

**BE THE CHANGE,
GO NET ZERO**





ABOUT THIS REPORT

2023 TCFD Report

The impact of climate change, after all, is not a matter of a single country, but rather a global crisis. The Intergovernmental Panel on Climate Change (IPCC), UN body for assessing the science related to climate change, is stressing the urgency of global climate action and sustainable development. In 2022, countries that attended the United Nations Conference of the Parties (COP27) reached an agreement to raise climate investment funds. The purpose of these funds is to compensate for the loss and damage incurred by developing countries due to climate change. The world is calling for more businesses to be transparent with their disclosure of climate-related information to combat climate change at a large scale.

Based on the mission to "Promote human health and protect the environment" SK chemicals has published the second Task Force on Climate-Related Financial Disclosures (TCFD) Report following last year's report to support a rapid response to the climate change trends. The report illustrates our greenhouse gas (GHG) reduction targets and strategies based on the Science-based Targets initiative (SBTi), reflecting SK chemicals' enthusiasm and commitment to climate action.

Through the TCFD report, we hereby inform our shareholders of the climate risks that SK chemicals is facing, our activities and performance to mitigate the risks, and diverse business opportunities attributed to climate change. The report is significant as it analyzes climate risks in different scenarios to identify the quantitative impact on our business and financial soundness, and reveals our response agendas and strategies.

SK chemicals prepared this report in accordance with the TCFD recommendations and utilized data from reputable organizations including the International Energy Agency (IEA) and Network for Greening the Financial System (NGFS) to evaluate the disclosed financial impact. In addition, we assessed the physical risks using The Climate Service (TCS) analysis tool by S&P Global to estimate and explain the physical risks associated with climate change. However, the outlook and plans included in this TCFD Report is subject to change depending on climate factors and shifts in market conditions and uncertainties, thus we are not bound to provide any liability or guarantee for the information and prospects herein.

Reporting Boundaries

The overall reporting scope of this report includes our business locations in Pangyo, Ulsan, Cheongju, and our overseas locations in China (Suzhou, Yantai) and subsidiaries, according to the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits of Korea. As for Scope 1 and 2, we included emissions from Pangyo, Ulsan, Cheongju, Dongtan, Life Science provincial offices, and Suzhou and Yantai in China. For our metrics and emissions reduction target for Scope 3 Category 15 (Investment), we included data from seven subsidiaries and affiliates. This is consistent with the standards we've submitted to SBTi to set our science-based targets. For anything in this report that is outside the overall reporting scope we have provided herein, we have explained it in detail with a notation.

- ➔ **Scope 1, Scope 2**
 - Korea: Pangyo (Headquarters, R&D center), Ulsan, Cheongju, Dongtan, Life Science provincial offices
 - Overseas: Suzhou and Yantai, China
- ➔ **Scope 3 Category 15 Investment**
 - Subsidiaries: SK bioscience, SK multi utility, SK chemicals Daejung
 - Affiliates: ENTIS, JSI, HDC POLYALL

Eco friendly materials, green materials, and bio materials in this report refer primarily to CR copolyester (with 50% or more recycled materials) and CR polyester (with 30% or more recycled materials) products, and PO3G (with 100% bio materials) made of biomass. They come under the subcategories of recycling and upcycling under the circular economy category in K-Taxonomy, a Korean guideline for green taxonomy. They have also obtained the Global Recycled Standard (GRS), and the International Sustainability & Carbon Certification (ISCC). Plus, widely accepted as a standard and a certification scheme for the use of recycled materials.

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This report has been published as an interactive PDF, allowing readers to move quickly and easily to pages in the report, and including shortcuts to the related web pages.

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APPENDIX 1. PHYSICAL RISK ANALYSIS: Methodologies and Findings

1.1 CEO MESSAGE



Dear respected stakeholders,

Last year, despite macroeconomic uncertainties and geopolitical risks, SK chemicals achieved robust business performance through improved profitability in the Copolyester business and stable profits in the Pharma Business.

On the ESG front, we entered the transitional phase where we accepted the ESG framework as a factor that is pivotal to the company's survival. Therefore, we have first set up the ESG management system, and established clear strategic ESG targets and action plans.

This has led to objective results in ESG evaluations at home and overseas. We have continued to be included in the Dow Jones Sustainability Korea Index, our MSCI rating has improved (from BBB → A), and we earned the highest rating of A+ from Korea Institute of Corporate Governance and Sustainability (KCGS).

In 2023, we plan to pursue an Eco Transition strategy at an accelerated pace as a global recycle solutions provider and secure a leadership position in the recycling market. We will contribute to GHG emission reductions throughout the entire value chain by securing sustainability in our main business of copolyester, while concentrating our efforts on circular recycle materials and circular recycle polyester/copolyester with immense growth potential.

Moreover, we will make every effort to build a better world for the planet and the people.

SK chemicals has set up science-based GHG emission reduction targets, for which we aim to obtain SBTi approval, so the 2040 Net Zero Commitment does not turn out to be an empty promise. We also published the TCFD Report with specific responses to climate change, for transparent disclosure of the process.

We will also ensure to achieve the sustainability of all SK chemicals stakeholders by strengthening the ESG support program for the supply chain and carrying out due diligence on human rights.

Based on our mission to "Promote human health and protect the environment", SK chemicals aims to take a leap forward as BIO and comprehensive life science company that innovates the green materials industry that will lead the natural circulation ecosystems, and human life. We will actively communicate with our stakeholders, and together, we will build a sustainable future.

We would like to ask for your continued support and interest towards the journey of SK chemicals.

1.2 BUSINESS PROFILE

SK chemicals' Core Business Sector

In response to the growing market demand for greener products, SK chemicals established its mission statement, "Promote human health and protect the environment", and reorganized the green chemicals and pharma businesses to enhance our climate strategies. We are making every efforts to secure global leadership in Green Chemicals business providing eco friendly materials and Pharma business providing total healthcare solutions with a focus on innovative pharmaceuticals.

About SK chemicals

With headquarters (ECO Lab) located in Pangyo, Seongnam, Gyeonggi-do, SK chemicals operates two manufacturing sites in Korea including the Green Chemicals Plant in Ulsan and S House in Cheongju, and another manufacturing site in Yantai, China. We also have sales subsidiaries and offices in the U.S., Germany, Japan, and Malaysia, through which we have formed the global network and gained a competitive advantage. SK chemicals will continue to increase the size and scale of our business segments and thrive into a leading chemicals company in the world.

Business Segments

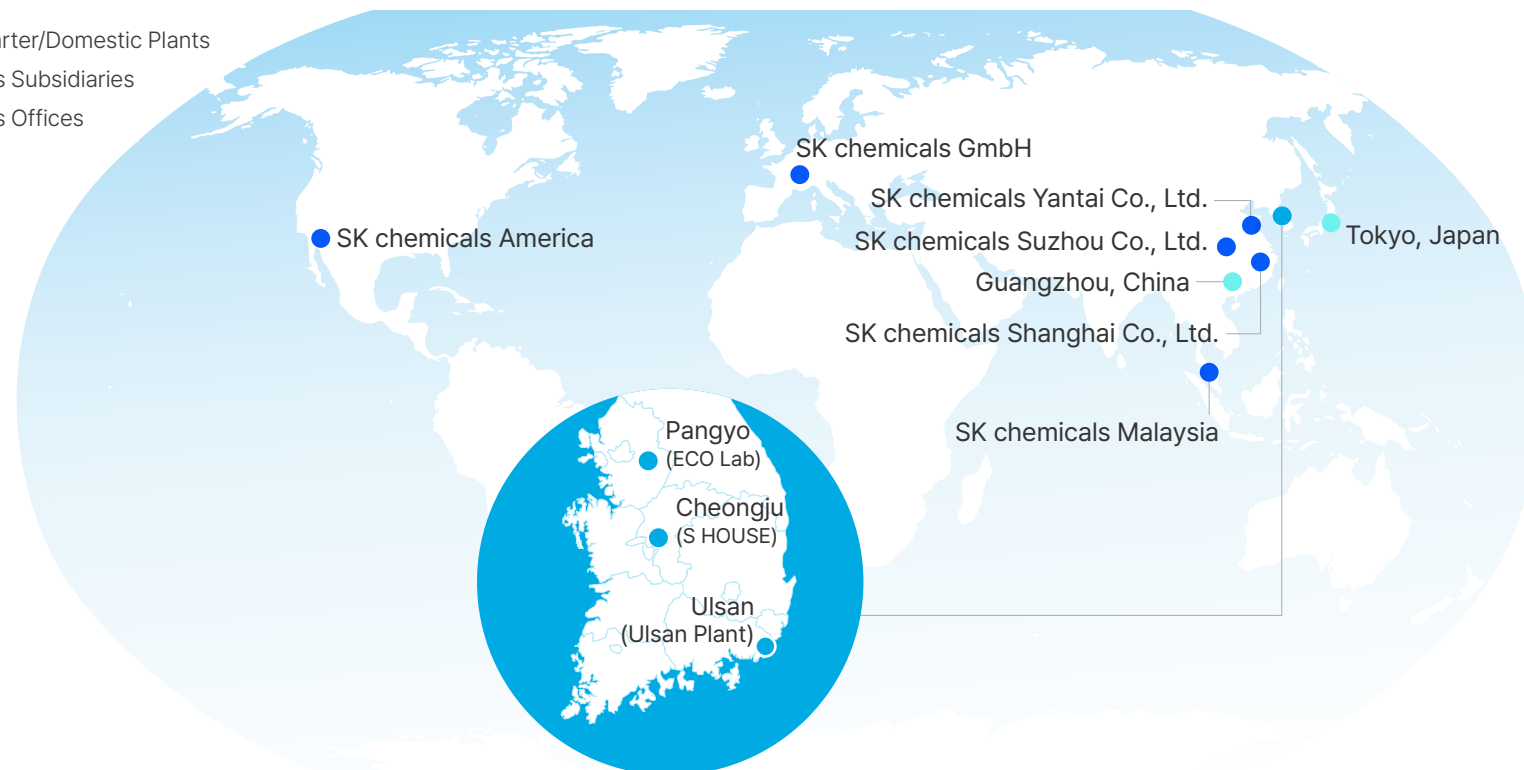
Green Chemicals Business

The green chemicals business has shifted into the green materials business that delivers materials based on circular recycle materials and biomass that protect the environment and are easy to use. In 2021, we became the first in Korea to commercialize ECOTRIA, r-copolyester made using circular recycle technologies, with which we seek to resolve the social issues concerning PET waste, and to build and expand a circular economy for us to circulate plastics indefinitely. Poly (trimethylene ether) glycol (PO3G) is a 100% bio-based material that is expected to replace raw materials derived from petroleum and significantly reduce GHG emissions, making a major contribution to the environment and climate. In March 2022, we conducted production trials of PO3G, and now we are ready to pioneer the eco friendly materials market with a mass production facility capable of producing 5,000 tons per year.

Pharma Business

In the pharma business, we produce high-quality natural and synthetic drugs sold at home and abroad. The business is thriving by consistently delivering R&D results and forming strategic partnerships with major pharmaceuticals companies worldwide. We are making remarkable achievements not only in Korea, but also in overseas pharmaceuticals markets of advanced countries by making hefty R&D investments for various studies related to natural and synthetic drugs and biosciences.

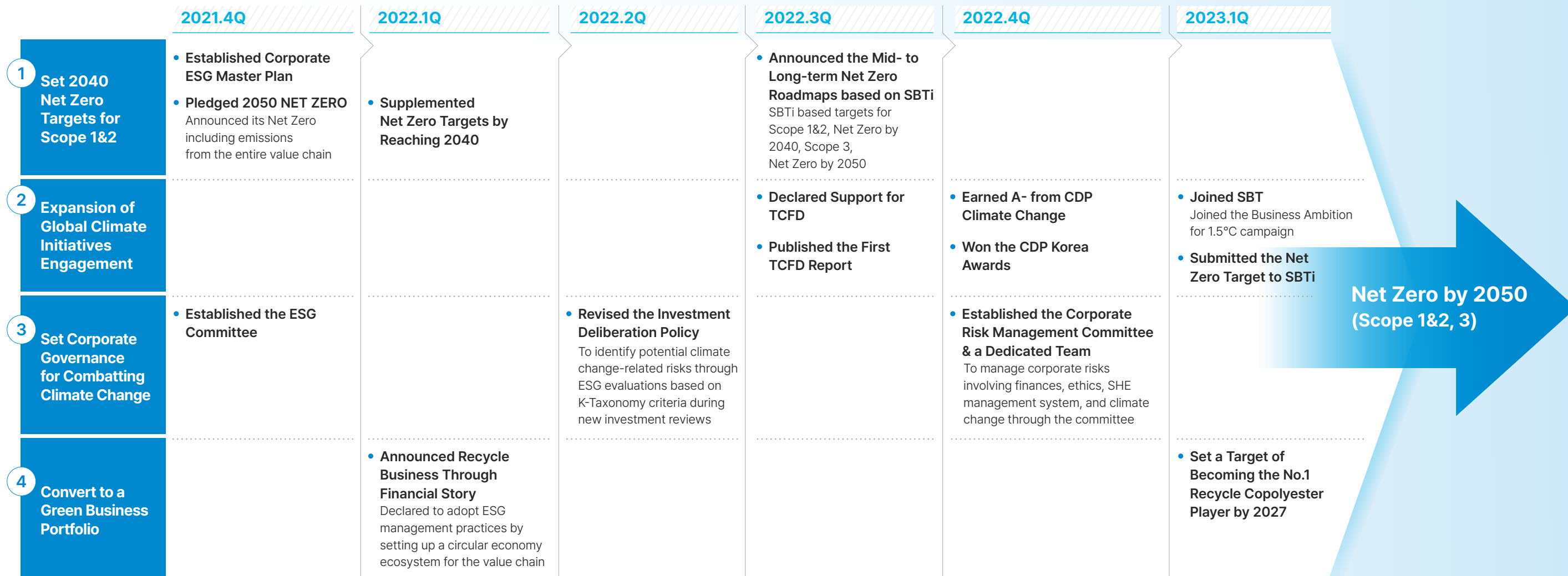
- Headquarter/Domestic Plants
- Overseas Subsidiaries
- Overseas Offices



Circular recycle in this report refers to chemical recycle. SK chemicals opens up a sustainable future by enhancing the renewability of chemically recycled materials.

1.3 OUR JOURNEY FOR CLIMATE ACTION

To overcome climate crisis, SK chemicals has set up the Net Zero Roadmap and detailed action plans considering the overall value chain, and is systematically managing risks at the Board of Directors. Moreover, we are eagerly taking part in global initiatives and transitioning our business to the green materials business to execute our commitment to sustainability.



1.4 RISK MANAGEMENT PROCESS AGAINST CLIMATE CHANGE

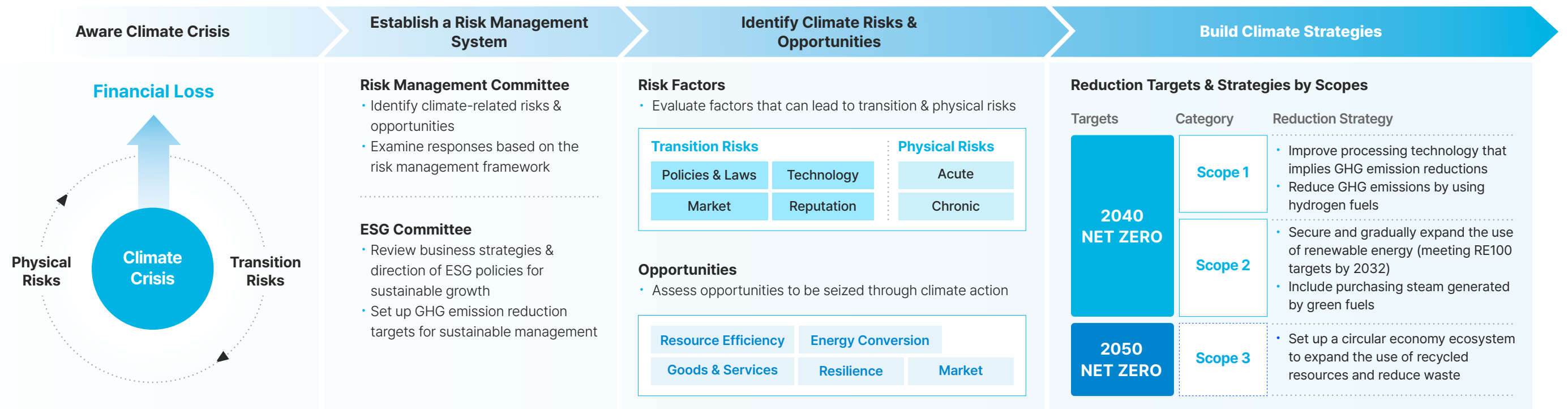
Risk Management System & Climate Strategies

Climate-related issues such as extreme weather events, water shortage, and biodiversity loss are no longer problems that affect individual people's life or local communities, and have become a global threat. Recognizing the impact of climate change on business, SK chemicals has set up Scope 1 and 2 Net Zero targets for 2040 and Scope 3 Net Zero targets for 2050 to tackle climate risks early on. To achieve Net

Zero targets, we have developed detailed reduction strategies for Scope 1 and 2 emissions. As for Scope 3 emissions, we plan to introduce the 'Eco Transition' strategy to minimize the environmental impact throughout our value chain and reduce emissions. With the growing need to systematically manage risks for sustainable development and growth, we have developed corporate governance geared to climate

change under which we set up our strategies and monitor their implementation by periodically identifying and analyzing business-related risks.

