Taking the Lead for Green Company

SK Inc. materials Net Zero Report

2022 Net Zero Report

SK Inc. materials

This report is not distributed in print to reduce carbon emissions.

CEO Greetings

We will jump up to become a global top specialized material technology company focusing on eco-friendliness and low-carbon.

After being incorporated into the SK Group in 2016, SK Inc. materials not only has consolidated its status as the global No. 1 company in the field of specialty gases for cutting-edge IT but also achieved remarkable growth as Global Top specialized material technology company while expanding its business base into the fields of industrial gases, semiconductor precursor, and etching gases.

As customer needs evolve and advance, the demand for solutions including eco-friendly and low-carbon values is also increasing. To respond to changes in the international community and the market, we have established three innovation strategies termed business portfolio innovation, capability innovation, and business model innovation, and plan to grow into a global top-level eco-friendly material company based on next-generation batteries, high-efficiency displays, and CCUS.

We are living in the new climate regime intended to limit the global temperature rise below 1.5°C by 2100. To actively participate in the activities to respond to climate change as such and secure differentiated carbon competitiveness and eco-friendliness, SK Inc. materials declared to achieve Net Zero · RE100 and established and is implementing climate change response strategies. Our efforts to respond to climate change will not only enhance social value, but also be positioned as our company's core competitive strategy. Through the publication of the first Net Zero Report this time, we will strengthen trust by disclosing our will and performance to stakeholders such as shareholders, customers, and cooperative companies. We request your interest in and support for SK Inc. materials's challenges and efforts toward a sustainable future.

SK Inc. materials CEO
YOUNG WOOK, LEE
이 용 욱

Company Introduction

This is the first report containing the Net Zero·RE100 declaration and roadmap of SK Inc. materials and its eight subsidiaries (hereinafter referred to as SK Inc. materials). SK Inc. materials plans to publish reports periodically to share the process of achieving Net Zero with various stakeholders and strengthen their trust.

Reporting Period

1st of Jan. 2021
to 31st of Oct. 2022

SK Inc. materials

In order to jump up to become a global top specialized material technology company, SK Inc. materials is securing a core portfolio in the fields of CCUS and battery materials, beyond the existing semiconductors and displays.

SK specialty Co., Ltd.

As a specialized company that produces core materials for semiconductors and displays, SK specialty is growing as a leader in the field of specialty gases & chemicals by expanding its business areas to specialty gases, wet chemistry, and eco-friendly materials based on its cutting-edge technology.

SK materials airplus Inc.

SK materials airplus produces high-purity industrial gases such as N_2, O_2, and Ar and supplies gases to semiconductor, petrochemical, and secondary battery manufacturing processes, and is leading the industrial gas market as a reliable business partner in these industries.

SK Tri Chem Co., Ltd.

SK Tri Chem has developed precursors, a key material in the semiconductor deposition process, in-house and supplies high-quality products to major domestic and foreign semiconductor manufacturers thereby growing into a company equipped with global competitiveness.

SK Showa Denko Co., Ltd.

SK Showa Denko developed and produces semiconductor etching gases, which had been import-dependent, and supplies them to global semiconductor manufacturers at home and abroad. In addition, SK Showa Denko has developed various high value added semiconductor materials to enhance the technical independence of the Republic of Korea and build a stable semiconductor material supply system.

SK materials renewtech CO., Ltd.

SK materials renewtech is an eco-friendly company that captures CO_2 emitted from petrochemical processes and produces ultra-high purity liquefied carbon dioxide used in semiconductor processes and dry ice for refrigerated logistics through refining and liquefaction processes of the captured CO_2.

SK materials performance Co., Ltd.

SK materials performance develops and supplies photoresist and related functional materials used in the formation of semiconductor circuits, and is expanding its business areas to display and image sensor materials that respond to light based on its cutting-edge R&D capabilities.

SK materials JNC Co., Ltd.

SK materials JNC is a company that produces OLED light emitting layer materials, and is creating a new standard for OLED displays by utilizing the blue dopant source technology.

SK materials Group14 Co., Ltd.

SK materials Group14 is a global battery core material company that produces silicon anode materials for next-generation batteries that have a larger charging capacity and can increase charging speed compared to existing anode materials with differentiated technology.

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Interactive User Guide

SK Inc. materials Net Zero Report is created in interactive PDF and allows the viewer to go directly to the relevant websites through hyperlinks in the document. Click on the icons on the navigation bar at the top of each page to go directly to the cover page, the table of contents, the previous or next page, or print.

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Go to the next page
Find information through word search
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Taking the Lead for Green Company

SK Inc. materials Net Zero Report

Commitment

Background of Net Zero Declaration

Sustainable Green Company with Stakeholders

We will actively participate in global movements to respond to climate change.

As the new climate regime was launched in earnest in 2021, all parties to the United Nations Framework Convention on Climate Change, including the Republic of Korea, are making efforts to limit the rise in the global average temperature not to exceed 1.5°C compared to the pre-industrial level by 2100. Many actors are taking actions to achieve climate change response goals, such as the EU and US that introduced a carbon border tax and global companies that declared carbon neutrality. SK Inc. materials is also reinforcing sustainability by declaring and fulfilling Net Zero · RE100 with a keen sympathy for the need to respond to climate change.

We will respond quickly to the eco-friendly needs of stakeholders.

As the issue of climate change has become important, the voices of customers and stakeholders demanding that companies should prioritize the social value termed eco-friendliness and low-carbon are growing. Accordingly, SK Inc. materials is leading the transition to a Net Zero society while satisfying the needs of customers by achieving Net Zero · RE100, practicing carbon neutrality in the entire production processes, and developing eco-friendly technologies and materials.

We will build the foundation of a carbon-neutral society based on innovative strategies.

SK Inc. materials is creating economic, social, and environmental values by securing state-of-the-art technologies and competencies and innovating our portfolio. SK Inc. materials will contribute to the realization of a carbon-neutral society by promoting the transition to eco-friendly electric vehicles through developing high-efficiency battery materials, enhancing energy efficiency through supplying low-power, high-performance display materials, and commercializing CCUS technology.

Net Zero · RE100 Target

In order to limit the increase in the average global temperature below 1.5°C, we will advance the time by more than 20 years than the global goal to achieve Net Zero·RE100.

The Paris Agreement aims to achieve Net Zero by 2050 in order to limit the increase in global temperature below 1.5°C compared to the pre-industrial level. SK Inc. materials plans to achieve Net Zero · RE100 by 2030, earlier than the foregoing.

SK Tri Chem·SK materials renewtech · SK materials performance will achieve Net Zero · RE100 by 2026, and SK materials JNC will achieve Net Zero · RE100 by 2024. SK materials airplus has not yet fixed its extension plan and therefore set the time to achieve Net Zero · RE100 as 2045. SK materials airplus periodically reviews and supplements its implementation plan.

SK Inc. materials's reduction target includes both Scope 1 (direct emissions) and Scope 2 (indirect emissions within organizational boundaries) greenhouse gas (GHG) emissions, and it is a very challenging level that greatly exceeds the reduction target of the Korean Nationally Determined Contributions (NDCs, reduction by 40% of 2018 emissions by 2030). SK Inc. materials plans to expand the management to include not only Scopes 1 and 2 but also Scope 3 (indirect emissions outside of organizational boundaries) hereafter to reduce greenhouse gas emissions across its business activities.

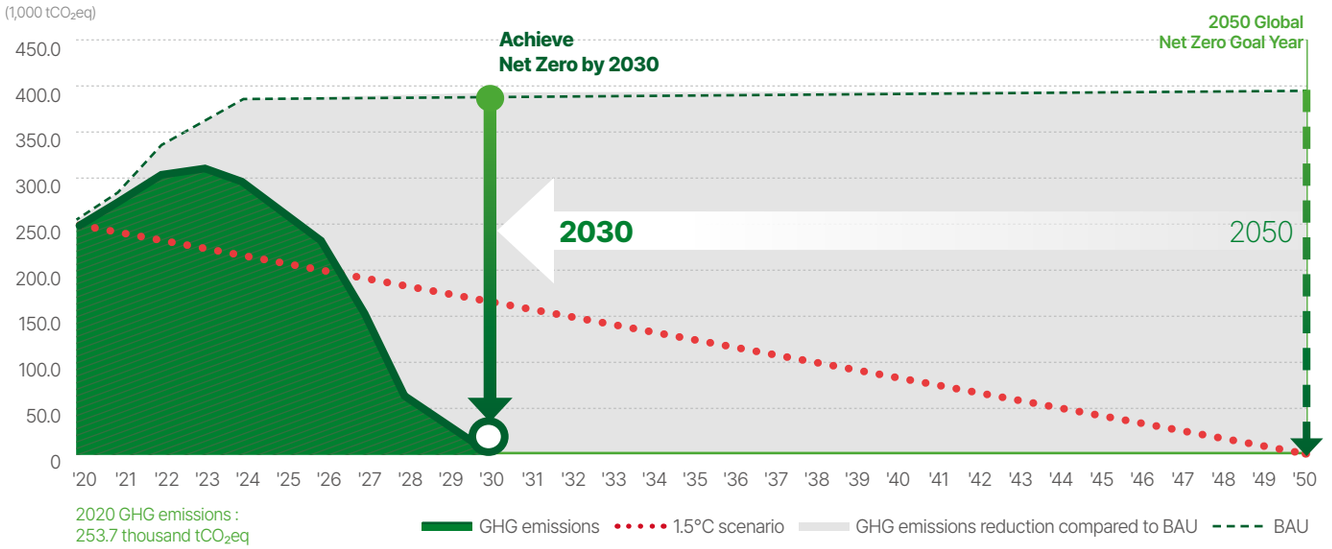
Taking the Lead for Green Company

SK Inc. materials
Net Zero Report

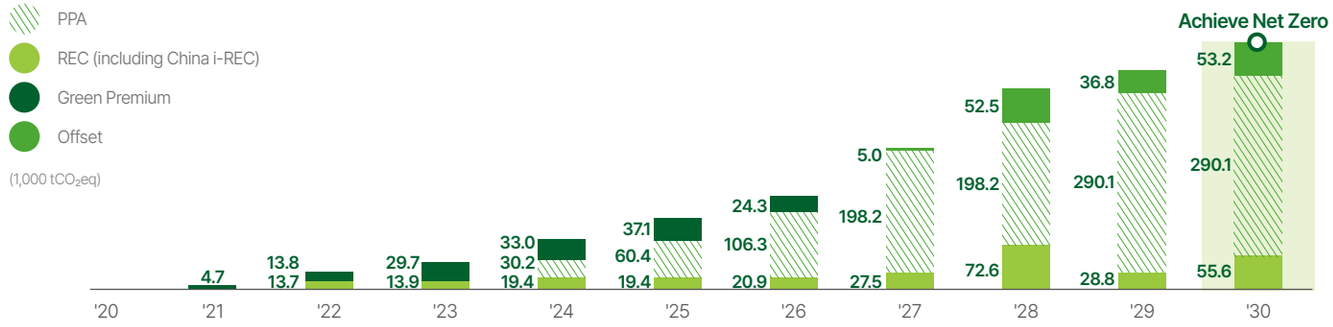
Net Zero · RE100 Roadmap

SK specialty

GHG Emissions Reduction Roadmap



GHG Emissions Reduction by Implementation Means



※ The GHG emissions reduction roadmap of SK specialty includes the GHG emissions from Yeongju plant in South Korea, Zhenjiang plant in China, and SK Showa Denko.
※ For the explanation on implementation means of GHG emissions reduction, please refer to the page 21 of this report.

