



# SK HYNIX SUSTAINABILITY REPORT 2022

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# Introduction

An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

**Regina Kim** | The World I Show You

A father and his child are holding hands as they gaze at nature that has been preserved. The message here is that we must move in the direction of conserving nature before it is destroyed and before animal and plant species are lost to extinction. At the same time, we must convey the importance and greatness of nature to the next generation.





## About this report

### Overview

SK hynix performs a variety of activities across the economic, social and environmental sectors, and has published a sustainability report every year since 2008 to transparently provide relevant information to stakeholders. In the process of publishing the report, we selected material issues by conducting a materiality assessment and interviews with stakeholders to collect their opinions. This sustainability report comprehensively outlines the ESG efforts and achievements of SK hynix.

### Reporting period

The reporting period is from January 1, 2021 to December 31, 2021, and for significant performances outside the reporting period, activities in the first half of 2022 are also included in this report. For quantitative performance, four years of data from 2018 to 2021 are provided for trend analysis.

### Reporting boundaries

This report covers our ESG activities and performances at all business sites in Korea (Icheon, Cheongju, Bundang) and manufacturing sites in China (Wuxi, Chongqing). In relation to the manufacturing sites in Wuxi and Chongqing, China, only partial information is provided, and the reporting boundary of each data is specified.

### Reporting standards

This report adheres to the Global Reporting Initiative (GRI) Standards: Core option, which are the global standards for sustainability reporting. It also aligns with ISO 26000, the UN Global Compact principles, SASB and TCFD recommendations. Financial information is on a consolidated basis, and follows the reporting standards and definitions of K-IFRS. Financial as well as non-financial information were prepared based on the fiscal year according to our disclosure system, and energy use-related data and greenhouse gas emissions were prepared in accordance with the emission verification results. Any significant changes are indicated separately.

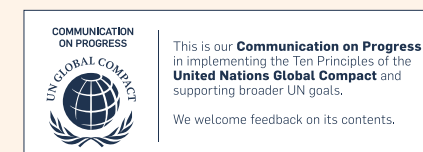
### Report assurance

In order to increase the internal and external reliability of the reported information, we commissioned LRQA, an independent assurance provider, to ensure the reliability and fairness of our preparation process and disclosed data and information. Detailed assurance statements are included in the Appendix.

### For additional information and inquiries

SK hynix ESG Strategy | [sustainability@skhynix.com](mailto:sustainability@skhynix.com)

SK hynix supports the Ten Principles of the UN Global Compact and strives to comply with the principles throughout management practices.

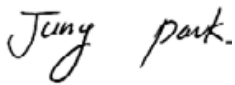


# CEO Message



co-CEO of SK hynix / Vice Chairman

**Park Jung-ho**



The year 2022 marks the 10th anniversary of SK hynix. 10 years ago, we strived to survive amidst a fierce competition, and now, we have become a global semiconductor company with an annual operating profit of more than 10 trillion Korean won. Today, we hope to achieve sustainable growth for the next 10 years and also 100 years as a pathfinder, taking the lead in navigating the uncharted territory.

With an industry-leading technological prowess and an unwavering commitment to become a global top-tier company, SK hynix reported record-breaking sales of 43 trillion Korean won and an operating profit of 12 trillion Korean won in 2021. In particular, we responded swiftly to soaring IT demand in a non-face-to-face environment and greatly expanded the sales of high-density DRAM products. Also, we remain No.1 in terms of the market share in the server market by targeting major global data center customers. In addition, we took the initiative to launch next generation strategic products for the first time in the world, which is evident from the development of the world's first DDR5 and HBM3. Last year, not only did we turned to profit in NAND but also we established a U.S based subsidiary called Solidigm, thereby achieving both quantitative and qualitative growth.

SK hynix is also geared towards putting ESG (Environment, Social, and Governance) in practice for sustainable growth. As the first company in Korea to join RE100, we are committed to sourcing 100% renewable power by 2050, and we have also set the target of sourcing 33% of power from renewable energy by 2030. In 2021, we have formed an ESG organization that directly reports to the CEO and created an ESG Management Committee. We have also strengthened the role of the board of directors so that the board, as the company's supreme decision-making body, oversees the executive management team, and thoroughly keeps track of the critical ESG related policies.

As we move from pandemic to endemic, we continue to face uncertainties in the global economy and the global supply chain. Nevertheless, we are responding to such uncertainties in a more agile manner. Therefore, SK hynix will stay ahead of the curve in these extraordinary times, and find ways to move forward. We will strive to capture the needs of the customers in advance to seek opportunities to lead the market, find solutions to respond to changes in the ICT market and overcome various technological challenges through open innovation: collaborating with some of the world's leading corporations. Also, through relentless technological innovation and R&D, we will strive to reduce our environmental impact and establish a semiconductor manufacturing process that is fundamentally eco-friendly, to lead the effort in creating a healthy semiconductor ecosystem.

Believing in the notion that "Past 10 years We Built Together & Next 100 years We Will Build Together", SK hynix will strive to take a quantum leap towards a bigger future by building upon the last 10 years of growth. Without the unwavering support of our stakeholders, who continued to take the long journey with us all these times, SK hynix could not have been able to achieve continued growth. To repay the trust and confidence our stakeholders placed in us, we will strive to build strong relationships through transparent communication to achieve sustainable growth and work towards building a better world. We ask for your continued support and interest in this journey we are about to take together towards the next 100 years. Thank you.

# Company Profile


## Technology Innovator for a Better World

Our company joined the SK Group in 2012, celebrating our tenth anniversary as SK hynix in 2022. Today we are one of the Group's leading affiliates and a representative of Republic of Korea industry. SK hynix is a semiconductor chipmaker, playing a key role in the ICT world of tomorrow. In 1984, we were Korea's first to begin trial production of the 16Kb SRAM, and since then we have leveraged our proprietary know-how and technological expertise to grow into a top-tier provider of cutting-edge memory-based semiconductor solutions.

The onset of the 4th Industrial Revolution and the outbreak of the COVID-19 pandemic have triggered changes in the market. In response, SK hynix aims to evolve from memory-based semiconductor solutions provider to top-tier global technology enterprise leading the advancement of the ICT industry.

We will help to build a better ICT ecosystem as a "Solution Provider" that realizes value for society and value in sync with the times. To this end we generate constant technological innovation in the era of the great digital transformation. Of course we are also seeking to enhance the happiness of our people and stakeholders at every turn.

Company name	SK hynix
CEO	Park Jung-ho, Kwak Noh-jung
Date Began Semiconductor Business	February 1983
Area of business	Manufacture and sales of semiconductor devices
Address of headquarters	2091, Gyeongchung-daero, Bubal-eup, Icheon-si, Gyeonggi-do, Korea
Products and services	<b>Memory semiconductor</b>   DRAM, NAND Flash, MCP(Multi-Chip Package), etc. <b>System semiconductor</b>   CIS(CMOS Image Sensor), etc.

We  Technology | **SK hynix**

### Purpose

The mission of SK hynix

**Making a better world with all members of society by  
leading the tech-based IT ecosystem**

### Values

The unique values upheld by all SK hynix members

**Tenacity**  
**Advanced Tech.**  
**Prosperity Together**

### Drivers

The reasons for which customers/society choose and support SK hynix

**Leading Technology**  
**Trusted Partnership**  
**Shared Social Value**

# 2021 at a Glance

## Evolution as a Solution Provider

SK hynix has been a leader in innovation and change over the past decade, growing in a way no one could have imagined. Notably, in 2021 our revenue reached a record high, and the product portfolio has been greatly improved in terms of sales composition. As such we have diversified our business structure and evolved our operation by another step. We are not complacently satisfied with our performance to date; rather we are reacting preemptively in a rapidly-changing environment and making great strides as a “global solution provider” that leads the world’s semiconductor markets.

on sales of just under

KRW **42** trillion

operating  
income of

KRW **12.4** trillion

in 2021

### Uncovering drivers of future growth

In 2021 SK hynix improved our product portfolio. Moreover, we took notice of the potential of the foundry market and continued to diversify our business structure by acquiring Key Foundry, which operates an 8-inch wafer fab. Meanwhile, the construction of the M16 Fab on the Icheon site was completed in February 2021. This facility is equipped to produce next-generation DRAMs, boasting extreme ultraviolet (EUV) lithography processing and other state-of-the-art infrastructure. At the same time, four new fabs are under construction on a 4.15 million m<sup>2</sup> site at Yongin, where a large-scale semiconductor cluster is being formed.

