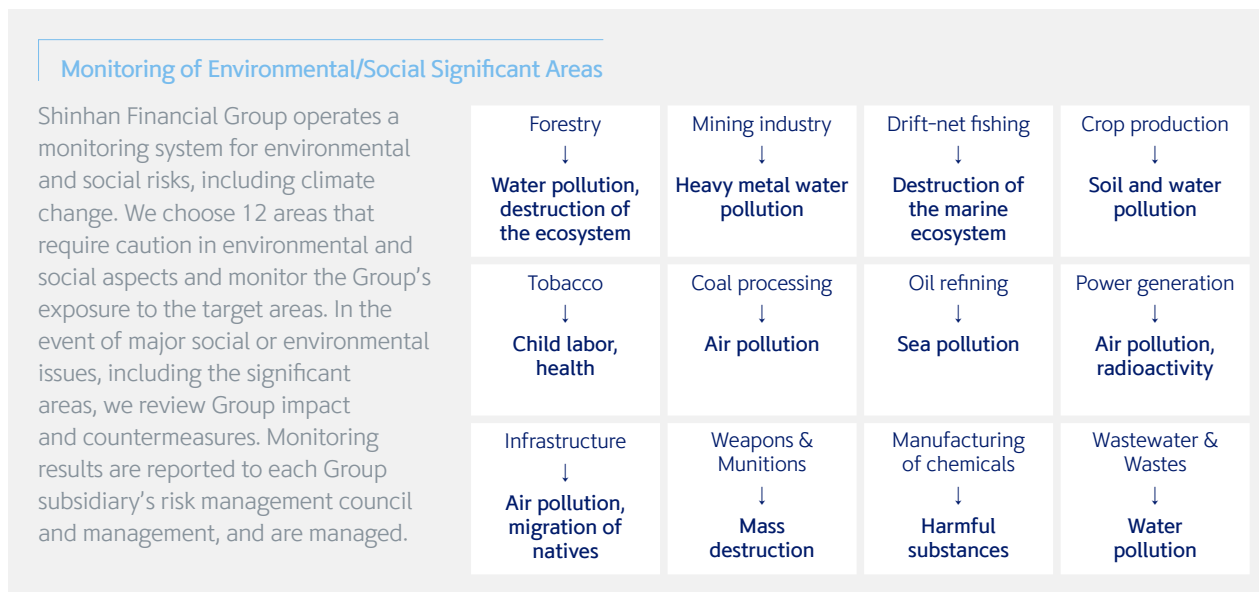
In addition, we run simulations to estimate financed emissions by using a company's financial information and emissions information in case of a new loan and investment. We identify the level of financed emissions and intensity through simulations and use them for the evaluation process.

## Risk Dashboard

We developed a system that connects to financed emissions reduction goals of the overall Group and each subsidiary and identifies the current level of financed emissions and intensity against the goals. Using the system, we regularly calculate and monitor each Group subsidiary's carbon emissions. In particular, we run a financed emissions dashboard system<sup>1)</sup> to monitor risks from sudden increases or unequal distribution of asset portfolio's financed emissions and intensity, leading to efficient risk management.

In addition, we are implementing the environmental and social risk management system roadmap that we established in 2017. In 2021, we built a PCAF-based financed emission measurement system and advanced Phase 1 while detailing ESG internal model development for Phase 2.

<sup>1)</sup> Process of setting the trigger point of asset portfolio emissions and intensity for all and high carbon-emitting areas of each Group subsidiary, and, in case of excess, identifying the cause through an analysis and establishing countermeasures



### Establishment of an ESG Loan/Investment Screening Process: Evaluation Model

Shinhan Financial Group developed an ESG evaluation model to detail and advance the loan decision-making system through individual evaluations in ESG aspects. We reviewed/chose diverse data of ESG aspects and reflected them in the model, and plan to use it for preferential interest rate application, new product development, screening process, and limit-setting in consideration of ESG grade.

