

2023 SK Inc.
TCFD Report



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Interactive PDF

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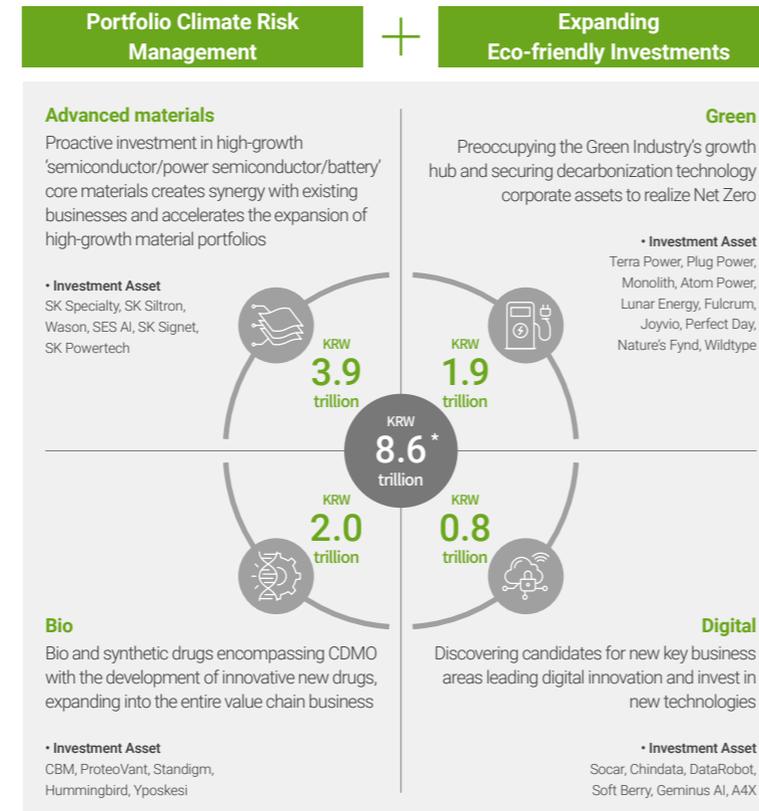
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TCFD Report

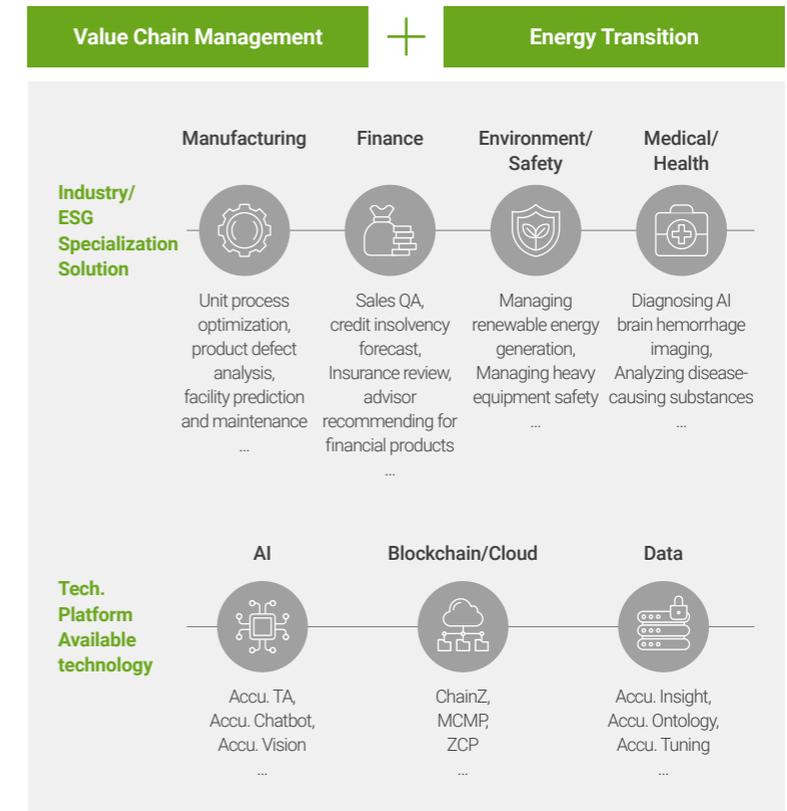


Overview

SK Inc. consists of an "Investment Division" focused on continuous business portfolio innovation, identifying and nurturing future growth drivers, and a "Business Division" engaged in comprehensive IT services based on digital technologies. To support these objectives, the company manages climate risks in line with the characteristics of the Investment Division (portfolio level) and the Business Division. It conducts comprehensive analysis of climate risks/opportunities across the organization. The Investment Division (portfolio level) manages climate risk by considering companies' emissions, reduction targets, investment plans related to emissions reduction, and uses a heatmap of regional/disaster-specific physical risks. Additionally, the division continuously expands the proportion of investments in environmentally friendly businesses. The Business Division has been increasing the use of renewable energy since the declaration of Net Zero by 2040, alongside the management of upstream climate risks, the division also expands the operation of ESG-focused solutions.



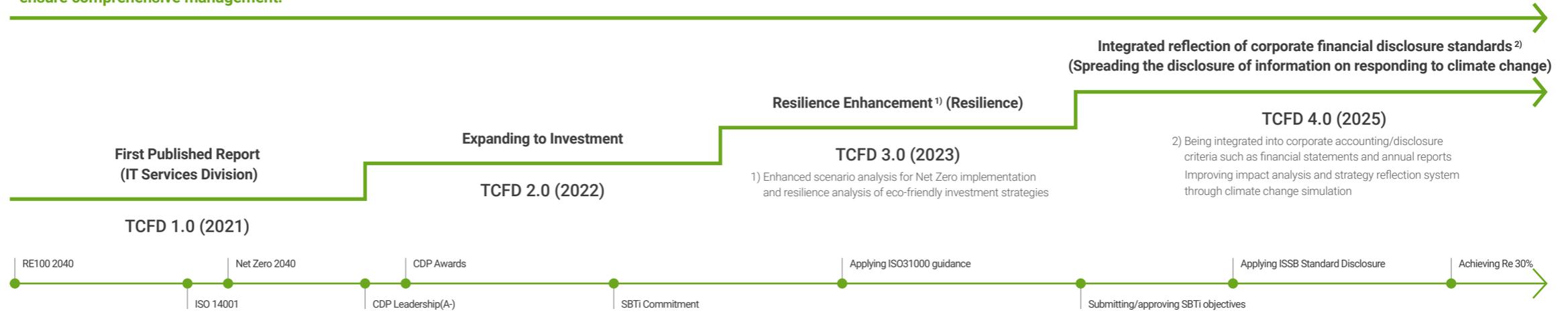
Investment Division  Business Division



* Cumulative investment amount by 2022 (direct investment assets of SK Inc. in the growth area), including merger costs and excluding divest amount

- SK Inc. continuously enhances its reporting scope and disclosure level in accordance with the TCFD framework, thereby refining the company's Transition Plan.
- In 2023, the scenario analysis scope has been expanded from the business sites to the portfolio level to strategically analyze the resilience against key risks throughout the value chain.
- Ultimately, SK Inc. aims to integrate the environmental information management systems of subsidiaries and investment companies to align with corporate financial disclosure standards and ensure comprehensive management.

TCFD Roadmap



SK Inc.'s Response to Climate

- SK Inc. actively participates in the international community's efforts to address climate change, supporting the Paris Agreement and being the first company in the domestic industry to join the RE100 initiative and declare Net Zero 2040. In 2022, SK Inc. strengthened its climate change response and disclosure by joining SBTi, disclosing emissions for all Scope 3 categories, and expanding the reporting scope according to TCFD guidelines.
- As a group, SK has declared a global carbon reduction target of 1% by 2030. SK Inc. aims to evolve into a company that contributes to global carbon reduction based on its expertise in investments and IT.
- This TCFD report expands the analysis scope of climate risks/opportunities to the portfolio level, focusing on the resilience of SK Inc.'s Net Zero Roadmap strategy, the climate risk analysis/management system of the investment portfolio, and details of environmentally-friendly investments.
- Moving forward, we will refine our management system, targets/indicators for climate risks and opportunities, and enhance communication with investors and shareholders.
- Moving forward, we will further refine our management system, targets, and indicators for climate risks and opportunities. We will also enhance communication with investors and shareholders.

Report Summary

- SK Inc. has prepared this report in accordance with the TCFD guidelines, in collaboration with the Carbon Disclosure Project (CDP).

Items	Major Measures	CDP Linkage
Governance	Through the ESG Committee under the board of directors, SK Inc. is responsible for determining how to respond to climate change, reviewing mid- to long-term strategies, approving major tasks, and managing and supervising implementation. The CFO oversees the organization that manages the financial impact of climate change on investment assets.	C1.1a, C1.1b, C1.2
Strategy	SK Inc. actively establishes a strategy to respond to key climate risks/opportunities by identifying financial impacts based on IEA and NGFS scenario-based self-analysis and external analysis tools (S&P Climanomics®, MSCI Climate VaR).	C2.1a, C2.3, C2.3a, C2.4, C2.4a, C3.1, C3.2, C3.2a, C3.2b, C3.3, C3.4
Risk Management	SK Inc. manages climate risk based on the Environmental Risk Assessment Process (ISO14001). From now on, it will be managed in conjunction with the enterprise risk management system based on ISO 31000 guidance.	C2.1, C2.2, C2.2a
Index/Goals	SK Inc. regularly monitors data related to 2040 Net Zero and RE100 goals to manage performance, and is expanding its investment share linked to the green taxonomy	C4.1, C4.1a, C4.1b, C4.2, C4.2a, C4.2b, C6.1, C6.3, C6.5, C6.5a

Governance

Board Oversight on Climate Change-related Risks/Opportunities

- SK Inc. reviews its environmental management strategy and implementation plans through the Board of Directors. Under the supervision and management of the Board, the CEOs of business and investment divisions discuss and decide on climate change response, energy conservation goals, and performance.
- The ESG Committee, in 2021, discussed and approved various important matters related to long-term climate change response, such as driving the Net Zero 2040 initiative, investing in green hydrogen businesses, securing stakes in electric vehicle battery material manufacturers, investing in self-generated renewable energy facilities for data centers, and building a business portfolio across the entire value chain in the hydrogen market. Additionally, in accordance with the Portfolio ESG Management Framework established in 2022, the ESG Committee receives reports on ESG and climate risk assessments from investment companies twice a year and holds decision-making authority on key matters.

ESG Committee

Composition	Members	Details
5 Independent Directors	Kim, Seon Hee (Chairman) Yeom, Jae Ho Kim, Byoung Ho Lee, Chan Keun Pak, Hyun Ju	Installation Purpose - Driving the company's mid- to long-term sustainable growth The ESG Committee has the right and role to hold meetings as needed - Review and management/supervision of mid- to long-term strategies, annual management plans and major activities - Prior review/determination of individual investment agenda (major capital expenditures, acquisitions, sales, etc.) - Monitoring and supervising ESG management performance - Managing/supervising climate change issues
1 Executive Director	Lee, Sung Hyung	

Major Resolutions on Climate Change & Environment in 2022 (Regular ESG Committee) agenda

Agenda	Details	Opening Schedule	Director Attendance Rate
KPI Performance Check	Reviewing the achievement of greenhouse gas emissions reduction goals toward Net Zero	22.11.24	100%
Portfolio ESG Integrated Management	Establishing a full portfolio ESG management framework for the entire investment process, including climate risk financial impact management measures	22.11.24	100%
Company M Investment Review	Considering additional investment into companies with key technologies of alternative foods	22.07.19	100%
Company Y Investment Review	Considering management right acquisition to foster silicon carbide business, a key component of electric vehicles	22.04.21	100%

* Other investment portfolio performance checks, SV creation performance, etc.

Management Role in Assessing/Managing Climate Change Risks/Opportunities

- The CEO of SK Inc. recognizes the significance of stakeholders' demands on climate change response from investors, customers, governments, and others, and understands their potential impact on the overall business management. Therefore, the CEO takes a proactive role in investing in and exploring business models for expanding environmentally friendly businesses, as well as driving cross-functional collaboration within the company.
- The CEO of SK Inc. participates in the SUPEX Pursuit Council, the highest deliberative body of the SK Group, to discuss and make decisions on group-wide ESG issues, including climate change response. Additionally, through performance monitoring processes, the CEO manages and oversees the incentive system (financial rewards) based on the organizational or individual environmental management-related performance.
- Under the environmental management system (ISO 14001), the CEO of SK Inc. receives regular reports on environmental risk and impact assessments, as well as internal audit results from business sites. The CEO delegates authority to the CFO to ensure systematic management of environmental performance and integrated management of the key organization's performance for climate change response.
- The CFO of SK Inc. oversees financial structures, business portfolio optimization and management functions, providing support to the CEO's decision-making from a comprehensive perspective, including financial management, enhancing synergies in ESG-focused businesses, and managing climate risk in the portfolio.