Going forward, we will aggressively make additional strategic investments to firm up our core infrastructure, shaping the SK hynix we envision around the twin pillars of DRAMs and NAND flash devices.

### Strengthening ESG Management

We stepped up our ESG management program in 2021. Our ESG Management Committee, which consists of the CEO and other key senior executives, convenes regularly to rigorously discuss major ESG issues and reflect those issues in management strategy. We have drawn a roadmap for implementing the pledge for RE100 and have established the new Carbon Management committee, which operates under the ESG Management Committee. These steps demonstrate our sincerity to fulfill our Net Zero pledge by 2050. Moreover, SK hynix is the first in the industry to attract investors in green bonds and social bonds, confirming our status as a leading company in ESG.

Especially in July 2022, we have announced PRISM, an ESG strategy framework unique to SK hynix and have established concrete targets and plans. In the future, our ESG programs will be conducted in stages on the basis of PRISM, growing with stakeholders and creating sustainable value.

PRISM Framework 

### Expanding R&D

In 2021, we worked hard on making our fundamental competitiveness even sounder and securing technology leadership in our industry. For the first time ever, we invested more than KRW 4 trillion in R&D expenses. Through this, we were able to expand the portion of the front end process and accelerate cost reduction. In addition, we have newly established the Revolutionary Technology Center (RTC) to respond better to the rapidly-changing semiconductor industry environment, bolster communication with the existing R&D personnel, and take innovation forward. Our relentless R&D work has reaped results, too. We became the first in the world to complete development of the high bandwidth memory 3 (HBM3) DRAM in October 2021, and started mass production in the first half of 2022. Two months later we shipped the first samples of our new 24Gb double data rate (DDR) 5. Then in February 2022, we completed development of a next-generation processing-in-memory (PIM) device, which has a built-in computation capability. In the days ahead, SK hynix will continue to evolve the business model and technology direction through aggressive investment and innovation.

## Spotlight

## Uncovering drivers of future growth through global partnerships: SK ICT Alliance launched

Uncertainty in the global markets has steadily grown, while demand is increasing for products that are innovative and distinctive. Global partnerships are essential for addressing the diversifying ICT market situation and various technological limitations.

SK hynix joined hands with SK telecom and SK square to establish the SK ICT Alliance in January 2022. This new entity will serve as the top decision-making body on developing and investing in information and communication technology convergence. It was launched to integrate the respective business areas of the three member companies—semiconductors (SK hynix), 5G networks (SK Telecom) and artificial intelligence (SK Square)—to generate synergy and secure global competitiveness in the ICT field. The first project for the SK ICT Alliance is to take Sapeon, Korea's first locally-produced AI chip for data centers, global. To this end, the three Alliance members have jointly invested to establish Sapeon Inc. as a local subsidiary in the United States. In addition we have raised over W1 trillion for our Global ICT Fund, which will be used to invest in promising companies involved in AI, blockchains, semiconductors, and other innovative technologies.

In the future, SK hynix will leverage innovative technology and strategic investment to grow even stronger and faster as a global leader. Our goal is to be a pathfinder that shapes the future of ICT.



SK ICT Alliance launch ceremony

# COVID-19 Response

The COVID-19 pandemic that broke out in 2020 continued to rage throughout 2021, with serious social and economic consequences. We introduce some of our activities as follows to protect the health of our people while at the same time minimizing business losses.

## Establishing a safe and healthy work environment

We established and implemented an internal COVID-19 response plan that exceeded the standards provided in the guidelines from the public health authority, allowing our people to work without being in constant fear of infection. Ample quarantine time was guaranteed to those employees who either came down with the disease themselves or had a family member who did so. We took steps to prevent the spread of COVID-19 by supplying masks to the people working inside our company as well as those at our subsidiaries and subcontracted suppliers. In addition, COVID-19 vaccines were administered inside the company, and we encouraged our people to get the shots by giving them three days off with pay after doing so. Pregnant mothers and employees with underlying conditions were allowed to work from home to ensure their safety, or they were granted special leave. The use of family care leave was expanded, and we lent our support to ensure our people and their families could lead healthy lives in the absence of healthcare availability while the COVID-19 pandemic dragged on.

## Advancing with local communities

SK hynix has overcome the pandemic crisis in close cooperation with the local communities struggling with COVID-19. The prolongation of the pandemic caused the number of blood donors to drop sharply, and we helped to address the supply shortage by running blood drives on five occasions during 2021. We assisted the farmers in the Icheon area, where SK hynix operates, by handing out bags of locally-grown rice to the employees who donated blood. We also reached out to the floriculturists, organizing a 2021 Campus Environment Creation Event that soothed the hearts and minds of our people while providing local growers with a way out of their economic woes.

## Helping employees with their mental health

SK hynix went beyond physically preventing the pandemic spread, working on ways to stop our people from suffering adverse psychological effects as the COVID-19 pandemic persisted endlessly.

**Offering contents for stress relief** | SK hynix invited mental healthcare professionals to give lectures on healthy ways to relieve stress, helping our people to manage stress on their own. In addition, we ran a campaign encouraging everyone to show respect and concern for those co-workers who confirmed for COVID-19, and support was given so that employees could focus on their work with greater peace of mind.

**Supporting mental health** | SK hynix runs an in-house counseling center called Mindwalk to offer counseling to both employees and their family members stressed out by COVID-19. We also operate 7979, a hotline that provides instant access to mental health professionals 24 hours a day, assisting our people to remain in top shape psychologically.

**Hosting a COVID-19 photo exhibition** | SK hynix organized "Distance Skill" a COVID-19 photo exhibition, at the Icheon business site during December 2021. The event told numerous stories of how life has changed since the pandemic hit, offering an opportunity for employees to relax their minds. At the same time, employees were given a chance to take an interest in members of the local community, which also has been suffering from COVID-19.



## CASE

## Mindwalk

'Mindwalk' has been in operation since 2011 to help employees relieve work-related stress and stay in top shape mentally. The counseling center offers a meditation program and various psychological tests such as the Myers-Briggs Type Indicator (MBTI) to improve employees' mental condition and help them better understand their own psychological and emotional states as well as those of the people around them. In addition to the counseling services, Mindwalk is responsible for managing risk factors from structural causes at specific worksites and for assessing employee work stress levels companywide. The center has ten certified counselors on staff; they are all employed by SK hynix and bound to adhere to the relevant Code of Conduct.

## Spotlight

## COVID-19 photo exhibition

SK hynix organized a photo exhibition with a COVID-19 theme to share employees' efforts to overcome the virus and build consensus. Here are some examples of the photos that were shown, along with their storylines



We had set up the screening clinic inside the company. All the SHE teams, despite their busy schedules, helped us run it on the day of the first snow. We didn't lose our smiles even though we were bundled up in so many clothes because of the cold weather... That was a difficult time, but I remember it fondly.

Kim Ga-won | SHE R&D



At the beginning of the COVID-19 outbreak, we worked on distributing face masks as a personal protective measure for employees. Thanks to the hard work of SHE members, SK hynix is up and running.

Kim Il-Yong | Cheongju Health



When I look back on our in-house screening clinic operation, our greatest difficulty was surely the struggle with weather. Summers were so hot our eyes, noses and mouths would be bathed in sweat. I express my thanks to the medial team members, who were so generous in lending their helping hands.