#### SHINHAN'S ESG RATING

Evaluation perspective	Evaluate ESG factors from the corporate sustainability perspective
Method of use	Plan to use for setting preferential interest rates, developing new products, reflecting in the screening process, and setting the limit

### The Equator Principles

In September 2020, Shinhan Bank became the first commercial bank in Korea to join the Equator Principles. The Equator Principles is a voluntary agreement of financial companies to not provide loans if a large-scale development project has such issues as harming the environment or violating human rights. Shinhan Bank applies the Equator Principles for implementation of large-scale development projects to review potential environmental and social risks and impact.

#### Target of Application of the Equator Principles

Large-scale project financing amounting to at least USD 10 million

#### Process for Reviewing Environmental and Social Risks that Reflects the Equator Principles

1. There is a need to categorize into grades according to the degree of environmental and social risks and impact (Grade A-C)
2. Conduct environmental and social impact assessments, build a management system, establish an action plan, and verify monitoring according to the grade
3. Reflect in financial agreements (compliance with agreed matters, etc.), regularly report on the status of implementing the Equator Principles, and disclose information

### Shinhan Asset Management's Net-Zero Shareholder Letter

Shinhan Asset Management became the first asset management company in Korea in October 2020 to send a net-zero shareholder letter and questionnaire to invested companies. In 2021, it increased the number of target companies from the previous year (242 companies → 338 companies) and questions (12 questions → 20 questions), and the reply rate also increased (41.7% → 53.8%). 10 industries, which account for more than half, recorded a reply rate of more than 50%, reflecting active shareholder communication and a high level of interest in ESG management and climate change response.

Based on the reply results, Shinhan Asset Management will continually monitor the companies and reflect the results in additional engagement activities and ESG investment grade adjustments. It also plans to increase engagement and strengthen communication with invested companies to reduce the gap between companies' declaration of GHG reduction goals and execution capabilities/organizations that was identified through shareholder letter replies.

#### Results of Shareholder Letter Reply Analysis

##### Publication of climate response report

More than 60% of replied companies said that they are publishing a climate response report.  
82% of companies that are not publishing a report said they plan to create a report. This is why the publication of climate response reports is expected to further accelerate.

##### Difficulty in setting an achievable GHG reduction goal

Many companies expressed difficulties in setting an achievable goal amid the enactment of the Framework Act on Carbon Neutrality in 2021 and raising of the 2030 Nationally Determined Contribution (NDC).  
Among replied companies (182), only nine companies conform with the raised NDC.  
54.2% of companies that established a reduction goal plan to raise the goal in the next year.

##### Gap between the goal and execution capabilities/organizations

65.9% replied that they have a GHG reduction goal but 52.7% replied that they have a BOD-level climate change-related organization.  
The difference in climate change governance may have an impact on execution capabilities.