[Reference] Incentives for Environmental Management Performance

- Type: Monetary rewards based on the establishment and evaluation of environmental management goals (KPIs) as part of annual ESG management.
- Recipients: All members, including CEO, CFO, and subordinate leaders.
 - For the CEO, incentives are determined based on the achievement of key strategic initiatives such as participation in global climate change initiatives like RE100 and SBTi, disclosure of TCFD information, and evaluation by external stakeholders.
 - ESG executives, including the CFO, align their KPIs with the CEO's and set goals for upgrading the overall ESG management system.
- Scale: Determined based on performance evaluation relative to individual/team goals.
- Indicators: Greenhouse gas reduction targets, greenhouse gas reduction projects, energy efficiency improvement goals, supply chain engagement, corporate performance in climate change-related sustainability indices, etc.

※ Employees Incentives

- SK Inc. has been providing monetary rewards (SV Points) through the eco-friendly practice mobile app service called "Hangarae" since 2019. Employees receive these rewards for participating in internal campaigns such as taking the stairs, reducing double-sided printing, minimizing food waste, and using reusable cups. The earned points can be used to purchase products from social enterprises, utilize internal cafes, or make donations.
- Employees who contribute to the company's ESG management upgrade through the development of eco-friendly solutions, discovery of eco-friendly business models, etc., are eligible for rewards under the SUPEX pursuit system. The rewarded individuals' names are posted in the company's "Hall of Honor."

“ As an investment company and IT company, SK Inc. is striving to strengthen management of financial risks of climate change that exert downward pressure on corporate value and secure market opportunities for green business, including investment in clean technology.

Lee, Sung Hyung CFO of SK Inc. / Oh, Tak Geun Director of Strategic Planning Division



Strategy | Climate Change Risk/Opportunity Identification and Strategy Reflection Process

SK Inc. identifies climate risks and opportunities based on the TCFD framework and selects critical risks/opportunities based on the characteristics of the business structure. Scenario analysis and business impact and response for selected critical risks/opportunities are reviewed and reflected in key business strategies and financial plans.



TCFD Identifying Climate Risks/Opportunities under the Framework

Establishing application/analysis periods, taking into account Scope3 management and our Net Zero and RE100 2040 objectives

- Scope of Coverage: Includes key business and assets and value chains across the enterprise
- Analysis Period (Time horizon): Short Term (~2025), Medium Term (~2030), Long Term (~2040)

Type of Climate Risk (TCFD large category)		Identifying Risks/Opportunities		Time Frame	Affected Value Chain	Impact
Transition Risk	Policy/Law	T1	Volatility of Korea RE100 Implementation Policy	Short/Mid/Long-Term	Operation	High
		T2	Introducing CBAM (carbon border tax), mandatory in Korea such as ISSB	Mid/Long-Term	Downstream	Mid
		T3	Strengthening ETS (Emission Trading System)	Short/Mid-Term	Operation	High
		T4	Lawsuit against environmental organizations, etc. against companies that have not implemented greenhouse gas reduction	Long-Term	Operation	Low
	Technology	T5	Lack of competitiveness due to failure to preempt Clean Tech investment	Mid/Long-Term	Downstream	High*
		T6	Customers requesting for green certification product information	Mid/Long-Term	All	Low
	Market	T7	Requiring investment portfolio climate risk management	Short/Mid/Long-Term	Downstream	High
		Reputation	T8	Demand for disclosure of climate change plans and implementation results from stakeholders	Mid/Long-Term	All
Physical Risk	Acute	P1	Increased frequency and intensity of natural disasters (flood, Tropical Cyclone, etc.)	Long-Term	All	High
	Chronic	P2	Increased likelihood of extreme climate/sea level rise	Long-Term	All	High
Opportunity	Energy resource	O1	Converting into renewable energy sources from fossil fuel-based energy sources	Mid/Long-Term	Downstream	High
	Market resource efficiency	O2	Increasing demand for electric vehicle materials and technology	Short /Long-Term	Downstream	High
		O3	Increasing demand for sustainable food market	Mid/Long-Term	Downstream	High
	Resource efficiency	O4	Emphasizing the importance of eco-friendly bioenergy	Mid/Long-Term	Downstream	High
	Product/Service	O5	Increasing demand for IT management solutions/services to address climate change	Short/Mid-Term	Operation	High

* Impact Criteria: Considering linkage of board and ESG committee resolutions, stakeholder demand levels, business impact, etc.

* Impact is classified as High, but is analyzed and managed in detail in the Transition Opportunity

Selection of Critical Risks/Opportunities

Considering the characteristics of SK Inc.'s business structure, major risks/opportunities are derived in connection with each Focal Questions by workplace and portfolio level. Subsequently, scenarios are selected to analyze the impact of significant risks/opportunities derived.

Critical Risk/Opportunity	
Business Level (Business Division)	Carbon Reduction Implementation Cost T1 T3
	Impacts on Operation/ Expansion of Data Center P1 P2 O5
Portfolio Level (Investment Division)	Exposed Climate Risk Levels by Investment Area P1 P2 T7
	Market Outlook Following Low Carbon Transition O1 O2 O3 O4

※ See p.15, 16 for details of climate risks/opportunities other than critical risks/opportunities. +

Strategy | Climate Change Risk/Opportunity Identification and Strategy Reflection Process

Scenario Selection and Analysis

- We conducted a comparative analysis of multiple scenarios, considering the Net Zero 2050 scenario from the IEA and NGFS (Below 1.5°C) and the high greenhouse gas emission pathway of IPCC RCP 8.5 (Above 4°C) as the primary scenarios for transition risk and physical risk, respectively, and adopting the main scenario of the high greenhouse gas emission pathway, IPCC RCP 8.5 (Above 4 °C), as the physical risk scenario. These scenarios take into account the current level of greenhouse gas policy implementation.
- Detailed Scenario Analysis Key Tasks of IT Business-oriented Workplace Level and Global Investment-oriented Portfolio Level in Design Phase Scenario analysis models and analysis tools suitable for Focal Questions have been utilized.
 - Business Site Level: Considering IEA (International Energy Agency) carbon outlook trends and NDCs and regulations in Korea, physical risks from direct operations and major supplier locations are analyzed using S&P Global's Clinics® Hazard modeling.
 - Portfolio Level: An analysis of carbon cost-based risk exposure by four areas of the NGFS scenario-based investment portfolio was conducted, and the physical risk was identified by region based on the analysis of MSCI Climate Var Report for major listed companies



* NGFS(Network for Greening the Financial System.) Green Finance Council

Critical Risk/Opportunity	Business Site Level	Portfolio Level	Critical Risk/Opportunity Items	Business Impact	Scenario Analysis / Strategy Application
Risk	Carbon reduction implementation cost	●	T1 Volatility of Korea's Renewable Energy Policy	Additional investment costs to achieve RE100	① Net Zero Transition Risk +
			T3 Strengthening ETS (Emission Trading System)	Additional cost increases due to increased quotas	
	Impact on data center operations	●	P1 P2 Increased frequency and intensity of natural disasters and abnormal weather conditions	Damage to facilities and disruption to services incur recovery costs and penalties (Not likely to occur, but diagnosing the impact of Worst Scenario criteria from a long-term perspective)	② Business & Supply Chain Physical Risk +
			Exposed climate risk levels by investment area	●	T7 Requiring investment portfolio climate risk management
P1 P2 Increased frequency and intensity of natural disasters and abnormal weather conditions	Sales, profitability drop as investment firms' financial performance deteriorates (Identification and management system for high-risk investment enterprises/ business establishments as of 2022)	④ Investment Portfolio Physical Risk +			
Opportunities	Market outlook following low carbon transition	●	O1 Transition into renewable energy sources from fossil fuel-based energy sources	Increasing portfolio profitability through preemptive investment and capacity acquisition in high-growth, low-carbon economy-related markets	⑤ Climate change transition opportunities +
			O2 Increasing demand for electric vehicle materials and technology		
			O3 Increasing demand for sustainable food market		
			O4 Emphasizing the importance of eco-friendly bioenergy		
	Impact on data center expansion	●	O5 Increasing demand for IT management solutions/ services to address climate change	Increasing revenue/profitability through expansion of IT services business and eco-friendly investment	

Strategy | ① Net Zero Transition Risks

Analysis of Net Zero Transition Risks

Renewable energy rates and greenhouse gas regulations affect the cost of procuring renewable energy and purchasing carbon credits for SK Inc., which declared Net Zero 10 years ahead of the country's carbon neutral target year. SK Inc. monitors related policy trends and regulatory changes from time to time and identifies the impact of implementing the Net Zero roadmap.

T1 [Policy/Law] Volatility of Korea RE100 Implementation Policy

Business Impact

- The means of achieving RE100 in South Korea can be broadly classified into self-generation, green premium tariffs, Power Purchase Agreements (PPAs), and Renewable Energy Certificates (RECs). However, the available means for RE100 implementation by companies are highly limited in reality. This is due to the instability of government policies in terms of supply and pricing.
- Therefore, SK Inc. has developed a roadmap to achieve RE100 by 2040 and has initially established on-site solar power generation facilities. However, due to limited available land, the amount of power that can be generated is less than 1%, making the purchase of renewable energy through strategic sourcing essential for achieving RE100.
- While green premium tariffs have the advantage of immediate procurement, they do not receive recognition for actual greenhouse gas reduction performance under the emission trading system in South Korea. REC purchases also carry the risk of price fluctuations due to the volatility of the Renewable Portfolio Standard (RPS) system being implemented by the government.
- South Korea's PPA system is still characterized by higher prices compared to general electricity and a shortage of supply. For the "PPA Customer Electricity Tariff" that the government planned to introduce in 2023, additional costs may arise depending on the time-of-use electricity consumption.
- SK Inc. aims to achieve RE100 by 2040, which is 10 years ahead of the government's carbon neutrality target year. As a result, the company considers the policy and regulatory risks that significantly influence the supply and pricing of renewable energy in South Korea.

Additional Power Acquisition Cost Estimate during Implementation of the RE100 2040 Roadmap (2021~2040)			
General Electricity Rate	Green Premium Rate Only	PPA Only	Mixed ¹⁾
KRW 1355.1 billion	+ KRW 125.6 billion	+ KRW 14.8 billion	+ KRW 13.3 billion

1) Mixed: Solar Self-Generation + Green Charge + PPA

※ Cost calculation key assumptions: 4% annual increase in electricity rates by 2040 and reflecting emission gains and losses based on household and carbon emission price of KRW 35,000

Mitigation

- Following the prioritization of self-generation, SK Inc. has utilized available land within its facilities to establish solar power generation facilities. Currently, we operate a total capacity of 650 kW in self-generation. It is estimated that through the installed solar power self-generation, approximately 100 million KRW in electricity costs are saved annually, and there is an expected greenhouse gas reduction effect of over 650 tons per year (considering a life cycle of 15-20 years).
- In addition to self-generation, we consider Power Purchase Agreements (PPAs) as a key procurement method to secure more stable renewable energy sources. We are also closely reviewing the timing of implementation and contract quantities by monitoring various cost variables, including PPA supply levels and specific regulatory changes such as the "PPA Customer Electricity Tariff."
- SK Inc. is planning to transition to renewable energy primarily through green premium tariffs until 2025 and then shift the focus to PPAs starting from 2026 (based on the second quarter of 2023 plans). We continue our engagement activities, such as participating in policy forums regarding improvements needed in renewable energy policies like the "PPA Customer Electricity Tariff" and supporting the Corporate Renewable Energy Foundation.

T3 [Policy/Law] Strengthening ETS (Emission Trading System)

Business Impact

- The greenhouse gas emissions trading scheme in South Korea increased the proportion of paid allocation during the third planning period (2021-2025) to 10%.
- First planning period (2015-2017): 0% → Second period (2018-2020): 3% → Third period (2021-2025): 10%
- SK Inc. is experiencing an increase in power consumption in data centers due to expansion of new customers and other factors during the third planning period, which is expected to lead to an increase in the purchase of emission allowances through payment.
- Long-term scenarios, such as those presented by the IEA, forecast an upward trend in carbon prices domestically and globally, which would result in an increase in the unit price of emission allowances that SK Inc. needs to purchase.
- Therefore, SK Inc. manages the key risk of stricter regulations in the emission trading scheme, which impacts the purchase price of emission allowances.

Mitigation

- SK Inc. is implementing the Net Zero 2040 roadmap and reduction plans, promoting various mitigation projects such as self-generation, renewable energy utilization, data center power efficiency improvements, and internal certification of reduction achievements by the Ministry of Environment.
- To examine the strategic resilience of the company's roadmap based on carbon price outlook, an analysis of the economic feasibility based on carbon allowance profits was conducted until 2040. It is projected that SK Inc. will have the potential for emission allowance sales revenue starting from 2027 when implementing the Net Zero roadmap. (Detailed scenario analysis can be found in the following section.)

Strategy | ① Net Zero Transition Risks

Strategic Resilience of Net Zero Roadmap

Due to the increasing power consumption of SK Inc.'s data centers, the cost of purchasing emission allowances is expected to rise annually. In response, our company has developed the Net Zero 2040 and RE100 2040 roadmaps and is actively pursuing renewable energy purchases and energy efficiency improvements each year. In analyzing the financial impact of implementing our Net Zero roadmap, we have applied the carbon price outlook from the most recent Net Zero 2050 scenario, APS, and STEPS scenarios provided by the International Energy Agency (IEA). The scenario analysis indicates that in the long term, across all three scenarios, the cost of purchasing emission allowances required if we do not achieve Net Zero exceeds the cost associated with driving the Net Zero initiative. This suggests that the cost of our Net Zero implementation is an investment in the long-term perspective.