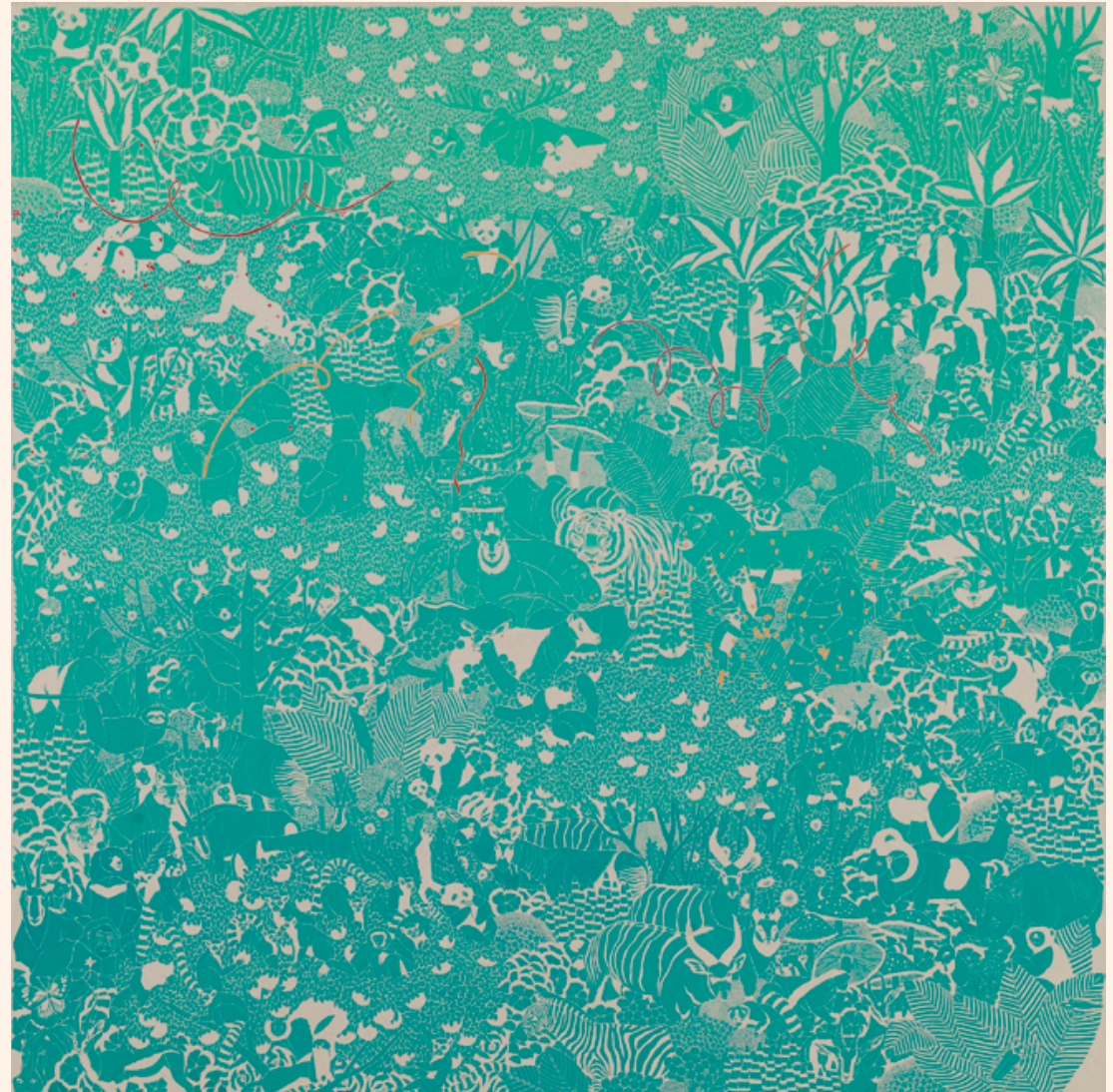
Jung Hye-jung | Icheon Health

# ESG Strategy

An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

**Choi Ji-hyun** | Welcome

The scene in which pollen is blowing and firecrackers explode conveys the message of welcoming someone to come. In the image of welcoming someone in the upper left corner, someone could be a living being or an extinct animal, or another animal, leaving viewers room to imagine for themselves.



# Our Business

## Double Bottom Line - our philosophy

SK hynix pursues a sustainable future by embracing a balanced value system in which both economic value (EV) and social value (SV) are considered priorities. The Double Bottom Line (DBL) management philosophy is a core value in which we strive to grow together with all of our stakeholders. Corporations cannot grow on their own; the trust and support of many stakeholders are essential for success. Only shareholders and clients mattered back when business profits were the sole concern. However, while social connectivity has steadily expanded, the scope of stakeholders has also kept widening, and their demands for corporate social responsibility and sustainability have also continued to grow. We firmly believe that we can earn the trust of all the stakeholders who are with us by vigorously implementing DBL management, which seeks EV and SV simultaneously, and ultimately bring benefits to everyone.

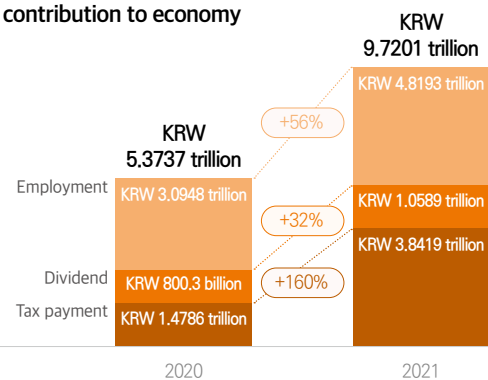
Under the belief that “if you can’t measure it, you can’t manage it,” we have classified social value as (1) indirect contribution to economy, (2) environmental performance, (3) social performance, and (4) governance. Each year we calculate and quantify our achievements in each of these four categories and transparently disclose the results to the public. Meanwhile, we have also published DBL Management System (DBLMS) as a guide for implementing DBL management and we operate an in-house SV portal to disseminate the DBL management philosophy to all our people. We are also encouraging our employees to internalize the importance of social value by reflecting SV criteria in the KPI evaluations of all company executives.

### SK hynix’s social value creation in 2021

\* SV measurement includes 5 subsidiaries: SK hynix system ic, SK hystec, SK hyeng, Happymore, Happynarae; and 4 social enterprises: Happy Meal-box, Happyschool, Happy2gether, SK hynix cleaning.

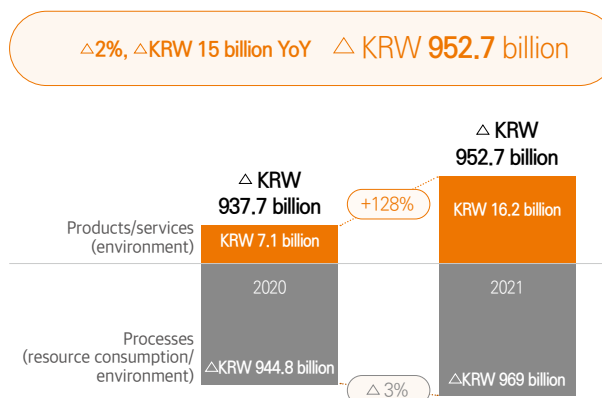
**KRW 9.4173 trillion in total**

#### Indirect contribution to economy



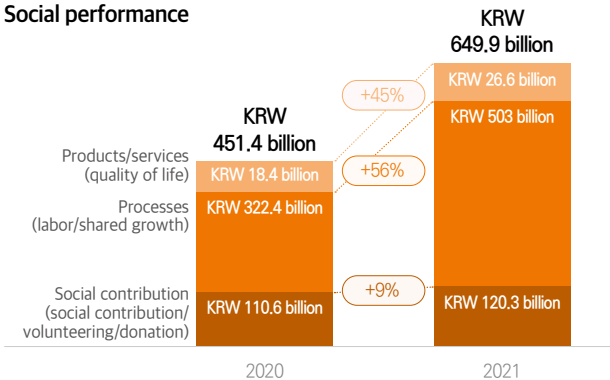
**+81%, +KRW 4.3464 trillion YoY KRW 9.7201 trillion**

#### Environmental performance



**△2%, △KRW 15 billion YoY △ KRW 952.7 billion**

#### Social performance



**+44%, +KRW 198.5 billion YoY KRW 649.9 billion**

## Spotlight

## SK hynix's Social Value Management System

Social value means the total contributions a business delivers to society through its business activities. In other words, it refers to the benefits that a company brings to the public and community by helping solve the problems of our society. SK hynix defines a social problem as a state in which many members of society suffer from structural problems that cannot be solved by individual efforts, and measures and discloses the social value we created according to our social value system. We had previously classified social value into “indirect economic contribution,” “social contribution through business activities,” “social contribution through philanthropic activities,” but in 2021, we reorganized the system into four new categories of “indirect economic contribution,” “environmental performance,” “social performance,” and “governance” to meet the changing needs of stakeholders. The performance in each category is measured based on objective and conservative criteria, and the social value we created is converted into monetary value. For the performance in governance category, it will be announced by further upgrading the indicator system by reflecting the characteristics of the field.