# A Map to Reach Net-Zero

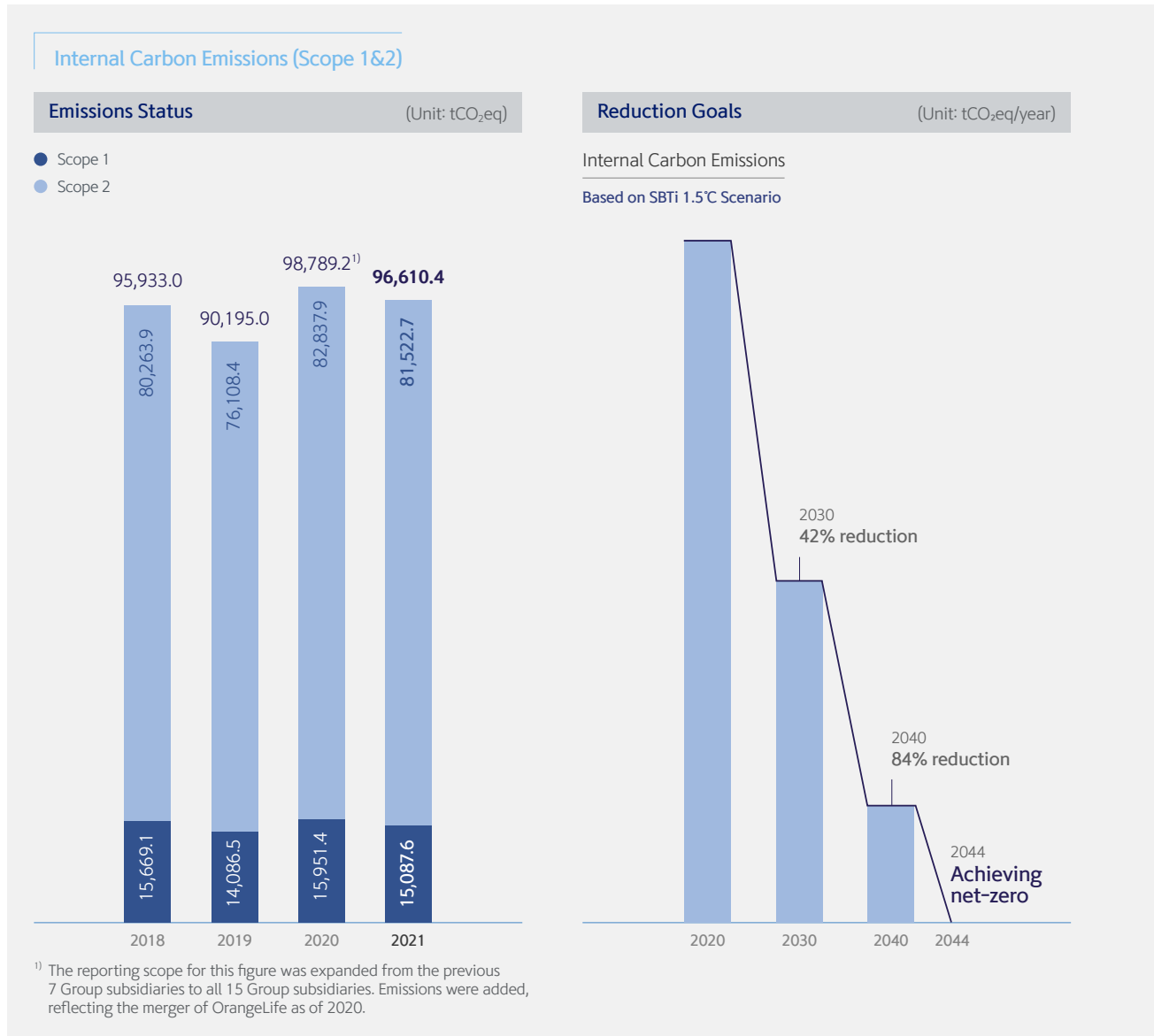
## METRICS AND TARGETS

By determining more advanced PCAF-based asset portfolio's financed emissions and establishing a goal by year, and reflecting it to the CEO evaluation of the Group subsidiaries, starting in 2022, Shinhan Financial Group is detailing the path to achieving its net zero goal. In the process of accomplishing its net zero goal, Shinhan will transparently disclose relevant metrics and targets and actively communicate with stakeholders, thus contributing to everyone's creation of a better world.

### Measuring Carbon Emissions and Setting Reduction Goals

Reaching the net zero goal begins with more accurate measurements of the amount of carbon that we currently emit. We understand the importance of measuring and managing internal GHG that is emitted through Shinhan Financial Group's direct energy consumption (Scope 1&2) as well as asset portfolio emissions (Scope 3) that arise from our investments and loans.