Developing Climate Change Response Strategies





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2.1 Corporate Climate Governance

SK chemicals monitors and supervises climate risks and opportunities that will arise at the board level. This has enabled us to establish a system of managing all risks dispersed throughout the company. Moreover, we transparently disclose the role of management tasked with evaluating and managing climate risks and opportunities.

GOVERNANCE

2.1 CORPORATE CLIMATE GOVERNANCE

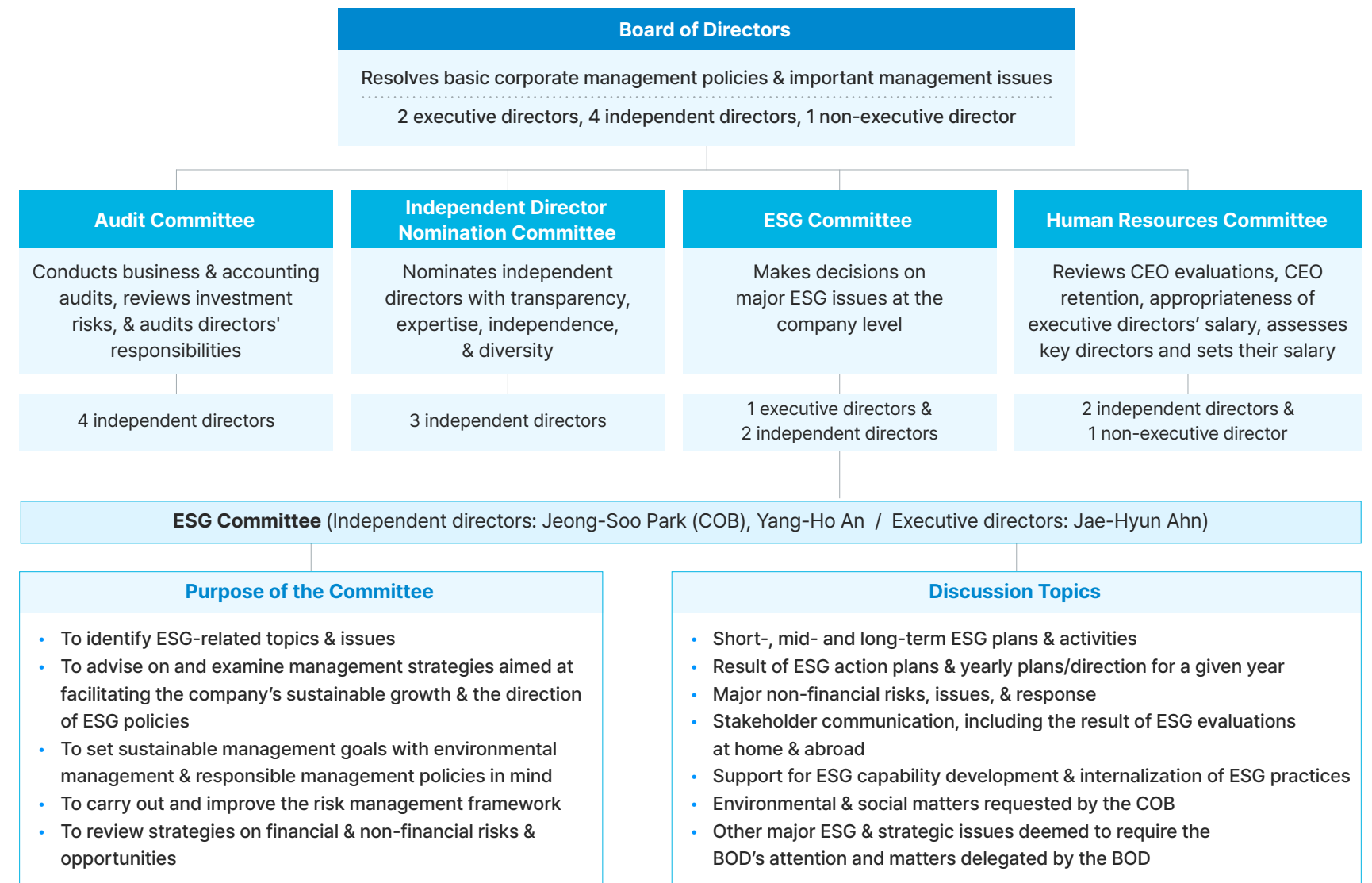
BOD Oversight and Operation of Committees

SK chemicals separates the Chairman of the Board (COB) and the CEO positions to strengthen checks and balances between the management and the BOD. The BOD supervises the company-wide climate and management strategies, and makes decisions on the basic direction. As of March 2023, the BOD is comprised of two executive directors, four independent directors, and one non-executive director who are nominated based on the principle of transparency, expertise, independence, and diversity.

Committees are established and run under the BOD with a view to enhance the efficiency and expertise of committees. The ESG Committee is tasked with setting corporate ESG targets and monitoring detailed performances and plans. Through the risk management framework, they identify risks and opportunities in the company's business areas and reviews strategies for responding to financial and non-financial risks and opportunities.

The Human Resources Committee monitors whether sustainable management and ESG strategies are reflected in the BOD reward policy, and how much progress has been made towards achieving the target. It must abide by the Human Resources Committee Policy in the deliberation and decision to make process regarding evaluations and salaries. They monitor and approve the progress of ESG targets, while keeping track of whether the company meets the set targets.

Board of Directors & Committee Composition



2.1 CORPORATE CLIMATE GOVERNANCE

Organization	<p>ESG Committee</p>	<p>Management Council</p>	<p>Dedicated Teams</p>
Roles and Achievements	<ul style="list-style-type: none"> The ESG Committee responsible for critical ESG issues at the enterprise level including climate actions, has resolved seven issues between March 2022 and March 2023. They created a climate change issue pool that reflects the international standards and industrial characteristics, conducted materiality assessment to identify and prioritize key issues. Issues identified were reflected in the corporate management strategy, meeting various needs of stakeholders as the key business strategy. The committee reviewed the corporate climate action and strategy, including detailed action plans for reducing GHG emissions in half by 2030 and for achieving Net Zero targets at all locations by 2040. They also discussed and approved a variety of issues that can affect the environment, such as setting up a biodiversity policy, investment expansion on CHDM No. 5, and a starting a joint venture with Shuye. 	<ul style="list-style-type: none"> The management, including the CEO, recognize the gravity of the impact of the stakeholders' demand for climate action on business. Thus, we are leading new investment and business opportunities for expanding the scope of eco friendly business. To that end, we are making a concerted effort with the Strategy, R&D and Production Teams. In addition, we have set the GHG emissions and environment efficiency index as KPIs in connection with the rewards and recognition program to pursue and advance ESG management. 	<p>ESG Progress Team</p> <ul style="list-style-type: none"> The team sets up corporate targets and strategies to reach Net Zero in tackling climate change. It leads the progress of specific action plans or provides support to relevant divisions and checks the implementation of action plans. By the same token, they are in charge of measuring GHG emissions by site, response to applicable laws, and response to global initiatives, including the CDP, TCFD, and SBTi. They also serve as a risk management team that oversees financial and non-financial corporate risks, including climate risks, that can arise in the process of carrying out strategic investment and management action plans. To do so, they discuss and inspect critical issues with business divisions and report to upper management. <p>Production Teams & Safety Environment Team</p> <ul style="list-style-type: none"> They introduce energy reducing and low carbon fuels/technologies in each process to implement action plans to reduce GHG emissions. They also conduct detailed action plans aimed at embracing environment friendly management practices, such as pollutant controls, compliance with environment laws, and obtaining the Zero Waste to Landfill (ZWTL) Certification.

ESG Committee's Track Record

Dates	Agenda
March 3, 2022	<ul style="list-style-type: none"> Reports the result of the materiality assessment on the 2021 Sustainability Report
April 14, 2022	<ul style="list-style-type: none"> Appointment of the Chairperson of the ESG committee Investment expansion for CHDM No. 5 Revision of the ESG Committee regulations Report on the revised policy to the Investment Deliberation Committee
June 22, 2022	<ul style="list-style-type: none"> Publication of the 2021 Sustainability Report Human rights management plan Setting up the biodiversity policy Report on the taxation policy
September 28, 2022	<ul style="list-style-type: none"> Setting up an SBTi-based roadmap to reach Net Zero. Publication of the 2021 TCFD Report
December 21, 2022	<ul style="list-style-type: none"> Establishment of Human Rights Management Committee Organization of Risk Management Committee Report on the business performance 2022 & management plans for 2023 Report on the 2022 ESG performance & 2023 plans
February 20, 2023	<ul style="list-style-type: none"> Launching a joint venture with Shuye
March 27, 2023	<ul style="list-style-type: none"> Report on the analysis of ESG evaluation results in 2022 & improvement plans for 2023 Report on the result of the materiality assessment



3

- 3.1 Climate Risk Management Framework
- 3.2 Sustainable Investment Strategy

SK chemicals identifies different types of risks that can affect our business landscape and implements detailed action plans by division and operates an integrated corporate risk management council. The Risk Management Committee conducts routine monitoring of the progress of action plans and reports the findings to the BOD.

RISK MANAGEMENT

3.1 CLIMATE RISK MANAGEMENT FRAMEWORK

Corporate Risk Management System

SK chemicals identifies climate risks and opportunities that influences the business and assesses the extent of their impact. To this end, we consolidated the risk control functions that were spread throughout the company in 2022, and began managing financial and non-financial risks at the board level by minimizing volatility in corporate value caused by business uncertainties. We selected key areas by type of risks such as financing, ethics/compliance, SHE (safety, health, environment) management system, climate change, and human rights through the Risk Management Committee. The committee constantly monitors the progress and plans to implement risk management beyond compliance. We appointed the chief risk officer (CRO) who reports progress of risk tasks each quarter to the BOD. To prevent a conflict of interest that can occur due to the business priorities, we structurally separated the risk control team from business teams to ensure independence and make it possible to manage risks for the maximum benefit of the company.

Organization Chart of the Risk Management Committee



Corporate Risk Management Process



3.2 SUSTAINABLE INVESTMENT STRATEGY

Establishing the Climate Risk Assessment Policy

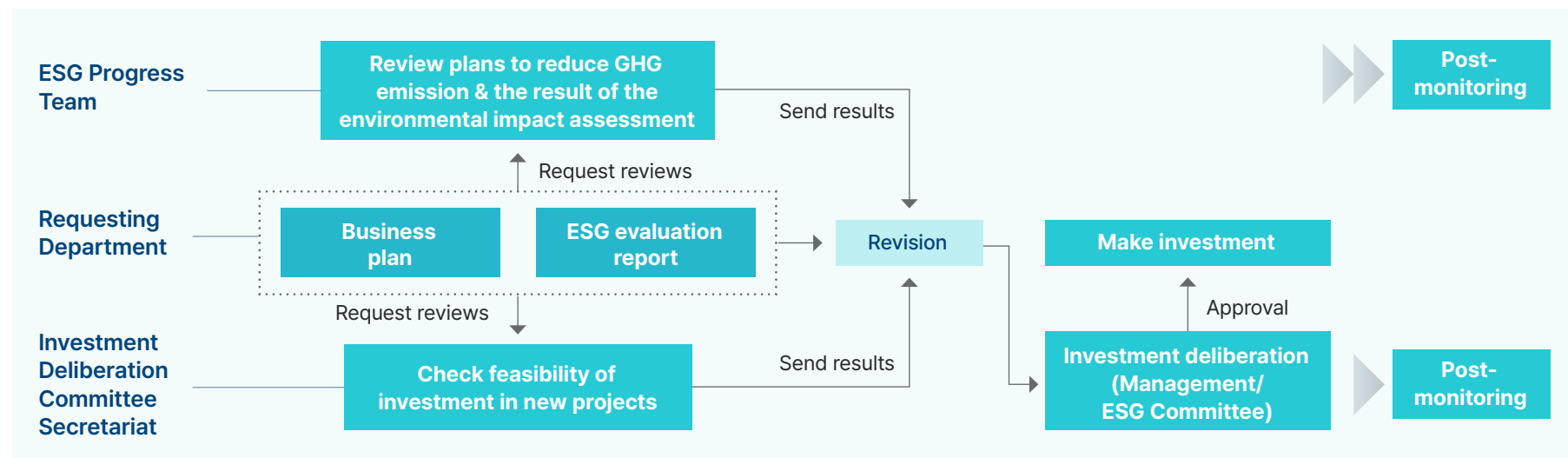
SK chemicals classifies businesses highly likely to face environmental and social issues in relation to climate change. Therefore, we adopted a policy of inspecting ESG evaluation reports when deliberating on investment proposals to minimize adverse impacts of SK chemicals' investment on the environment and society in 2022. The Investment Deliberation Committee inspects the ESG evaluation reports based on "K-Taxonomy, Financial Society investment exclusion" to identify potential climate risks. After making an investment, we conduct post-monitoring focusing on the progress of environmental and social risk mitigation measures based on the ESG evaluation reports to pursue sustainable management.

ESG Evaluations in New Investment Proposals

SK chemicals Investment Deliberation Committee deliberated on the issues of investment expansion for CHDM No. 5 in April 2022 and launch/investment of a joint venture with Shuye in February 2023. Among these, the ESG Progress Team comprehensively examined the investment and management strategy, the possible impact that can arise while carrying out the plan, and the environmental and social impact and reported the ESG evaluation results to management. Consequently, all items passed the standard (K-Taxonomy, Financial Society investment exclusion). Going forward, we plan to monitor whether the action plans have been implemented.

Items	Summary	Result
Expanding investment in CHDM No. 5	<ul style="list-style-type: none"> • Corresponds to introducing a GHG emission reduction system • Can make plans to reduce GHG emissions through off-gas monitoring • Aim to create social value, such as job creation & tax payments 	<p>Approved</p>
Launching a joint venture with Shuye	<ul style="list-style-type: none"> • Corresponds to recycling and upcycling of waste in a circular economy • Setting up of specific plans aimed at reducing GHG • Securing of response agendas/strategies for water preservation & pollution prevention 	<p>Approved</p>

Investment Decision Process



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Climate crisis such as tropical cyclones, wildfire, and extreme temperatures, has become a reality we are currently facing in 2023. SK chemicals has divided such climate risks into short-, mid- and long-term risks and opportunities, and completed the evaluation of their impact on our business strategy and financial plans. We also grouped the risks into transition risks and physical risks, and analyzed their financial impact based on various climate scenarios. Then, we secured resilience in our response agendas/strategies to establish a specific response system.

- 4.1 Climate Related Risks and Opportunities
- 4.2 Climate Change Materiality Assessment
- 4.3 Approach to Climate Change
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STRATEGY

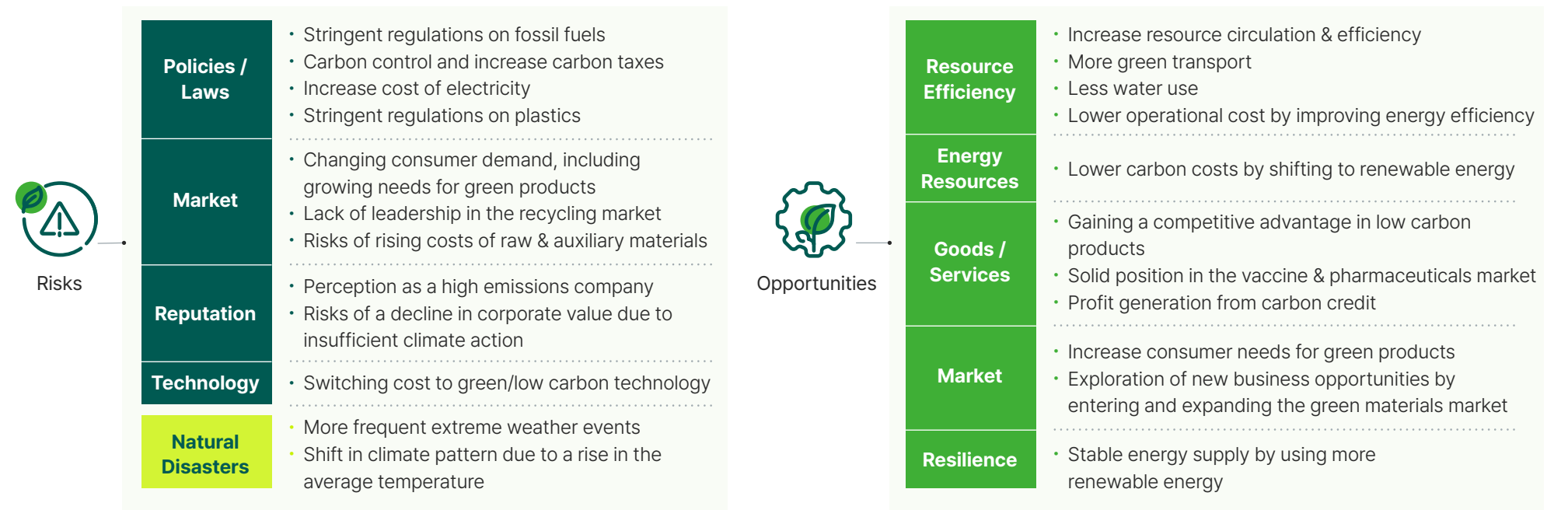
4.1 CLIMATE RELATED RISK AND OPPORTUNITIES

Climate-Related Risks and Opportunities

For SK chemicals, climate change poses a new set of crisis and opportunities in tandem. The risks involved in climate change presents a financial threat across our business but, it also opens up strategic opportunities to enter new markets and embark on new business. Considering the entire value chain, we broke down the risks posed by climate change and opportunities that to be seized through our response to climate change into five categories, which we identified and analyzed. Consequently, we identified the risks arising from reinforced carbon policies that can be introduced due to climate change, shifts in market demand, and natural disasters as major risks. Conversely, improved energy efficiency, reduction in carbon emissions by introducing renewable energy, and factors due to expansion of the green market are expected to provide new opportunities. Based on our findings, we developed a short-, mid- and long-term business timelines, implemented strategies that enable us to effectively respond to risks and opportunities and improve resilience ultimately.