Net Zero · RE100 Target: 2030

SK specialty will achieve Net Zero·RE100 by 2030 to provide carbon-neutral values to customers early, and to jump up to become a global No. 1 eco-friendly specialty gas & chemical technology company.

Net Zero · RE100 Implementation Strategy

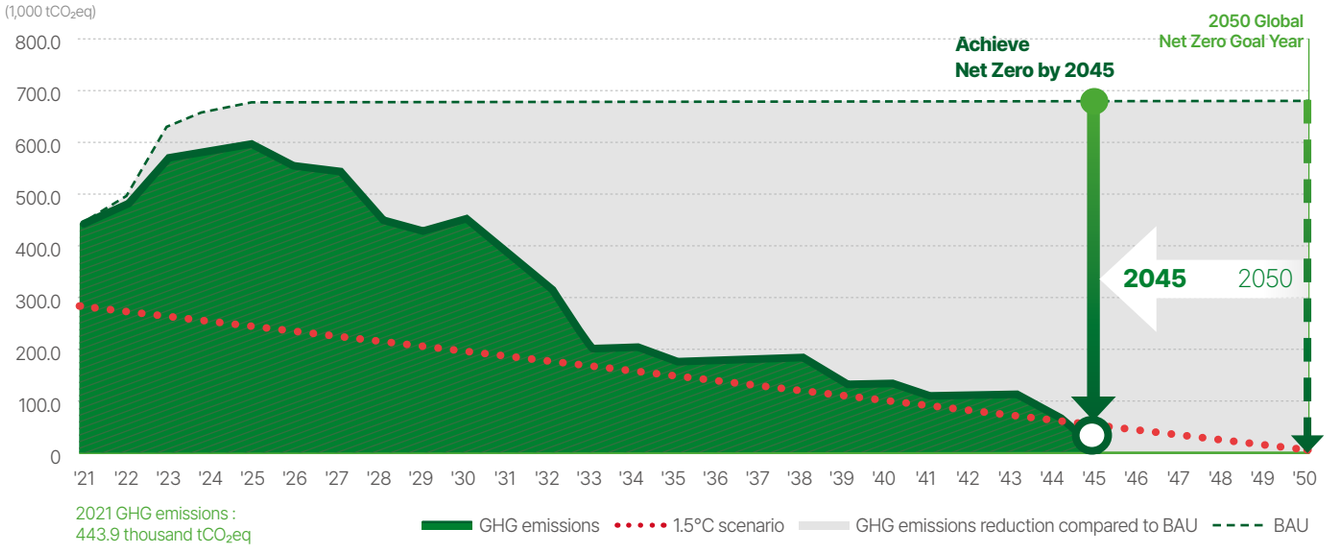
Most of the greenhouse gases generated by SK specialty are due to the use of electricity. SK specialty has been using the green premium system since 2021, and signed a large-scale photovoltaic PPA contract in 2022 to convert about 9% of electricity usage to renewable energy from 2024. Hereafter too, SK specialty will implement Net Zero · RE100 by securing various means.

Cumulative Amount of GHG Emissions Reduction by Implementation Means

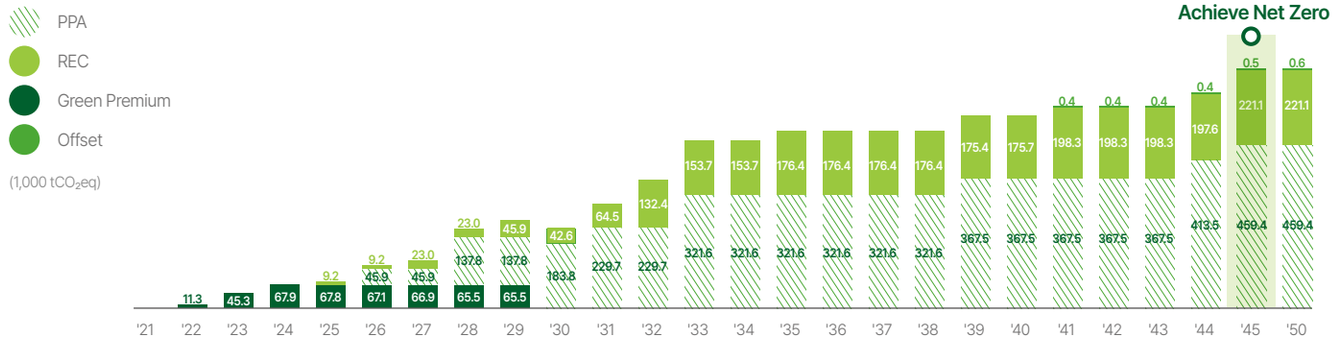
PPA	1,173.4 thousand tCO2eq
REC	271.9 thousand tCO2eq
Green Premium	147.7 thousand tCO2eq
Offset	142.4 thousand tCO2eq
Total	1,735.4 thousand tCO2eq

SK materials airplus

GHG Emissions Reduction Roadmap



GHG Emissions Reduction by Implementation Means



※ For the explanation on implementation means of GHG emissions reduction, please refer to the page 21 of this report.

Net Zero · RE100 Target: 2045

SK materials airplus produces industrial gases such as argon and nitrogen contained in the air using Air Separation Unit (ASU), and uses a large amount of electricity in the process. SK materials airplus will implement measures to reduce electricity consumption and achieve Net Zero · RE100 by 2045 by utilizing renewable energy.

Net Zero · RE100 Implementation Strategy

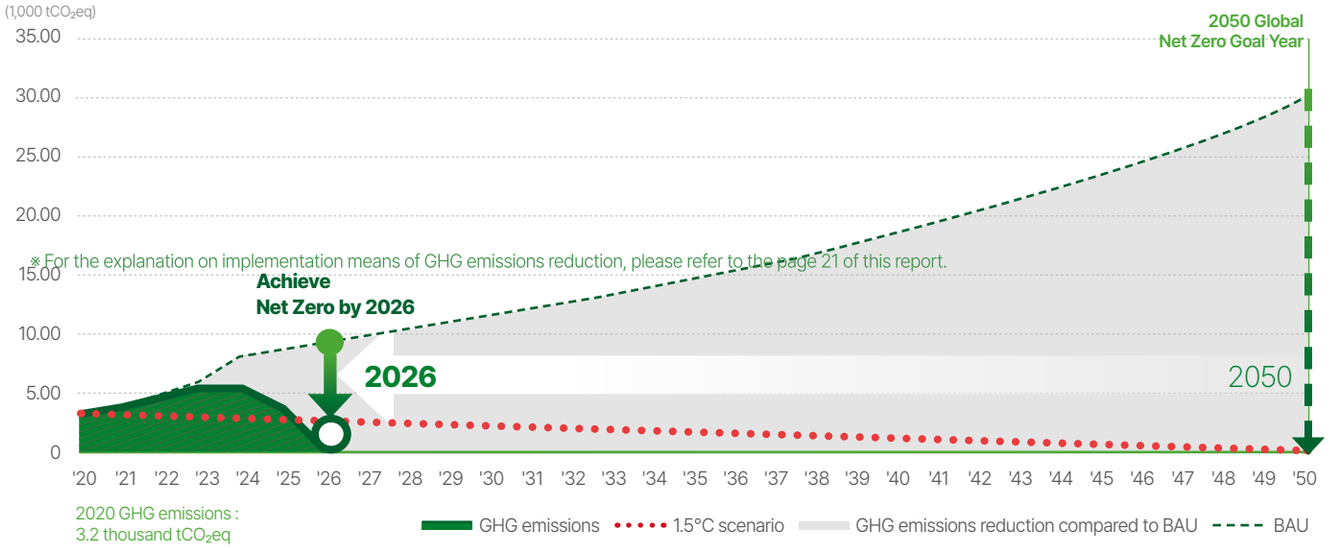
SK materials airplus has been purchasing green premium from 2022, and will sign a PPA after 2026 to increase the proportion of renewable energy use. SK materials airplus will implement Net Zero · RE100 by reducing electricity consumption by improving process efficiency, replacing obsolete equipment, and preparing a direct solar power generation plan using idle lands or the roofs of buildings.