By using a Paris Agreement(1.5°C scenario)-based scientific tool that is presented by the Science Based Target initiative (SBTi), we plan to reduce the Group's internal carbon emissions by 42% by 2030 and 84% by 2040, and achieve net-zero by 2044. In addition, we will apply the Sectoral Decarbonization Approach (SDA) of SBTi that is based on the 2°C scenario to reduce financial assets' financed emissions by 33.7% by 2030, and 59.5% and 83% by 2040 and 2050, respectively. In addition, we will apply the Sectoral Decarbonization Approach (SDA) of SBTi that is based on the 2°C scenario to reduce financial assets' carbon emissions by 34% by 2030, 60% by 2040, and 83% by 2050. Shinhan Financial Group joined SBTi in 2020 and continues to check relevant status on a quarterly basis. We disclose information on carbon emissions when we announce the Group's earning's results every quarter to further strengthen information transparency.



### Financed Emissions of the Group Asset Portfolio in 2021 (Scope 3)

Emissions Status						(Unit: KRW trillion, 10 thousand tCO <sub>2</sub> eq)
Asset categorization	Calculated asset size	Financed emissions	Emissions weight	Emissions intensity	Data Score <sup>1)</sup>	
Listed stocks and corporate bonds	46.3	721	15.4%	15.6	2.8	
Corporate loans and unlisted stocks	126.6	3,602	77.1%	28.4	3.6	
Project finance	3.3	232	5.0%	70.7	3.7	
Real estate for commercial use	17.5	53	1.1%	3.0	4.0	
Mortgage	27.8	14	0.3%	0.5	4.0	
Car loans	5.9	47	1.0%	8.0	4.3	
<b>Total</b>	<b>227.4</b>	<b>4,669</b>	<b>100%</b>	<b>20.5</b>	<b>3.5</b>	

<sup>1)</sup> Assigned a grade that ranges from 1 point to 5 points depending on what data was used as the basis for calculation, from among emissions disclosed based on the PCAF standard, emissions based on amount of physical activity, and emissions based on amount of economic activity

### Carbon Intensity by Industry and Asset

(Unit: tCO<sub>2</sub>e/KRW 100 million)

	Power generation	Steel	Cement	Chemicals	Paper	Aluminum	Transportation	Others
Corporate loans	164.20	128.00	124.40	76.80	62.70	54.70	47.92	21.03
Unlisted stocks	-	52.50	56.90	61.30	90.90	41.80	48.90	6.40
Listed stocks	178.70	169.30	223.70	18.70	82.50	8.00	14.75	3.00
Corporate bonds	187.00	163.70	320.20	78.40	94.00	47.00	9.00	4.37
<b>Total</b>	<b>181.39</b>	<b>131.76</b>	<b>122.65</b>	<b>77.03</b>	<b>63.97</b>	<b>54.56</b>	<b>35.63</b>	<b>16.09</b>