## Social value measurement system

Indirect contribution to economy	Economic	Employment		
	The value that the company indirectly creates for the economy through business activities	Dividend		
		Tax payment		
Environmental performance	Environment	Products/services	Resource consumption	Environmental pollution
	Environmental benefits generated by the company's products and services	Processes		
Social performance	Social	Products/services	Quality of life	
			Consumer protection	
		Processes	Labor	
			Shared growth	
		Social contribution	Social contribution activities	
Donation				
Volunteering				
Governance	Governance	※ The governance indicator is being reviewed as social value metrics based on governance activities		
How the company strengthens its business stability through transparent governance				

## Social value measurement principles

## 1 We aim to measure all business activities.

- Measure overall corporate activities, including product development, production, sales, HR, and cooperation with business partners
- Measure positive as well as negative performance

## 2 We measure outcomes but aim to measure impacts.

- Measure the changes in the lives of the beneficiaries as the direct outcome of business activities
- Aim to assess the impact that our business activities ultimately have on society



## 3 Principle of conservatism

- Use objective and conservative criteria and data to increase validity and reliability



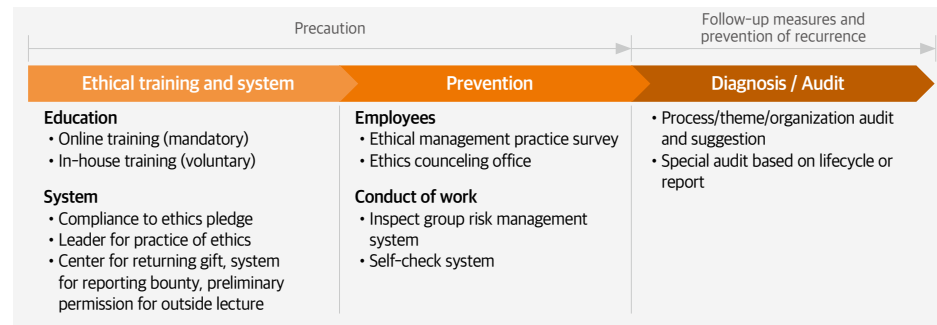
## Business ethics & compliance

### Code of conduct

The SK business philosophy and principles of conduct, also known as the SK Management System (SKMS), are the basis upon which we established the SK hynix Code of Conduct, which all organizational members are obliged to follow as the correct behavioral norms and the value judgment standards. We have also established practical guidelines that provide concrete standards for judgment. SK hynix's leaders, employees, and Board members as well as key stakeholders including suppliers must understand and comply with SK hynix's Code of Ethics. For more details about ethics management, please refer to [SK hynix's website](#).

### Ethical management institution and system

Ethical management and the related programs and system can be largely broken down into training & prevention before the fact, follow-up measures after the fact, and diagnosis & auditing to prevent recurrence.



### Ethical management training & practice survey participation rate in 2021

Category	Ethical management training	Ethical management practice survey
SK hynix	100%	89.9%
Subsidiaries (SK hynix system ic and 3 other companies)	100%	100%
Joint venture (Hitech)	100%	100%
Contractors/suppliers/service providers	100%	100%

### Global compliance inspection system

The SK hynix compliance verification system consists of inspection before and after the fact, as well as monitoring throughout. The employees who are about to undertake work that may raise fair trade law concerns are contacted through our global compliance program, and they are thoroughly familiarized with a checklist designed to prevent fair trade violations from ever happening. A follow-up inspection is conducted to verify whether the checklist was performed, allowing for early discovery of any violations.

### Operating principles of the global compliance program

SK hynix is committed to strictly adhering to all relevant international laws and regulations. Thus, we have upgraded the conventional compliance program covering antitrust issues to build and operate a Global Compliance Program. The GCP is based on the laws and regulations of each country where SK hynix operates as well as international treaties and customers' requirements, and was designed after taking the nature of the semiconductor industry into consideration. You may find the details on the [SK hynix's website](#).

### Dedicated compliance organization and monitoring system

SK hynix appoints a Compliance Officer and runs a Compliance Monitoring System to verify whether the rules and laws are being followed. Monitoring looks for the possibility that violations are occurring with respect to the company's business. Reports are submitted to the CEO and Board of Directors whenever information is discovered that points to legal violations. Regular monitoring is conducted and overseen by the Compliance Team, and it can also be done irregularly when the Compliance Officer deems it necessary. By every December, the Compliance Team establishes the monitoring plan for the following year, and a Monitoring Team is assembled, consisting of people from the relevant units inside the company as well as specialists from outside. Disciplinary actions are imposed for any violations discovered through the monitoring, in accordance with company regulations and the severity of the infraction. Rewards are also given to whistleblowers and employees with exemplary compliance records.

## Human rights

### Human rights policy

Our corporate culture at SK hynix is built upon the business principle of respecting the dignity of our employees and business associates. The SK hynix Human Rights and Labor Policy specifies detailed guidelines on thirteen different topics, including the general principles related to respect for human rights, prohibition of forced labor, prohibition of child labor, restrictions on work by minors, working hours, wages, prohibition of discrimination, freedom of association, responsible mineral sourcing, and protection of stakeholders' information.

### Risk management

We have established a process for inspecting human rights and labor issues, and we regularly assess the risks associated with those issues and make corrections as needed. Importantly, we conduct a human rights impact assessment at our business sites both inside and outside Korea, identifying the potential for human rights issues to occur at each location.

The 2021 human rights impact assessment covered our operations in Korea (Icheon and Cheongju sites) and China (Wuxi and Chongqing sites), and Hitech, a joint venture. High-risk factors were not in present in our Icheon, Cheongju, Wuxi, and Chongqing sites, but some high-risk factors were found in Hitech, confirming the need for human rights risk management. We identified about 120 improvement tasks across all sites, and 40 short-term tasks were 100% completed. For more details about human rights in SK hynix, please find out the [SK hynix Human Rights Report 2022](#).

### Risk improvement and mitigation

Our people receive human rights training as part of our effort to mitigate human rights-related risks. We also operate a whistleblowing channel and a process for dealing with grievances.

**Human rights training programs** | Our human rights training programs are designed to ensure that our employees' human rights are respected as well as to raise their awareness of human rights management. Employees complete a training course that is mandatory companywide, and additionally are offered the human rights education program run the UN Global Compact Network Korea via an online platform.