Cumulative Amount of GHG Emissions Reduction by Implementation Means

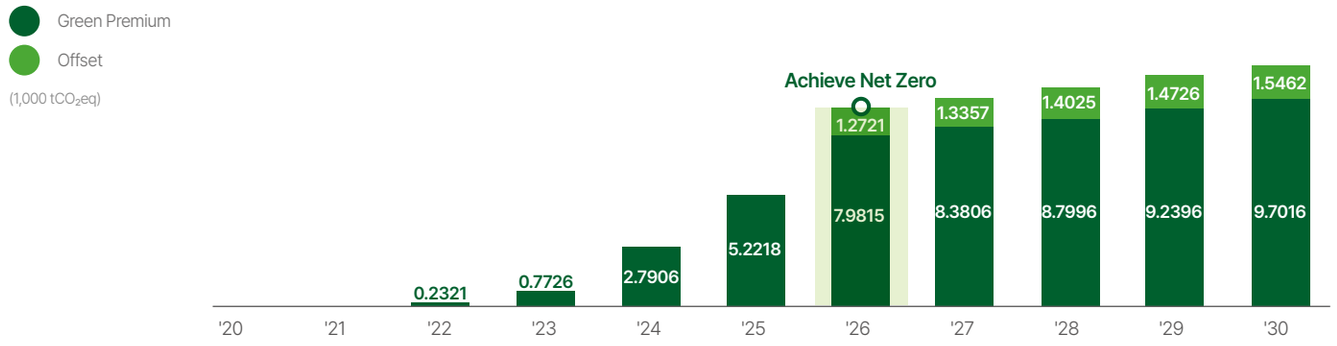
PPA	5,650.7 thousand tCO2eq
REC	2,727.6 thousand tCO2eq
Green Premium	457.0 thousand tCO2eq
Offset	2.1 thousand tCO2eq
Total	8,837.4 thousand tCO2eq

SK Tri Chem

GHG Emissions Reduction Roadmap



GHG Emissions Reduction by Implementation Means



※ For the explanation on implementation means of GHG emissions reduction, please refer to the page 21 of this report.

Net Zero · RE100 Target: 2026

SK Tri Chem is a company that produces core semiconductor materials. SK Tri Chem plans to supply low-carbon products to customers and is contributing to carbon neutrality in the value chain. SK Tri Chem will secure differentiated competitiveness by achieving Net Zero · RE100 by 2026.

Net Zero · RE100 Implementation Strategy

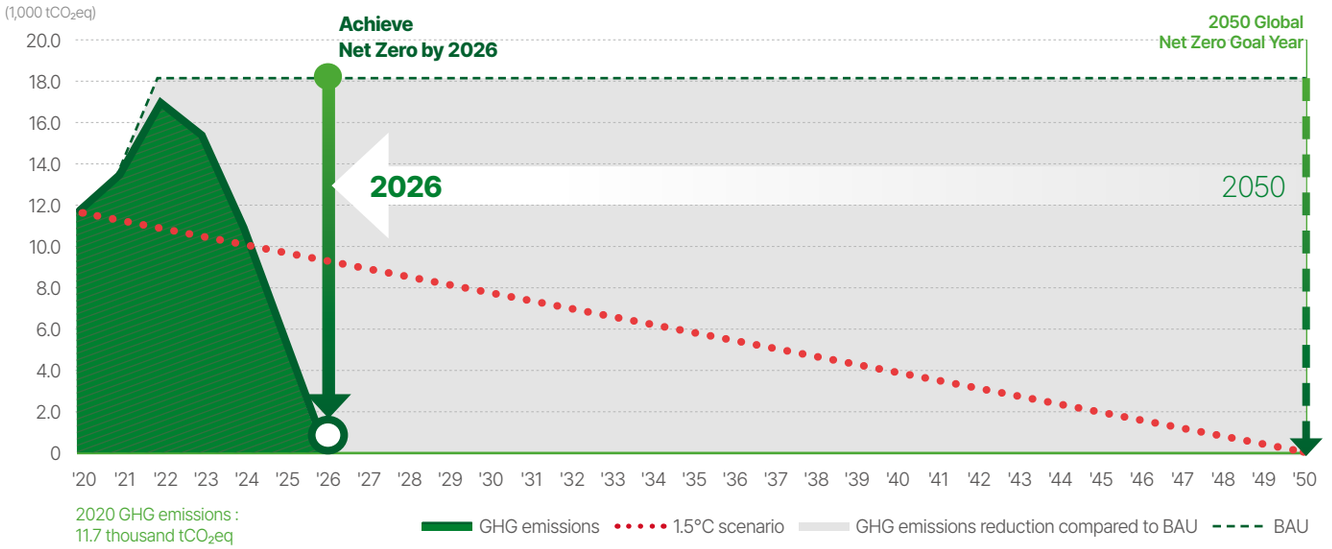
SK Tri Chem introduced the green premium system in 2022 to reduce the greenhouse gas emissions due to the use of electric power. By 2026, SK Tri Chem will convert all electricity to renewable energy using the green premium and PPA system, and achieve Net Zero · RE100 by offsetting carbon through voluntary carbon credit trading.

Cumulative Amount of GHG Emissions Reduction by Implementation Means

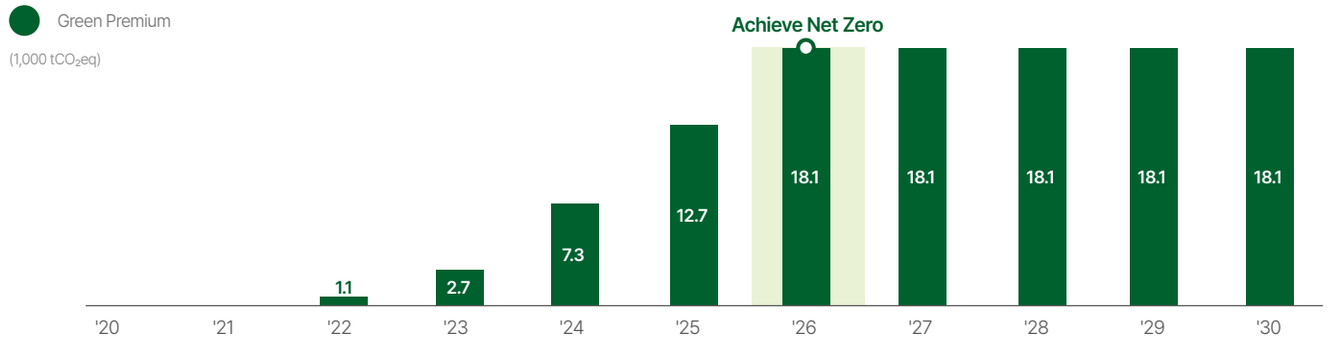
Green Premium	17.0	thousand tCO_2eq
Offset	1.3	thousand tCO_2eq
Total	18.3	thousand tCO_2eq

SK materials renewtech

GHG Emissions Reduction Roadmap



GHG Emissions Reduction by Implementation Means



※ For the explanation on implementation means of GHG emissions reduction, please refer to the page 21 of this report.

Net Zero · RE100 Target: 2026

SK materials renewtech is an eco-friendly company that recovers and recycles the CO_2 emitted from petrochemical processes. SK materials renewtech will establish a CO_2 circulation system that does not emit additional carbon and achieve Net Zero · RE100.

Net Zero · RE100 Implementation Strategy

SK materials renewtech has been using the green premium system since 2022, and will establish a long-term renewable energy supply system to achieve the Net Zero · RE100 target by 2026.

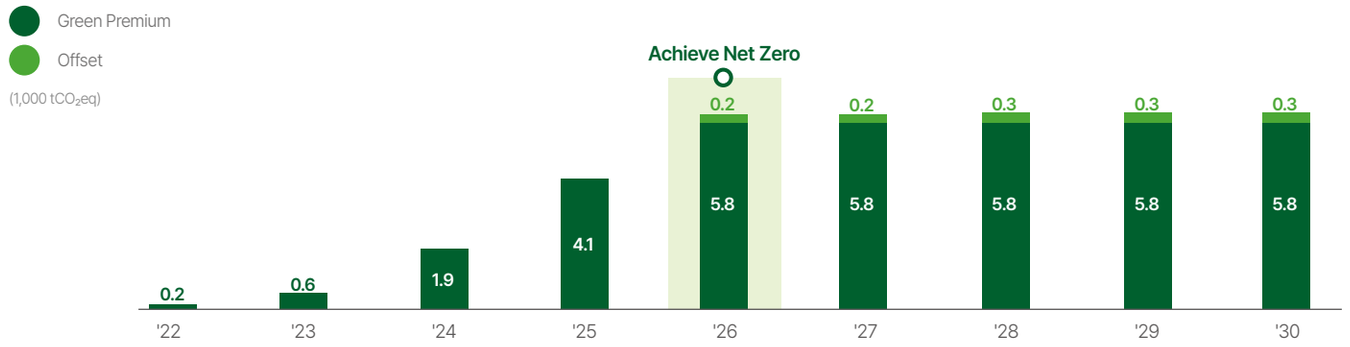
Cumulative Amount of GHG Emissions Reduction by Implementation Means

Green Premium	41.9 thousand tCO_2eq
Total	41.9 thousand tCO_2eq

SK materials performance

GHG Emissions Reduction Roadmap

GHG Emissions Reduction by Implementation Means



※ For the explanation on implementation means of GHG emissions reduction, please refer to the page 21 of this report.

Net Zero · RE100 Target: 2026

SK materials performance is a ICT Polymer comprehensive materials company. SK materials performance is actively responding to climate change by providing low-carbon solutions based on state-of-the-art R&D capabilities.

Net Zero · RE100 Implementation Strategy

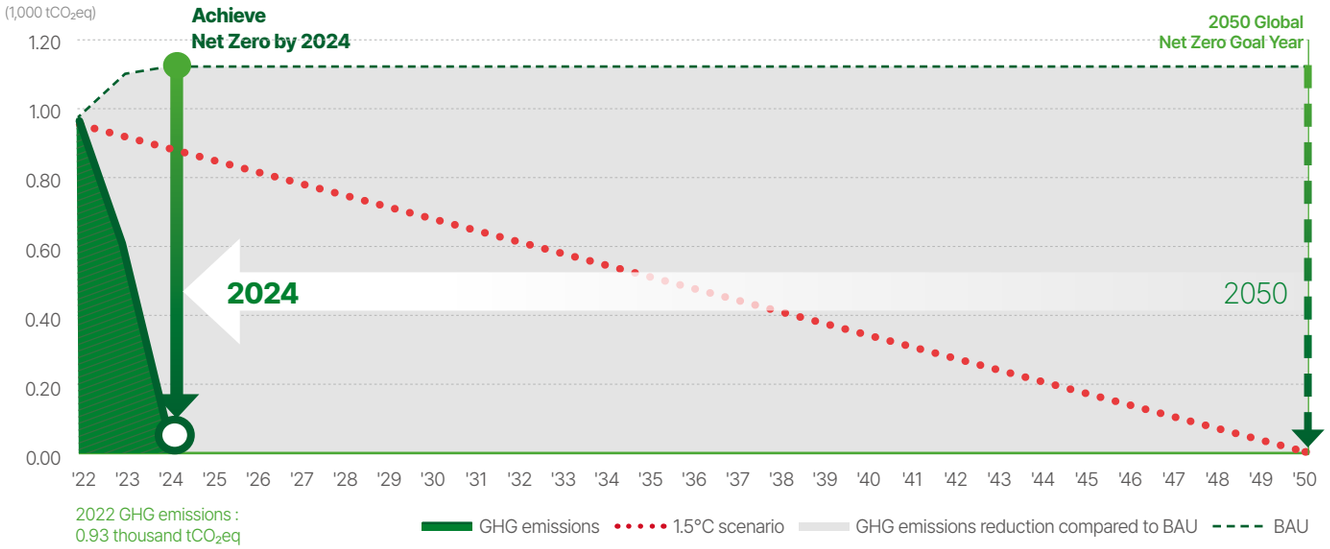
SK materials performance aims to achieve Net Zero · RE100 by 2026 by utilizing the green premium system introduced in 2022. From 2025, when greenhouse gas emissions are expected to increase, SK materials performance will seek ways to jointly secure renewable energy with other subsidiaries to secure long-term means of implementation.