Overview of Scenario Analysis

The main parameters are carbon prices on the STEPS, APS, and Net Zero 2050 paths, which are the latest three scenarios with the IEA GEC Model (2022)

	the Stated Policies Scenario (STEPS)	Announced Pledges Scenario (APS)	Net Zero Emission by 2050 Scenario (NZE 2050)
Scenario Outline	Prospects taking into account the current reduction targets in addition to the policies/measures pursued by each country	Despite the Greenhouse Gas Reduction Goals (NDCs) announced by governments, expected to achieve a 40% reduction by 2050	Fossil fuel replacement by 2030, Net Zero expected by 2050
Temperature Rise	Above 3 °C	Above 2 °C	Below 1.5 °C
Carbon prices in South Korea	In 2030 42 (USD) In 2040 67 (USD)	In 2030 40 (USD) In 2040 110 (USD)	In 2030 90 (USD) In 2040 160 (USD)

※ APS, NZE 2050 abide by the Emerging market and developing economies with Net Zero emissions pledges

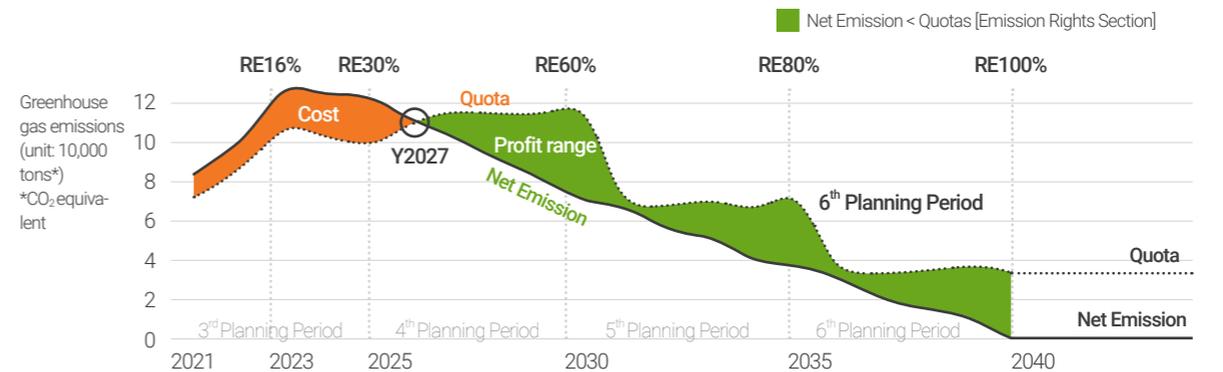
SK Inc.'s Net Zero Target Implementation and Assumption

- Implementing the RE100 roadmap: 30% in 2025 → 60% in 2030 → 80% in 2035 → 100% in 2040
- Achieving energy efficiency goals: 3.5% or more of greenhouse gas reduction annually through energy efficiency
- Data center power usage: Estimated through 2025, then the same usage through 2040
- Korea Emissions Trading Scheme (K-ETS) Percentage of Paid Allocation: 4th (2025-2030) → 5th (2031-2040) → 6th (2035-2040) Linear increase assumption (allocation rate 12-16%)

Results of Financial Impact Analysis based on Emissions when Implementing our Net Zero Target Ontrack

Net Emissions by 2026 > Quota → Purchase of Emissions (Cost) Required
 Net Emissions < Quota → Emission Rights Sales (yield) from 2027 onwards from 2027

Loss of emission rights by period following reduction (RE100, Energy Efficiency)



Gain/Loss Comparison during Net Zero Implementation by the Carbon Price Outlook by Scenario (unit: KRW 100 million)

Scenario	Classification	~2025	~2030	~2040	Total
STEPS	Based on BAU	▲ 26.1	▲ 128.3	▲ 325.9	▲ 480.3
	Net Zero Implementation Criteria	▲ 52.1	▲ 53.1	109.6	4.4
APS	Based on BAU	▲ 25.6	▲ 122.7	▲ 463.6	▲ 611.9
	Net Zero Implementation Criteria	▲ 51.7	▲ 55.2	168.5	61.6
NZE 2050	Based on BAU	▲ 39.4	▲ 263.0	▲ 752.8	▲ 1,055.2
	Net Zero Implementation Criteria	▲ 61.8	2.4	281.9	222.5

※ BAU-based = Emissions Purchase Cost for Emissions Exceeded by Reduction Activities
 Net Zero-based = (Emission Gain or Loss) - (RE100 and Energy Efficiency Investment Costs)

Strategy | ② Operations & Supply Chain Physical Risks

Physical Risk at Major Business Sites P1 P2

After analyzing the financial impact of climate risks such as temperature rise, coastal flooding, and Fluvial Basin Flooding on our major workplaces by 2040, we checked our response to potential risks. While the short-term risks we face are minimal, we reaffirmed the importance of managing data center co-operation efficiency and disaster recovery from a long-term perspective. In addition, considering supply chain risks, we also analyzed the case of 3 suppliers, which is 45% of the purchase amount in 2022.

Physical Scenario Analysis Overview

By 2040, the physical risks of major workplaces due to the 7 major climate risk factors (extreme temperature, coastal flooding, drought, Wildfire, Tropical Cyclones, water stress, Fluvial Basin Flooding) were compared around the IPCC RCP 8.5 and 4.5 route.

- To be analyzed: Direct Business Sites (Daedeok Data Center, Pangyo Data Center) and Major Supplier Business (3 global suppliers accounting for 45% of IT equipment purchases, 5 facilities for manufacturing our products)
- Analytic Method: S&P Global Clinics® Hazard modeling calculates a modulated average annual loss to the asset value of a workplace based on vulnerability data based on the frequency of risk occurrence by location and asset type

Physical Risk Analysis Results for Direct Operations Sites

The risk of asset loss due to climate change other than “Fluvial Flooding” is expected to be insignificant in the RCP 8.5 route, which will accelerate global warming by more than 4 degrees by 2040.

Modeled Average Annual Loss



Asset loss risk by data center climate risk factor (by 2040)

*Exclusion of analysis (-) if no relevant source of hazard occurs

● RCP 2.6 (Very low greenhouse gas emission scenario to keep temperature rise below 2°C)

Directly Operated Workplace	Chronic						Acute																	
	Extreme Temperature			Coastal Flooding			Drought			Wildfire			Tropical Cyclone			Water stress			Fluvial Basin Flooding					
	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40			
Daedeok Data Center				-	-	-																		
Pangyo Data Center				-	-	-																		

● RCP 4.5 (Emission scenarios in which mitigation policies are substantially implemented to keep the temperature increase at 2°C).

Directly Operated Workplace	Chronic						Acute																	
	Extreme Temperature			Coastal Flooding			Drought			Wildfire			Tropical Cyclone			Water stress			Fluvial Basin Flooding					
	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40			
Daedeok Data Center				-	-	-																		
Pangyo Data Center				-	-	-																		

● RCP 8.5 (Worst-case scenario where emissions continue in the 21st century and temperature rise is greater than 4°C)

Directly Operated Workplace	Chronic						Acute																	
	Extreme Temperature			Coastal Flooding			Drought			Wildfire			Tropical Cyclone			Water stress			Fluvial Basin Flooding					
	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40			
Daedeok Data Center				-	-	-																		
Pangyo Data Center				-	-	-																		

[Chronic] Data Center Operating Costs due to Rising Temperatures

Business Impact

- The risk of asset loss by data centers due to extreme temperatures is minimal in all RCP Scenarios. Nonetheless, SK Inc. considers temperature changes a major physical risk. This is because electricity costs for cooling facilities and IT equipment in the data centers account for a significant proportion (approximately 45%) of the annual operating costs.
- Rising external temperatures, such as summer heat waves and tropical nights, is directly linked to increased power costs to operate the data center’s cooling system. If the outside temperature rises by 1°C and lasts for a year, it is estimated that the annual electricity cost will increase by 2.5-3.5% (about 4.4-620 million KRW) as of 2021.

Mitigation

- To minimize the impact of external temperatures rising, our data centers are equipped with high-efficiency facilities such as automatic water spraying systems around the cooling facilities. In addition, we are monitoring airflow in the computer rooms through CFD(Computational Fluid Dynamics) since 2021. Through science-based analysis and using layout simulations we are able to rearrange IT equipment, update and replace antiquated systems to save energy, time, and cost.

[Acute] Data Center Disaster Recovery Costs due to Large-scale Fluvial Basin Flooding

Business Impact

- Data centers are especially vulnerable to fluvial flood hazards only under the high emission scenario(RCP 8.5) in 2030-2040. If an exceeding historical 100-year fluvial flood level event occurs, costs for facility restoration and business interruption is estimated over 30% of the total asset value of the Data centers.
- In the worst-case scenario if there is large-scale natural disaster such as fluvial flooding, the results could be power outages and facility shutdowns in the data centers. This will cost damage recoveries and customer compensations (up to 2.2 billion KRW per day). While unlikely, SK Inc. considers these climate factors to be a major risk, given its reputation as an IT service provider.

Mitigation

- SK Inc.’s data center has prepared measures to withstand rainfall of 100ml per hour and conducts simulated training exercises to respond to heavy rainfall incidents and manage humidity. Preemptive maintenance and reinforcement of key facilities are carried out based on concentrated heavy rainfall forecasts. In particular, building leaks, drainage pumps, and drainage systems are subject to concentrated inspections and maintenance.
- The data center is equipped with systems such as high-capacity uninterruptible power supplies (UPS) and emergency generators for large-scale power outages caused by natural disasters such as floods. Test and training for For IT service continuity are exercised regularly by simulating the case of the entire power supply disruption and practicing to switch to an emergency power system.

Strategy | ② Operations & Supply Chain Physical Risks

Supply Chain Physical Risk Analysis Results

By 2040, the risk of asset loss due to coastal flooding resulting from sea-level rise is very minimal for all pathways, including RCP 8.5, except for one facility (in Malaysia) exposed to flooding risk.

Modeled Average Annual Loss



Asset Loss Risk by Major Supplier Climate Risk Factors (~2040)

* Excluding analysis if there is no corresponding risk factor source (-) mark

● RCP 2.6 (Reduction policy is implemented considerably to adjust the temperature increase to 2°C)

Major Suppliers' Workplace	Chronic						Acute																	
	Extreme temperature			Coastal flooding			Drought			Wildfire			Tropical Cyclone			Water stress			Fluvial Basin Flooding					
	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40			
Supplier A																								
Supplier B(facility1)																								
Supplier B(facility2)																								
Supplier B(facility3)																								
Supplier C																								

● RCP 4.5 (Reduction policy is implemented considerably to adjust the temperature increase to 2°C)

Major Suppliers' Workplace	Chronic						Acute																	
	Extreme temperature			Coastal flooding			Drought			Wildfire			Tropical Cyclone			Water stress			Fluvial Basin Flooding					
	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40			
Supplier A																								
Supplier B(facility1)																								
Supplier B(facility2)																								
Supplier B(facility3)																								
Supplier C																								

● RCP 8.5 (Worst-case scenario where emissions continue in the 21st century and temperature rise is greater than 4°C)

Major Suppliers' Workplace	Chronic						Acute																	
	Extreme temperature			Coastal flooding			Drought			Wildfire			Tropical Cyclone			Water stress			Fluvial Basin Flooding					
	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40	'20	~'30	~'40			
Supplier A																								
Supplier B(facility1)																								
Supplier B(facility2)																								
Supplier B(facility3)																								
Supplier C																								

※ Using only the location information of the manufacturing facilities of the company's trading products agreed to be provided by the supplier (applying the asset type 'General Manufacturing' collectively)

[Acute] Supplier Manufacturing Facilities Suspended due to Natural Disasters

Business Impact

- Approximately 60% of the HW/NW equipment procured for SK Inc.'s IT services business (as of 2022) is manufactured in facilities located in China, Malaysia, Ireland, and Singapore. The potential for asset loss due to coastal flooding is relatively high across RCP 4.5 to 8.5 scenarios.
- Difficulties in sourcing raw materials and disruptions in the manufacturing facilities of HW suppliers due to coastal flooding and other natural disasters may lead to revenue decline and cost losses due to purchase delays and price increases for raw materials and alternative competitive products.

Mitigation

- The Malaysian facility-holding suppliers have multiple manufacturing facilities in various countries within the same product category and have implemented business continuity management systems (BCP) in response to natural disasters.
- SK Inc. collects data on greenhouse gas reduction and climate change adaptation measures from key suppliers on an annual basis. Starting from 2023, the company also requests suppliers to provide their response plans for supply chain risks related to climate disasters. Continuous monitoring is planned to ensure that manufacturing facilities are not excessively concentrated in regions with high physical risks.