High carbon intensity

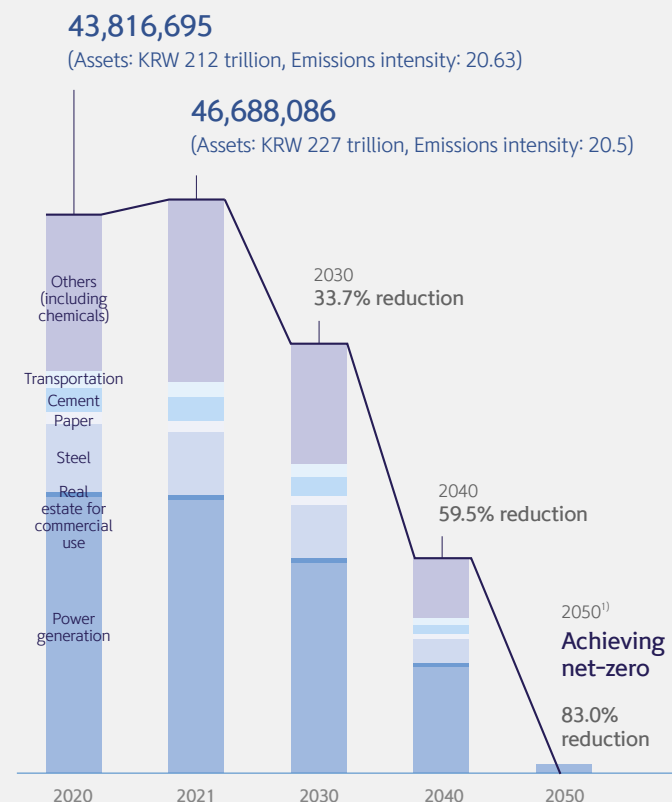
Low carbon intensity

### Reduction Goals

(Unit: tCO<sub>2</sub>eq/year)