Analysis of Risks & Opportunities

■ Transition Risks ■ Physical Risks ■ Opportunities



Timeline in Business Stages

SHORT-TERM

- Improve the reaction process in production
- Use of hydrogen fuels
- Start supplying renewable energy
- Convert to green mobile combustion sources

2022 to 2025

MID-TERM

- Expand use of hydrogen fuels in production
- Steam suppliers convert to green fuels
- Meet RE100 targets

2025 to 2035

LONG-TERM

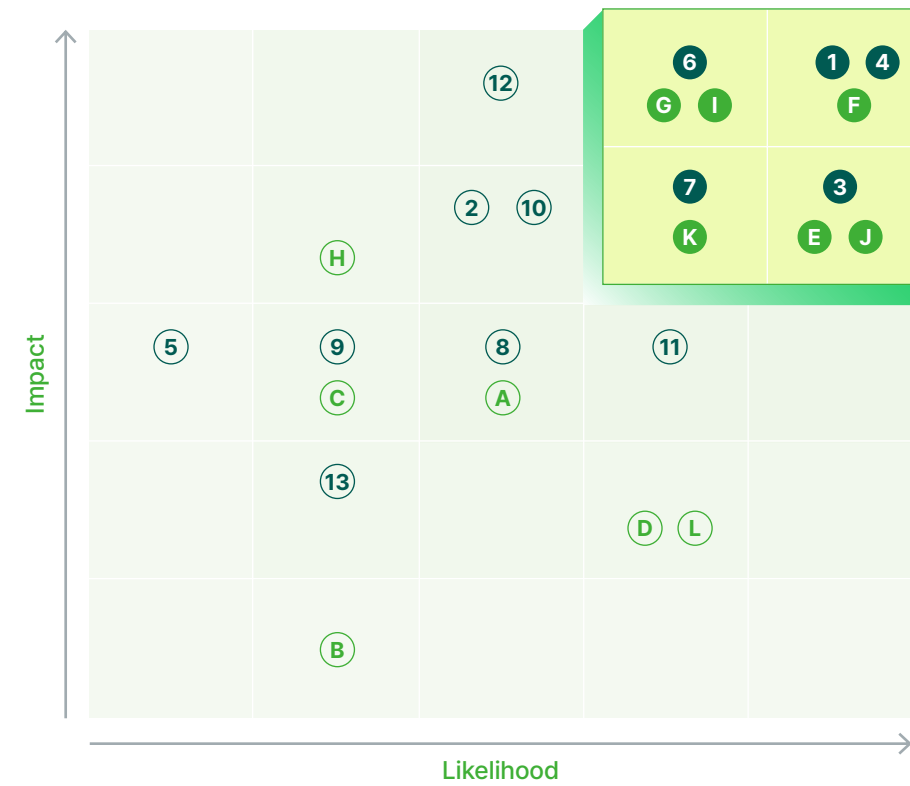
- Complete the circular economy ecosystem by expanding the Global Recycle Cluster
- Achieve Net Zero (Scope 1&2, Scope 3)

2035 to 2050

4.2 CLIMATE CHANGE MATERIALITY ASSESSMENT

SK chemicals developed a climate risks and opportunities pool based on peer industry group analysis and literature review, and identified key items that can affect the company’s business targets, financial performance, and operations. We assessed the occurrence probability of these items, on account of the business strategies, market trends and competitiveness. Then we put together the response measures status strategies that correspond to our Eco Transition business model, growth strategy, and stakeholder needs. Concerning factors with major financial impact and high probability, we plan to carry out a detailed quantitative evaluation and disclose the result. We will continue to manage each factor with performance/results indicators, and effectively handle climate risks and opportunities.

Materiality Assessment on Risks & Opportunities



Category	No.	Risks & Opportunities	
Risks	1	• Increase utility costs due to stringent regulations on fossil fuels	
	3	• Higher electricity costs due to the possibility of revised Korea Energy Master Plan	
	4	• Lower product competitiveness due to stringent regulations on plastics worldwide likely to increase customer cost	
	6	• Shift in market needs prompted by customer demand for greener products	
	7	• Lose leadership in the recycling market by failing to secure supplies of recycling resources	
	Opportunities	E	• Reduce operational costs & carbon emissions based on an efficient and optimal production process
		F	• Conversion of all energy used in our production sites into clean, renewable energy, and cut down on carbon costs
G		• Establishment of sustainable management system and securing product competitiveness due to development and sale of low carbon products	
I		• Generate revenues from carbon credit by securing greenhouse gas reduction certification of recycle polyester	
J		• Boost sales driven by higher consumer demand for green products	
K		• Exploration of new business opportunities by entering and gradually expanding the green materials market	

Materiality Assessment Process



Create a Pool of Climate Risks & Opportunities

- Literature review, peer industry group analysis/benchmark
- Analyze transition/physical risks & opportunities



In-Depth Analysis

- Analysis and evaluation of risk priorities & probability
- Evaluate realization probability & value of opportunities



Set Strategies

- Develop strategies by risk
- Develop strategies by opportunity

4.2.1 CLIMATE-RELATED RISKS

We identified the potential financial impact of transition and physical climate risks according to the TCFD guidance on risk classification system, and formulated our response agendas/strategies.

Types of Risks	Category	No.	Risks & Potential Financial Impacts	Response Agendas	Occurrence Stage		
					Short	Mid	Long
Transition Risks	Policies & Laws	1	• Increase utility costs due to stringent regulations on fossil fuels	• Set science-based Net Zero targets for Scope 1&2 by 2040, and carry out based on specific action plans	●	●	●
		2	• Rise in carbon costs due to tougher global carbon restrictions and imposing carbon tax levy	• Analyze financial impact of rising carbon prices and set Net Zero targets	-	●	●
		3	• Higher electricity costs due to the possibility of revised Korea Energy Master Plan	• To minimize the impact of volatile power costs and secure renewable energy sources, generation for solar power on site & contracts for PPAs or REC	-	●	●
		4	• Lower product competitiveness due to stringent regulations on plastics worldwide likely to increase customer cost	• Secure sustainability through circular/recyclable raw materials and circular recycling business	●	●	●
		5	• Risks of fines & penalties due to non-compliance with environmental laws	• Conduct a systematic inspection & periodic risk assessment together with audits to ensure compliance with Clean Air Conservation Act, Clean Water Conservation Act through integrated control of SHE risks at the enterprise level • Identify the current emissions status by setting up a GHG emissions management system and ensure compliance with Act on the Allocation & Trading of Greenhouse Gas Emission Permits	●	●	●
	Market	6	• Shift in market needs prompted by customer demand for greener products	• Set up a green materials business model, and convert to using recycle raw materials in copolyester 100% by 2030.	●	●	●
		7	• Lose leadership in the recycling market by failing to secure supplies of recycling resources	• Sign an asset transfer agreement with Shuye, a company specialized in green materials, to secure r-Monomer	●	●	●
		8	• Rising raw & auxiliary materials costs due to carbon restrictions in the supply chain & carbon tax levy	• Continuous monitoring of carbon risks on suppliers of key raw materials	-	●	●
	Reputation	9	• Perception of the petrochemical industry as a major contributor to GHG emissions	• Transparently disclose GHG emissions from the entire value chain & strategies/action plans to reach next zero targets	●	●	●
		10	• Decline in corporate value due to a low external evaluation rating on our insufficient climate action & environmental oriented management	• Establish a climate governance system and comprehensively control corporate risks • Enthusiastically engage in global initiatives, such as declaration on adopting ESG business practices aimed at holding the increase of global average temperature to 1.5°C, CDP, SBTi, & TCFD to commit to and fulfill pledges • Enhance disclosure of climate-related data to shareholders including investors	●	●	●
Physical Risks	Technology	11	• Rising investment & conversion costs for green & low carbon technologies	• Achieve carbon reduction by expanding the family of low carbon products based on biotechnology & recycling technology	●	●	●
	Acute	12	• Rising recovery costs due to frequent occurrence of extreme weather events like floods & tropical cyclones in our locations	• Form a Safety & Health Committee at each location under the corporate SHE Operation Committee for carrying out detailed action plans to prevent risks early. • Distribute safety rules for employees & suppliers to follow and provide training.	●	●	●
	Chronic	13	• Rising operational costs due to long-term change in climate patterns, such as increased global average temperature	• Evaluate potential long-term threats based on geographical characteristics of operational locations, and plan to conduct continuous monitoring	-	●	●

Major risks Risk impact: ● Low ● Mid ● High

4.2.2 CLIMATE-RELATED OPPORTUNITIES

We analyzed opportunities to be seized through climate response and the financial value. We build and implement growth strategies so we can create value by taking the opportunities.

Category	No.	Risks & Potential Financial Impact	Response Status
Resource Efficiency	A	• Setting a circular economy aimed at stimulating resource circulation and boosting efficiency	• Expanded the business structure to secure the infrastructure for the recycle cluster
	B	• Reducing costs of fossil fuels & carbon credit by using green transport	• Set up and implemented the plan for a complete conversion to electric cars by 2030
	C	• Lower operational costs & carbon emissions by adopting building design with higher energy efficiency	• The eco friendly design of Pangyo headquarters (ECO Lab) allows to lower energy use by 40%, which earned the Platinum Certification from the Leadership in Energy & Environmental Design (LEED) program in the U.S.
	D	• Using less water resources in production locations	• We monitored water use at all production sites every month, and reinforced the water risk control system by setting the target of reaching 90% water recycling rate
	E	• Reduce operational costs & carbon emissions based on an efficient and optimal production process	• We reflected the optimization of raw materials and energy in KPIs of executives in charge of action and implemented them • We lowered the GHG emissions by 37,200 tCO ₂ eq annually by improving the reactive process in DMT production
Energy Resources	F	• Conversion of all energy used in our production sites into clean, renewable energy, and cut down on carbon costs	• Analyzed the mid- to long-term costs per energy source, and set up the risk minimization strategy • Set and implemented RE100 targets for 2032 by increasing the ratio of renewable energy by adopting solar power in 2023
Goods/ Services	G	• Establishment of sustainable management system and securing product competitiveness due to development and sale of low carbon products	• Plan to convert to using 100% recycle raw materials in copolyester by 2030 to shift to eco friendly businesses • Measured the carbon footprint of our products, and earned the low carbon certification in a life cycle assessment (LCA), allowing us to reduce Scope 1&2, 3 emissions and cut down on carbon costs (Conducted an LCA on products that account for 90% of our 2022 sales, and acquired the UL EPD Certification on the copolyester family of products)
	H	• Solid position in the vaccine & pharmaceuticals market by curbing the spread of climate-related diseases	• Set up a development plan for vaccines, biopharmaceuticals for preliminary prevention and treatment of viruses
	I	• Generate revenues from carbon credit by securing greenhouse gas reduction certification of recycle polyester	• Working to get certification for emission reductions achieved with CR-PET & CR-PETG, which are Circular Recycle ¹⁾ materials
Market	J	• Boost sales driven by higher consumer demand for green products	• Set the target of reaching 80% green materials content in our products, including PO3G & recycle copolyester, by 2030
	K	• Exploration of new business opportunities by entering and gradually expanding the green materials market	• Set up a target of becoming a Global Recycle Leading Company based on our Eco Transition strategy
Resilience	L	• Stabilizing supply and demand and reducing cost volatility by signing long-term supply of renewable energy	• Signed an agreement with a brokerage firm to secure supply of renewable energy in 2024

1) Circular Recycle refers to chemical recycling

Major risks

4.3 APPROACH TO CLIMATE CHANGE

SK chemicals sets up and adopts strategies that correspond to climate risks and opportunities as we proactively tackle climate crisis. As a result of our analysis on the impact of key factors, we are expecting short- and long-term financial impacts from 2023 to 2050. To minimize negative impacts of climate crisis and take proactive steps to seize opportunities, we will reach Scope 1&2 Net Zero targets throughout our operations, while leading the drive to cut down on GHG emissions throughout the entire value chain by setting up a circular economy. Moreover, our efforts to convert to and expand the green materials business that meet the market and customer demands will become an essential strategy to promote and drive the sustainable development of SK chemicals.

Response Agendas of Major Climate Risks and Opportunities

	Major Risks & Opportunities	Response Agendas/ Status
<p>Risks</p>	Policies/ Laws <ul style="list-style-type: none"> Stringent regulations on fossil fuels A hike in electricity costs as a result of revising the energy scheme Stringent regulations on plastics 	<ul style="list-style-type: none"> Set science-based Scope 1&2 Net Zero targets and carried out detailed action plans Introduced solar energy & renewable energy to minimize the impact of volatile power costs Secured sustainability through circular/recyclable raw materials and circular recycling business
	Market <ul style="list-style-type: none"> Changing consumer demand, including growing needs for green products Stable supply of recycling resources 	<ul style="list-style-type: none"> Developed a business model for green materials Signed an asset transfer agreement with Shuye, a company specialized in green materials, to secure r-Monomer
<p>Opportunities</p>	Resource Efficiency <ul style="list-style-type: none"> Reducing operational costs & carbon emissions by improving energy efficiency 	<ul style="list-style-type: none"> Reflected the optimization of raw & auxiliary materials in KPIs of executives in charge of action plans for energy reduction, and implemented them
	Energy Resources <ul style="list-style-type: none"> Lower carbon costs by shifting to clean & renewable energy 	<ul style="list-style-type: none"> Set RE100 targets for 2032 by increasing the ratio of renewable energy used
	Goods/ Services <ul style="list-style-type: none"> Gaining a competitive advantage by low carbon product sales Profit generation from carbon credit 	<ul style="list-style-type: none"> Plan to convert to 100% recycled copolyester by 2030 Plan to obtain certification for emission reductions achieved with Circular Recycle products
	Market <ul style="list-style-type: none"> Increased consumer needs for green products Exploration of new business opportunities by expanding the green market 	<ul style="list-style-type: none"> Set the target of reaching 80% green materials content in our products sold in 2030 Set up a targets of becoming a Global Recycle Leading Company based on our Eco Transition strategy



"Be Green"

- 1 Reach Net Zero at All Locations**
 Cut down Scope 1&2 emissions by adopting clean energy, including green fuels & renewable energy in response to stringent regulations

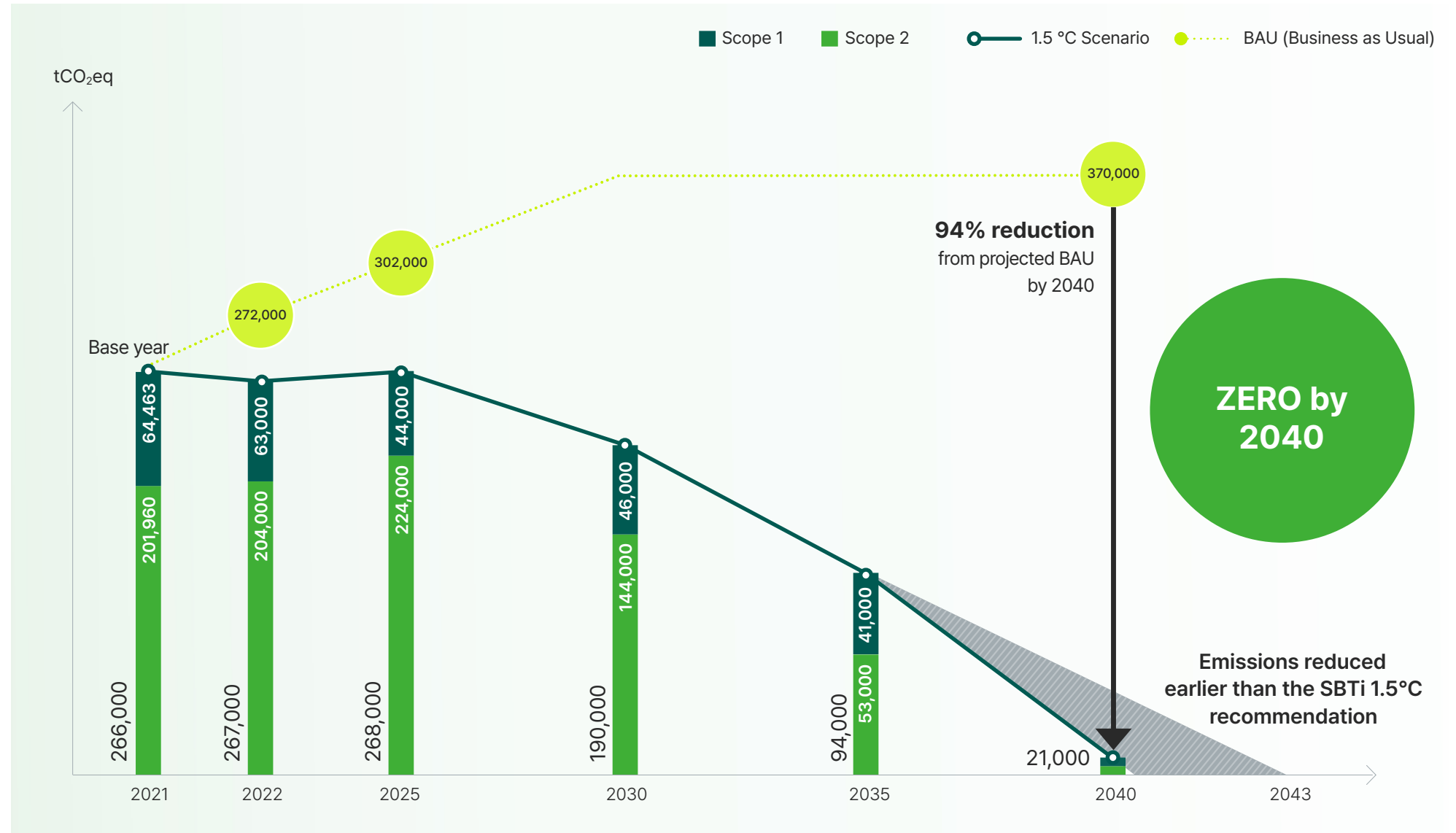
- 2 Build a Circular Economy**
 Reduce GHG emissions throughout the value chain (Scope 3)

- 3 Transition to a Green Business Portfolio**
 Secure technologies, products that satisfy the changing market and customer demands to propel sustainable growth and develop new revenue streams

4.4 SCOPE 1&2 NET ZERO STRATEGY

2040 Net Zero Roadmap

SK chemicals has devised a reduction roadmap to achieve Scope 1 and 2 Net Zero by 2040. This represents the targets three years earlier than SBTi's commitment to the best case climate scenario, 1.5°C. Building on this journey, we submitted our SBTi Commitment Letter in 2023. We look forward to getting our commitment approved by 2024 and affirming our pledge to achieve these targets. Moreover, SK chemicals will review implementations for continuous reduction of emissions and adjusting the annual target every year, considering the shifting business landscape.