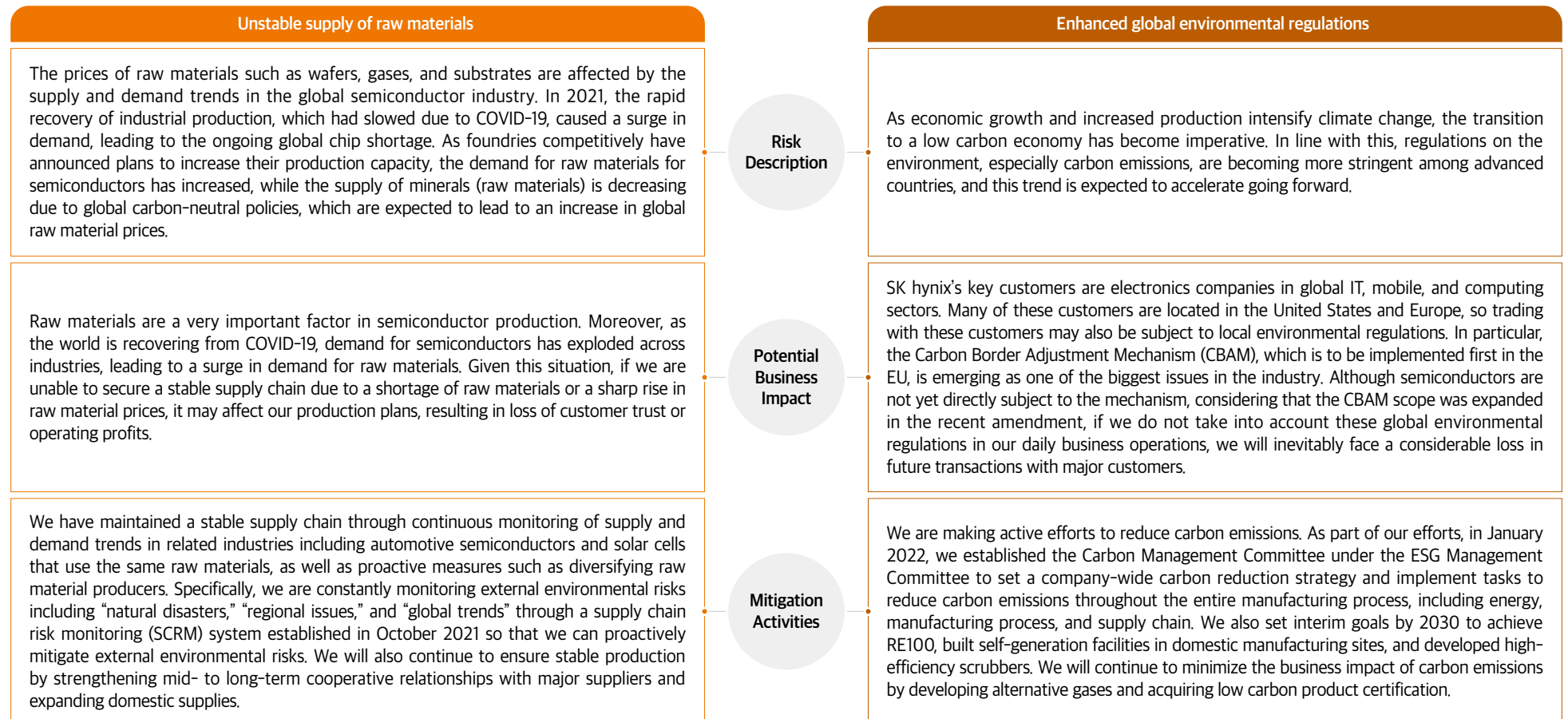
**Human rights issue whistleblowing channels and grievance procedures** | We operate a channel called Dodream via the SK hynix intranet for reporting or counseling on HR grievances of any kind, including workplace sexual harassment and bullying. In addition, employees may contact the Ethics Counseling Center to report human rights abuses stemming from unethical behavior, while the Labor-Management Council and Grievance Committee are standing by to help employees work out their grievances.



## Risk management

SK hynix establishes and implements a Business Continuity Plan (BCP) across all operations in preparation for emergencies including disasters and catastrophes. We conduct activities to mitigate key risks under the BCP for domestic and overseas operations and manage other potential risks. The details of our BCP-related activities, such as the BCP organization, activities, and operation procedures, are disclosed on [our website](#). Among the emerging risks managed by SK hynix, we report our responses to “unstable supply of raw materials” and “enhanced global environmental regulations” on this page.

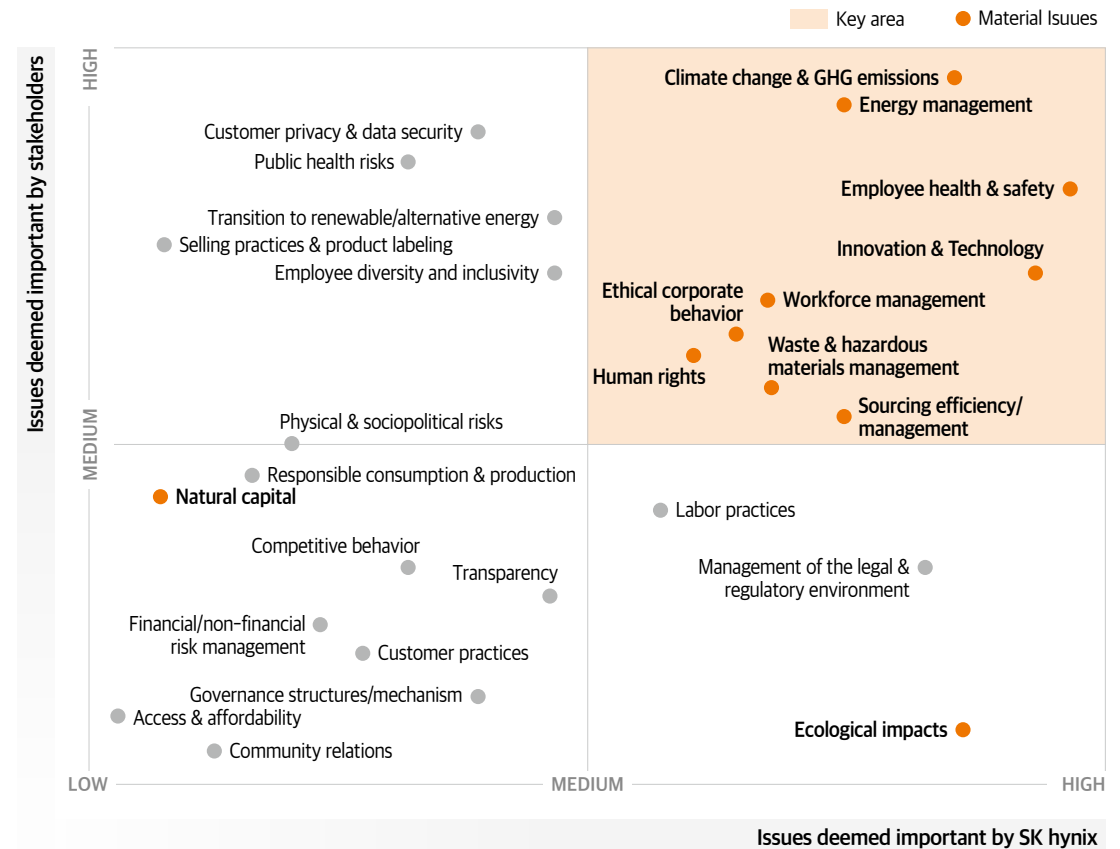
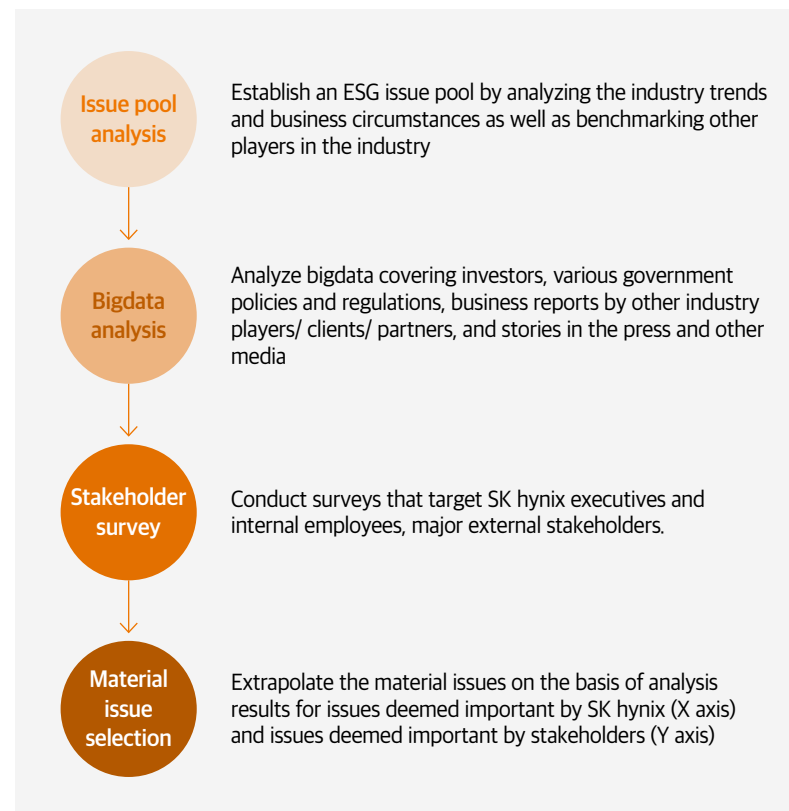
### Emerging risks