Strategy | ③ Investment Portfolio Transformation Risk

Investment Portfolio Transformation Risk Analysis & Investment Strategy Reflection Process T7

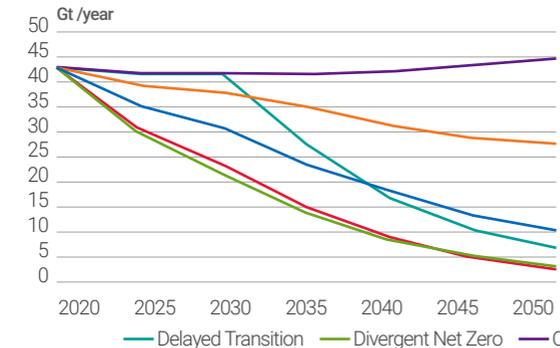
In 2022, SK Inc. established a climate risk management system for its investment companies and analyzed the level of climate risk exposure in four portfolio areas through scenario analysis. A framework was developed to compare the cost of actual risk, taking into account the economic evaluation and market conditions when achieving the reduction targets of investment companies, with operating profits. This system will be piloted from 2023 and will be used to formulate a concrete reduction pathway for Scope 3 emissions by 90% by 2050.

Climate Change Scenario Analysis (NGFS Scenario)

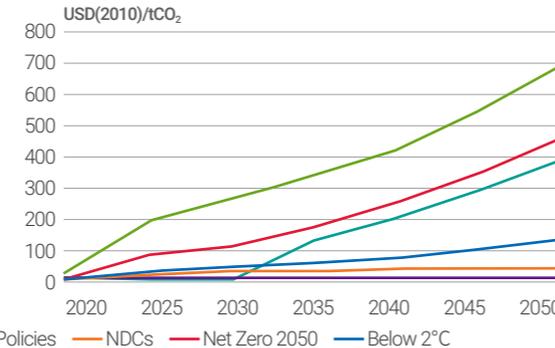
At the portfolio level, it is important to assess the market evaluation risk regarding the low-carbon transition costs of companies. To do this, three NGFS (Network for Greening the Financial System) scenarios, which are widely used in the financial sector, were selected and analyzed, particularly those that are frequently compared by national banks and financial institutions. The analysis was conducted using carbon prices and GHG emission trajectories. The NGFS Current Policies scenario was adjusted using the average price of emission allowances during the two phases (2018-2020) when the allocated emission allowances trading ended and the final price was determined.

	Current Policies	Delayed Transition	Net Zero 2050
Explanation	Maintaining current government regulations	Reinforcing regulations after 2023	Gradually strengthening regulations
Temperature rise	Above 3°	1.6°C	1.4°C
Parameter	Carbon Price & National Emissions		

[Reference] Carbon Emissions by NGFS Scenario



[Reference] Carbon price by NGFS scenario



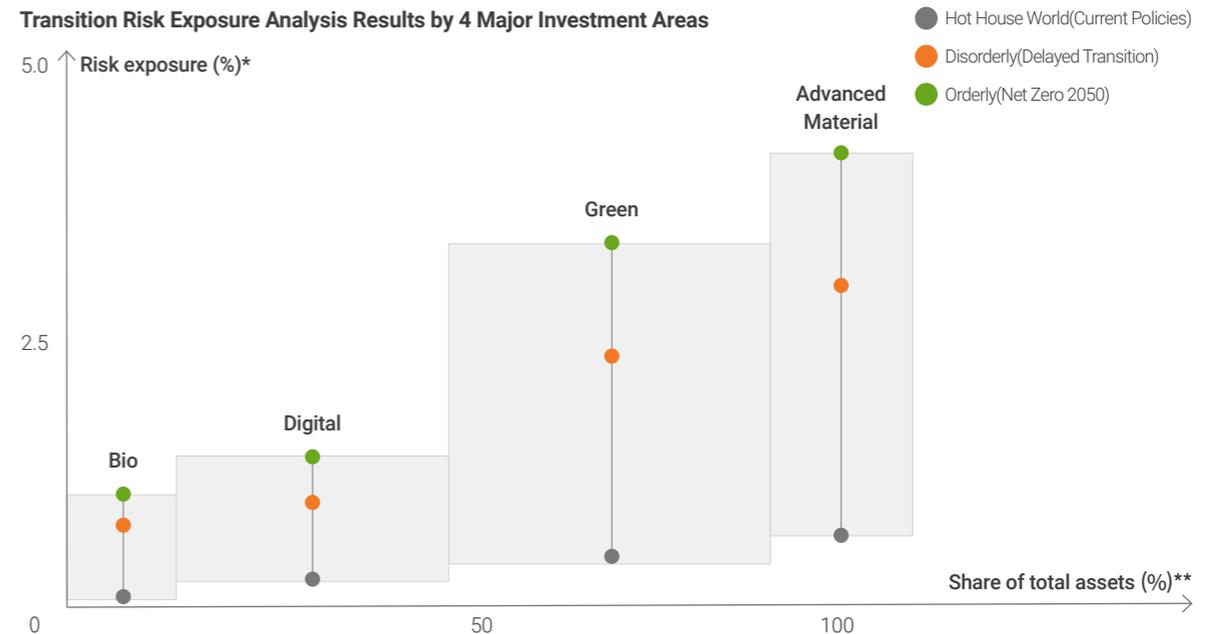
Source: IIASA NGFS Climate Scenarios Database

Investment Portfolio Conversion Risk Exposure Analysis Result T7

Category	Companies performing risk exposure analysis	Net zero target-setting company
Number (proportion)	27 member companies (100%)	24 member companies (89%)
Explanation	Member companies (24), direct subsidiaries (3)	Member companies (24)

In 2022, the exposure to transition risks was assessed based on companies within the SK Group that are major subsidiaries and have direct emission data available. The risk exposure was calculated as the cost of risk as a percentage of revenue. It considered the current emissions, the business-as-usual (BAU) emissions incorporating expansion plans for each subsidiary, and the expected revenue. Within the portfolio, all SK Group companies, except for some directly-owned subsidiaries, have a 2050-α Net Zero target. It was observed that if these targets are achieved, the portfolio's risk exposure would decrease to 0% based on the Net Zero scenario. A financial impact management and investment strategy integration system, which have been established to assess the actual impact on SK Inc., is planned to be implemented from 2023.

Transition Risk Exposure Analysis Results by 4 Major Investment Areas



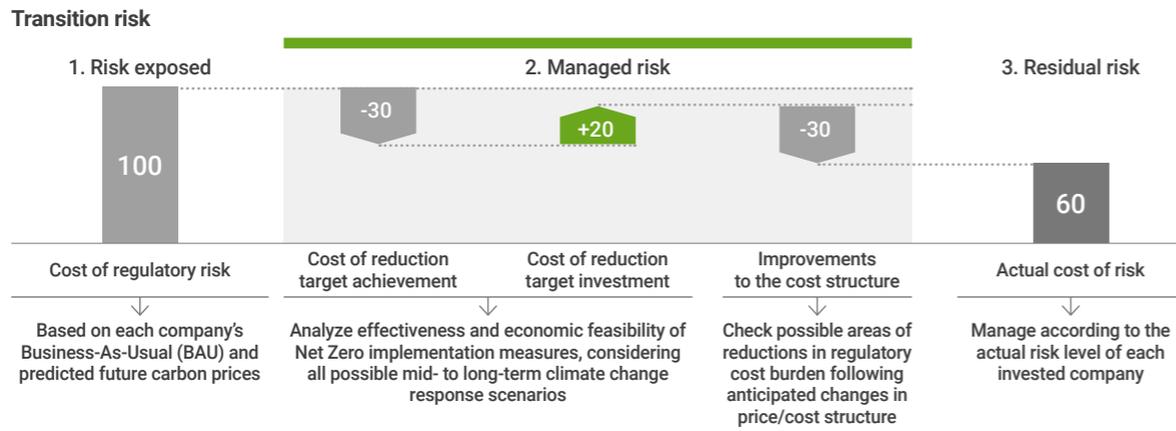
* Risk exposure: 2023-2050 years of cumulative risk costs ÷ cumulative sales

** Percentage of total assets: Total assets X SK share

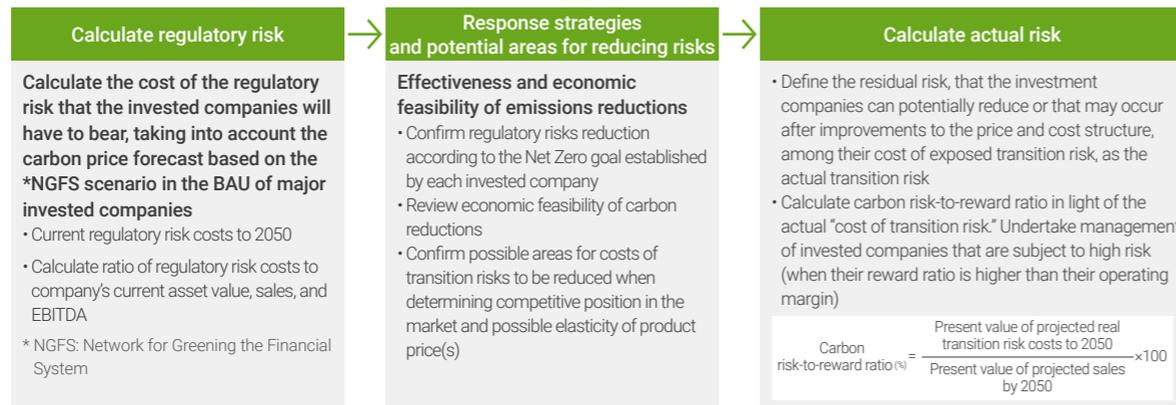
Strategy | ③ Investment Portfolio Transformation Risk

Financial Impact Management Framework for Climate Transition Risks

SK Inc. has established a climate risk management system for portfolio investment companies. The actual risk, which deducts mitigated risks through the management of portfolio companies from the exposed regulatory risks, is utilized as the basis for evaluating the investment companies. In this process, the effectiveness and cost-effectiveness of emissions mitigation measures held by each investment company are reviewed, along with an assessment of their market viability to support transition risks. This transition risk is then converted into a "carbon risk-to-reward ratio (RRR)," an indicator that is compared to the company's ability to generate sales in the future, in order to evaluate its soundness in terms of carbon risk.



Management Strategies by Stage

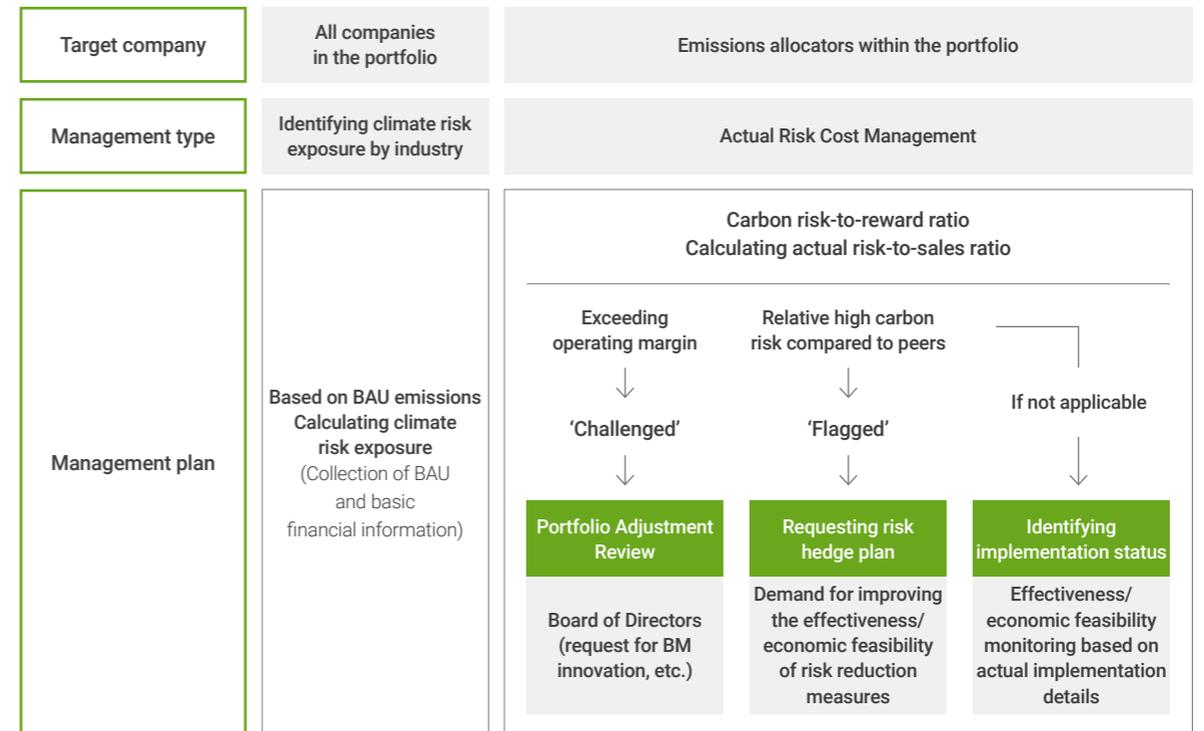


Investment Strategy Incorporation Process (Real Risk)

Regarding the subsidiary's existing investment portfolio, if the Carbon risk-to-reward ratio is higher than the operating profit margin, it will be classified as a 'Challenged' and a portfolio adjustment review will be conducted. If it is not classified as a 'Challenged' but has higher risk exposure compared to similar companies in the industry, it will be classified as 'Flagged' and more economically viable mitigation target implementation measures will be demanded. Furthermore, even in the absence of these circumstances, continuous monitoring will be conducted for any fluctuations due to changes in the market situation.