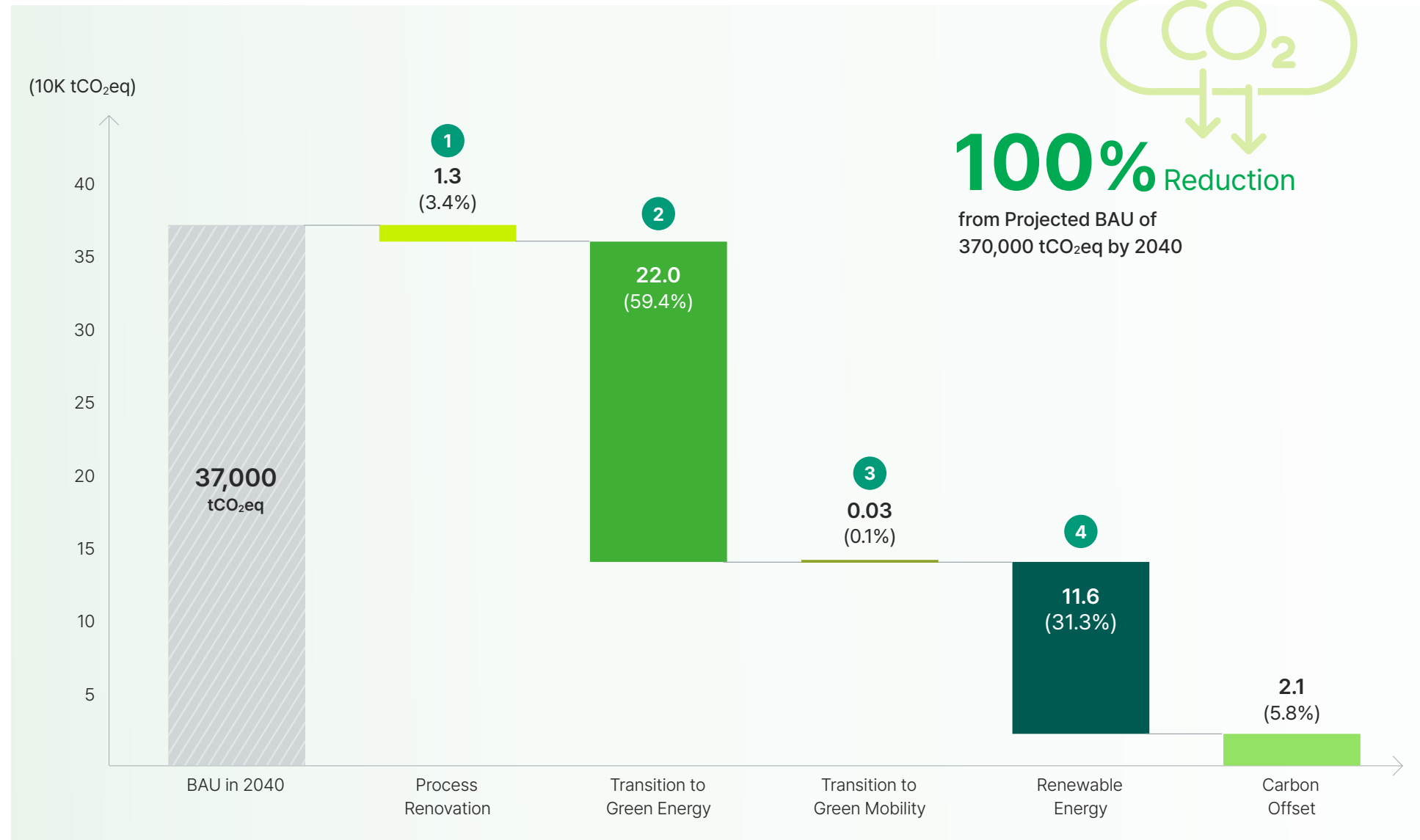
4.4.1 SCOPE 1&2 NET ZERO SOLUTION

Net Zero Plan by 2040

SK chemicals has set an annual reduction plan to convert the manufacturing process, convert to green fuels and green mobility, and introduce renewable energy as a pathway for reaching Scope 1 and 2 Net Zero by 2040. Concurrently, we drew up a carbon offset plan for the remaining emission allowance.

As for Scope 1 emissions, we will adopt a dual strategy of using eco friendly hydrogen and introducing green production processes to reduce emissions and realize sustainable manufacturing methods. As for Scope 2, we installed solar power systems at our locations to cut down on GHG emissions during electricity production, and increase the use of renewable energy through purchasing RECs and contracting PPAs. In addition, we will make every effort to reduce our carbon footprint by using steam generated from green fuels like hydrogen.

- 1 Impact of converting the DMT process into QTA**
- 2 Adoption of hydrogen fuel in all process at the Ulsan Plant**
 - Scope 1 emissions reduction via DMT, CHDM, & copolyester, etc.
 - Scope 2 emissions reduction via steam generated from LNG & hydrogen fuel
- 3 Headquarters, Ulsan Plant vehicles**
- 4 PPA, REC, & solar panels at Cheongju Plant**



4.4.2 SCOPE 1 NET ZERO ROADMAP

Scope 1 Emissions Reduction Strategies

To reduce Scope 1 emissions, we have adopted a strategy of renovating the production process at our Ulsan Plant and converting to green fuels. Primarily, we began using hydrogen fuels in 2022 by developing a manufacturing process that captures and uses hydrogen gas emitted from production and re-uses them as energy. We plan to increase the ratio of hydrogen fuel uses in all processes at Ulsan Plant to 44% by 2028, 56% by 2034, and 86% by 2040. Concerning mobile combustion emissions, we will increase the share of hydrogen fuels and electric vehicles used at the ECO Lab and wastewater treatment facilities in phases to transfer 100% green transport by 2030. SK chemicals anticipates that this will lead us to achieving Net Zero emissions, while we work continuously with diverse partners to develop manufacturing processes and secure hydrogen fuels.

Reduction Method

- 1 Converting the DMT process and using off-gas emissions in the CHDM process to reduce GHG emissions
- 2 Adopting hydrogen fuels in the DMT process and expanding the green company vehicles
- 3 Introduction of hydrogen fuels in the CHDM process
- 4 Adopting hydrogen fuels in the copolyester process in 2028 and expanding the ratio by 2033
- 5 Adopting hydrogen fuel in the recycle production process



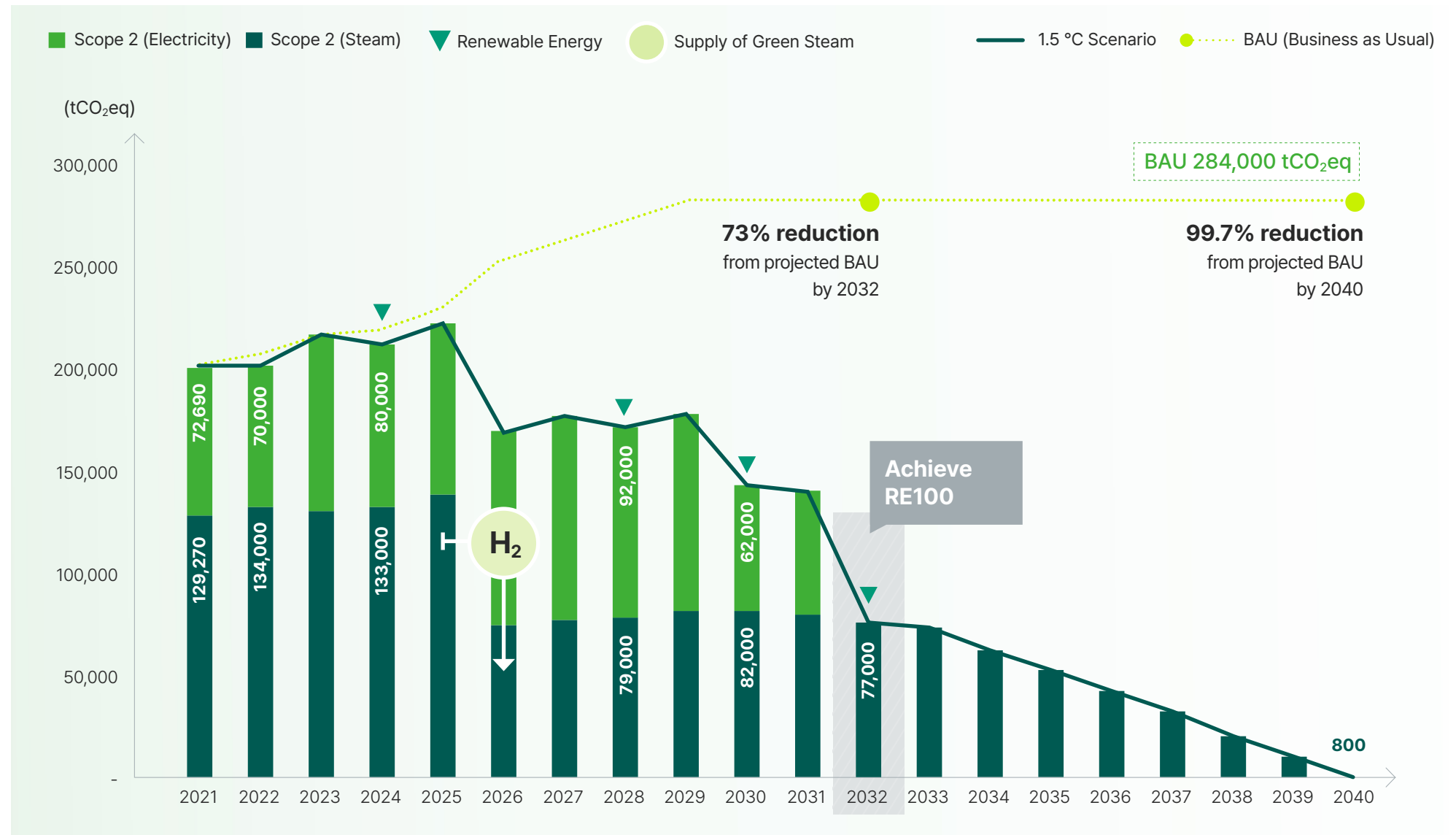
4.4.3 SCOPE 2 NET ZERO ROADMAP

Scope 2 Emissions Reduction Strategies

As for Scope 2 emissions regarding electricity, we set the target of achieving RE100 by 2032 through supplying renewable energy at all locations. The detailed strategy for this is to start running a solar power at the Cheongju Plant in 2023 and to gradually increase the renewable energy supply by 2032, starting from its introduction in 2024.

As for Scope 2 emissions on steam, we will phase out fossil fuels, begin supplying steam produced from green sources like LNG and hydrogen in 2026 and use them as the energy source for the Ulsan Plant. Accordingly, we estimate SK chemicals can reduce approximately 77,000 tCO₂eq starting in 2026, and intend to decrease 99.7% of the projected BAU by 2040, equivalent to 167,000 tCO₂eq. SK chemicals is working together with a subsidiary, SK multi utility, with the aim of securing steam produced from green fuels.

These endeavors will enable us to reduce the carbon footprint of our products and create a sustainable business model.



4.4.4 RE100 STRATEGY

Adoption of Renewable Energy

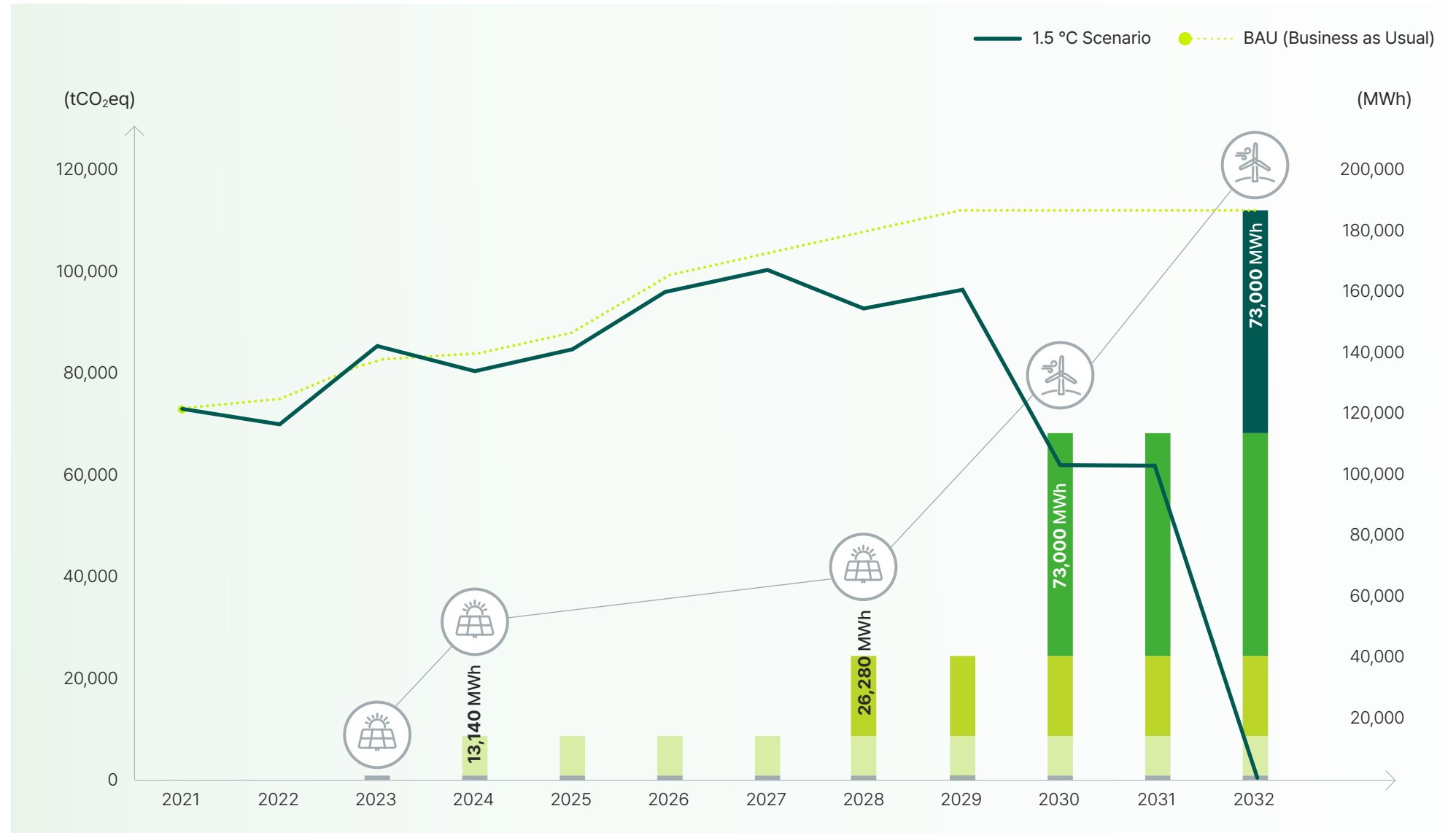
SK chemicals made a forecast and analysis of electricity consumption by each of our locations in preparation of adopting renewable energy. We also developed measures to phase in renewable energy to reach our RE100 targets by 2032.

We evaluated the BAU forecast and the 1.5°C scenario for reducing Scope 2 emissions from electricity production, and calculated the renewable energy needed per year to meet our target. Starting with the rollout of a solar power plant at the Cheongju Plant, we will implement four renewable energy agreements to reduce emissions from electricity use. In 2032, we plan on carrying out the second large scale wind PPA (or REC) and acquiring additional Renewable Energy Certificate (REC) for the remaining emission allowance to reach our RE100 target.

With these renewable energy transition plans, we intend to decrease carbon emissions generated from electricity consumption at our locations.