Cumulative Amount of GHG Emissions Reduction by Implementation Means

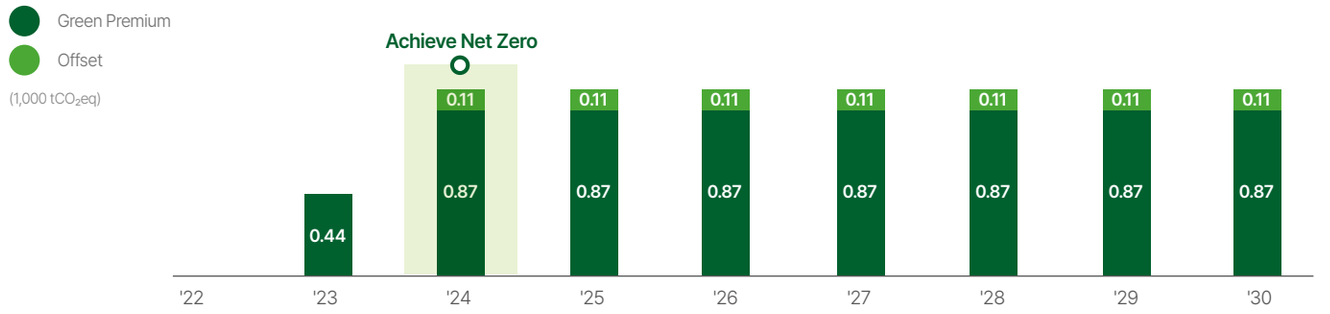
Green Premium	12.6 thousand tCO2eq
Offset	0.2 thousand tCO2eq
Total	12.8 thousand tCO2eq

SK materials JNC

GHG Emissions Reduction Roadmap



GHG Emissions Reduction by Implementation Means



※ For the explanation on implementation means of GHG emissions reduction, please refer to the page 21 of this report.

Net Zero · RE100 Target: 2024

SK materials JNC is a company that produces OLED light emitting layer materials. SK materials JNC will reduce the power consumption of display equipment through the development of low-power, high-performance OLED blue dopant, and reduce the carbon emitted during the manufacturing process to achieve Net Zero · RE100 by 2024.

Net Zero · RE100 Implementation Strategy

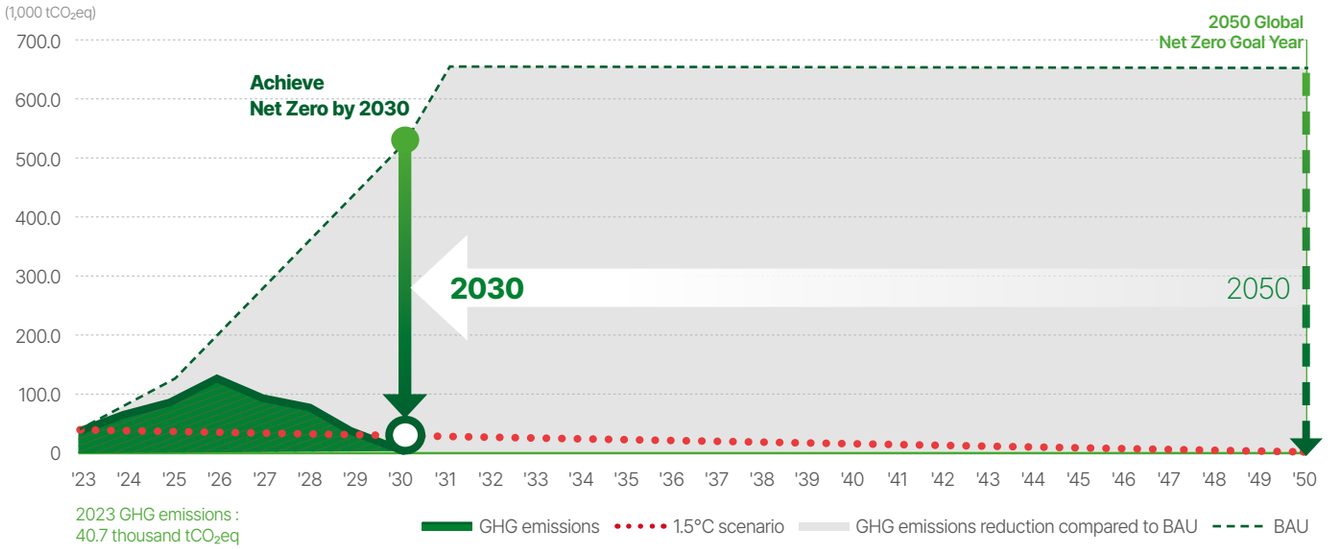
SK materials JNC has established a RE100 implementation plan centered on green premium due to its low energy consumption. Hereafter, SK materials JNC we will secure renewable energy jointly with other subsidiaries to switch the production system into a low-carbon production system.

Cumulative Amount of GHG Emissions Reduction by Implementation Means

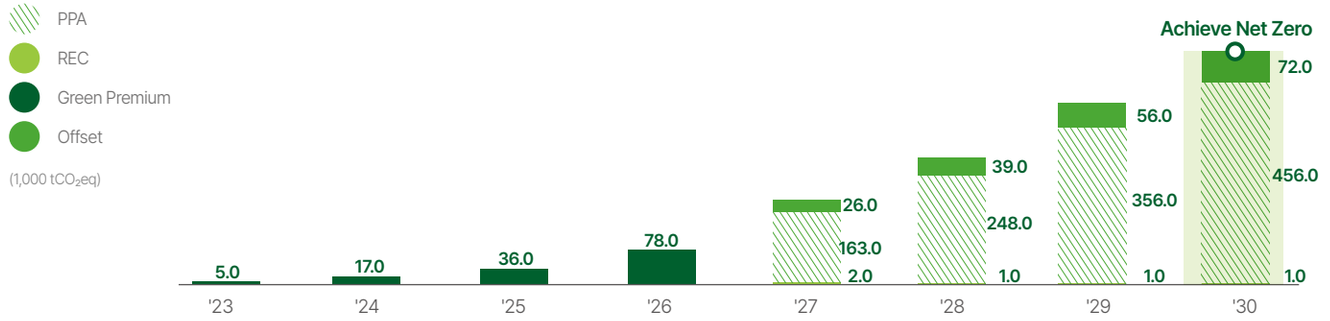
Green Premium	1.3 thousand tCO2eq
Offset	0.1 thousand tCO2eq
Total	1.4 thousand tCO2eq

SK materials Group14

GHG Emissions Reduction Roadmap



GHG Emissions Reduction by Implementation Means



※ SK materials Group14 is under construction of a production plant as of Nov. 2022, and GHG emissions are expected after the start of operation in 2023.
※ For the explanation on implementation means of GHG emissions reduction, please refer to the page 21 of this report.

Net Zero · RE100 Target: 2030

SK materials Group14 is a company specialized in battery materials, and is contributing to the spread of eco-friendly electric vehicles by developing high-efficiency and high-capacity anode materials. SK materials Group14 will achieve Net Zero · RE100 by 2030 by reducing greenhouse gases generated during the production of anode materials.

Net Zero · RE100 Implementation Strategy

SK materials Group14 will start producing next-generation anode materials for batteries from 2023. SK materials Group14 will achieve Net Zero · RE100 by utilizing the green premium system from 2023 to 2026 and introducing renewable energy through PPA as a main means of implementation from 2027.

Cumulative Amount of GHG Emissions Reduction by Implementation Means

PPA	1,223.0 thousand tCO2eq
REC	5.0 thousand tCO2eq
Green Premium	136.0 thousand tCO2eq
Offset	193.0 thousand tCO2eq
Total	1,557.0 thousand tCO2eq

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SK Inc. materials
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Climate Change Governance

Governance

"The roles of the Board of Directors (BOD) and the Management have been clarified, and the departments in charge of ESG by subsidiary have collaborated to establish a work performance system that can create synergy."

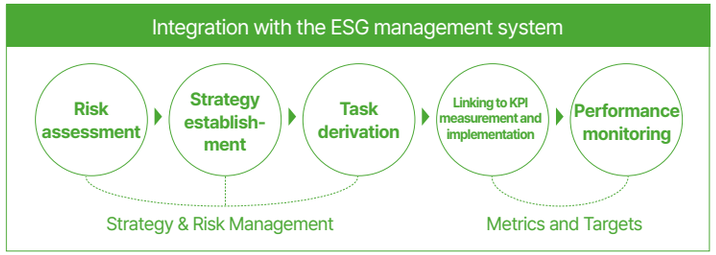
Roles of the Board of Directors and the Management

	Role	Major Action
Board of Directors	• Management and supervision of climate change issues • Recognition and control of climate change and overall business risks	• Review of important climate change issues reported regularly - e.g.: 『Net Zero · RE100 Declaration』, 『Direct PPA contract』, etc.
Manage-ment	• Climate change response • Major decision-making related to climate change	• Issue checking through climate change response organizations • Reflection of carbon reduction performance on the KPIs (in connection with incentives) • Securing Net Zero · RE100 implementation means (contract signing, facility investment, etc.)