In 2023, we plan to conduct a pilot real risk assessment targeting member companies classified as entities subject to carbon emission allowance allocation. This pilot assessment will serve as the basis for progressively enhancing the portfolio's climate risk management system based on real risk assessments in the future.

Substantial Transition Risk Management Process

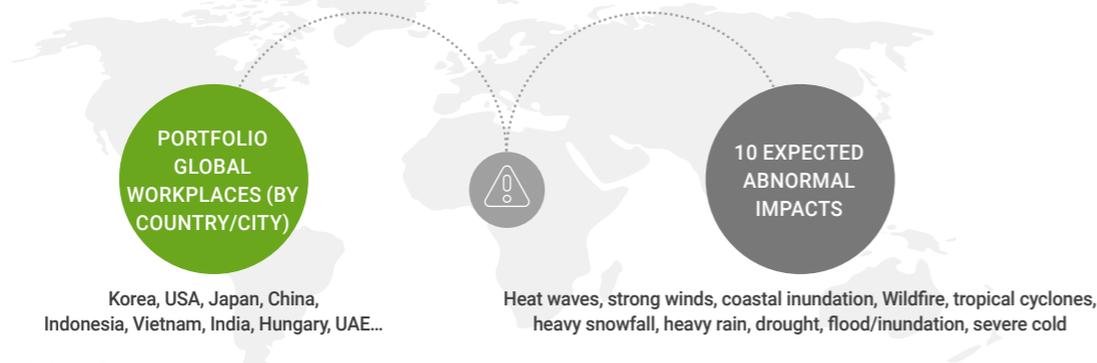


Strategy | ④ Physical Risk in Investment Portfolio

P1 P2 Framework for Managing Physical Risk

Physical risk refers to the risk that arises from the physical impacts of climate change. In recent years, the frequency of extreme weather events has increased, intensifying the financial impact of physical risks. In response to this, SK Inc. is analyzing the potential financial impacts based on the areas exposed to extreme weather events using external climate and weather data, such as MSCI Climate VaR. According to the analysis conducted in 2022, the estimated climate risk exposure of SK Inc.'s investment portfolio over the next 15 years revealed that the most significant physical risks are heatwaves, coastal flooding, and tropical cyclones. The regions with the highest financial loss potential due to climate risk were identified as Busan in South Korea, Dumai in Indonesia, and Incheon in South Korea. To address these high-risk regions and investment companies, SK Inc. conducts biannual portfolio ESG performance evaluations and monitors whether appropriate management systems are in place. Furthermore, when expanding business operations or selecting investment regions, SK Inc. considers physical risk as a factor in decision-making.

Physical Risk



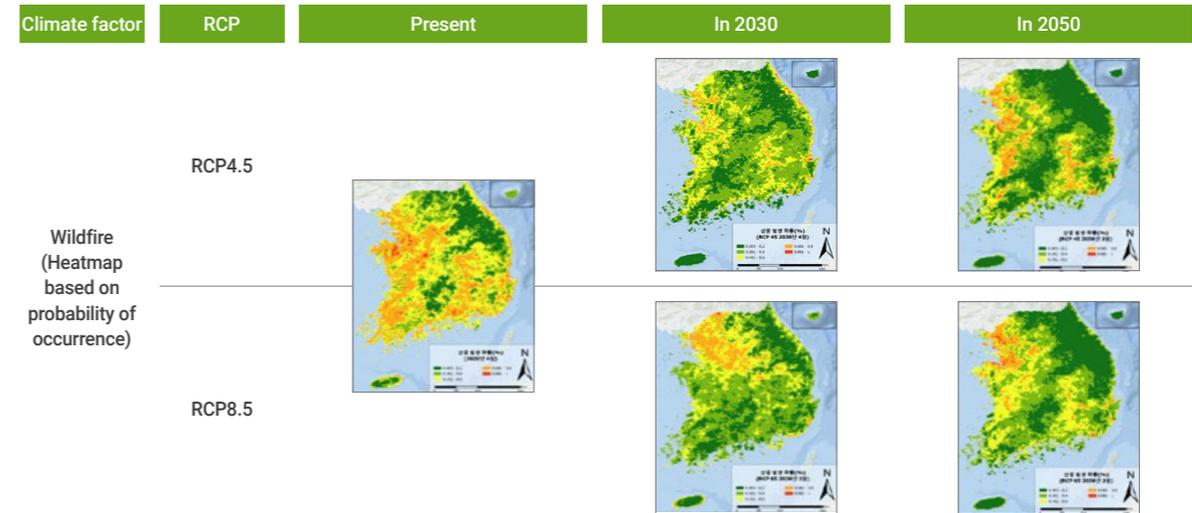
Risk level classification



Physical Risk Management Case for Investment Companies (SK Telecom)

- It assesses Physical Risks of Climate Change until 2050 based on RCP Scenarios and builds the "SK Telecom Climate Change Physical Risk Map" to simulate the impact on communication equipment
 - : Types of Disasters: Wildfires, Landslides, Heavy Rainfall, Heatwaves, and Heavy Snowfall (5 types)
- Transitioning to a Natural Disaster Prediction and Response System that reflects climate change scenarios
 - : Analyzing the financial impact of extreme weather events on 16,000 domestic network infrastructures based on RCP scenarios
 - : Identifying high-exposure areas with a high probability of significant risks and expected damage scale in advance
- Planning response strategies to minimize economic losses based on simulation results of natural disasters

Climate Change Physical Risk Map of SK Telecom



Managing existing facilities	Maintenance of communication infrastructure System maintenance for pre-maintenance and post-recovery of currently operating communication facilities and equipment: Reinforcing electric power system for communication facilities expected to be flooded/damaged or relocating base stations
Reflecting new facilities	Risk-reflected Design Reflecting physical risks when designing future communication equipment and building sites

Strategy | Climate Change Risk (other items)

T2 [Policy/Law] Introduction of CBAM (carbon border tax) and Mandatory in Korea such as ISSB

Business Impact

- IFRS, US SEC, EU EFRAG, and other organizations have announced climate disclosure standards. As a result, there is an increasing demand from the financial society for disclosure of greenhouse gas emissions up to Scope 3 and risks associated with climate change.
- Particularly, starting with the EU's CBAM, there is a global movement towards establishing trade regulations to address climate change. Companies that are not agile in responding to these trends may find themselves at a disadvantageous position in the global supply chain.

Mitigation

- Currently, SK Inc. is not directly subject to the EU CBAM. However, considering the possibility of future domestic implementation, SK Inc. plans to regularly analyze the financial impact of transition risks in its global investment portfolio. The results of future monitoring will be incorporated into the management system of the investment portfolio as a proactive risk management measure.
- Although the disclosure of climate-related information based on ISSB standards is not mandatory in South Korea so far, SK Inc. is expanding the reporting scope related to climate disclosure, including Scope 3, taking into account the ISSB guidelines.

T4 [Policy/Law] Lawsuits against Companies Failing to Reduce Greenhouse Gas Emissions by Environmental Organizations

Business Impact

- Lawsuits questioning the responsibility for greenhouse gas management, including uncertainties in emission reduction plans and issues of greenwashing regarding the implementation of reduction targets, are increasing against high-emitting global companies. This can negatively impact corporate image and trustworthiness.

Mitigation

- There have been no legal cases against domestic companies to date, and SK Inc. has declared the year 2040, which is 10 years ahead of South Korea's carbon neutrality target of 2050, as the target year for Net Zero. SK Inc. transparently discloses its annual greenhouse gas reduction performance through sustainability reports, CDP, and other platforms.
- In 2022, SK Inc. committed to the Science Based Targets initiative (SBTi), and in 2024, it plans to undergo verification of its near-term reduction targets, including Scope 3 targets.
- SK Inc. continues to monitor regulatory trends in environmental issues to mitigate potential legal issues. It analyzes the needs of environmental stakeholders according to ISO 14001 and 31000, and monitors and verifies compliance obligations according to ISO 37301 (Compliance Management System) through certification bodies.

T5 [Technology] Failure to Secure Clean Tech Investment Leading to a Decline in Competitiveness

Business Impact

- According to the IEA Energy Outlook 2022, the scale of clean energy investments is projected to increase from \$1.4 trillion in 2022 to \$4.5 trillion by 2030, based on the IEA NZE scenario.
- Rating agencies such as MSCI and KCGS consider investment plans in Clean Tech as a key evaluation criterion for global companies, and failing to make proactive investments in this area is expected to weaken SK Inc.'s ability to respond to future climate change and its competitiveness.

Mitigation

- SK Inc. has introduced a framework for analyzing the risk exposure and actual risk costs of portfolio companies under various transition scenarios. It is also continuously expanding the proportion of environmentally friendly investments in new investments. (Refer to the Opportunities section for more details)

T6 [Market] Increased Demand for Information on Environmentally Certified Products from Customers

Business Impact

- As demands for setting Scope 3 targets and reducing greenhouse gas emissions in the supply chain grow from the international community and environmental organizations, there is also an increasing demand for environmentally certified products and Life Cycle Assessment (LCA) information from suppliers, particularly in global companies. Suppliers who fail to meet these customer demands may experience a decline in trust and weakened business competitiveness.
- It is anticipated that even in SK Inc.'s IT service B2B customers, there will be a future demand for reducing greenhouse gas emissions and expanding environmentally certified products. SK Inc. recognizes the importance of managing environmental information for its core IT service infrastructure, including Data Centers and hardware/networking equipment.

Mitigation

- SK Inc.'s primary IT infrastructure, including Data Centers, is increasing the share of renewable energy-based electricity every year in line with the RE100 2040 Roadmap.
- Additionally, SK Inc. manages the presence of eco-labels for purchased hardware products and enhances supplier engagement, including recommending target setting based on SBTi criteria and requesting LCA information for key hardware suppliers.
- Moreover, SK Inc. strengthens communication with customers by incorporating its Net Zero implementation and overall environmental management system (ISO 14001 certification) into standard customer proposals.

Strategy | Climate Change Risk (other items)

T8 [Dignity] Demand for Disclosure of Stakeholders' Climate Transition Plans and Performance

Business Impact

- Inadequate response to climate change can lead to negative evaluations from stakeholders, potentially damaging the brand image and decreasing the corporate value of SK Inc. As an investment-focused company within the SK Group, a decline in reputation can also have negative impacts on other SK Group companies and hinder global investment attraction.
- Institutional investors, such as the National Pension Service in South Korea and global ESG asset management firms like BlackRock, hold around 20% of SK Inc.'s shares. While there have been no instances of share reduction due to environmental issues so far, inadequate climate change response may lead to long-term investment contraction.

Mitigation

- Since 2020, including SK Inc., seven SK Group companies have joined RE100, becoming the first in South Korea to do so. In 2021, SK Group made a Net Zero declaration, securing a leading position in climate change response domestically.
- SK Inc. actively incorporates the demands for climate change response from major investors and various stakeholders into its business activities. It transparently discloses relevant strategies and performance through TCFD reports and sustainability reports.
- SK Inc. has received recognition for its various environmentally friendly improvement activities for addressing climate change in 2022, such as being recognized as a CDP Leadership (A-) for two consecutive years, inclusion in the DJSI World Index for 11 consecutive years, and achieving the MSCI AAA rating. SK Inc. aims to continuously improve and address the demands for climate change response in the future.

Strategy | ⑤ Climate Change Transition Opportunities

Identifying Significant Climate Change Transition Opportunities

SK Inc. has recognized the importance of innovation and dissemination of key technologies for achieving Net Zero, such as hydrogen electrolysis, electric vehicles, CCUS (carbon capture, utilization, and storage), renewable energy, and bioenergy, as presented in the IEA NZE 2050 and NGFS 2050 scenarios. As a technology and investment-focused company, SK Inc. is actively seeking solutions to address the fundamental causes of climate change, leveraging them as business opportunities, and focusing on commercialization through securing innovative technologies and business models. This approach is seen as a strategic element that enables SK Inc. to adapt flexibly to future low-carbon market dynamics.

Classification of Climate Change Transition Opportunities		Major opportunity	Time frame	Value Chain	Financial impact
Energy resources	01	Transition from fossil fuel-based energy sources to renewable energy sources	Mid/Long Term	Downstream	Investment asset value increase
Market	02	Growing demand for electric vehicle materials and technologies	Short/Mid Term	Downstream	Investment asset value increase
	03	Growing demand in the sustainable food market	Mid/Long Term	Downstream	Investment asset value increase
Resource efficiency	04	Emphasis on the importance of eco-friendly bioenergy	Mid/Long Term	Downstream	Investment asset value increase
Product/Service	05	Expanding demand for IT solutions/services to respond to climate change	Short/Mid Term	Operation	Sales increase

Utilizing Climate Change Scenarios

As a global investment company, SK Inc. primarily references the IEA Net Zero scenario for global energy policies and technology outlooks. It also analyzes the Republic of Korea's 2050 carbon neutrality scenario and NDC projections, taking into account the policy landscape of South Korea. The insights derived from this analysis are integrated into SK Inc.'s investment strategies and new service development strategies.