Reduction Method

- Solar Power Plant at Cheongju Plant (1,255 MWh)
- 1st solar renewable energy
- 2nd solar renewable energy
- 1st wind renewable energy
- 2nd wind renewable energy



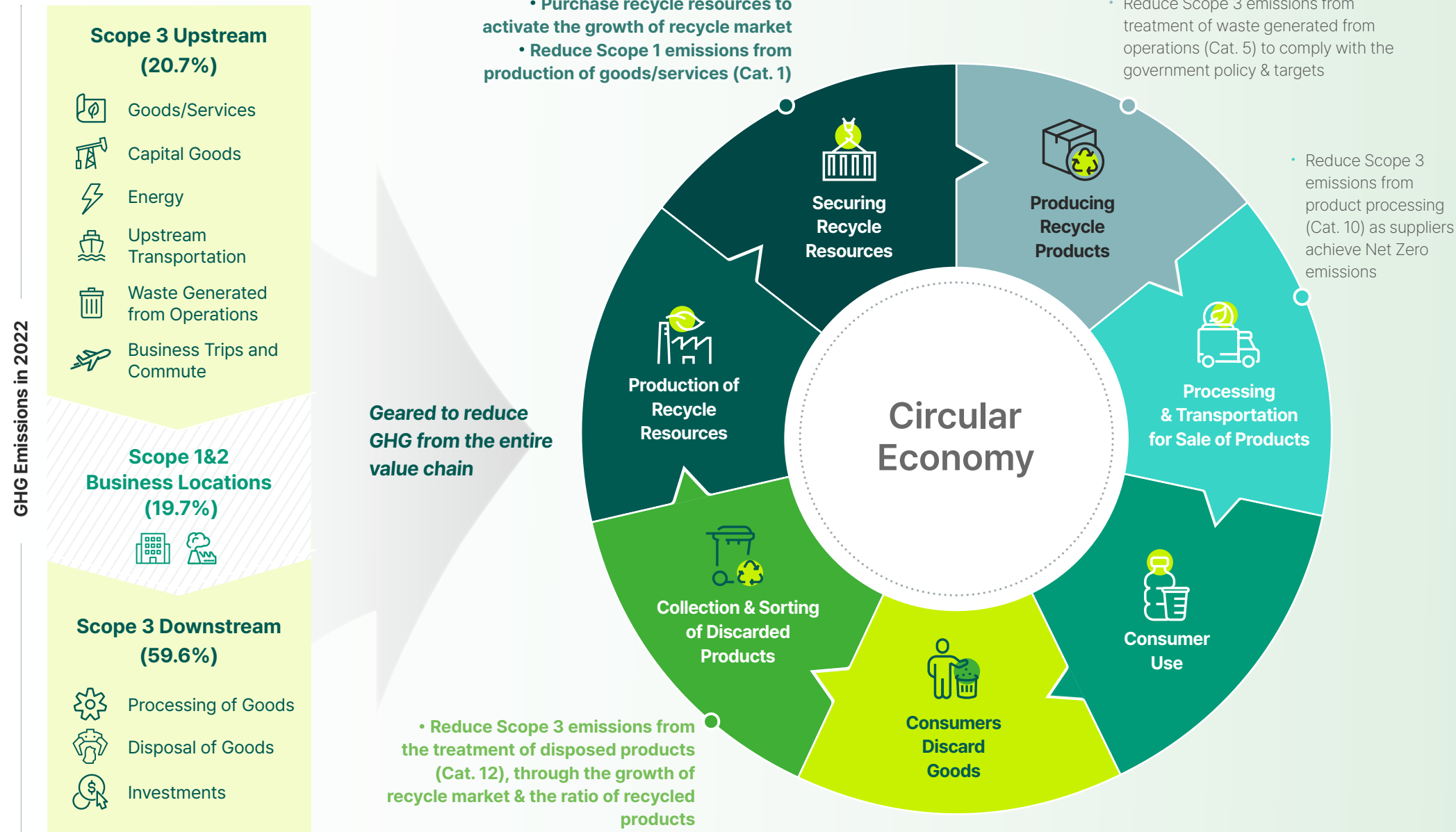
4.5 SCOPE 3 NET ZERO SOLUTION

Net Zero Plan by 2050

At SK chemicals, Scope 3 emissions accounted for 80% of all GHG emissions in 2022. To achieve Net Zero emissions in due time, we not only consider the GHG emissions at our business locations, but also work to decrease emissions from the entire product life cycle.

Transition to the green business portfolio is the result of our efforts to go green on the path to building a circular ecosystem. We plan to develop a closed-loop recycling system and repeatedly use resources that go into the production of goods (reduction from Cat. 1 and 12) to build a sustainable system.

Through this, we expect to maximize resource efficiency and minimize factors that cause pollution to realize sustainable management ultimately and create economic value in harmony. In addition, we reach out to various stakeholders, including the government, business partners, and investors in an effort to expand the Recycle Cluster.

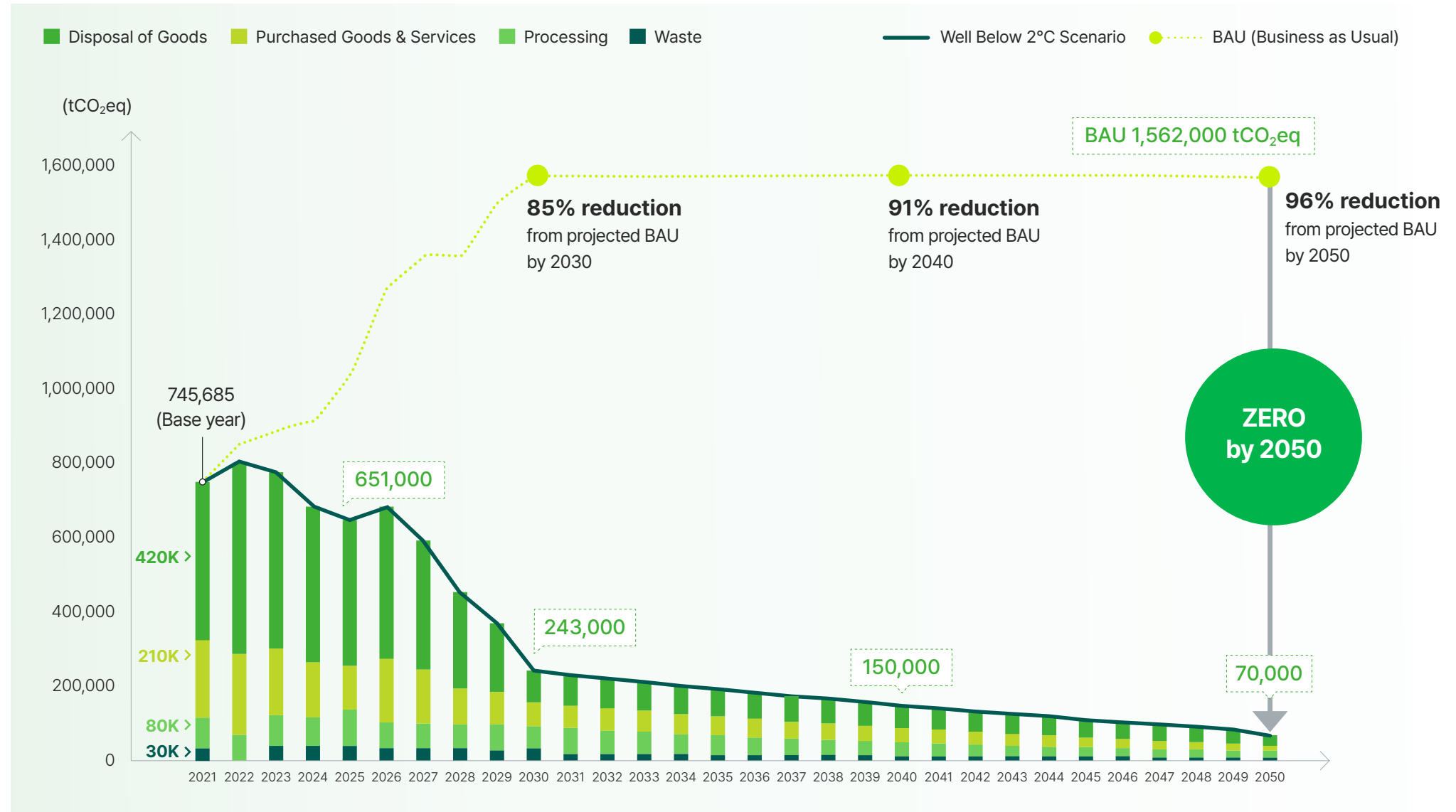


4.5.1 SCOPE 3 NET ZERO ROADMAP

Scope 3 Emissions Reduction Strategies

Starting from 2021, SK chemicals has developed the Scope 3 GHG emissions inventory to measure our GHG emissions. We selected the main category that accounts for 69% of our emissions (746,000 tCO₂eq), and set plans to reduce 96% of emissions from the projected BAU level by 2050 and 91% of emissions from the base year by taking the absolute contraction approach. As we start the green materials business¹⁾ and build a sustainable ecosystem for a circular economy, we anticipate that we can drastically curtail emissions from the production of goods and services (Cat. 1), and the treatment of disposed products (Cat. 12) by 484,000 tCO₂eq (77%) by 2030 compared to the base year. Moreover, we will take on the responsibility for future generations and the environment by achieving the Net Zero by 2050 throughout our value chain, by continuously reducing operational waste²⁾ and taking action to cut down on GHG emissions together with our suppliers.

- 1) Plan to convert to using 100% recycle raw materials in copolyester by 2030
- 2) Government announcement of reducing plastic waste by 50% and recycling 70% of wastes generated until 2030 (Comprehensive measures to control recycling & waste). The Ulsan Plant acquired the silver rating in the ZWTL Certification in 2022 (94% actual recycling rate) and plans to earn the gold rating in 2025.



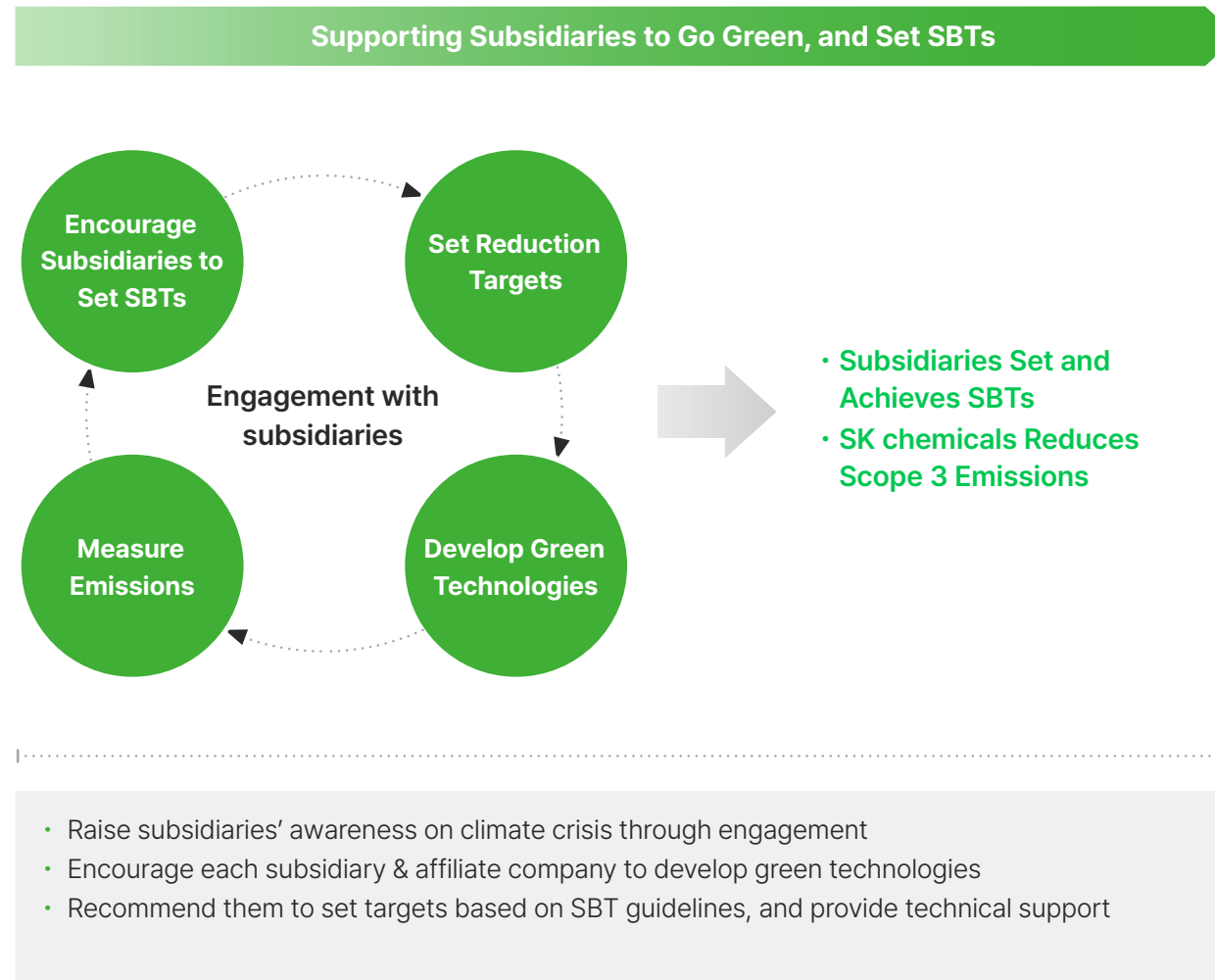
4.5.2 ENGAGEMENT PLAN OF CATEGORY 15

Set Subsidiaries' Reduction Targets

To achieve Net Zero emissions in Scope 3, SK chemicals has devised an additional engagement strategy aimed at reducing Category 15 emissions (associated with company's investments) according to SBTi guidelines. Pursuant to the GHG Protocol, our seven subsidiaries and affiliates¹⁾ fall under Scope 3 Category 15, amounting to 25.5% of the overall Scope 3 emissions by SK chemicals (as of 2021). Therefore, we have set another target of building more than approximately 32% of our investment portfolio with SBTi-approved subsidiaries by 2027 based on the SBT Portfolio coverage methodology.

By doing so, we can control climate risks comprehensively and early by encouraging and supporting subsidiaries to set SBTs. This is a meaningful move because we are not simply declaring Net Zero, but rather taking a step further to expedite the implementation of our reduction strategies.

To fulfill such engagement targets, we will work closely with our subsidiaries and affiliates.



SK Chemicals Reaches Net Zero

- Raise Corporate Value through ESG Practices**
- Enlarge New Green Business Opportunities, and Attract Customers**
- Improve Leadership as a Green Company**

- Reduce GHG emissions from the entire value chain
- Manage financial risks from climate change by implementing Net Zero of subsidiaries

1) SK bioscience, SK multi utility, SK chemicals Daejung, ENTIS, JSI, HDC POLYALL, ST Green Energy

4.5.3 ECO TRANSITION STRATEGY

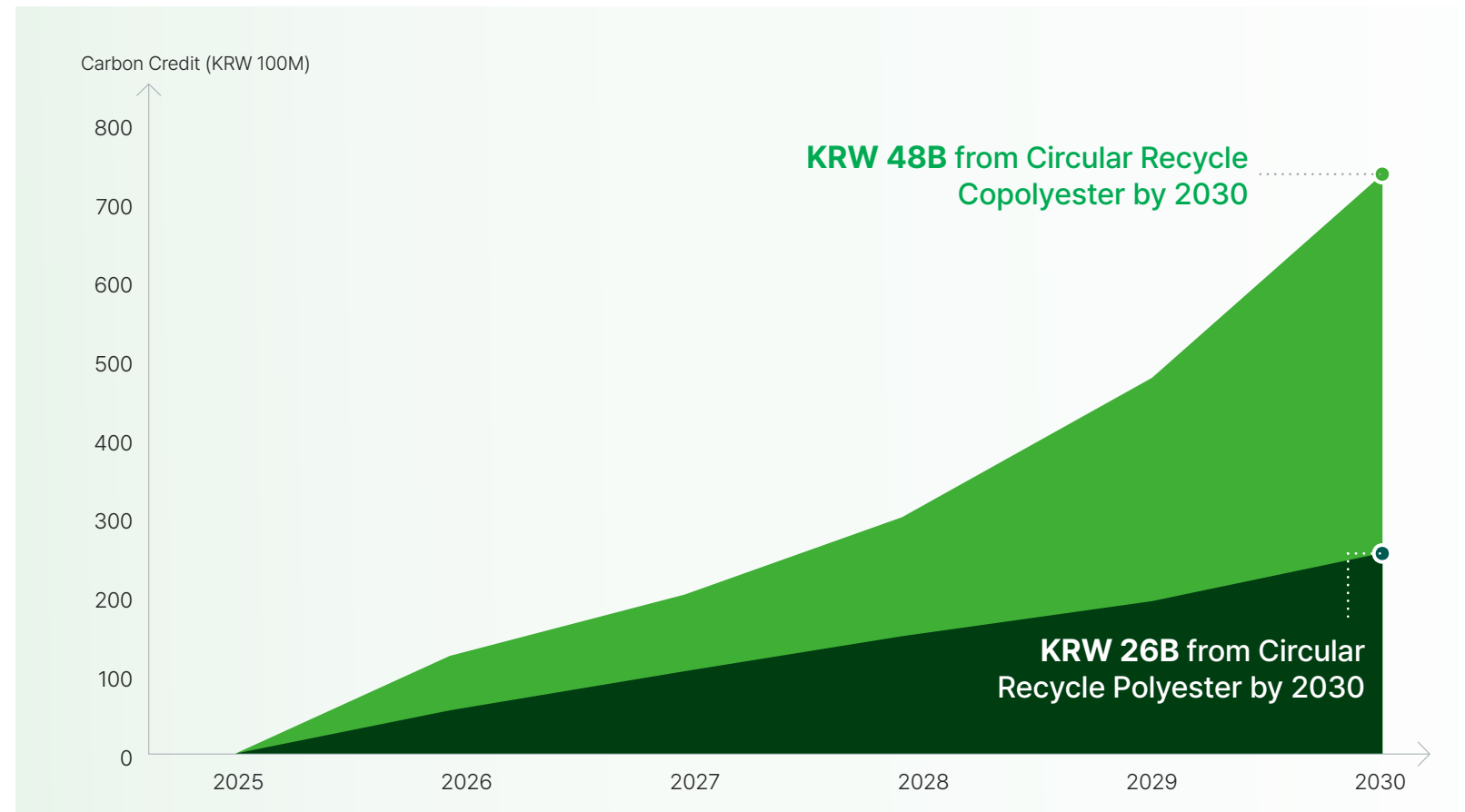
Carbon Credits through the Green Business

SK chemicals is strengthening the green portfolio of products, such as Circular Recycle materials and bio materials through its Eco Transition management strategy centered around the green materials business. As a result, we have succeeded in mass-producing CR-PET applied with the circular recycle technology in 2021. In 2022, we acquired the UL EPD Certification (low carbon certification) on recycle copolyester products.