#### Financed Emissions of the Group Asset Portfolio

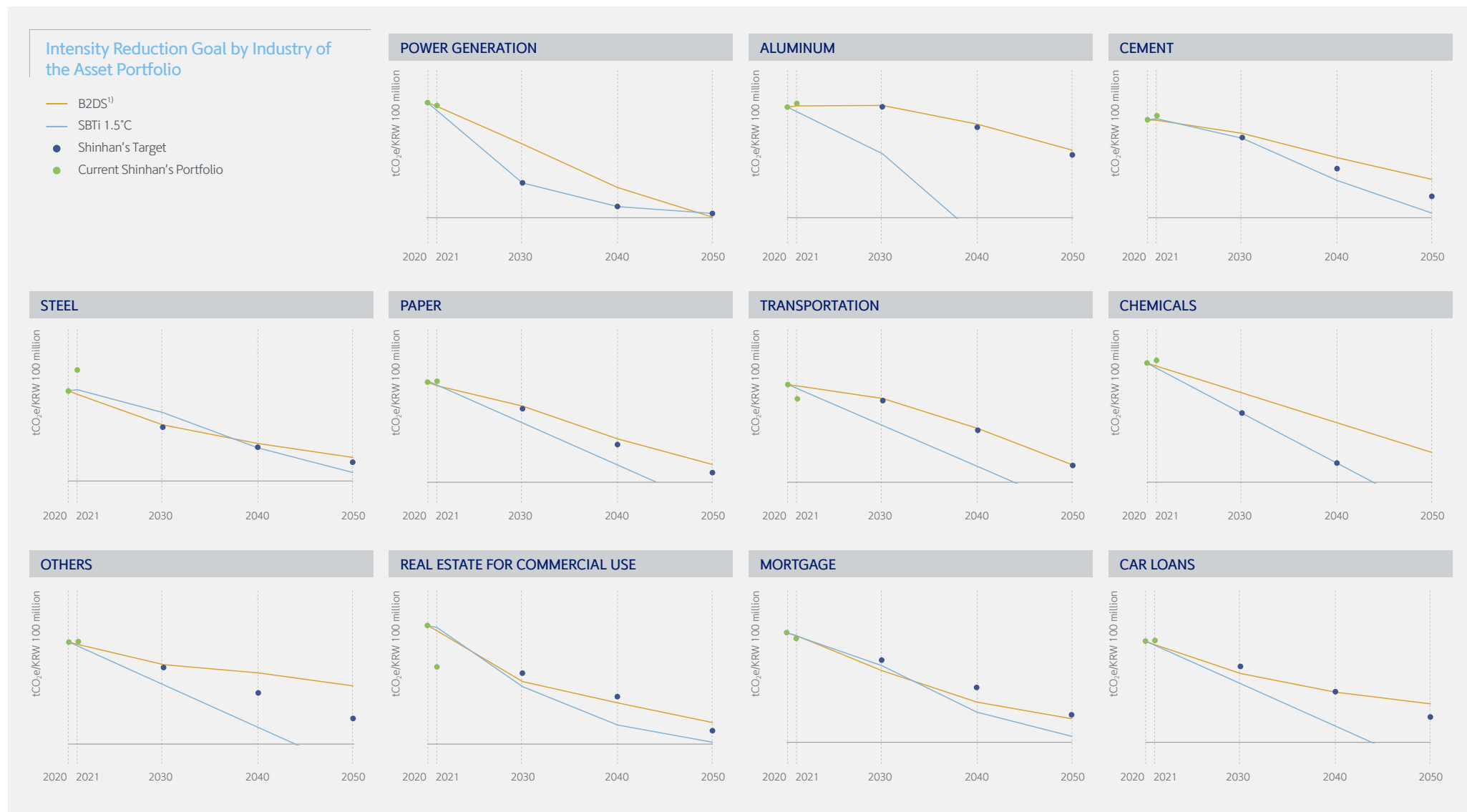
Based on SBTi 2°C & 1.5°C Scenarios



<sup>1)</sup> Plan to make remaining emissions in 2050 net-zero through such off-setting measures as green investments based on the PCAF standard, emissions based on amount of physical activity, and emissions based on amount of economic activity

## PCAF-based Measuring of Financed Emissions and Setting of Reduction Goals

In 2021, Shinhan Financial Group conducted PCAF-based financed emissions measurements and built a database. By doing so, it became the first financial company in Korea to establish a reduction goal by year/industry through 2050.



<sup>1)</sup> B2DS Scenario: The Beyond 2°C Scenario (B2DS) conducts an analysis by including how much currently-available technologies and technologies with innovative processes can be used to limit warming to a level that is considerably lower than 2°C, and it forecasts the achievement of 1.75°C in terms of average global temperature by 2100.

## Shinhan's Promise – Green Finance for Future Generations

Shinhan Financial Group believes that financial institutions can perform important roles in resolving the climate crisis by providing capital that is needed to facilitate the shift to a low-carbon economy. Shinhan is ready to support a sharp low-carbon transition of industrial processes, land use, buildings, transportation, and other infrastructure to satisfy the goals of the Paris Agreement.

In accordance with the “Zero Carbon Drive”, eco-friendly strategy of the Group, we will set and implement an eco-friendly financial support (offset) goal of KRW 30 trillion, which is around 15 times larger than in 2020, by 2030. By doing so, we will discover and expand new eco-friendly growth engines in overall businesses as part of efforts to fulfill financial institution roles for future generations.

### Expansion of Eco-friendly Asset Size

- Discover new eco-friendly growth engines
  - Invest in new eco-friendly technologies/discover companies
  - Increase renewable energy equity investments, etc.
- Conduct performance management that reflects K-Taxonomy