Climate Change Response Process

SK Inc. materials evaluates climate change risks and identifies the levels of importance by item to derive detailed response strategies and tasks. The implementation of tasks is periodically monitored in connection with KPIs and managed in line with the ESG performance management system.

Climate Change Response Process

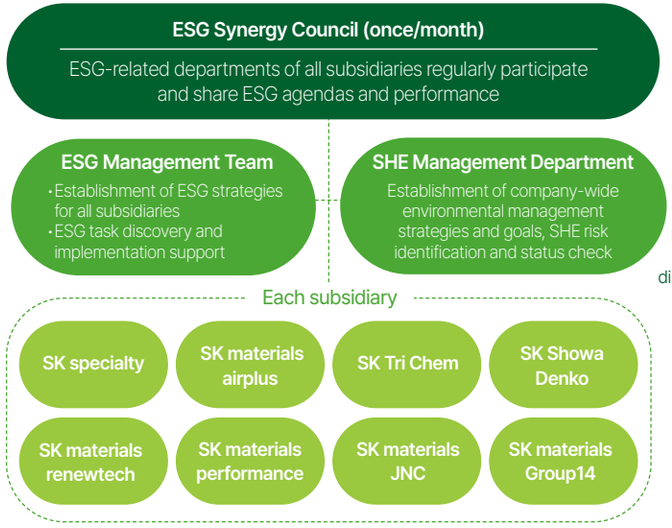


Climate Change Response Organization and System

In SK Inc. materials, ESG activities are mainly managed by the BOD and CEO of each subsidiary. The CEO executes each company's climate change response activities and makes major decisions, while the BOD manages and supervises climate change issues.

SK Inc. materials has established a system that enables subsidiaries to share information with each other, support capacity building, and grow together. The SHE Management Department and ESG Management Team establish the environmental and other ESG strategies of SK Inc. materials and manage climate change agendas and performance. ESG-related departments across the company regularly participate in the ESG Synergy Council to propose and discuss agendas, and the decisions made in the process are implemented according to the ESG management system of each subsidiary.

Climate Change Agenda and Performance Management System - SK Inc. materials



Reflect the discussion

Climate Change Agenda and Performance Management System – Each Subsidiary

Board of Directors	• Regular review of agendas • Management and supervision of climate change issues
CEO	• Establishment of climate response strategy • Comprehensive decision-making related to climate change
Depart-ments in charge of ESG	• ESG strategy establishment and performance management • Regular reporting of climate change agendas to the management and the BOD
Relevant Depart-ments	• Implementation of climate change tasks, designing tasks from a business perspective, etc.

Establishment of Climate Change Response Strategies and Indicators

"SK Inc. materials analyzed the financial impact of climate change by identifying and evaluating major risks and opportunities based on climate change scenarios. Based on the analysis results, SK Inc. materials establishes response strategies and draws customized management indicators by item to monitor the performance."

Response Strategies Based On Major Climate Change Risks and Opportunities

Category		Risk · Opportunity	Period	Financial Impact	Response Strategy	Management Indicators
Transition Risk	Current regulation	Reinforcement of GHG emission regulations	Long-term	• Increase in the cost of purchasing carbon credits due to reduction in the GHG quota and increase in the proportion of paid quotas	• Monitoring and responding to current regulations through external advice • Calculation of expected excess/deficiency by year and reflection on annual budget plans • Establishment of integrated carbon credit management system among subsidiaries of SK Inc. materials	Achievement of Net Zero · RE100 by 2030
	Market	Increase in demand for use of renewable energy by stakeholders such as customers	Long-term	• Increase in operating costs due to the purchase of renewable energy	• Declaration to achieve Net Zero · RE100 by 2030	
	Technology	Transition to low-carbon technology	Long-term	• Increase in R&D and investment costs • Increase in revenue through new product development and productivity improvement	• Technical cooperation with partners (Showa Denko, JNC, etc.) • Recruiting of R&D specialists • Implementing demonstration project after transferring CO_2 capture technology	Expansion of carbon footprint certification (measurement & reduction)
	Reputation	Increase in stakeholders' concerns or negative views	Mid-term	• Negative impact on corporate value and reputation due to passive responses to climate change or insufficient information disclosure	• Declaration to achieve Net Zero · RE100 by 2030 • Publication of Sustainability Report • CDP response (Climate Change, Water Security) and TCFD information disclosure • Publication of Net Zero Report	Transparent information disclosure through CDP response
Physical Risk	Acute	Increase in damage due to abnormal weather events such as typhoons and floods	Mid-term	• Loss of sales during the recovery period due to production disruption caused by increased frequency and intensity of extreme abnormal weather events such as typhoons, floods, and wildfires	• Proceduralization and internalization of Business continuity plan (BCP) • Operation of inspection organizations such as the SHE Inspection TF, computerized management of inspection results and corrective actions • Diversification of risk through buying fire insurance, etc.	Achievement of 100% wastewater recycling by 2030
Opportunity	Market	Advance into next-generation silicon anode materials	Long-term	• Investment to advance into the battery material business (Equity investment in technology companies, establishment of joint ventures, etc.)	• Invested in the equity of U.S. battery materials company Group 14 Technologies and established a joint venture 'SK materials Group14' • SK specialty's expansion investment in SiH_4, a silicon anode material	-

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Climate Change Response Activities

Net Zero · RE100 Implementation Strategy

"SK Inc. materials aims to achieve Net Zero · RE100 with direct reduction through the development of NF_3 recovery and disposal systems in addition to the current strategy to secure renewable energy and carbon offset."

Future strategy

Current strategy

Renewable energy

Expected cumulative reduction by 2030;

4,328,000 tons

92.6%

Secure renewable energy using green premium, REC purchase, and PPA

Offset

Expected cumulative reduction by 2030;

345,000 tons

7.4%

Offset using voluntary carbon credits

+

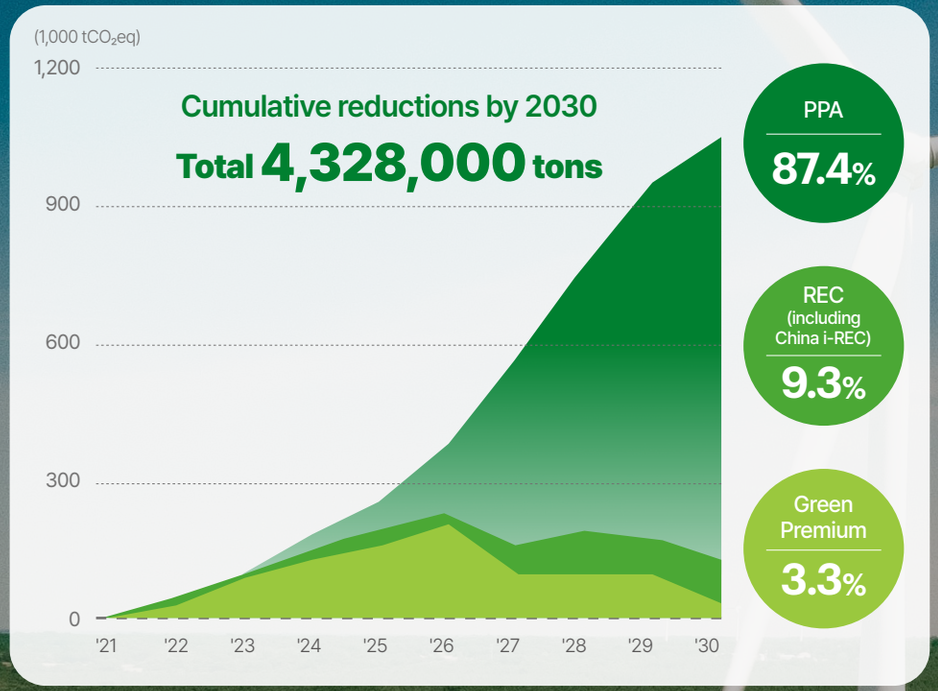
Direct reduction

NF_3 Recovery and Disposal System

Expand the Renewable Energy Use

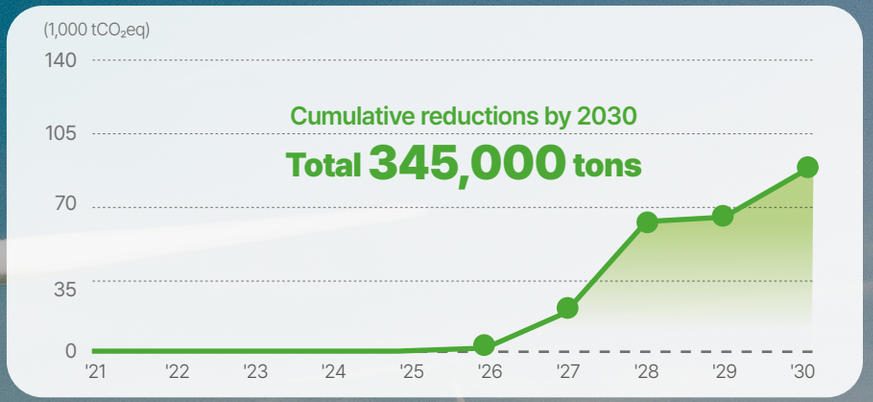
At least 93% of the greenhouse gas emissions generated by SK Inc. materials are generated due to the use of electricity. Therefore, in order to achieve Net Zero · RE100, it is important to optimize facility efficiency and develop low-power products to minimize power consumption and convert the power used into renewable energy. SK Inc. materials has been securing renewable energy using the green premium system from 2021 after the declaration of Net Zero · RE100, and plans to expand the use of renewable energy through PPA from 2024. Through the foregoing, it is expected that a total of 4,328,000 tCO_2eq of greenhouse gases emissions can be reduced by 2030.

PPA-centered Conversion Plan to Renewable Energy



Offset

SK Inc. materials intends to utilize carbon credits to offset those greenhouse gases emissions that cannot be reduced by the use of renewable energy or direct reduction methods. SK Inc. materials has secured a total of 100,000 tons of voluntary emission reduction through the Reducing Emissions from Deforestation and forest Degradation Plus (REDD+) project, and plans to secure additional emission reduction by getting the carbon reduction effect of eco-friendly products and services certified.