The expansion of the green business not only helps reduce wastes and carbon emissions, but also creates opportunities to generate revenues from carbon credits. This means that the carbon management of the past is shifting from restriction-oriented reduction to voluntary reduction throughout the value chain.

Carbon credits are issued when eco friendliness is approved of the reduced emissions generated from goods and services based on credible standards. Once approved, these credits to be used as practical means to reach Net Zero targets and have a positive impact on company finances.

Since 2021, SK chemicals has carried out detailed action plans to seize opportunities presented through climate action. Going forward, we will earn carbon credits for Circular Recycle PET and copolyester products to generate cumulative revenues of KRW 190 billion by 2030. We will also expand the Recycle Cluster to secure a stable supply of renewable raw materials and increase their use to improve their profitability.



Assumptions

- Reduction forecast: Circular Recycle Polyester 1.35 tCO₂eq/Ton, Circular Recycle Copolyester 0.66 tCO₂eq/Ton
- Carbon pricing based on the IEA's 1.5 °C Net Zero emission scenario

4.6 CLIMATE SCENARIO ANALYSIS

Pursuant to TCFD recommendations, we discerned the financial impact on potential climate risks, along with conducting scenario analysis on transition and physical risks to prepare preliminary response measures. To evaluate the consequences of transition risks, we used scenarios from credible organizations, including the IEA's 1.5°C Net Zero Emissions by 2050 Scenario (NZE), NGFS's below 2°C scenario and the above 3°C scenario. We compared the costs of climate response based on the carbon pricing from three scenarios. To analyze the physical risks, we used the four scenarios of the Representative Concentration Pathway (RCP) defined in IPCC's assessment report. These scenarios describe four different GHG atmospheric concentrations based on the amount of radiant energy reaching air by human activities among solar radiant energy, apart from energy absorbed by the planet.

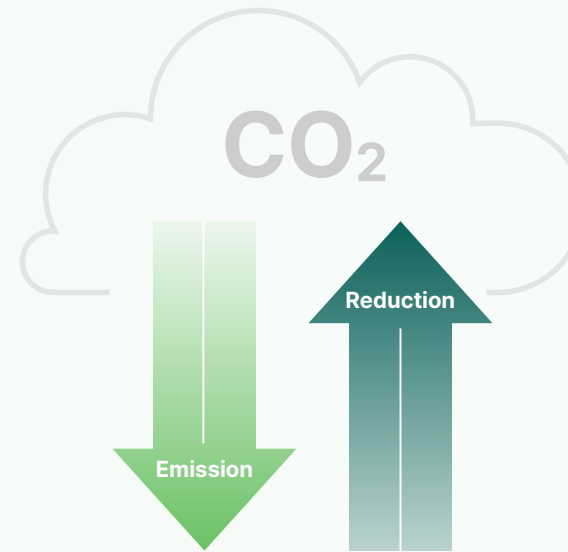
For instance¹⁾, RCP 8.5 refers to the scenario where the concentration of carbon has reached 940 ppm, delivering a global average temperature increase of about 4.8°C and precipitation increase of 6.0% by 2100. In this case, the average temperature of the Korean peninsula will rise 6.0°C with a precipitation increase of 20.4%, which is expected to result in a significant loss of asset value. By assessing such climate change scenarios, we will determine potential risks and continue monitoring the climate-related situation to prepare for uncertainties.

Transition Risks

- Policies/Laws**
 - Stringent regulations on fossil fuels
 - A hike in electricity costs as a result of revising the energy scheme
 - Stringent regulations on plastics
- Market**
 - Change in consumer demand, including increase needs for green products
 - Stable supply of recycling resources

↓

- Paris-aligned 1.5°C Scenario**
 - A scenario designed for strict reduction based on the Paris Agreement
- Below 2°C Scenario**
 - A scenario with delayed policy and technology response
- Above 3°C Scenario (No Mitigation)**
 - A scenario where temperature has increased by 3°C or more due to passive response



Physical Risks

- Acute**
 - Rising recovery costs due to frequent occurrence of extreme weather events like floods & tropical cyclones in our locations
- Chronic**
 - Rising operational costs due to long-term change in climate patterns, such as increased global average temperature

↓

- RCP 2.6 Scenario (420 ppm)²⁾**
 - An intense response involving immediate reduction of GHG emissions
- RCP 4.5 Scenario (540 ppm)²⁾**
 - A scenario where policies to reduce GHG emissions are fully implemented
- RCP 6.0 Scenario (670 ppm)²⁾**
 - A scenario where policies are partially implemented through passive response
- RCP 8.5 Scenario (940 ppm)²⁾**
 - Continuation of current level GHG emissions with no reductions

1) Referred to the Korea Adaptation Center for Climate Change website 2) RCP projections for CO₂ concentration in 2100

4.6.1 TRANSITION RISK: Carbon Cost Analysis

We evaluated the carbon price risks following the strengthened GHG emissions regulations based on three climate scenarios of IEA NZE, NGFS's delayed transition and current policy. In other words, we analyzed the final estimated costs by reflecting the carbon pricing based on each scenarios, to the projected GHG emissions under case the BAU and Net Zero scenarios are implemented by 2040. The results

revealed that the BAU scenario, where no GHG reduction actions are taken, would cost the company at least KRW 76 billion and KRW 173 billion at maximum. Alternatively, if we pursue Net Zero under the most ambitious 1.5°C target scenario, we are expecting the cost of KRW 73 billion, saving KRW 100 billion compared to BAU.

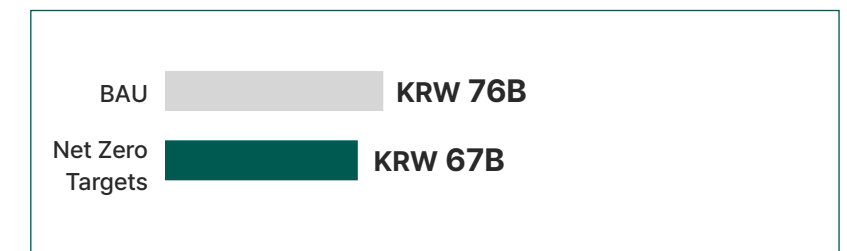
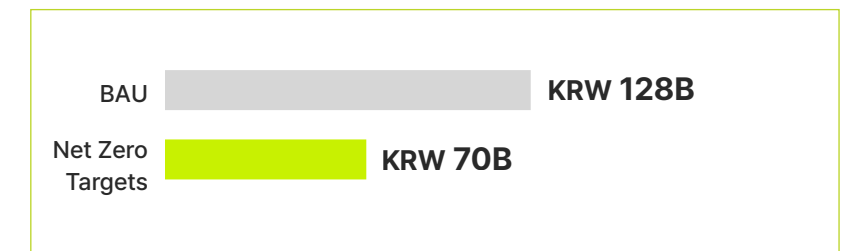
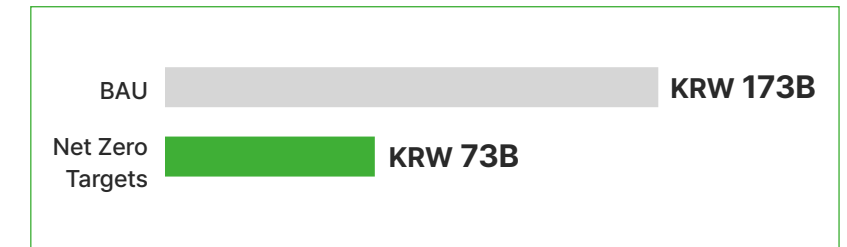
Climate Scenarios

Scenarios	Summary	Assumptions
Paris-aligned 1.5°C Scenario (IEA Net Zero Emission by 2050)	<ul style="list-style-type: none"> A scenario about a large-scale energy transition of the world to achieve carbon neutrality by 2050, and limiting global temperature rise below 1.5°C Poses low physical risks, but high implementation risks 	<ul style="list-style-type: none"> Carbon prices rise up to USD 205.0 by 2040 Increased adoption of green technology like solar, hydrogen and carbon capture, utilization & storage (CCUS) included in the national carbon neutralization plan leading to worldwide reductions
Below 2°C Scenario (NGFS Disorderly Transition – Delayed Transition)	<ul style="list-style-type: none"> Delayed adoption of national policies & technology development as the world delays climate actions Has a higher physical risks than the 1.5°C scenario 	<ul style="list-style-type: none"> Carbon prices rise up to USD 127.7 by 2040 No progress in global annual emissions reduction by 2030, tougher restrictions applied thereafter
Above 3°C Scenario (NGFS Hot House World – Current Policies)	<ul style="list-style-type: none"> A BAU scenario where the world pursues relaxed, inconsistent climate targets, leading to global temperature rise by 3°C or more Frequent occurrence of extreme weather events 	<ul style="list-style-type: none"> Carbon prices consistent to USD 5.6 by 2040 Global emissions continues to increase by 2080. The world maintains an energy system with high carbon intensity



Result of Climate Scenario Analysis

Result of Analysis on Carbon Costs for 2040 (Unit: KRW Billion)

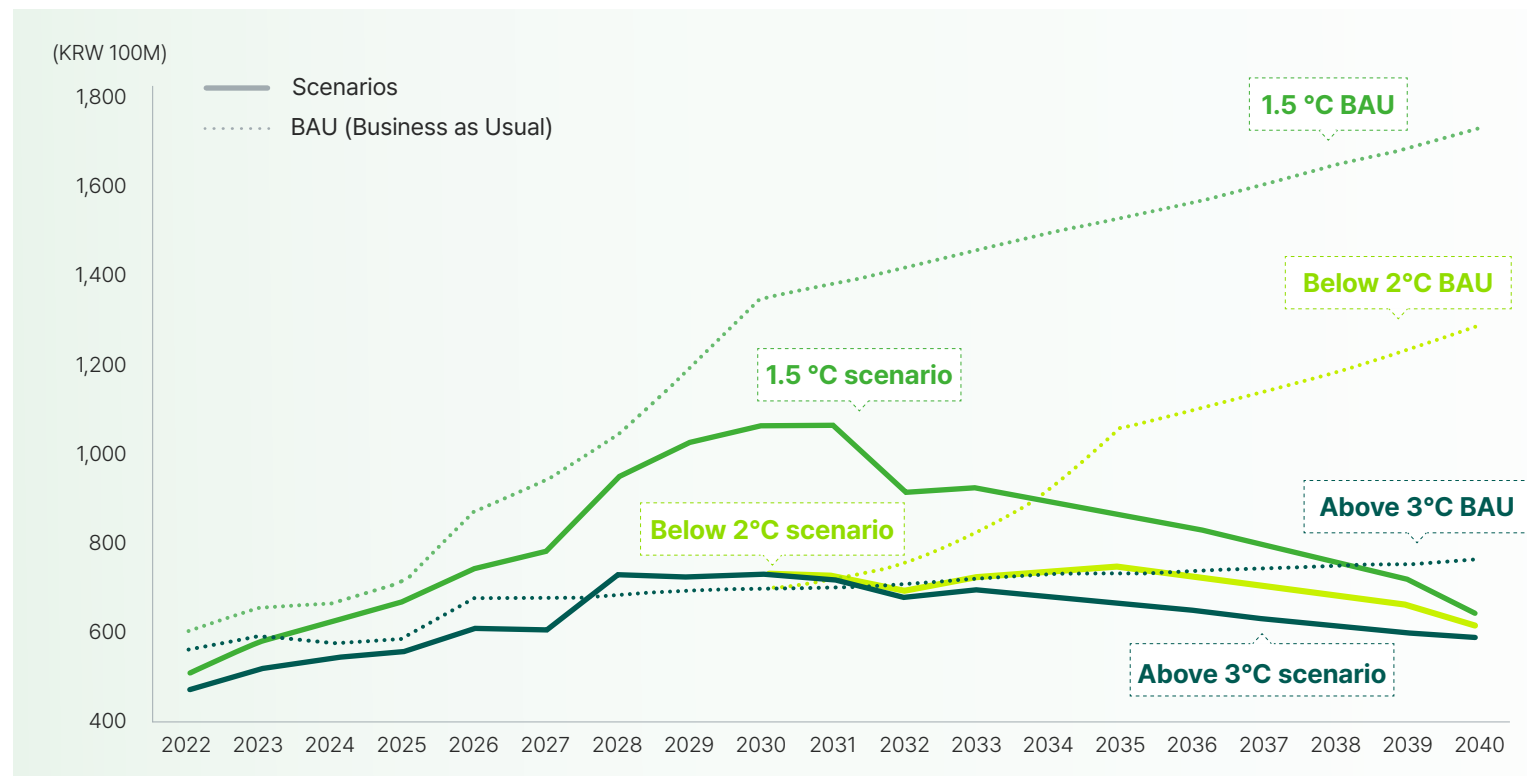


4.6.1 TRANSITION RISK: Carbon Cost Analysis

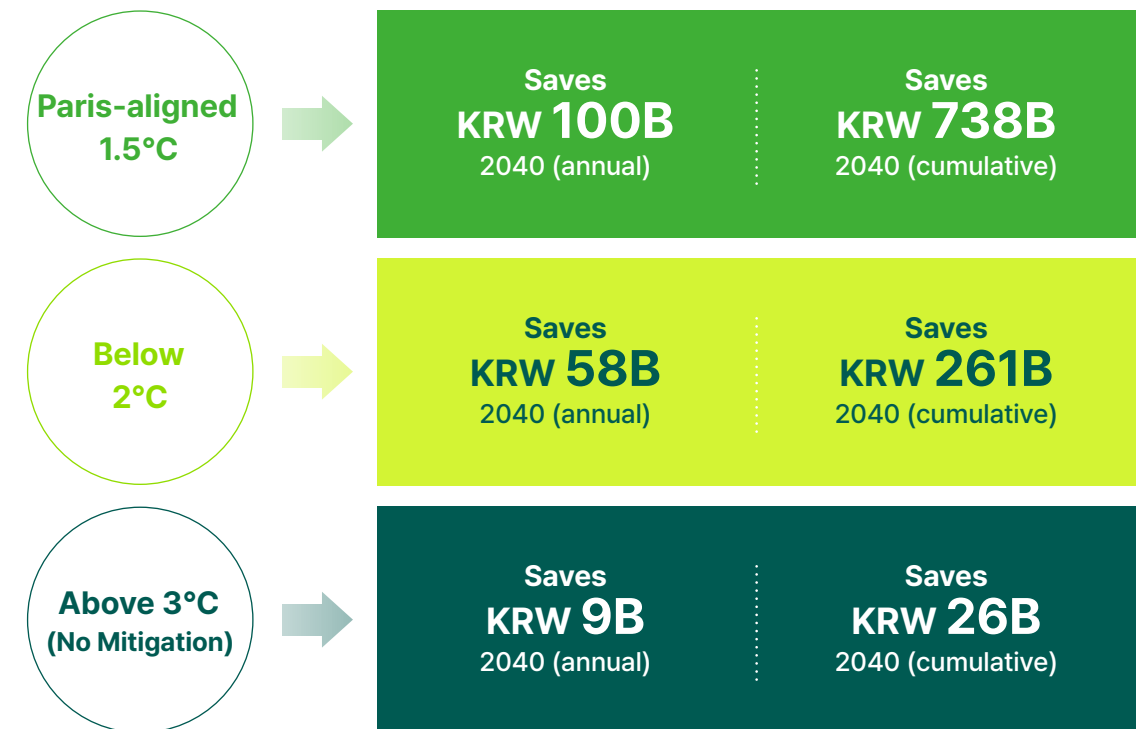
In conclusion, investment geared to reach the Net Zero targets is thought to have a positive impact on SK chemicals' financial status in the long run under all three climate scenarios. We also found that energy and carbon costs can put our business under pres-

sure if we fail to invest in appropriate transition costs. SK chemicals will continue to evaluate the potential costs, and prepare ourselves for potential financial impact in order to respond wholeheartedly to climate risks.