	South Korea 2050 Carbon Neutral Scenario, NDC	Emissions by 2050 Scenario (IEA NZE Scenario)
Scenario Overview	Prospects for technology and investment needed to implement carbon neutrality and NDC in the Korean government	Substitute fossil fuels by 2030; Aiming to achieve Net Zero by 2050
Temperature rise	Below 2.0 °C	Below 1.5 °C
Major Items	The 3rd Automobile Policy Basic Plan - Planning to transition electric and hydrogen vehicles GHG reduction plan by industry sector - Introducing building energy management system - Reducing technology in the livestock industry	Increased demand for renewable energy sources EV market outlook Prospects for using CCUS technology

Strategy | ⑤ Climate Change Transition Opportunities

01 Transition into Renewable Energy Sources from Fossil Fuel-based Energy Sources

Business Impact

- IEA and NDC scenarios, along with various market reports, anticipate continued market expansion through active investments and support for clean energy by global nations. However, South Korea faces overall limitations due to a shortage of renewable energy resources. In order to overcome these limitations and lead innovation in the domestic energy market, SK Inc. plans to invest in building a clean hydrogen-based ecosystem and CCUS (carbon capture, utilization, and storage) technology companies.
- (Global) The International Energy Agency (IEA) forecasts that CCUS will contribute around 10% to the cumulative reduction of carbon emissions in the global energy sector from 2021 to 2050 in the IEA Net Zero 2050 scenario.
 - Estimated contributions of CCUS technology to carbon reduction: 40 million tons per year in 2021 to 1.2 billion tons per year in 2030, and 6.2 billion tons per year in 2050.
- (Domestic) Given the characteristics of South Korea's power generation and industrial structure, CCUS technology is necessary as a means to alleviate carbon emissions. (It is expected to contribute 3.8% to the 2030 NDC target and 8.0-12.3% to the 2050 carbon neutrality goal.)

Adaptation

- In January 2021, SK Inc. made investments in PlugPower, a leading company in the hydrogen economy industry in the United States, jointly with SK E&S. In June 2021, SK Inc. also invested in Monolith, the world's first producer of green hydrogen, securing a seat on its board as a leading investor.
- SK E&S established a joint venture company, SK PlugH2V, with PlugPower in January 2022 to pursue the supply of hydrogen electrolysis facilities. Additionally, SK Inc., as the driving force within SK Group, announced plans to invest 18 trillion won by 2025 to construct the world's largest liquid hydrogen plant and establish an ecosystem throughout the entire value chain, from hydrogen production to distribution and consumption.
- SK Inc. plans to lead the domestic green hydrogen and solid carbon markets through the joint venture with Monolith established in 2021.
- SK Inc. is also investing in companies such as 8rivers, which possesses core CCUS technologies, ION Clean Energy, a promising company in carbon capture, and Summit Carbon Solutions, the world's largest CCS (carbon capture and storage) project, to secure CCUS technologies proactively.

[Note] Investment Status

Investment Company	Possessed Skills	Investment Value	Investment Period
PlugPower	Water electrolysis facility and hydrogen fuel cell for green hydrogen production	Approximately KRW 1.6 trillion (joint investment by SK E&S)	2021
Monolith	Producing hydrogen and commercial solid carbon from methane (no CO ₂ evolution)	Non-disclosure	2021

02 Growing Demand for Electric Vehicle Materials and Technologies

Business Impact

- The South Korean government aims to reduce approximately 29.7 million tons of greenhouse gas emissions in the transportation sector by 2030 through the expansion of eco-friendly mobility, such as the widespread adoption of electric and hydrogen vehicles. The Eco-friendly Vehicle Act promotes the replacement of commercial vehicles with environmentally friendly vehicles. According to the IEA NZE 2050 scenario, the global market share of electric vehicles is projected to increase from 4.3% in 2020 to 60.9% in 2030.

Adaptation

- SK Inc. is actively investing in key materials and technologies, such as semiconductors for eco-friendly electric vehicle infrastructure, to lead in the rapidly growing electric vehicle market.
- To secure a position in the next-generation lithium-metal (Li-Metal) battery market, SK Inc. invested 300 billion won in SES AI, a company with lithium-metal anode materials and high-concentration electrolyte technology, in 2018. In 2021, an additional investment of 40 billion won was made, securing a position as one of the top three shareholders. SES AI aims to commercialize its prototypes by 2025, with expectations of significantly improved charge/discharge lifespan (over 10 times) to replace conventional fossil fuels.
- In 2019, SK Inc. invested 270 billion won in Wason, a Chinese manufacturer of copper foil, a crucial material for electric vehicle batteries. An additional investment of 100 billion won was made in 2020.
- SK Inc. also invested 26.8 billion won in SK Powertek (formerly YesPowerteknix), a domestic designer and manufacturer of SiC (silicon carbide) power semiconductors for electric vehicle current direction control and power conversion. SK Inc. secured a 33.6% stake by investing KRW 26.8 billion in 2021 in SK Powertech (formerly Yes Powerteknix), a design/manufacturer of silicon carbide (SiC) power semiconductors (electric vehicle current direction control and power conversion control). It also acquired a 53.4% stake (W293.2 billion) in Signet EV, a Korea-based company that obtained the world's first U.S. certification for its development of ultra-fast electric vehicle chargers, in 2021.

[Note] Investment Status

Investment Company	Possessed Skills	Investment Value	Investment Period
Lunar Energy	Residential Solar ESS business	About KRW 60 bn	2020, 2022
SES AI	Developing next-generation lithium metal (Li-Metal) batteries	about KRW 70 bn	2018, 2021
Wason	Copper Foil Manufacturer (Global No. 1)	Approx. KRW 380 bn	2019, 2020
SK Powertech (previous YPTX)	Silicon carbide (SiC) power semiconductor (only in Korea)	About KRW 100 bn	2021, 2022
SK Signet	Manufacture of ultra-fast EV rapid charger	About KRW 300 bn	2021
Atom Power	Energy solution and EV charging business	About KRW 100 bn	2022

Strategy | ⑤ Climate Change Transition Opportunities

03 Increasing Demand for Sustainable Food Market

Business Impact

- The South Korean government has set a greenhouse gas reduction target of 180,000 tons compared to the base year of 2018 in the agricultural and livestock sector by 2030, including through the use of alternative processed foods.
- The agricultural and livestock sector not only accounts for 22% of global greenhouse gas emissions but also faces increasing concerns about land and water pollution due to pesticides and waste. Sustainable food solutions have been proposed as a response. Additionally, a high market growth rate is expected, especially among future key consumer groups such as the millennial generation.
- Indeed, investments in alternative food-related industries have grown significantly, from around 130 billion won in 2016 to 2.6 trillion won in 2020, representing a twenty-fold increase.

Adaptation

- SK Inc. entered the alternative food market by investing 54 billion won in Perfect Day starting from 2020, considering the rapid growth and market size of the alternative food market. SK Inc. further secured a board seat through additional investments and actively engaged in the exploration of alternative food and food tech startups.
- SK Inc. selectively invests in leading global alternative protein companies in the United States and the United Kingdom and has established and operates funds related to alternative food for expansion into China.
- In the domestic market, SK Inc. collaborates with well-established food companies, jointly investing in the establishment of joint ventures, distribution, and R&D infrastructure, aiming to develop concrete alternative food businesses tailored to the Korean market.

[Note] Investment Status

Investment Company	Possessed Skills	Investment Value	Investment Period
Perfect Day	Producing fermented milk protein - Can be used as a raw material for ice cream, cheese, bread, etc.	About KRW 120 bn	2020, 2021
Joyvio Group	F&B distribution company established by Legend Holdings, a Chinese firm - Expected to jointly invest and cooperate for the alternative food sector	About KRW 40 bn	2021
Nature's Fynd	Possession of fermented protein technology - Launched cream cheese and alternative meat patties	About KRW 29 bn	2021
Wild Type	Successfully developed salmon cultured meat for the first time in the world - Scheduled for commercial production after US FDA GRAS approval	About KRW 8.8 bn	2022

04 Expansion of IT Solutions and Services Demand for Climate Change Mitigation

Business Impact

- The South Korean government has set long-term roadmaps for building energy management and transitioning to eco-friendly vehicles, including the goal of achieving carbon neutrality by 2050, as outlined in the "2050 Carbon Neutrality Scenario." In addition, in October 2022, the government introduced real-time energy demand management through ICT technology and AI-based energy production infrastructure as key measures to achieve energy efficiency (Carbon Neutrality and Green Growth Promotion Strategy). These policies are expected to increase the demand for energy management system upgrades in energy-intensive industries such as manufacturing and the power sector, as well as IT services related to eco-friendly vehicle infrastructure management and electric vehicle charging facilities.
- The latest IEA Net Zero Scenario emphasizes that the existing Net Zero by 2050 targets are insufficient to achieve the 1.5-degree pathway and that stronger greenhouse gas reduction regulations and the adoption of reduction technologies are essential. In this regard, efforts from companies are needed not only to reduce Scope 3 emissions within the value chain but also to reduce emissions outside the value chain. There is an ongoing trend of increasing emission reduction targets and strengthening disclosure of Scope 3 emissions, primarily in the United States and Europe.
- Considering the trend of global companies managing product carbon footprints based on Life Cycle Assessment (LCA) and participating in voluntary carbon credit markets, the demand for IT management systems for greenhouse gas measurement, verification, and reduction credit trading is expected to grow.
- SK Inc., with its digital capabilities in Big Data, AI, Blockchain, etc., sees these changes as important opportunities to provide customers with environmentally friendly products and services.

Adaptation

- SK Inc.'s business divisions proactively identify the direction of the government's environmental policies and customers' ESG needs to provide IT services in line with greenhouse gas reduction demands, such as participation in renewable energy industrial park projects, energy management systems (EMS), and Battery as a Service (BasS).
- Since 2022, the company has expanded the customer base for Click ESG, an ESG performance assessment platform, and is developing an LCA platform to manage emissions in the supply chain and the Centro platform for voluntary carbon certification and trading. These initiatives foster business models that connect to the Net Zero ecosystem.
- In 2023, SK Inc. aims to provide "ESG/Net Zero End-to-End Services" as a "Customer's Green Digital Partner" and is upgrading its business strategy and organizational structure to consolidate IT expertise and ESG consulting capabilities.

The Case of BM Linked to the Carbon Trading Market

SK Inc. Centro (voluntary carbon reduction certification and trading platform)

- (1) We provide "Registry service" that supports the business process of certifying carbon reduction projects by certification bodies; and
- (2) "Marketplace service" for reliable carbon credit transactions.

Strategy | ⑤ Climate Change Transition Opportunities

05 Emphasizing the Importance of Eco-friendly Bioenergy

Business Impact

- The South Korean government actively supports R&D investment and management activities for immediately deployable technologies among low-carbon industrial materialization technologies for renewable resources.
- The International Energy Agency (IEA) emphasizes the importance of environmentally friendly innovative technologies for waste treatment and utilization as environmental pollution from waste intensifies. As of 2021, the global biofuel market is estimated to reach approximately 146 trillion KRW. Biofuels play a crucial role in decarbonizing transportation modes such as aviation and shipping, and countries worldwide are expected to continue supporting the expansion of biofuels through policy measures, indicating robust growth prospects.

Adaptation

- SK Inc. is planning to invest in environmentally friendly businesses and technologies necessary to achieve Net Zero, while also pursuing market entry into the domestic bioenergy industry.
- In late 2021, SK Inc. jointly invested approximately 60 billion KRW with a domestic private equity fund in Fulcrum BioEnergy, a U.S. company that produces synthetic fuels using municipal solid waste. The company aims to explore the potential of waste-derived biofuels by introducing Fulcrum's innovative process domestically.

[Note] Investment Status

Investment Company	Possessed Skills	Investment Value	Investment Period
Fulcrum	Waste biofuel business	About KRW 30 bn	2021

Strategy | Transition Plan

Transition Plan

SK Inc. is implementing a transition plan with the goal of achieving Net Zero Scope 1+2 emissions by 2040. In 2022, the company established a Scope 3 management system, and related transition plans are currently under review by the internal ESG committee. Among the Scope 3 categories, Category 15 (Investments) currently has the highest emissions share. To achieve the SK Group's targets of 2050-a Net Zero and a carbon reduction contribution of 200 million tons by 2030, SK Inc. plans to further expand the proportion of environmentally friendly businesses in its portfolio and enhance its climate risk management system, which has been implemented since this year.