Glossary of Terms

PPA (Power Purchase Agreement)	A system in which electricity users (company) can purchase renewable energy electricity from renewable energy generators.
REC (Renewable Energy Certificate)	When a company or institution purchased REC sold by a power generation company, the company or institution is considered to have purchased 1 MWh of renewable energy per 1 REC.
Green Premium	A system in which electricity users who consume renewable energy electricity and wish to get it certified voluntarily agree to a payment amount and purchase the renewable energy electricity by adding a separate premium to the existing electricity rate.
Offset	A system in which the greenhouse gas emission reduction certified by an external business is used for the achievement of the company's greenhouse gas reduction targets.

Direct reduction

NF_3 Recovery and Disposal

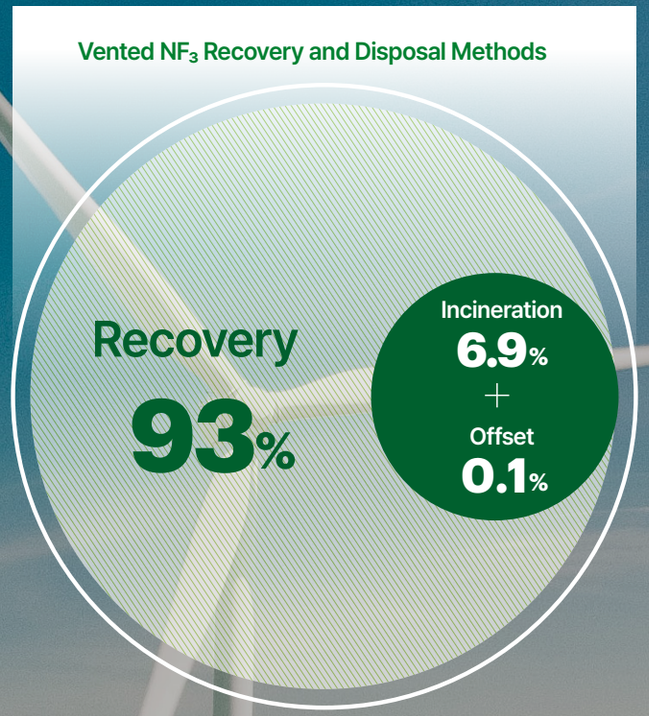
SK specialty manufactures NF_3, which is used as a cleaning gas in semiconductor and display processes. Although NF_3 is not included in the targets of greenhouse gas regulation under the domestic law, it is classified as one of the seven major greenhouse gases internationally, and in fact, its GWP* reaches 17,400 (AR6, 6th Assessment Report. IPCC). It is difficult to accurately measure the amount of NF_3 vented because there is currently no standard or method for measuring vented NF_3.

However, SK specialty recognizes that the greenhouse gas problem caused by NF_3 vented is also a task that must be solved without fail, and is promoting the development of a recovery · disposal system to directly reduce NF_3.

First, it was confirmed through lab tests that 99.9% of the NF_3 vented can be removed by recovering 93% of the NF_3 that is vented and incinerating the rest, and commercialization tests to apply the foregoing to production facilities are in progress. When the technology development is completed, the recovery · disposal system will be installed sequentially at SK specialty's Yeongju plant in South Korea and Zhenjiang plant in China to reduce greenhouse gas emissions.

***GWP (Global Warming Potential)**
This is numerical values indicating the degrees of contribution by each greenhouse gas to global warming and is expressed based on carbon dioxide. This is measured as the ratio of the infrared absorption capacity (heating effect) caused by 1 kg of greenhouse gas over a period of time (usually 100 years) to the effect of 1 kg of carbon dioxide.

Vented NF_3 Recovery and Disposal Methods



Process Efficiency Improvement

SK Inc. materials is reducing energy consumption every year by implementing process efficiency improvement projects based on the ideas and suggestions of its members. In 2021, a total of 1,504 tCO_2eq of greenhouse gas emissions was reduced by reducing utility usage in major specialty gas production processes and increasing energy efficiency by improving facility performance and changing operating conditions. In 2022, a total of 36 process efficiency improvement tasks such as production efficiency improvement, operation optimization, and facility improvement are being reviewed and carried out.

Results of Process Efficiency Improvement in 2021

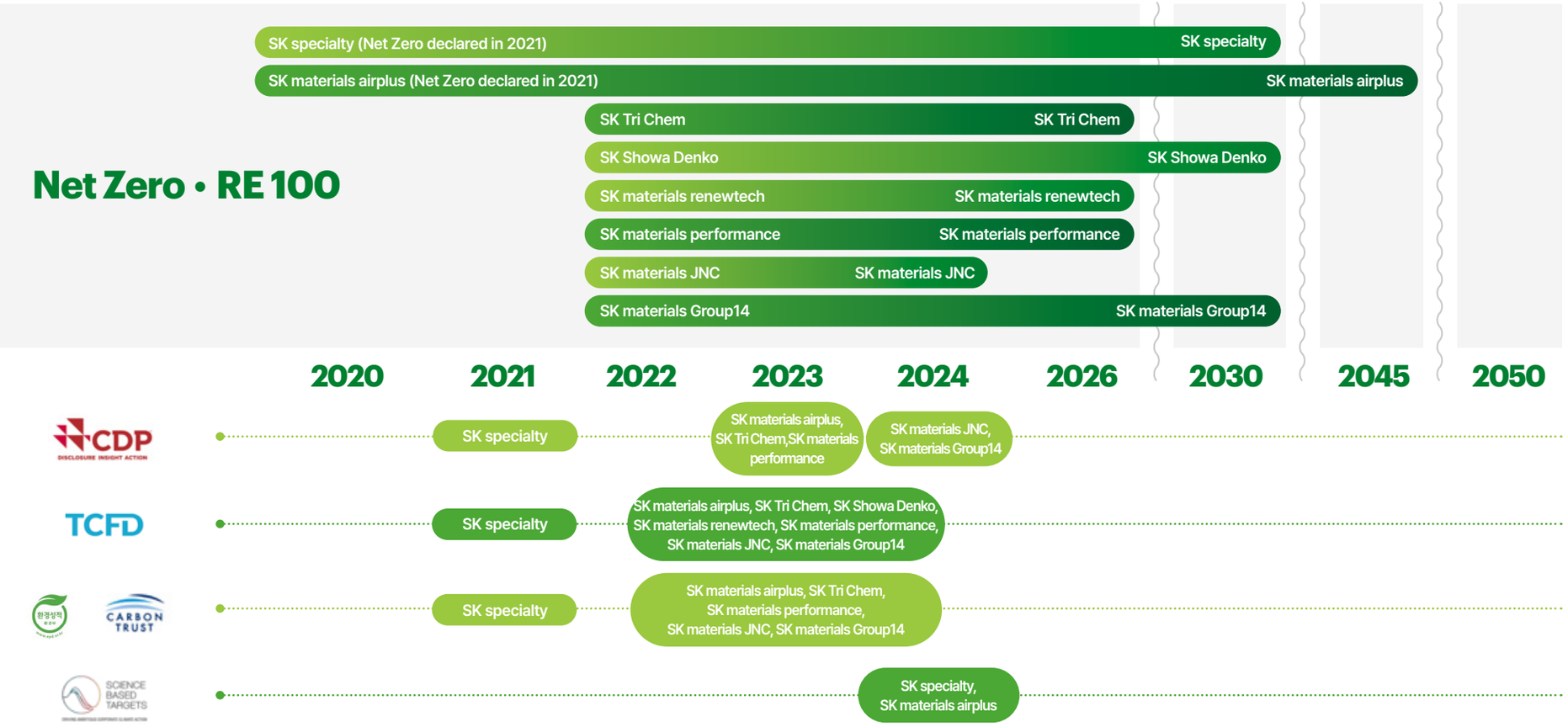
	Savings	Emissions Reduction
Electric power	3,234,013 KWh	1,486 tCO_2eq
LNG	7,966 Nm^3	18 tCO_2eq
Total	-	1,504 tCO_2eq

Climate Change Response Activities

"SK Inc. materials is taking the lead in responding to global climate change by voluntarily participating in global initiatives."

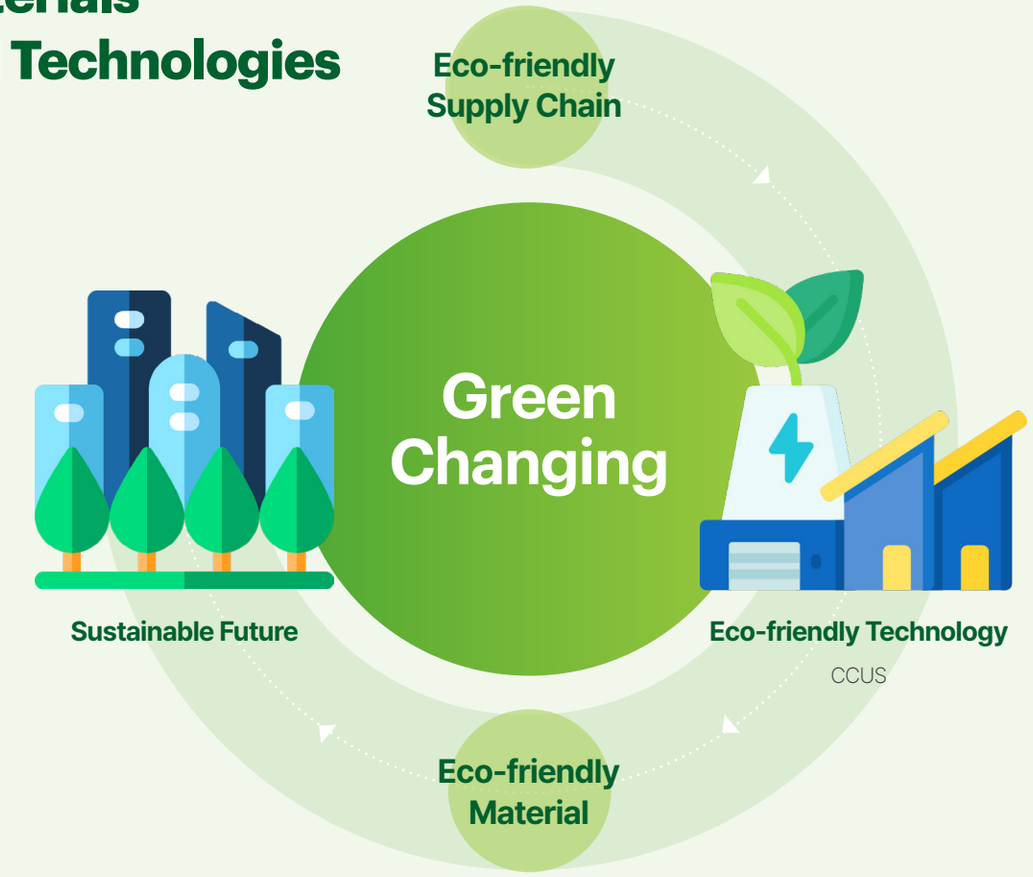
All subsidiaries of SK Inc. materials have declared to achieve both Net Zero and RE100 simultaneously. SK specialty joined the Global RE100 Initiative and reports its annual usage of renewable energy, and other subsidiaries have voluntarily participated in the RE100.
SK Inc. materials responds to the CDP (Carbon Disclosure Project) evaluation and publishes reports that meet international standards such as TCFD (Task Force on Climate-related Financial Disclosure) to transparently disclose the implementation process and outcome of Net Zero·RE100. In addition, SK Inc. materials plans to join the SBTi (Science-Based Target Initiative) to scientifically set short- and mid- to long-term greenhouse gas reduction targets of the company and implement climate change reduction strategies.