Cost of Climate Action Under the BAU & Net Zero Scenarios



Costs Savings from Reaching Net Zero by Scenario

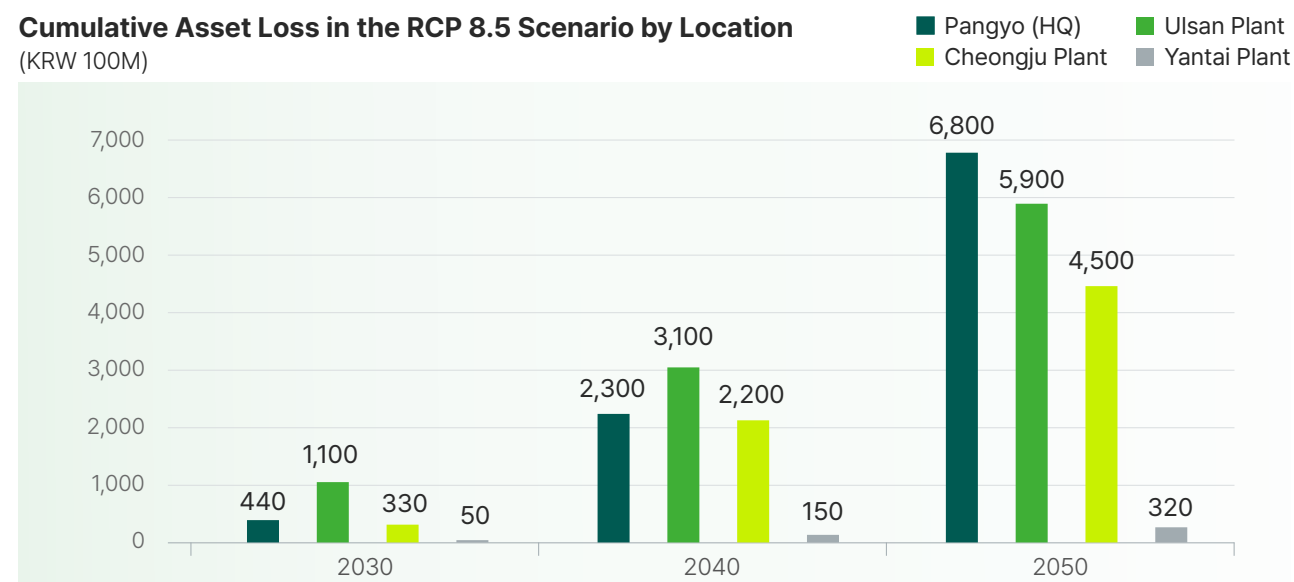
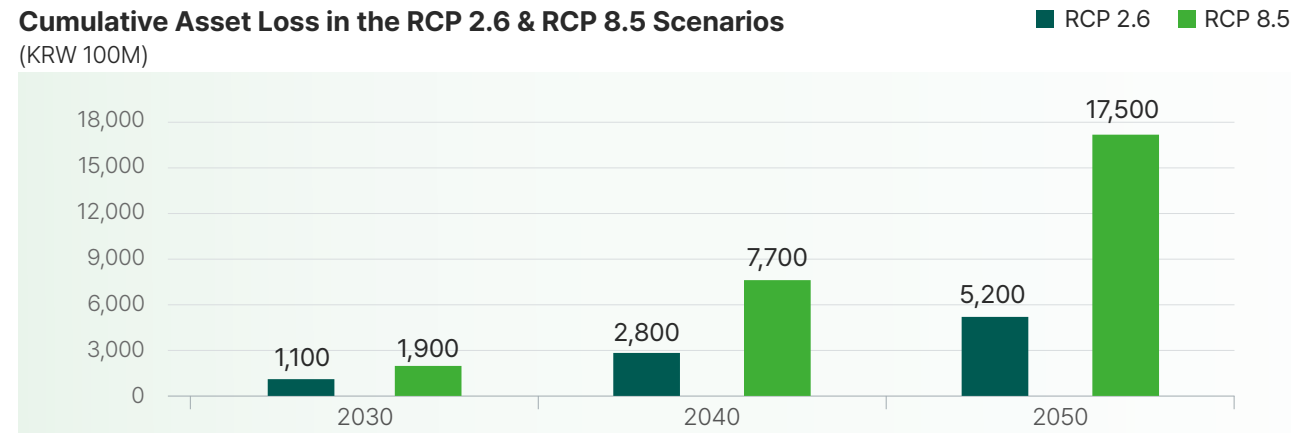


What are Climate Change Scenarios? Climate change scenarios are projections of future GHG emissions based on a global temperature rise and the progress on carbon transition. There are multiple climate scenarios developed by IPCC and other international organizations. By analyzing these scenarios, we can gain insights into prospective views on to what extent climate risks and what kinds of climate risks can affect the business.

4.6.2 PHYSICAL RISK: Financial Impact Analysis

SK chemicals evaluated the financial impact using four RCP scenarios developed by S&P Global's Climonomics Hazard Modeling to analyze the physical loss incurred by climate change. The analysis was done at our headquarters in Pangyo (ECO Lab), the Cheongju Plant, the Ulsan Plant and the Yantai Plant owned by SK chemicals, in which we measured and compared the reduced asset value until 2100. We identified seven major physical risks that affect these locations, including extreme temperatures, fluvial flooding, and wildfire etc.

We used the RCP 2.6 scenario that is tantamount to the Net Zero scenario and the RCP 8.5 scenario, where we continue to generate GHG emissions at current state and the global average temperature rises by 3°C or more, and assessed the cumulative asset loss until 2050. The result revealed that the loss on assets from our entire locations by 2030 could be as high as KRW 190 billion, but it could reach up to KRW 1,750 billion by 2050 due to a significant increase in the global average temperature. In the RCP 8.5 scenario, the Pangyo headquarters and the Cheongju and Ulsan Plants suffer a significant loss on assets by 2050, primarily caused by extreme temperatures that raise the cost of cooling, the HVAC¹⁾ system maintenance, and flood recovery.



RCP Scenarios

RCP 2.6	Temperature increase of between 0.9~2.3°C and a sea level rise of between 0.26~0.55m by 2100
RCP 4.5	Temperature increase of between 1.7~3.2°C and a sea level rise of between 0.32~0.63m by 2100
RCP 6.0	Temperature increase of between 2.0~3.7°C and a sea level rise of between 0.33~0.63m by 2100
RCP 8.5	Temperature increase of between 3.2~5.4°C and a sea level rise of between 0.45~0.82m by 2100

Risk Factors

- Extreme Temperatures
- Wildfire
- Tropical Cyclones
- Drought
- Fluvial Flooding
- Coastal Flooding
- Water Stress

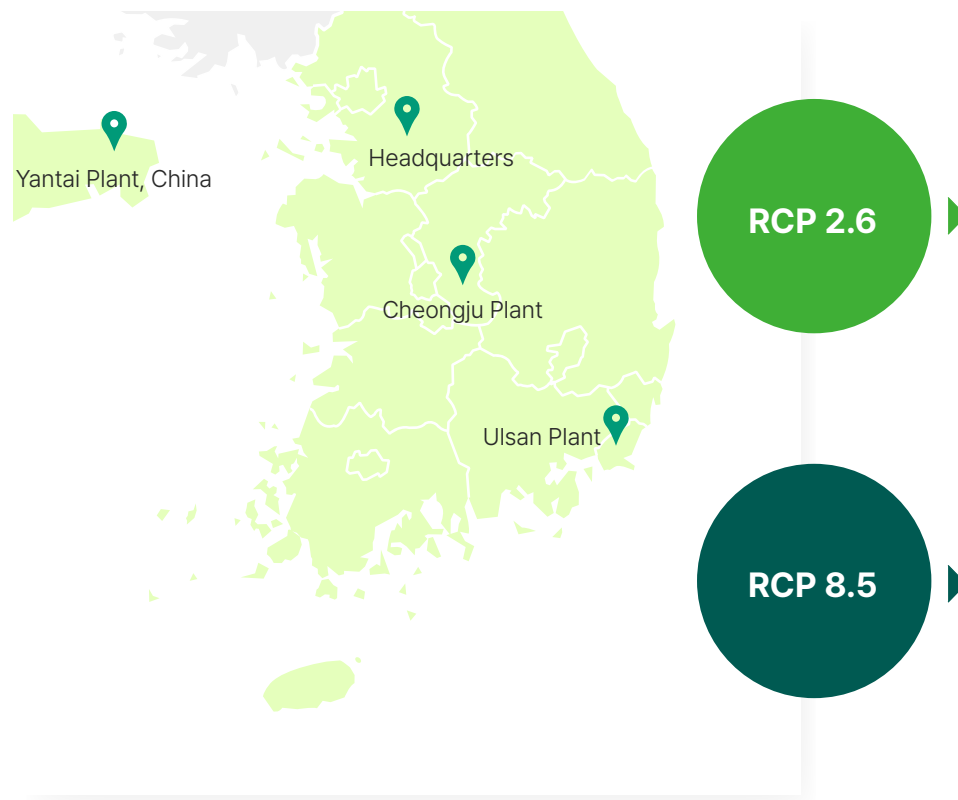
* Refer to Appendix 1. [+](#)

1) HVAC (Heating, Ventilation, and Air Conditioning): Controls and adjusts the temperature, humidity, & air conditioning to maintain the environment as needed.

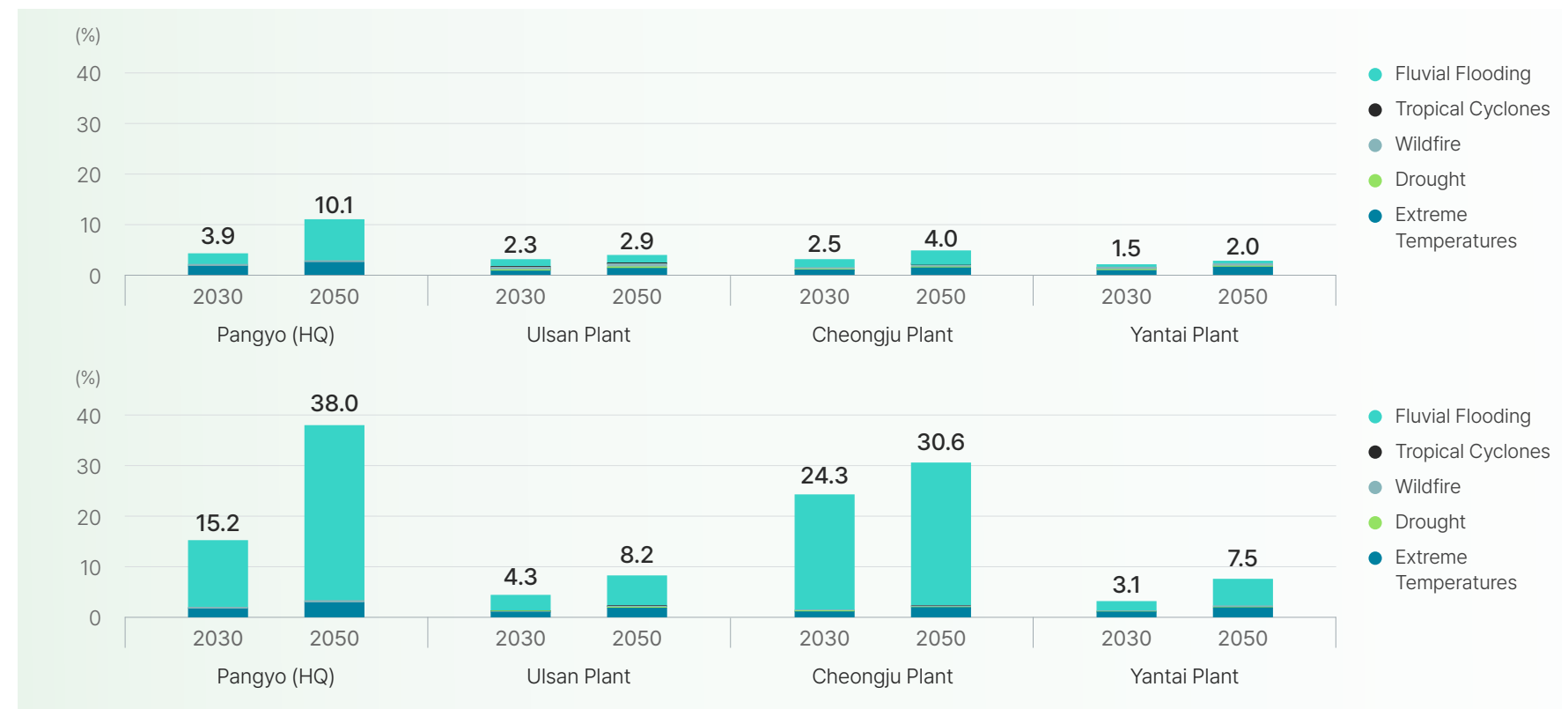
4.6.2 PHYSICAL RISK: Financial Impact Analysis

In contrast to the RCP 2.6 scenario, where the global average temperature stays below 2°C as a result of an ambitious mitigation efforts, the RCP 8.5 scenario, where the global average temperature can rise by 3°C or more, are analyzed to pose greater climate risks. This applies to all of our locations, and we expect to experience an annual average loss of up to 38% between 2050 and 2059. Looking at individual physical risks in the 2030s and 2050s, we forecast to be less exposed to drought, wildfire, and tropical cyclones due

to the geographical features of our locations, but can experience damage from fluvial flooding and extreme temperatures. The loss rate may vary depending on the geographic characteristics of each location, but projections indicate that extreme temperatures could escalate precipitation levels which, in turn, cause fluvial flooding. Therefore, we are operating the Safety and Health Committee at each of our locations to make preparations against fluvial flooding and an emergency response system to minimize potential damage.



Annual Average¹⁾ Asset Loss Rate (%) & Major Contributors



1) 2030 refers to the period between 2030 & 2039, while 2050 refers to the period between 2050 & 2059.

4.7 CORPORATE CLIMATE RESILIENCE

SK chemicals reviewed its strategy using the transition and physical risk scenarios that we have developed to analyze our resilience against potential climate risks in the future. In other words, we have built a secure resilience foundation by setting Scope 1&2, 3 Net Zero targets and implementation strategies capable of responding to risks arising from climate change and stricter carbon policies and restrictions. We will continue to identify the risks and assess financial impact by different scenarios and implement our respective strategies at the enterprise level, pivoting accordingly.

Transition / Physical Risks	Scenarios	Financial Impact by Scenario
Regulatory Response & Market Demand to Go Low Carbon	Paris-aligned 1.5°C Scenario	Cumulative cost of KRW 2,400 Billion under BAU by 2040
	Below 2°C Scenario	Cumulative cost of KRW 1,600 Billion under BAU by 2040
	Above 3°C Scenario	Cumulative cost of KRW 1,300 Billion under BAU by 2040
Extreme Climate Change due to Increase in Carbon Emissions	RCP 2.6, 4.5 & 6.0 Scenario	Potential cumulative loss of KRW 520 Billion in asset value by 2050
	RCP 8.5 Scenario	Potential cumulative loss of KRW 1,750 Billion in asset value by 2050

Resilience Strategy

Set Scope 1&2 Net Zero targets and implement strategies for 2040
Can cut up to KRW 738 billion by 2040 (cumulative costs) by pursuing Net Zero targets and using more green fuels and renewable energy to achieve energy efficiency

Achievement of Net Zero targets throughout the value chain by 2050
Reduce waste, reuse resources, and support subsidiaries to meet Net Zero targets by building a circular economy ecosystem

Generate additional KRW 190 billion in cumulative revenue by expanding the sale of Circular Recycle Products

Improve energy efficiency by implementing green building design & continuous maintenance of air conditioning systems
to curtail rising energy costs driven by global warming

Create a corporate SHE system that prevent and respond to accidents caused by natural disasters like tropical cyclones & heavy rain
Also, adopt building design that withstands winds up to 34m/s to prepare for extreme weather events

Precheck and reinforce the monitoring system on drainage systems close by to prepare for fluvial flooding



5

- 5.1 Our Approach to Metrics & Targets
- 5.2 Scope 1&2 Emissions and Net Zero Targets
- 5.3 Scope 3 Emissions and Net Zero Targets
- 5.4 Waste Emissions and Reduction Targets
- 5.5 Renewable Raw Materials and Investment Cost

Climate change risks and opportunities SK chemicals has identified, strategies and implementation plans formulated for these risks and opportunities are measured and managed based on specific indicators. We disclose not only Scope 1 and 2 emissions, but also all Scope 3 GHG emissions, as well as the state of affairs and futural targets associated with management indicators for water resources, wastes, and atmospheric pollutants, together with the environmental investments. Climate risks and opportunities, targets set to manage our progress against the target are revealed, including descriptions on how we pursue these targets.