# Materiality Assessment

SK hynix runs materiality assessments each year to understand the impact that ESG issues have on the company. The results are reflected in the company's mid- to long-term strategies. Notably, in 2022 a bigdata evaluation platform was used to analyze and reflect the content in various corporate reports, policies & regulations, and media stories, by using crawling method. Through the newly introduced bigdata evaluation platform, there are total of 11 ESG material issues that SK hynix decided to cover. They include 9 issues (the key area in the matrix) that are important to both SK hynix and external stakeholders and 2 other issues (natural capital and ecological impacts).

## Process for materiality assessment



## Changes in 2022

SK hynix has so far derived a pool of meaningful ESG issues through industry trends and company status analysis, media and peer benchmarking. Based on this results, we conducted a stakeholder survey at the beginning of the year to prioritize material ESG issues. In 2022, SK hynix conducted a materiality assessment by leveraging a big data/AI-based platform in addition to a stakeholder survey. The existing survey method has the advantage of being able to hear the real voice of stakeholders, but it has limitations in expanding the scope of the survey or increasing the response rate, and it is also burdensome to conduct surveys occasionally. On the other hand, if we use AI platform, a large amount of data can be analyzed in real time when we need it, and it is possible to understand how various stakeholders have a variety of priorities on different ESG issues. As a result of the materiality assessment conducted using the new platform, the issues of “ecological impacts” and “natural capital,” are not included in the key areas of our materiality assessment. However considering the high priority from the regulators which are important stakeholders, and the importance of water resource management in the semiconductor industry, we have classified them as material issues that need to be addressed. SK hynix will continue to identify and manage material ESG issues by actively reflecting changing needs of various stakeholders based on bigdata evaluation platform and reflect them in our management strategy.

## Material issues

Issue		Details	Stakeholder views						Page
			Investors	Customers	Suppliers	Industries & Peers	Regulators	Media	
1	Climate change & GHG emissions	Climate change risk management & GHG emissions/ reductions	1	3	3	3	4	12	40~44, 56~57
2	Employee health & safety	Occupational health & safety, employee welfare	5	10	9	9	7	6	34~39, 92
3	Energy management	Energy consumption & conservation	2	8	8	7	14	5	43~44
4	Innovation & Technology	Technology development & innovation, digital transformation	27	6	5	5	25	2	59~66
5	Workforce management	Human resource recruitment & maintenance, employee nurturing & training, employee satisfaction levels	12	5	4	6	20	8	86~93
6	Ethical corporate behavior	Ethical responsibilities, compliance management	27	7	7	8	12	16	15
7	Human rights	Grievance Mechanism, human rights policy	27	18	18	18	2	9	16
8	Waste & hazardous materials management	Management of hazardous substances, waste recycling/ reuse/ reduction	6	15	17	16	9	24	49~52
9	Sourcing efficiency/management	Supply chain management & assessment, responsible procurement	8	9	10	10	24	14	70~80
10	Ecological impacts	Pollutant discharges, harmful chemical leaks, water pollution	27	26	26	26	10	26	40~53
11	Natural capital	Biodiversity, water resource management	10	21	23	20	8	21	45~48

## Stakeholder engagement

SK hynix organizes key stakeholders into six groups in consideration of accountability, influence, dependence, and interest. We actively communicate with stakeholders through various channels to identify issues of interest and needs, and share our responses.

### Stakeholder communication channels

#### Customers



- Customer-oriented QI (Quality Intelligence) activities
- Product exhibitions
- Website
- CSC(Customer Service Center)<sup>①</sup>
- QBR(Quarterly Business Review)<sup>①</sup>
- QTR(Quarterly Technical Review)<sup>①</sup>

#### Employees



- Management briefings
- Labor-Management Council
- Communication bulletin board (Comm.ON)
- Junior Board, 1-on-1 meetings
- SK hynix Culture Survey
- Communication and Consensus Planning Group

#### Shareholders/Investors



- Earnings conference calls and disclosures
- Electronic voting system
- General Shareholders' Meeting
- Investor meetings and conferences with securities firms
- IR webpage and telephone hotline

#### Suppliers



- Shared Infrastructure Portal
- Regular general meeting of the Shared Growth Committee
- Shared Growth Day
- Semiconductor Win-Win CEO Seminar
- Win-Win Academy
- ESG consulting

#### Local communities



- Work Environment Health Center
- Happiness Sharing Fund Operating Committee
- Regional Committee on Chemical Substances

#### Government/NGO



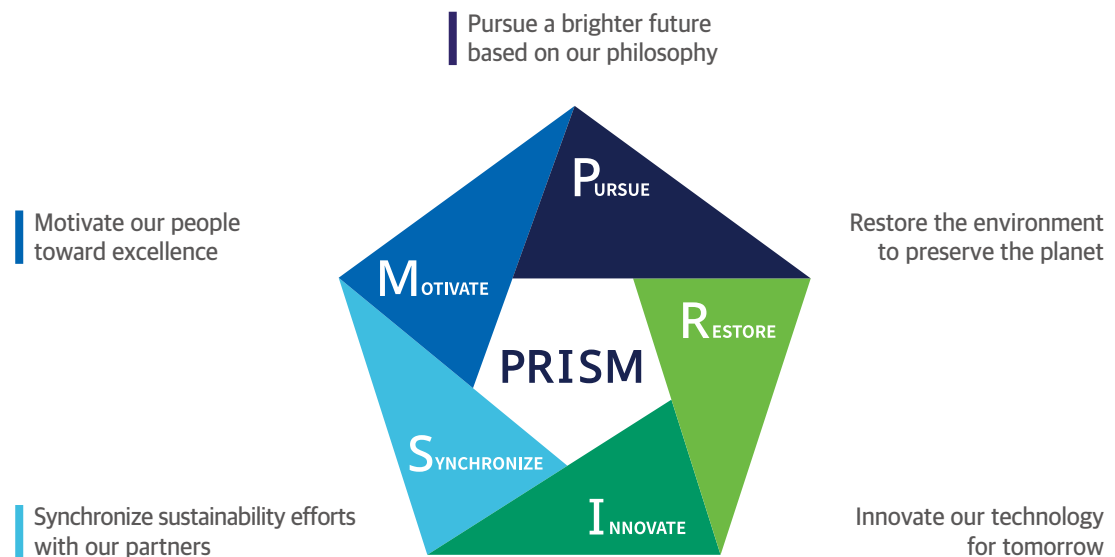
- Korea Chamber of Commerce and Industry Council
- National Assembly
- Policy meetings
- Korea Semiconductor Industry Association
- SHE Advisory Council
- UNGC Korea

# PRISM Framework and 2030 Goals

SK hynix is a company with a sense of purpose with its unique management philosophy called the Double Bottom Line (DBL). As a purpose-driven company, our mission is to spread positive influence to the world through the creation of economic value (EV) and social value (SV), thereby creating a better world and a brighter future. This is why we pursue sustainability.