Upstream

Raw Material Production/Transportation

Scope 3 category	tCO ₂ eq
1. Purchased goods and services	7,854
2. Capital goods	1,840
3. Fuel and energy related activities (not included in scope 1 or scope 2)	8,402
4. Transportation and distribution	7
5. Waste generated in operations	1
6. Business travel	2,129
7. Employee commuting	1,900
8. Leased assets	-

Establishing supplier management goals related to Category 1 and 2 (purchasing/capital goods)

Operation

Production of products and services

Direct/indirect emissions (Scope 1+2)	tCO ₂ eq
Direct emissions (Scope 1)	1,431
Direct energy usage	24 (TJ)
Indirect emissions (Scope 2)	107,782.5
Indirect energy usage	2,256 (TJ)

2040 Net Zero & RE100

Downstream

Product use and investment

Scope 3 category	tCO ₂ eq
11. Use of the Product	61,926
12. Disposal of the product	291
15. Investment	11,445,468

Expanding Eco-Friendly Investment & Investment Portfolio
Advancing climate risk management system

SK Inc.'s Transition Planning



Strategy | Transition Plan

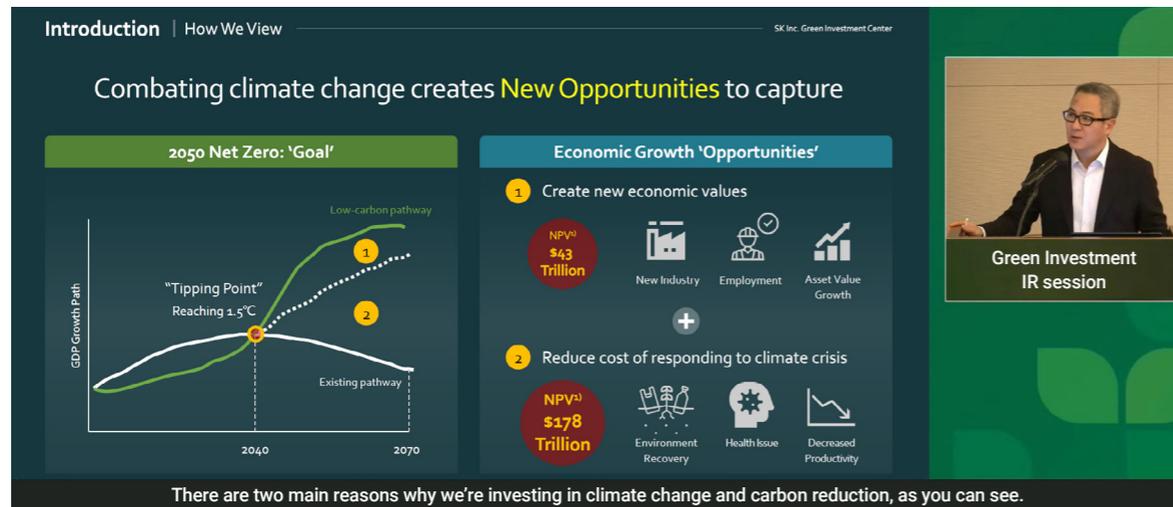
Stakeholder Communication

Communication Channels with Shareholders

SK Inc. is making efforts to diversify its communication channels with shareholders/investors to effectively communicate the company's initiatives, operations, and performance in carbon emission reduction projects, as well as the direction and outcomes of environmentally-friendly investments.

Shareholder/Investor Communication Channel	Major Communications in 2022-2023	QR Link
Shareholders' Meeting, Analyst/Investor Meeting	• Decarbonization solution new investment history/ performance to prepare decarbonization growth base	 https://sk-inc.com/kr/ir/irArchive.aspx
Disclosure/Performance announcement	• Decarbonization Solution New Investment History and Investment Performance	 https://sk-inc.com/en/media/view.aspx?seq=247
Home page	• Strengthening energy carbon emission reduction through electrification and expansion of clean fuel assets	Available from July 31st on the SK Inc. website

SK Inc.'s green business investor meeting (Dec. 2022)



Introduction | How We View SK Inc. Green Investment Center

Combating climate change creates **New Opportunities** to capture

2050 Net Zero: 'Goal'

Low-carbon pathway vs. Existing pathway. "Tipping Point" Reaching 1.5°C by 2040.

Economic Growth 'Opportunities'

- 1. Create new economic values: NPV¹⁾ \$43 Trillion. Includes New Industry, Employment, and Asset Value Growth.
- 2. Reduce cost of responding to climate crisis: NPV¹⁾ \$178 Trillion. Includes Environment Recovery, Health Issue, and Decreased Productivity.

Green Investment IR session

There are two main reasons why we're investing in climate change and carbon reduction, as you can see.

Transition Plan Communication Case

Since establishing the Net Zero goal for 2021, SK Inc. has been communicating with stakeholders about climate change response activities to achieve Net Zero. In 2023, SK Inc. plans to continuously communicate with shareholders/investors' inquiries related to the climate change management system and transition planning.

Status of Inquiries Regarding Shareholder/Investor Conversion Plan since 2021

Classification	Subject of inquiry	Percentage of Transition Plan Inquiries	SK Inc. response content
Transition plan at the business site level	Carbon neutral plan	17%	• Responding to the Korean government's policy under the goal of carbon neutrality
	RE100 promotion	17%	• Renewable energy procurement status
Transition plan at investment portfolio level	Phasing out high carbon production	8%	• Business strategic direction for high-carbon industries
	Green Business Strategy	54%	• SK Group's hydrogen industry • Eco-friendly technology development plan
Information disclosure	TCFD Reporting	4%	• TCFD Reporting Plan

* As of 2021-2022

Strategy | Transition Plan

Emission Reduction Activities Implementation Status

SK Group - Member Company Reduction Targets Status

2050-α Net Zero

In 2021, SK, the first domestic company to declare Group-level Net Zero, is striving to achieve net-zero greenhouse gas emissions earlier than the global carbon neutrality target of 2050. SK member companies have set ambitious achievement milestones called "2050-α" considering the characteristics of their businesses, and they are establishing and implementing reduction targets and action plans to demonstrate global climate leadership within their respective industries.



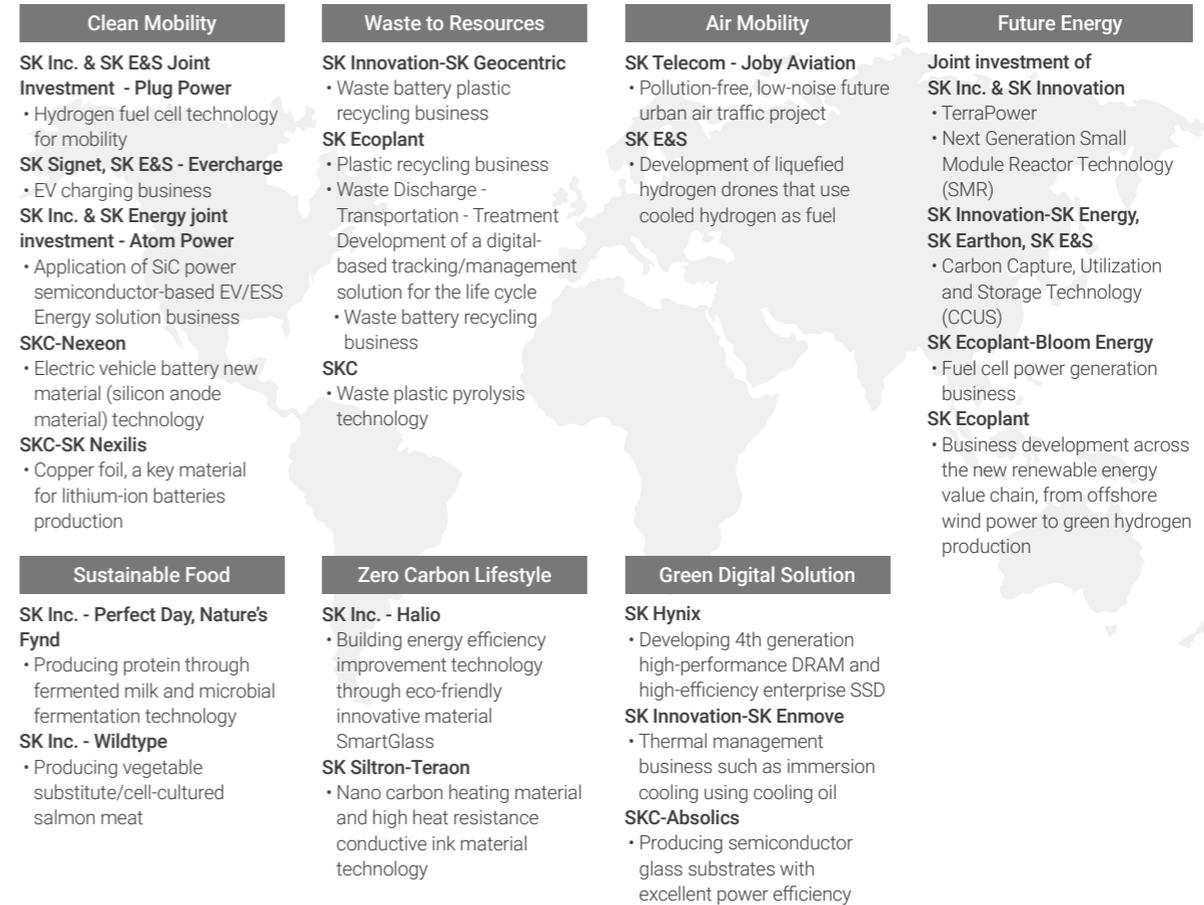
First-ever RE100 Membership in South Korea

RE100 is a voluntary global initiative by companies aiming to source 100% of their electricity from renewable energy by 2050. In 2020, SK, including SK Inc., became the first South Korean group to join RE100, demonstrating leadership in reducing greenhouse gas emissions in Scope 2. Additionally, other member companies that have not yet joined RE100 are also planning to expand their use of renewable energy in line with RE100 standards.

7 Member Companies Joining E100



SK Group - Status of Reduction Activities



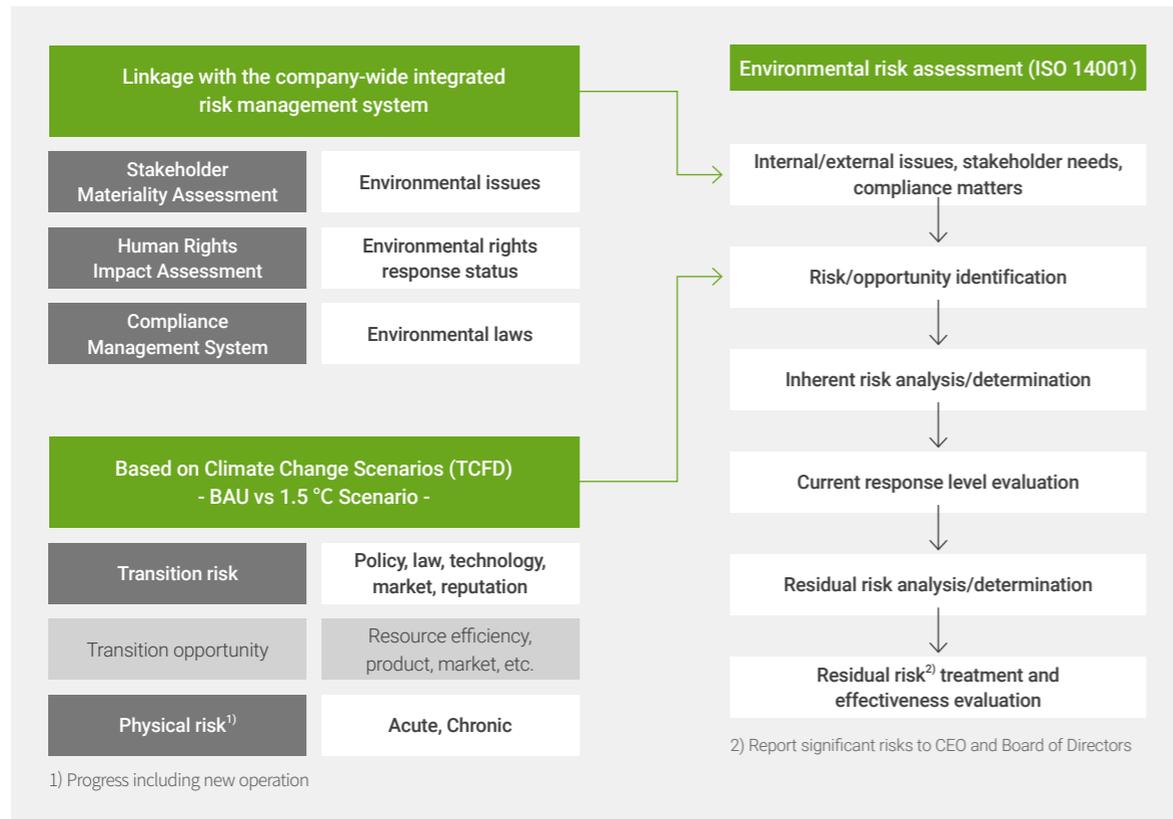
2030 Ambition:
Achieving contribution goals of reducing 200 million tons of global carbon emissions

Risk Management

Risk Management System for Environmental/Climate Risks

Environmental Management System (ISO 14001) and integrated enterprise-wide risk management system, SK Inc. identifies, prevents, and evaluates climate risks proactively. The suitability and effectiveness of risk assessment are validated through annual internal and external audits. Significant risks are reported to the CEO and the board of directors to ensure a company-wide response. In 2023, the company plans to integrate the environmental/climate risk management system into the enterprise-wide risk management system based on ISO 31000 guidelines.