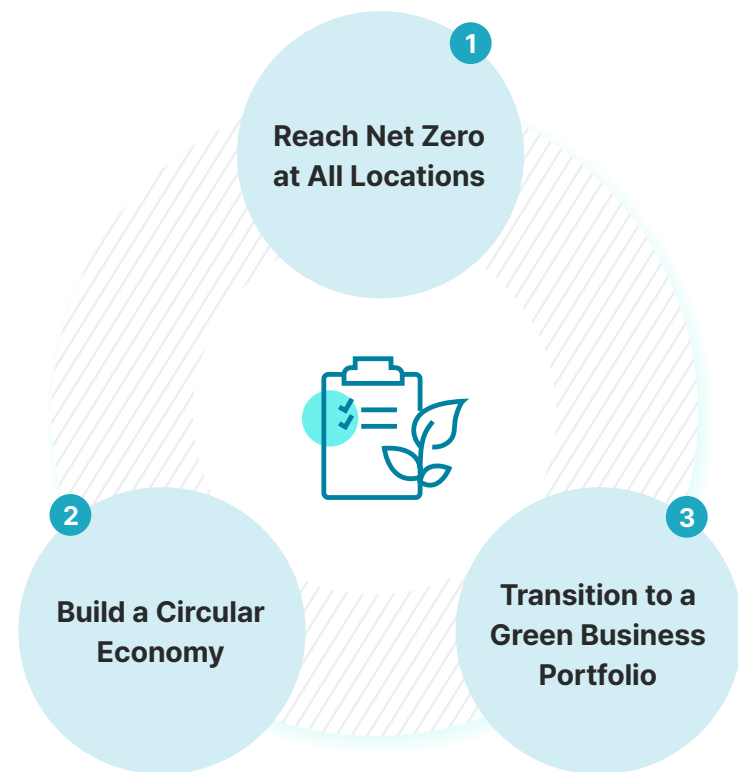
METRICS & TARGETS

5.1 OUR APPROACH TO METRICS & TARGETS

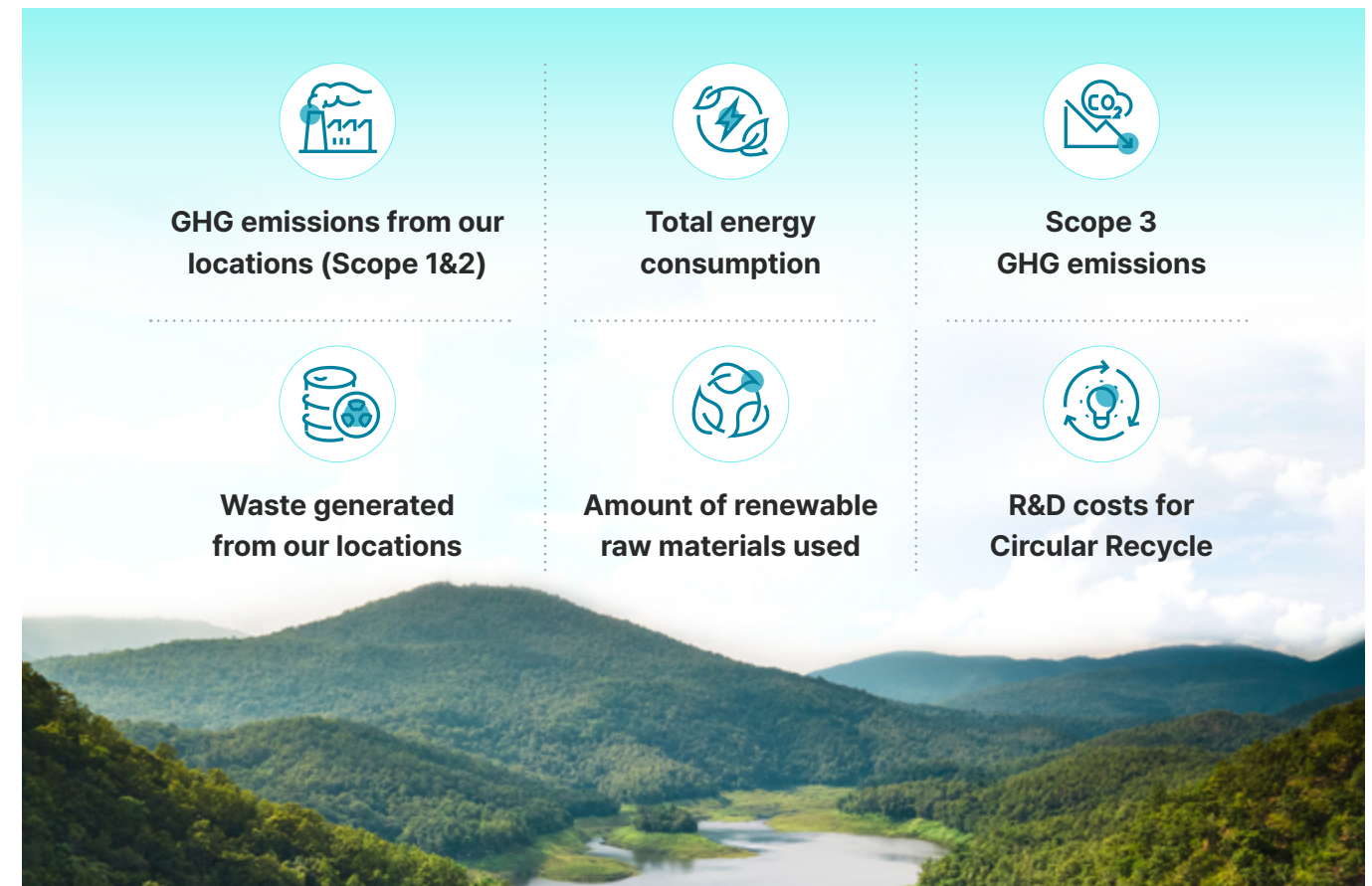
SK chemicals has identified climate risks and opportunities, and set main strategies aimed at responding to these risks and opportunities.

We will carry out detailed action plans to achieve our strategies at the enterprise level, and set management indicators to announce the implementation process to our stakeholders.

Main Strategies



Measurement & Management Indicators



5.2 SCOPE 1&2 EMISSIONS AND NET ZERO TARGETS

Results of GHG & Energy Measurements and Reduction Targets

SK chemicals complies with the Korea Emissions Trading Scheme (K-ETS), and measures the GHG emissions generated from each location based on the GHG Protocol Guidance. The total Scope 1 and 2 emissions in 2022 amounted to 266,895 tCO₂eq and the total energy of 4,852 TJ was consumed. We have adopted a major strategy to reach Scope 1&2 Net Zero targets by 2040. The Ulsan Plant will begin using eco friendly fuels such as hydrogen in the copolyester and DMT processes, and expand the ratio every year. We are planning for 100% transition to green transport by 2030 as we gear up to convert to green transport at all our locations. As for the transition to green energy in Scope 2, we have rolled out a solar power plant in the Cheongju Plant in 2023, and intend to achieve 100% renewable energy transition by 2032. Lastly, we will secure steam generated from 100% green fuels by 2040, and reduce Scope 2 emissions from steam.

In this way, SK chemicals will continuously monitor the emissions and progress in our strategy and reach Net Zero by 2040.

GHG Emissions (Scope 1&2)

	Items	Unit	2020	2021	2022
GHG emissions	Total	tCO₂eq	500,631	266,423	266,895
	Scope 1	tCO ₂ eq	403,227	64,463	63,053
	Scope 2 - Electricity	tCO ₂ eq	96,688	72,690	70,046
	Scope 2 - Steam	tCO ₂ eq	720	129,270	133,799
GHG emissions in KRW		tCO₂eq/100 million	55	24	21

Total Energy Consumption

	Items	Unit	2020	2021	2022	
Total energy used	Total	TJ	7,467	5,232	4,852	
	Direct energy sources	TJ	5,381	1,696	1,393	
	Indirect energy sources	Total	TJ	2,086	3,536	3,459
		Electricity (by region)	TJ	1,990	1,519	1,463
	Steam	TJ	96	2,017	1,996	
Energy consumed in KRW		TJ/100 million	0.8	0.5	0.4	

Net Zero Targets

Targets	Unit	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Adopt hydrogen boilers ¹⁾	%	-	9	19	19	17	17	44	44	44	44	44	52	56	60	63	67	70	74	86
Transition to green transport	%	-	10	14	19	27	37	52	72	100	-	-	-	-	-	-	-	-	-	-
RE100 achievement rate	%	-	1	8	8	7	6	17	17	47	47	100	-	-	-	-	-	-	-	-
SKMU transition to hydrogen ²⁾	%	-	-	-	-	11	11	11	11	11	14	17	20	31	43	54	66	77	89	100

1) The average blending ratio of hydrogen in three boilers from the DMT & Copolyester processes and in the r-BHET process. 2) Based on kWh



5.3 SCOPE 3 EMISSIONS AND NET ZERO TARGETS

Result of Scope 3 Measurements and Reduction Targets

Since 2021, SK chemicals has measured the emissions under Scope 3 categories according to the GHG Protocol. In 2022, the total Scope 3 emissions amounted to 1,089,040 tCO₂eq. Among all categories, the results from 5 categories (Categories 1, 3, 5, 12, 15) were verified by a third party.

Scope 3 emissions from Categories, 1, 12, and 15 accounted for the highest at 90% in that year. Thus, we will reduce emissions from Categories 1 and 12 by creating a circular economy ecosystem and expanding the green materials business, and also cut down on Category 15 emissions by working with our subsidiaries to enabling them to set and implement plans to reduce emissions.

GHG Emissions (Scope 3)

Category	2021		2022	
	Emissions (tCO ₂ eq)	Percentage (%)	Emissions (tCO ₂ eq)	Percentage (%)
Purchased goods & services	210,236	19.5	220,997	20.3
Capital goods	29,193	2.7	38,543	3.5
Energy	21,763	2.0	9,381	0.9
Upstream transportation	4,143	0.4	4,732	0.4
Waste	31,348	2.9	4,403	0.4
Business trips	243	0.0	880	0.1
Commutes	2,636	0.2	1,468	0.1
Rent	-	-	-	-
Downstream transportation	-	-	-	-
Processing	82,867	7.7	61,774	5.7
Product use	-	-	-	-
Product disposal	421,235	39.1	514,718	47.3
Lease	-	-	-	-
Franchises	-	-	-	-
Investment	275,004	25.5	232,144	21.3
Total	1,078,668	100.0	1,089,040	100.0

Net Zero Targets (Scope 3)

Targets	Unit	2022	2023	2024	2025	2030	2035	2040	2045	2050
Ratio of recycle copolyester to total sales	%	-	18	36	50	100	-	-	-	-

5.4 WASTE EMISSIONS AND REDUCTION TARGETS

Waste Management System & Reduction Targets

SK chemicals uses Allbaro, the Korean government system for waste-related data, to continuously manage waste by controlling the amount of waste generated and the amount of waste treated. In the case of the Ulsan Plant, in particular, we explored various means to boost the recycling rate, managed to improve the actual recycling rate to 94% and earned the silver rating in the ZWTL Certification in August 2022. However, we will not rest on our laurels, but rather set an ambitious targets of 95% recycling rate (gold rating) and achieve the targets by 2025.

Moreover, SK chemicals has set and currently implements an annual waste reduction target of 5% for all of our locations.

Amount of Waste Generated

Items	Unit	2020	2021	2022
Amount of waste generated (average + specific)	Tons	35,570	19,331	17,317
Amount of general waste generated	Total	25,570	7,315	5,289
	Recycled and reused	19,813	5,800	4,235
	Landfill	5,626	1,374	882
	Incinerated with energy recovery	0	11	4
	Incinerated without energy recovery	131	130	169
	Other treatment method	0	0	0
Amount of designated waste generated	Total	10,000	12,016	12,027
	Recycled and reused	6,849	8,779	9,205
	Landfill	395	434	513
	Incinerated with energy recovery	673	1,688	1,068
	Incinerated without energy recovery	2,072	1,107	1,238
	Other treatment method	11	9	4
Amount of waste generated in KRW	Ton/100 million	3.9	1.8	1.4
Recycled	Amount recycled	26,663	14,579	13,438
	Recycling ratio	75	75	78

Waste Reduction Targets

Targets	Unit	2022	2023	2024	2025
Amount of waste generated	Tons	17,317	16,451	15,629	14,847

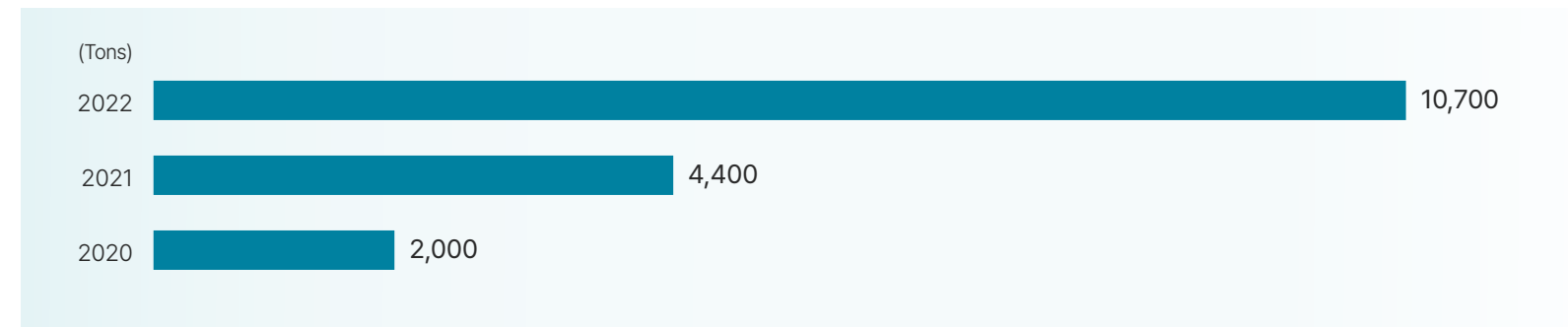
5.5 RENEWABLE RAW MATERIALS AND INVESTMENT COST

R&D & Investments in Circular Recycle

As we make the transition to the green materials business, SK chemicals has gradually increased the use of renewable raw materials directed at producing and selling recycle products. ECOTRIA R developed using mechanical recycle technology includes raw materials obtained from recycled PET (PCR PET). In 2021, we succeeded in mass-producing ECOTRIA CR by applying circular recycle technology. As ECOTRIA R is categorized into the PET category, Code 1 under International Resin Identification Codes, is garnering keen attention from the market as a recyclable material. ECOTRIA CR has acquired the GRS (Global Recycled Standard) and ISCC (International Sustainability and Carbon Certification) Plus, an international standard and a certification scheme for renewable energy sources.

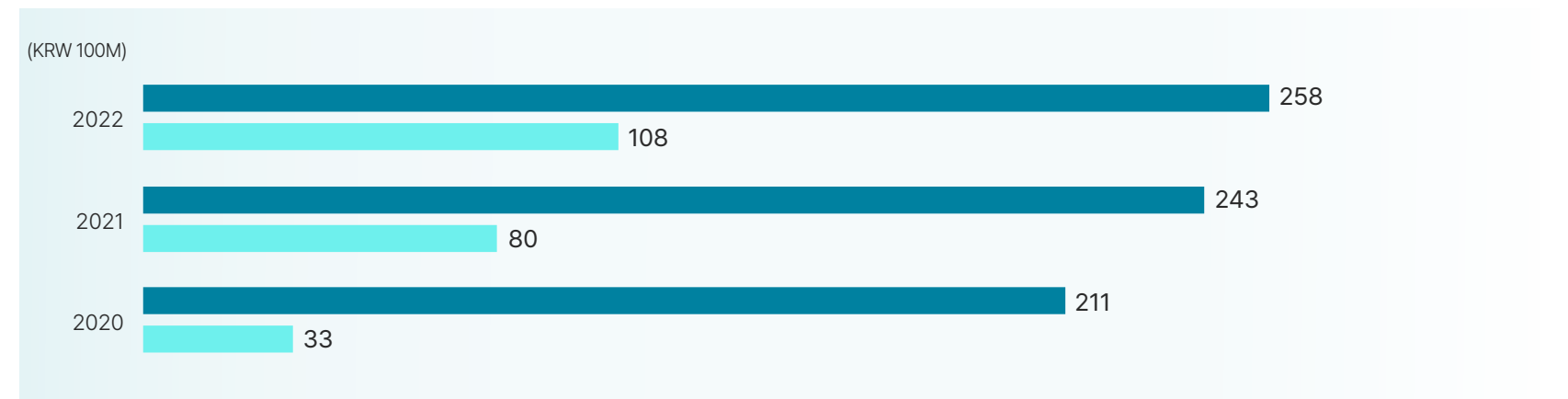
We have gradually expanded R&D investments in Circular Recycle as a part of our commitment to establish a competitive advantage and leadership in the recycle market.

Amount of Renewable Raw Materials¹⁾ Used



1) r-BHET, PCR PET, etc.

Costs of R&D in the Green Chemicals Business



Circular recycle in this report refers to chemical recycle. SK chemicals opens up a sustainable future by enhancing the renewability of chemically recycled materials.



6 TCFD RECOMMENDATION INDEX

TCFD Recommended Disclosures

	Pages
Governance	
a) Describe the board's oversight of climate-related risks and opportunities	9~10
b) Describe management's role in assessing and managing climate-related risks and opportunities	10, 12~13
Strategy	
a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	15~18
b) Describe the impact of climate-related risks and opportunities on the organization's business, strategy, and financial planning	29~33
c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	34
Risk Management	
a) Describe the organization's processes for identifying and assessing climate-related risks	12
b) Describe the organization's processes for managing climate-related risks	10, 12~13
c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management	12
Metrics and Targets	
a) Describe the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	36
b) Disclosure Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	37~38
c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	15, 20~26, 37~40

APPENDIX 1. PHYSICAL RISK ANALYSIS: Methodologies and Findings

S&P Global Analysis Requirements

Category	Risks	Definitions	Parameters	Baseline Period	Model/ Data
Acute	Coastal flooding	• Probability of flood caused by rising sea levels 12x severe than the baseline flood	Rate of sea level rise, storm surge	1979 - 2014	Kopp, et al. 2014 Muis, et al. 2016
	Fluvial basin flooding	• Probability of flood caused by flooding that occur once in 100 years against the baseline flood	Climate variables: Annual frost & dry days, precipitation, topographic variables: basin area, slope area, etc.	1950 - 1999	CMIP5, NEX-GDDP, WWF Basin Data
	Tropical cyclones	• Annual probability of tropical cyclones with intensity level of 3 or higher against the baseline tropical cyclone	Sea surface temperature	1950 - 1980	PaSHM (up to 2040)
Chronic	Extreme temperatures	• Annual frequency of daily temperature highs that exceeds the 90 th percentile against the baseline temperature	Temperature	1950 - 1999	CMIP5, NEX-GDDP
	Drought	• Annual probability of meeting drought criteria that exceeds the 90 th percentile against the baseline drought criteria	Temperature, precipitation	1980 - 1999	CMIP5, NEX-GDDP
	Wildfire	• Annual probability of meeting wildfire criteria that exceeds the 90 th percentile against the baseline wildfire criteria	Temperature, precipitation	1980 - 1999	CMIP5, NEX-GDDP
	Water stress	• Current WRI water stress indicators against the water stress model predictions by location	Water intake, amount of reused water	Current Period	WRI's Aqueduct 3.0 (up to 2040)

Below are the definition of all risks, parameters and models used in the physical risk analysis.

Result of Financial Impact Analysis by Scenario Until 2100