In 2021, SK hynix announced SV 2030, a mid- to long-term roadmap for social value creation based on the DBL management philosophy, and set goals to be achieved by 2030 in four areas: environment, shared growth, social safety net, and corporate culture. This was the first initiative that specified SK hynix's mid- to long-term goal of SV creation for the next 10 years. Going one step further, in 2022, we developed PRISM, an ESG strategy framework that encompasses all of the goals set out in the existing SV 2030, while also broadly incorporating new ESG-related demands of stakeholders. This is our new initiative that has been further evolved from SV 2030.

Divided into the five pillars of Pursue, Restore, Innovate, Synchronize, and Motivate, PRISM represents why SK hynix pursues ESG management, what will be done, and how to achieve this purpose.








The first pillar, P (Pursue), contains our beliefs that forms the DBL management philosophy. The reason we want to practice ESG management is to create a happier and brighter future for all by creating SV as well as EV.

To this end, SK hynix strives to protect the earth by restoring the environment while creating a better world through innovative technologies for the future. This is the goal that SK hynix aims to achieve through the second and third pillars of PRISM, R (Restore) and I (Innovate).

All these can only be realized with the participation of SK hynix employees as well as suppliers who share the same thoughts and principles as us. This is why we are seeking to integrate the capabilities of not only our employees but also external stakeholders through M (Motivate) and S (Synchronize), the fourth and fifth pillars of PRISM.

## PRISM 2030 Goals

Most of the goals set out in each of the five pillars of PRISM are challenging for us. However, we will continue to set new and challenging goals to meet the changing times and the needs of our stakeholders. Furthermore, we will transparently disclose our efforts and process toward achieving our goals. Just as light passes through a prism and creates a beautiful spectrum, SK hynix will contribute to creating a brighter future by exerting our positive influence on the world through our unique ESG management practices.

 <b>PURSUE A BRIGHTER FUTURE</b>	 <b>RESTORE THE ENVIRONMENT</b>	 <b>INNOVATE TECHNOLOGY</b>	 <b>SYNCHRONIZE SUSTAINABILITY EFFORTS</b>	 <b>MOTIVATE OUR PEOPLE</b>
<div data-bbox="185 671 501 708"> <b>Our Value to Society</b> </div> <ul style="list-style-type: none"> <li>• Generate social contribution value of KRW 1 trillion (cumulative)</li> <li>• Create 1,000 jobs for people with disabilities or low-income households*</li> <li>• Promote participation of 100,000 people in the global ICT talent fostering program (cumulative)*</li> <li>• Help 100,000 people from underserved communities by conducting social contribution activities with cutting-edge technology (cumulative)*</li> <li>• Serve 12,000 people through our meal sharing program (cumulative)*</li> </ul> <div data-bbox="185 1051 501 1088"> <b>Robust Governance</b> </div> <ul style="list-style-type: none"> <li>• Increase gender/nationality diversity of the Board to 30%</li> </ul> <div data-bbox="185 1212 501 1249"> <b>Safety &amp; Health at Work</b> </div> <ul style="list-style-type: none"> <li>• Reduce the integrated incidents rate by 10%*</li> <li>• Lower the prevalence rate of metabolic syndrome by 10%*</li> </ul>	<div data-bbox="573 671 889 708"> <b>Climate Action</b> </div> <ul style="list-style-type: none"> <li>• Maintain scope 1 and 2 GHG emissions at 2020 levels<sup>1)</sup></li> <li>• Reduce GHG emissions intensity by 57% (by 2026)</li> <li>• Create energy saving of 3000 GWh (cumulative)</li> <li>• Achieve 33% renewable electricity use</li> </ul> <div data-bbox="573 1051 889 1088"> <b>Water Stewardship</b> </div> <ul style="list-style-type: none"> <li>• Conserve 600 million tons of water (cumulative)</li> <li>• Reduce water withdrawal intensity by 35% (by 2026)</li> </ul> <div data-bbox="573 1212 889 1249"> <b>Circular Economy</b> </div> <ul style="list-style-type: none"> <li>• Receive ZWTL Gold(99%) certification</li> </ul>	<div data-bbox="960 671 1276 708"> <b>Sustainable Manufacturing</b> </div> <ul style="list-style-type: none"> <li>• Reduce GHG emissions from process gases by 40%</li> <li>• Improve the destruction and removal efficiency of abatement systems to 95%</li> </ul> <div data-bbox="960 1051 1276 1088"> <b>Green Technology</b> </div> <ul style="list-style-type: none"> <li>• Double HBM energy efficiency</li> <li>• Increase eSSD energy efficiency by 1.8 times</li> </ul>	<div data-bbox="1348 671 1664 708"> <b>Responsible Engagement</b> </div> <ul style="list-style-type: none"> <li>• Ensure 100% of new suppliers sign SK hynix Supplier Code of Conduct</li> <li>• Ensure 100% of tier 1 suppliers complete online ESG self-assessment (every two years)</li> <li>• Ensure 100% of high-risk/critical suppliers receive on-site ESG assessment (every two years)</li> <li>• Triple the number of responsibly sourced minerals (from 3TG minerals to 12 minerals)</li> </ul> <div data-bbox="1348 1051 1664 1088"> <b>Shared Growth</b> </div> <ul style="list-style-type: none"> <li>• Invest KRW 3 trillion in technological cooperation to promote shared growth (cumulative)</li> </ul>	<div data-bbox="1736 671 2051 708"> <b>Inclusive Workplace</b> </div> <ul style="list-style-type: none"> <li>• Triple the ratio of women in executive positions</li> <li>• Ensure 10% representation of women in team leader positions**</li> </ul> <div data-bbox="1736 1051 2051 1088"> <b>Empowering People</b> </div> <ul style="list-style-type: none"> <li>• Achieve 200 hours of annual self-development education per employees**</li> </ul>

\*Figures from domestic sites

\*\*Figures based on domestic engineering and office staff

1) GHG emissions from the Dalian fabrication plant we acquired from Intel in December 2021 are not reflected in the target. Emission control targets for new manufacturing sites such as the Dalian Fab and Key Foundry, for which the acquisition contract was signed in 2021, will be announced later after a separate detailed analysis.