Net Zero • RE 100



Eco-friendly Materials and Technologies

Climate Change Risk Management
Support for Strengthening
Environmental Capabilities



NF_3 Substitute Material
Low GWP Specialty Fluid
Next-Generation Anode Material for Batteries
OLED Blue Dopant

Development of Eco-friendly Materials

As the severity of the climate crisis has come to the fore, companies demanding carbon neutrality of the entire supply chain are increasing, and major developed countries are actively introducing carbon border taxes and a Directive on Corporate Sustainability Due Diligence. The low-carbon material market continues to expand as the climate crisis response measures become a sort of trade barrier to domestic and foreign companies. Accordingly, SK Inc. materials is actively developing various eco-friendly materials, recognizing that preemptively securing low-carbon material technology is an essential requirement for enhancement of the company's competitiveness and sustainable growth of the company.

Development of Eco-friendly Technologies

SK Inc. materials is striving to secure CCUS technology. CCUS technology is expected to play an important role as a bridge to fill the technological gap until carbon neutrality is reached by minimizing carbon emissions from businesses that use fossil fuels.

- NF_3 Substitute Material
- Low GWP Specialty Fluid
- Next-Generation Anode Materials for Batteries
- OLED Blue Dopant
- CCUS

Eco-friendly Materials and Technologies

NF_3 Substitute Material

"SK Inc. materials has completed the development of an original technology for NF_3 substitute gas with low GWP."

NF_3 (nitrogen trifluoride) is used as a cleaning gas to remove residues in semiconductor and display manufacturing processes. Although greenhouse gas reduction effects were obtained when the existing product, SF6 (GWP 23,500), was substituted by NF_3, the needs for new materials have increased as the GWP of NF_3 amounts to 17,400. Therefore, SK Inc. materials conducted joint research with the Korea Research Institute of Chemical Technology, the National NanoFab Center, and Kwangwoon University from 2017 to 2020 to develop F_3NO that has the same level of etching and cleaning efficiency as NF_3 while having a very low GWP. According to the result of measurement by the Korea Testing and Research Institute (KTR), the GWP of F_3NO is 20-30, which is much lower than that of NF_3, lower than 1/100. If SK Inc. materials, which accounts for more than 40% of the world's NF_3 production, supplies a substitute cleaning gas with a low GWP, greenhouse effects can be reduced considerably.

The development of the NF_3 substitute material is an eco-friendly technology that can turn a crisis caused by climate change into an opportunity, and is a practical alternative that can fundamentally solve the greenhouse gas problem caused by NF_3.

SK specialty R&D Department **Junghun Kwak**, Team Leader

Low GWP Specialty Fluid

"SK Inc. materials is expanding its eco-friendly material portfolio by developing low GWP specialty fluids based on electrolysis technology."

Since 2020, SK Inc. materials has conducted research and development of specialty fluid for semiconductor equipment with insulating properties through joint research with the Korea Research Institute of Chemical Technology. Through the accumulated electrolysis technology of SK Inc. materials and the fluorine compound synthesis and refining technology of the Korea Research Institute of Chemical Technology, SK Inc. materials secured the same level of quality as overseas proprietary products in a short period of time. SK Inc. materials plans to start developing low GWP eco-friendly dielectric fluids from 2023, and expand the scope of application to immersion cooling fluids for data centers in semiconductor, EV battery, and ICT industries. SK Inc. materials will develop a high value-added specialty fluid series based on AHF (anhydrous hydrogen fluoride) through its differentiated technology to secure new growth engines and expand its eco-friendly material portfolio.

SK Inc. materials is striving for research on Specialty Fluid series products such as the development of fluorine-based dielectric fluids and the development of low GWP eco-friendly dielectric fluids. This will contribute to strengthening the competitiveness of the future electric vehicle and ICT industries in addition to the semiconductor industry.

SK Inc. materials **Junghun Kwak**, Team Leader

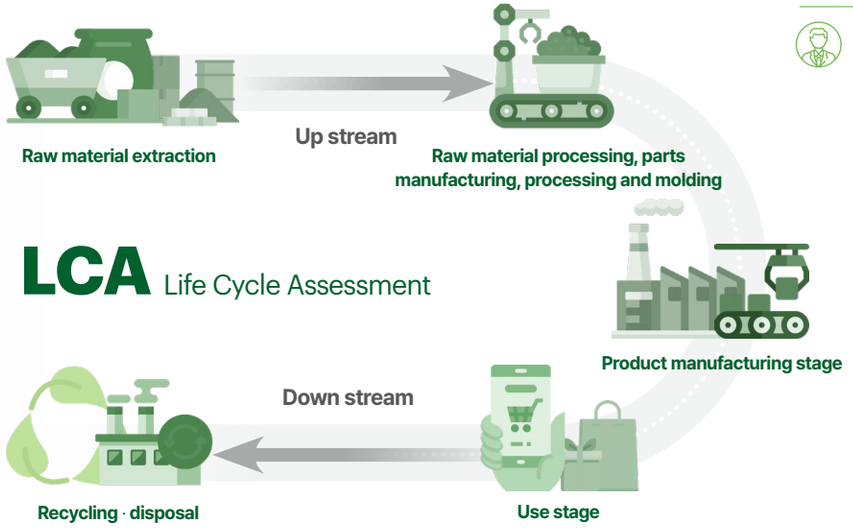
Eco-friendly Materials and Technologies

Next-Generation Anode Materials for Batteries

"SK materials Group14 is contributing to the dissemination of eco-friendly electric vehicles by producing high-efficiency and high-capacity anode materials for electric vehicle batteries."

SK materials Group14 possesses the technology to produce battery anode materials, a major material for electric vehicle batteries. SK materials Group14's silicon anode material can significantly improve battery performance because its electric capacity is at least five times larger compared to conventional graphite. The improvement in battery performance will lead to the increase of electric vehicle supply, and will have a great effect on reducing carbon emissions caused by driving fossil fuel vehicles. By 2030, approximately 2.14 million electric vehicles equipped with SK Materials' Group Fourteen's silicon anode material will be supplied so that greenhouse gas emissions can be reduced by 201,825 tCO_2eq per year.

In 2024, disclosure of the carbon footprint of all batteries placed on the EU market will become mandatory. SK materials Group14 seeks to establish an improvement system by quantitatively evaluating the environmental impact of anode materials in the products' entire life cycle ranging from the raw materials extraction for anode materials to manufacturing, use, disposal, and transportation, and identifying vulnerable elements.

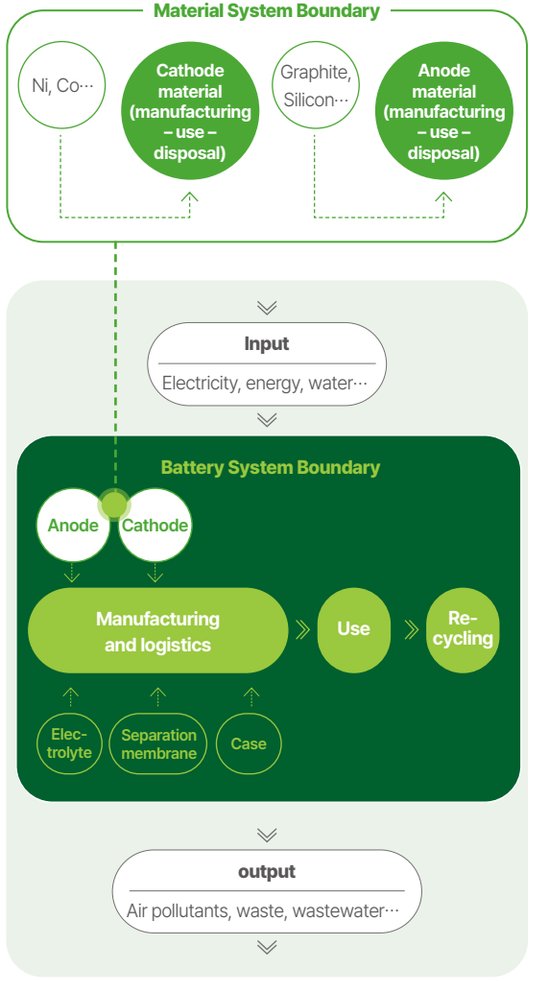


Silicon anode materials will play a pivotal role in leading the growth of our company, and will be positioned as core materials that will lead the expansion of the electric vehicle market, which is an eco-friendly mobility, hereafter.