#### Green Finance (Offset) Goal

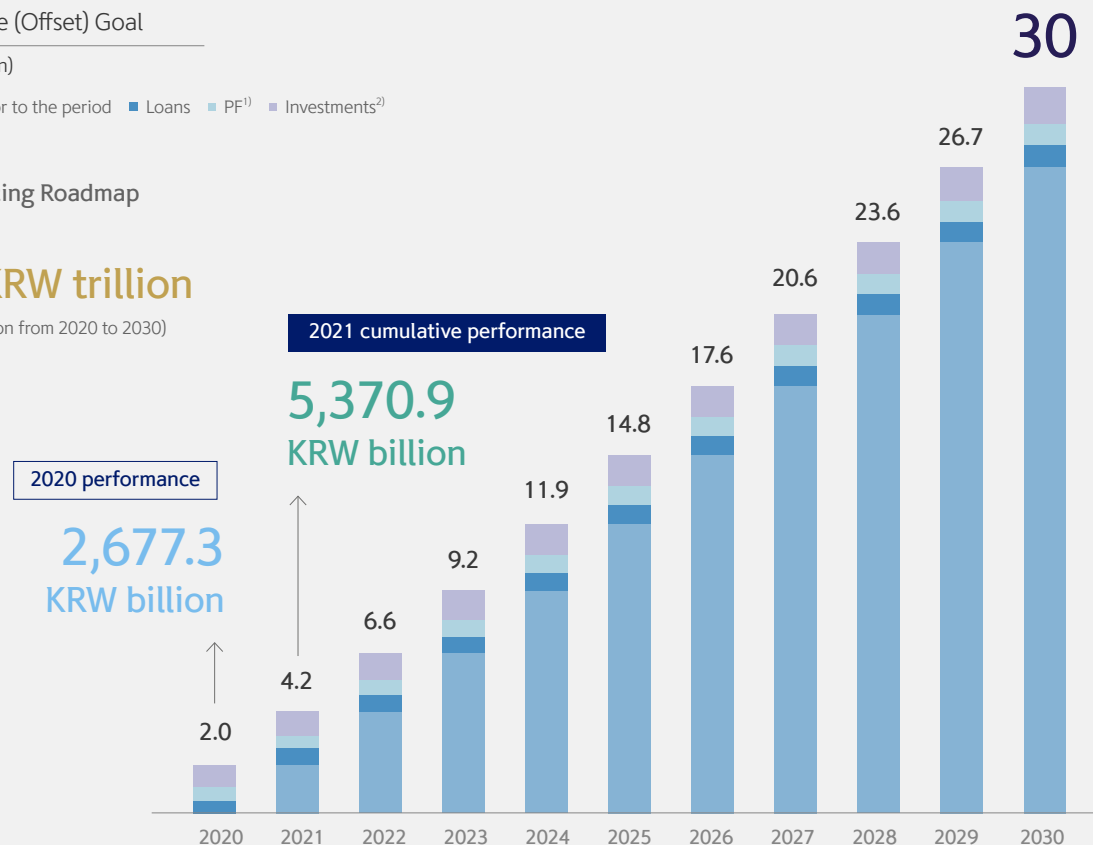
(Unit: KRW trillion)

■ Cumulative prior to the period ■ Loans ■ PF<sup>1)</sup> ■ Investments<sup>2)</sup>

#### Green Financing Roadmap

**30 KRW trillion**

(New accumulation from 2020 to 2030)



\* The offset goal is the photovoltaic/wind power-based renewable energy PF proportion. Carbon emissions were estimated at a level that can be offset without any reduction efforts.

<sup>1)</sup> Excluding fund investment performance of the Group subsidiaries (included in green investment)

<sup>2)</sup> Investment performance of asset management companies and sales performance of the Bank, securities company, and others selling fund products

# Do the Green Thing for a Wonderful World

Shinhan Financial Group has chosen and is implementing the transition to a low-carbon economy as one of its top-priority tasks. To this end, we participate in various climate-related initiatives and programs, demonstrate global leadership to respond to climate change, and conduct systematized scenario-based carbon emissions analyses to detail the path of green finance that Shinhan should take.

Going forward, we will further ramp up speed in executing green finance under the slogan of "Do the Green Thing".

We will establish and run management processes and detailed execution strategies to achieve reduction goals for Shinhan's internal emissions and financed emissions.

We will continually update climate change-related data and analysis models to provide more reliable information to all stakeholders and become an industry-leading benchmark model.

We will conduct a detailed analysis every year of figures that result from change and Shinhan's financial impact and transparently disclose the information.

We will encourage changes that can more clearly integrate climate-related risks and opportunities in the Group's business strategies such as development of financial products that are connected to environmental evaluation/indexes and expansion of eco-friendly PF investments.

We will transparently disclose climate change information and actively collect various stakeholders' opinions to make full-fledged efforts for cooperation.

Shinhan Financial Group will do more than the disclosed content in this report. In the many journeys that we should take, moving towards the future, we will more realistically perceive the seriousness of the climate issue and focus all our competencies to demonstrate strong global leadership and perform key roles in green finance.