Environmental/Climate Risk Management Process



Value Chain Climate Risk Management

SK Inc. identifies transition risks and physical risk factors and manages climate risks from suppliers, customers, and investment companies, with a focus on managing Scope 3 emissions and expanding environmentally friendly business activities.

Upstream (Suppliers)

We are conducting support activities to enhance the environmental management level of our partner companies through ESG (Environmental, Social, Governance) initiatives (See P. 95 for details). [+](#)

In particular, we are focusing on engagement activities to reduce greenhouse gas emissions, with a key focus on upstream activities related to HW/NW equipment manufacturing. By 2023, we aim to refine our climate risk management system in the supply chain, including eco-friendly product certifications, Life Cycle Assessment (LCA) information, and Business Continuity Planning (BCP) related to climate risks.

Downstream (Investors)

Starting from 2022, we have initiated climate risk exposure management for investment companies. This involves financial analysis that considers the exposed risks, the costs required for mitigation goals, and the comparison of actual climate risk costs and operating profit ratios, taking into account market prices and cost structures. Furthermore, we plan to continuously enhance downstream climate risk management by expanding the scope of our management and strengthening our methodologies.

Metrics & Targets | Climate-related Management Indicators and Goals of SK Inc.

SK Inc. manages greenhouse gas (GHG) and energy indicators as key performance indicators (KPIs) aligned with the Net Zero 2040/RE100 2040 roadmap. It strengthens the management of indicators throughout the value chain by integrating them with Scope 3 engagement and environmentally friendly business operations.

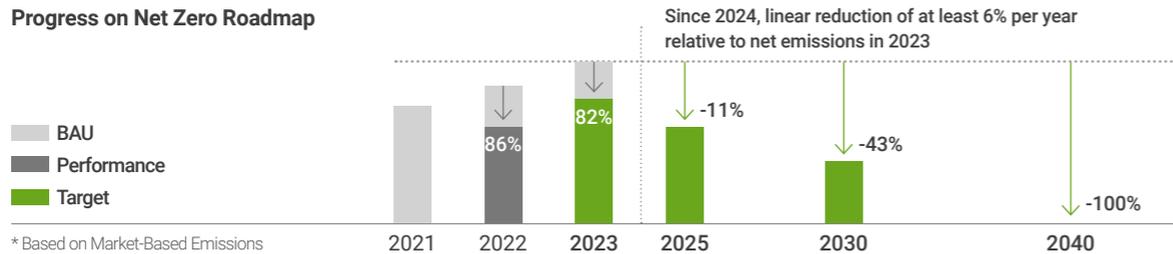
GHG Emissions and Energy Management

SK Inc. measures and monitors greenhouse gas (GHG) emissions on a monthly basis at each of its facilities. These measurements are utilized for performance management and assessment, including the use of Net Zero key performance indicators (KPIs). The calculation of GHG emissions follows the guidelines provided by the government's "Guidelines for Managing Energy Targets Related to GHG Emissions" and the Korea District Heating Corporation guidelines. The company ensures the accuracy and reliability of GHG indicators and performance by adhering to internationally recognized standards and frameworks, including the IPCC Guidelines 2006, WRI/WBCSD GHG Protocol 2004, ISO 14064-3 2006, ISO 14001, and relevant national regulations governing the allocation and trading of GHG emissions allowances. These indicators and performance data undergo third-party verification to validate their integrity.

Greenhouse Gas Reduction Target (Net Zero) and Performance

Long-Term target	Achieving Scope 1+2 Net Zero by 2040
Near-Term target	Annual increase in reduction amount compared to BAU by 2023: 10% in 2022 (14% in performance) → 18% target in 2023 Absolute reduction of 6% or more every year from 2024 to 2023 (SBTi target submission/verification scheduled for 2024)

Progress on Net Zero Roadmap



* Based on Market-Based Emissions

Increasing in reduction compared to BAU every year since Net Zero 2040 declaration in 2021 (by 2023)

Annual Greenhouse Gas Emissions by Scope 1&2 Fuel

Location-based emission standards [Unit: tCO₂eq]

Classification	2019	2020	2021	2022	
Scope 1+2 emissions (total)	63,978	64,014	86,109	109,207	
Scope 1	Subtotal	121	206	1,432	1,431
	City gas	89	68	523	526
	Diesel	32	138	100	162
	Gasoline	-	-	738	687
	Propane	-	-	71	56
Scope 2	Subtotal	63,857	63,808	85,677	107,782*
	Power	63,531	63,550	84,166	107,091
	District heating	326	258	511	692

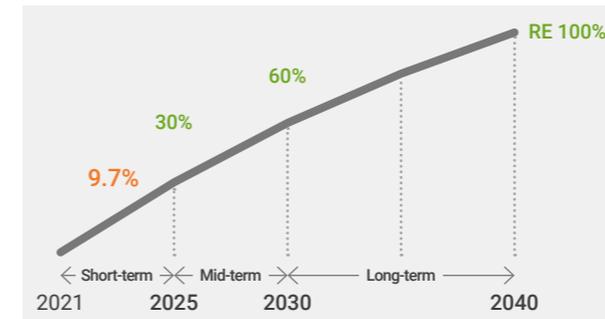
* Absolute increase in 2022 due to the increase in power consumption due to the expansion of the upper surface of the Data Center

※ The sum of greenhouse gas emissions above is based on the guidelines for reporting and certification of greenhouse gas emissions trading system. Therefore, there may be a difference from the total value for each detailed energy source.

Renewable Energy Transition Target (RE100) and Performance

Long-Term target	Transition 100% of electricity use to renewable energy by 2040
Near-Term target	Transition 30% of electricity use to renewable energy by 2025 Transition 60% of electricity use to renewable energy by 2030

Progress on RE100 Roadmap



Year	Target	Performance
2021	3%	3.2%
2022	9%	9.7%
2023	16%	-
2025	30%	-
2030	60%	-
2040	100%	-

[unit: TJ]

Classification	2019	2020	2021	2022	
Sum	1,319	1,340	1,795	2,283	
Power	Demand (A)	1,348	1,375	1,880	2,282
	Reduced amount (B)	41	46	122	41
	Usage (A-B)	1,307	1,329	1,758	2,241
	RE %	0.2%	0.3%	3.3%	9.7%
Other than power	12	11	37	42	

Metrics & Targets | Climate-related Management Indicators and Goals of SK Inc.

Scope 3 Management

SK Inc. expands the scope of Scope 3 measurement annually, and since 2022, it calculates and discloses emissions for all categories applicable to the company. In particular, we strengthen Value Chain Engagement with investment companies and suppliers associated with the 'Investments' category, which accounts for over 90% of the total Scope 3 emissions. This includes our enhancing engagement with suppliers involved in purchasing, usage, and disposal processes.

Long-Term goal	Targeting 90% reduction in total Scope 3 emissions by 2050 compared to 2021 (Promoting to achieve 2050-a Net Zero at the SK group level, including major SK member companies by 2050)
Near-Term target*	(Upstream) Establishing SBT (Science-Based Greenhouse Gas Reduction Target) for more than 50% of Category 1,2 (purchasing/capital goods) related suppliers by 2025 (Downstream) Reducing 30% in Category 15 (investment) emissions compared to the base year by 2030

* Base year 2021 (according to the SBTi guide, SBTi targets for 2024 will be submitted/verified after reviewing base year and targets)

Scope 3 Category GHG Emissions (Unit: tCO₂e)

Classification		2019	2020	2021	2022
Sum	Scope 3 Total Emissions	5,464	5,637	13,391,021	11,529,818
Upstream	Purchased Products & Services	First report in 2021	First report in 2021	7,480	7,854
	Capital goods	First report in 2021	First report in 2021	2,588	1,840
	Fuel & Energy not included in Scope 1,2	First report in 2021	First report in 2021	84	8,402
	Transportation & Distribution	11	12	12	7
	Waste generated during operation	11	12	30	1
	Business travel	696	914	896	2,129
	Employee commuting	8	8	3,324	1,900
	Leased property	4,738	4,691	Included in Scope 2 from 2021	-
Downstream	Product use	First report in 2021	First report in 2021	56,442	61,926
	Product disposal	First report in 2021	First report in 2021	265	291
	Investment ¹⁾	First report in 2021	First report in 2021	13,319,899	11,445,468

1) Calculated by expanding the scope of collection and public disclosure of major subsidiaries among investment companies to 14 subsidiaries

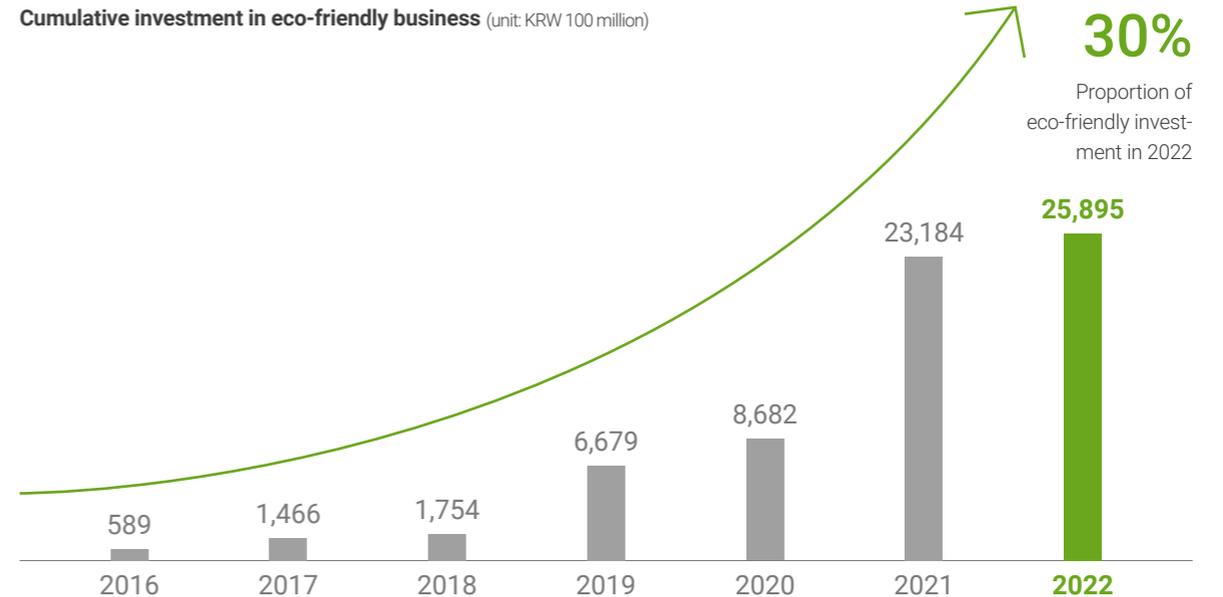
Scope 3 and Value Chain Engagement Management Details

	KPI	Implementation Details
2021	<ul style="list-style-type: none"> Additional expansion of Scope3 emission calculation categories to 3 or more Engagement for suppliers (Direct receipt of greenhouse gas management information data from suppliers, etc.) 	<ul style="list-style-type: none"> Calculating all categories applicable to our company (6 → 11 in 2021) GHG data from manufacturers accounting for more than 70% of our HW purchases, and establishing KPIs for environmental management of suppliers Including environmental management level in evaluation of integrated purchasing companies, etc.
2022	<ul style="list-style-type: none"> Advancing Scope 3 calculation (expansion of calculation scope for investment items) Reinforcing engagement with suppliers, management of SBT establishment rate 	<ul style="list-style-type: none"> Adding major direct subsidiaries, SK Powertech and SK Pinx Sending out letters of recommendation for SBT establishment to major suppliers/ Including SBT establishment recommendations in the Supplier Code of Conduct

Managing the Proportion of Eco-friendly Investment

With a strong sense of mission to lead the low-carbon era, SK Group has established a goal to reduce approximately 200 million tons of CO₂ by 2030, which accounts for 1% of the global carbon reduction target. To achieve this, SK Inc. actively invests in environmentally friendly businesses for climate change adaptation and green transition, carbon emission reduction, and decarbonization solutions to contribute to global Net Zero and SK's carbon neutrality. As of 2022, SK Inc. allocates 30% of its direct investment in growth areas to environmentally friendly businesses, expanding its green portfolio. Going forward, SK will continue to proactively invest in environmentally friendly businesses and technologies, and enhance collaboration among SK Group's green businesses to drive the growth of the green economy.

Cumulative investment in eco-friendly business (unit: KRW 100 million)



Share of eco-friendly business investment

2019	2020	2021	2022
16%	21%	29%	30%

* The share of investments in companies engaged in business related to the Korean green taxonomy among new investments since the declaration of an integrated holding company (2015).

2023 SK Inc. TCFD Report

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