SK materials Group14 **Sung-mo Kim** Project Leader

***LCA**

A tool to 1) quantify resource inputs and environmental outputs, and 2) systematically evaluate their potential impact on the environment during the entire life cycle of a product



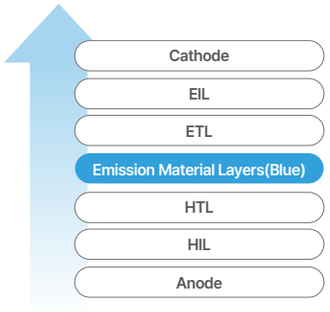
Eco-friendly Materials and Technologies

OLED Blue Dopant

"SK materials JNC will produce OLED blue dopant with low optical loss to reduce display power consumption and contribute to carbon neutrality."

SK materials JNC is developing and producing 'blue dopant', which is the most important and difficult to produce among the materials of emission material layers of OLED. SK materials JNC 's blue dopant makes it easier to control the light emission wavelengths compared to existing materials, and has narrower light emission spectrums so that light can be extracted with low optical loss. That is, the efficiency of luminous energy can be improved so that the power consumption of displays can be reduced. Given the growth rate of the OLED market, it will be possible to reduce about 10,000 tons of greenhouse gas emissions per year by 2030.

Development and production of 'blue dopant', the most important material among OLED emission material layer materials.



By improving the efficiency, color purity, and lifespan of blue light-emitting materials, which were technical challenges for next-generation OLED displays, SK materials JNC has accelerated the change from the existing LCD to the OLED industry.

SK materials JNC Device Evaluation TS Team **Kang Min-soo** Team Leader
SK materials JNC Device TS Team **Yang Yoo-seok** Team Leader

WF_6

"SK Inc. materials is reducing the carbon footprint of its products by continuously improving process efficiency."

WF_6 (tungsten hexafluoride) is used in the metallization process for semiconductors. Through a chemical reaction, fluorine (F) is removed and tungsten (W) is deposited on the wafer to form a wiring. The metallization process, which is the last stage in semiconductor manufacturing, is a very important process in the semiconductor production as it has a huge impact on the yield and quality of semiconductors.

WF_6, produced by SK Inc. materials, was the first in the industrial gas industry to acquire carbon footprint 'measurement' and 'reduction' certifications simultaneously from the British Carbon Trust in January 2022. SK Inc. materials reduced energy consumption in the WF_6 production process by increasing process efficiency, and as a result, SK Inc. materials was recognized for its performance by reducing carbon emissions by about 5% in 2021 compared to 2020.

Eco-friendly Materials and Technologies

CCUS

"SK Inc. materials is actively investing in and cooperating with technology to expand its CCUS technology platform."

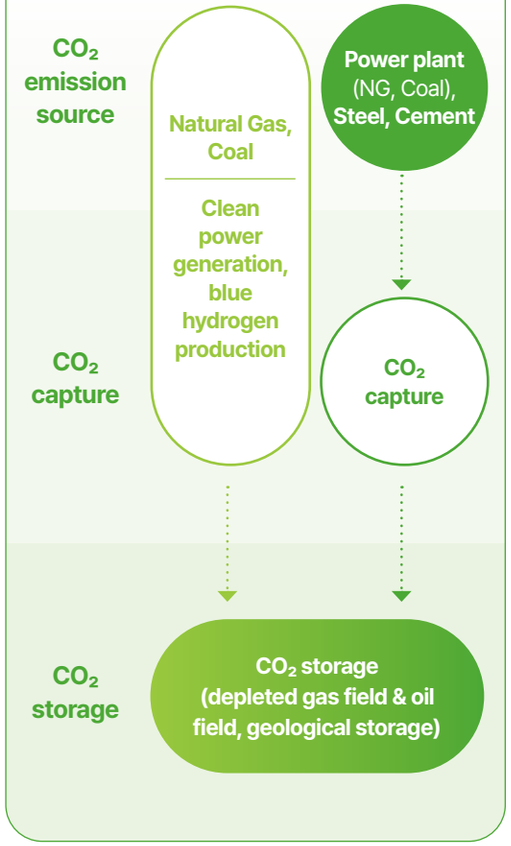
SK Inc. materials will add on CCUS (Carbon Capture, Utilization, and Storage) technologies to existing know-how and competency in industrial gas plant operation and CO_2 capture and purification processes, ultimately to create commercial projects with environmental values.

SK Inc. materials has secured a clean power technology in which supercritical CO_2 power generation process captures CO_2 without any separate facility. This technology enables the clean electricity, with higher power generation efficiency at a relatively low cost. In addition, SK Inc. materials can produce hydrogen by capturing up to 99% of CO_2 with its blue hydrogen manufacturing technology that cools and separates CO_2 at low temperatures, making the technology more efficient and economically sound.

SK Inc. materials also secured a next-generation technology in the post-combustion CO_2 capture for industrial application such as natural gas/coal-fired power plants, steel or cement production facilities. Compared to the existing CO_2 capture technology, its absorber and stripper kinetics are much faster, and operation is less energy intensive, making CO_2 capture efficiency beyond 95% economically sensible.

SK Inc. materials is confident to provide unparalleled carbon reduction solutions to customers, leveraging its evolving technology portfolios and R&D efforts. The CCUS core technologies at SK Inc. materials will ultimately advance our footsteps towards Net Zero goal.

Business using CCUS technology



Eco-friendly Supply Chain Management

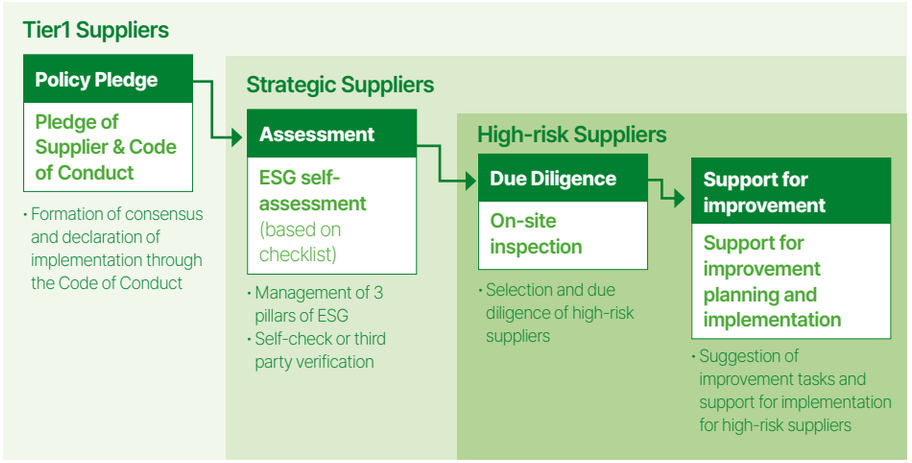
Supplier Management and Support

"SK Inc. materials is improving the level of ESG management of its suppliers through the operation of the Mutual Growth Council."

SK Inc. materials has been operating the Mutual Growth Council since 2020 to improve the long-term competitiveness of suppliers. To help suppliers internalize their ESG capabilities, SK Inc. materials operates workshops and seminars on the topics of responding to climate change, water resource efficiency improvement, and energy saving, and provides consulting on the greenhouse gas emissions reduction items.

In addition, SK Inc. materials is operating an ESG risk management system that evaluates and manages overall ESG areas such as environment, social, and governance. SK Inc. materials conducts ESG risk assessments for strategic suppliers and provides customized management and support to high-risk suppliers.

ESG Risk Management Process for Suppliers



ECO Alliance Activities

"SK Inc. materials contributes to the establishment of an eco-friendly semi-conductor ecosystem by joining the 'ECO Alliance*' consisting of SK hynix and 44 semiconductor-related companies."

In November 2022, SK Inc. materials declared the use of renewable energy together with 17 members of the ECO Alliance to state its will to reduce carbon emissions in the semiconductor supply chain. SK Inc. materials will continue to support the transition of the semiconductor supply chain to low-carbon systems and fulfill its corporate social responsibility by preparing the capability to respond to environmental initiatives, establishing carbon emission reduction plans, and sharing its experience in securing implementation means with other members.

*ECO Alliance is a federation of semiconductor-related companies to build an eco-friendly semiconductor ecosystem.

Provision of Customized Eco-friendly Solutions

"SK Inc. materials enhances customer value through eco-friendly solutions."

SK Inc. materials is securing differentiated competitiveness by identifying customer needs and pain points and providing customized core technologies that can solve the foregoing to customers. Based on the achievement of Net Zero · RE100, development of eco-friendly materials, low-carbon and eco-friendly technology platform in the field of ESG, and the capability to develop materials, SK Inc. materials will continuously expand its EV (economic value) and SV (social value) to build solid trust relationships with customers.

Providing Customized Solutions

Member Awareness Raising Activities

"SK Inc. materials is operating awareness-raising campaigns and life practice programs so that its members can recognize the importance of responding to climate change and lead an eco-friendliness in their daily life."

Promoting Member Engagement Activities

SK Inc. materials has been continuously conducting awareness-raising activities to ensure that each member recognizes the seriousness of climate change and voluntarily continues activities to create social values.
In addition, SK Inc. materials periodically publishes ESG Letters to share various climate change response activities such as reducing disposable product consumptions and saving water that can be practiced by individuals. The Haenggarae points are reserved when the members participate in the ESG Letter Quiz in order to increase their participation and raise understanding.
Also, SK Inc. materials implemented eco-friendly practice campaigns such as 'save the community and save the environment' for improving the mindset of the members so that they are encouraged to contribute together to the creation of social values and solving social problems.

Cost Reduction and Energy Saving Idea Contest

SK Inc. materials has been conducting the 'Cost Reduction & Energy Saving Idea Contest' since April 2022 so that each member can contribute to climate change response by changing their workspace and work manner. A reward system has been prepared so that members can actively participate and propose creative ideas, and the adopted ideas were utilized in the business, which led to the creation of tangible and intangible effects.

Haenggarae Program

In October 2020, SK Inc. materials and its subsidiaries launched the Haenggarae app that enables the members to practice creating social values and accumulate points. In 2021, 80% of the members of SK Inc. materials joined the platform, and a total of 11.17 million Haenggarae points were issued. Through the use of stairs, zero leftover, healthy walking, and the use of commuter bus, CO_2 emissions were reduced by 73 tons and social value of about 7.59 million won was created. In 2022, ESG management strategies are linked with Haenggarae program, and the action items were expanded as tools to encourage eco-friendly activities in daily life and create social value.

Taking the Lead for Green Company

SK Inc. materials Net Zero Report

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