## 2021 achievements and 2022 targets of PRISM

		2030 Goals (Base year: 2020)	2022 Targets	2021 Achievements	Related major issues	Page
Pursue	Our Value to Society	Generate social contribution value of KRW 1 trillion (cumulative)	KRW 190.3 billion	KRW 120.3 billion		26~30
		Create 1,000 jobs for people with disabilities or low-income households*	918 jobs	918 jobs		
		Promote participation of 100,000 people in the global ICT talent fostering program (cumulative)*	18,250 persons	9,050 persons		
		Help 100,000 people from underserved communities by conducting social contribution activities with cutting-edge technology (cumulative)*	13,644 persons	6,444 persons		
		Serve 12,000 people through our meal sharing program (cumulative)*	3,470 persons	2,370 persons		
	Robust Governance	Increase gender/nationality diversity of the Board to 30%	11%	11%	Human rights, Ethical corporate behavior	31~33
Safety & Health at Work	Reduce the integrated incidents rate by 10%* (Base year: 2021)	1.1% decrease	-	Employee health & safety	34~39	
	Lower the prevalence rate of metabolic syndrome by 10%* (Base year: 2021)	1.1% decrease	-			
Restore	Climate Action	Maintain scope 1 and 2 GHG emissions at 2020 levels	Scope 1 and 2 emissions of 7.38 million tCO <sub>2</sub> eq	Scope 1 and 2 emissions of 7.64 million tCO <sub>2</sub> eq	Climate change & GHG emissions, Energy management	42~44
		Reduce GHG emissions intensity by 57% (by 2026)	6,514 tCO <sub>2</sub> eq/100 million Gb, 32% decrease	8,151 tCO <sub>2</sub> eq/100 million Gb, 15% decrease		
		Create energy saving of 3000 GWh (cumulative)	341 GWh	186 GWh of domestic energy savings		
	Water Stewardship	Achieve 33% renewable electricity use	100% renewable energy consumption at overseas sites	Renewable energy consumption of approximately 2.6 million GJ	Ecological impacts, Natural capital	45~48
		Conserve 600 million tons of water (cumulative)	82 million tons of water savings	49.8 million tons of water savings		
		Reduce water withdrawal intensity by 35% (by 2026)	106,303 ton/100 million Gb, 12% decrease	108,148 ton/100 million Gb, 11% decrease		
	Circular Economy	Receive ZWTL Gold(99%) certification	99%*	98%*	Waste & hazardous materials management	49~51
Innovate	Sustainable Manufacturing	Reduce GHG emissions from process gases by 40%	4% reduction	3% reduction	Climate change & GHG emissions, Energy management	56~58
		Improve the destruction and removal efficiency of abatement systems to 95%	91% for domestic sites	90% for domestic sites (as of first half of 2022)		
	Green Technology	Double HBM energy efficiency	1.28 times increase	1.26 times increase	Innovation & Technology	62~64
		Increase eSSD energy efficiency by 1.8 times	1.26 times increase (2023 target)	1.2 times increase		
Synchronize	Responsible Engagement	Ensure 100% of new suppliers sign SK hynix Supplier Code of Conduct	100%	100%	Sourcing efficiency/ management	70~80
		Ensure 100% of tier 1 suppliers complete online ESG self-assessment (every two years)	100% (2023 target)	89% <sup>1)</sup>		
		Ensure 100% of high-risk/critical suppliers receive on-site ESG assessment (every two years)	53% <sup>2)</sup>	45%(as of first half of 2022)		
		Triple the number of responsibly sourced minerals (from 3TG minerals to 12 minerals)	4 minerals (3TG)	100% RMAP certification for 3TG minerals		
	Shared Growth	Invest KRW 3 trillion in technological cooperation to promote shared growth (cumulative)	KRW 556.4 billion	KRW 330.4 billion		81~83
Motivate	Inclusive Workplace	Triple the ratio of women in executive positions (Base year: 2021)	2.0%	1.9%	Human rights, Workforce management	86
		Ensure 10% representation of women in team leader positions**	4.3%	3.7%		
	Empowering People	Achieve 200 hours of annual self-development education per employees**	117 hours per employee	107 hours per employee	Workforce management	88~91

\* Figures from domestic sites

\*\* Figures based on domestic engineering and office staff

1) This is the participation rate of 1,032 suppliers in Korea selected according to our standards among all Tier 1 suppliers.

2) Based on the results of the online ESG self-assessment conducted in 2021, it will be implemented over two years from 2022 to 2023, so the target for 2022 was set at 53%, which is half the level.

# Pursue

## a brighter future based on our philosophy

Guided by the DBL management philosophy, we have established a system for building and operating our “Social Safety Net” for creating value for society. This term also signifies that we intend to build the apparatus for faithfully fulfilling these roles. We consider social contribution to be “Connecting humans with technology for the happier future” In step with this vision, we engage in various projects for community service. In so doing, we remain in close contact with the local communities where we operate.

SK hynix has built a sound governance structure around the twin pillars of transparency and autonomy, and we are now committed to strengthening stakeholders’ trust and support and to creating sustainable value over the long term.

Ensuring a safe and healthy work environment for our organizational members is one of the most fundamental of our corporate management responsibilities. At SK hynix we live “safety first” creed, and we remain dedicated to creating a workplace in which all of our people can be happy.

### Achievements in 2021

KRW **120.3** billion  
Social contribution value creation

**11** %  
Percentage of women representation in Board  
of Directors

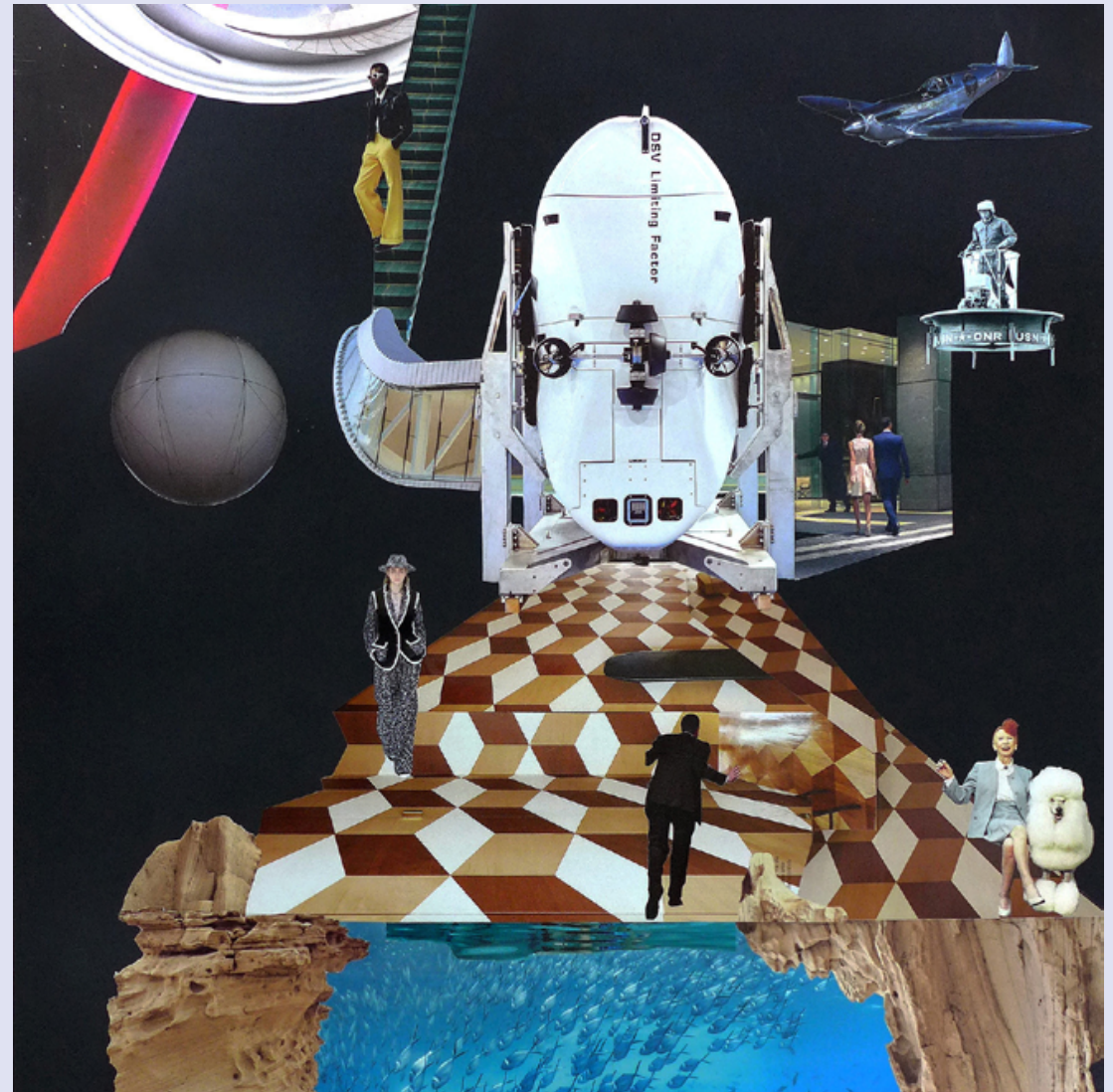
**918** jobs  
Jobs created for people with disabilities or  
low-income households

**Material issues in 2022:** human rights, ethical corporate behavior, and employee health & safety

An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

**Kim Ji-soo** | The Glaciers Don't Melt

Climate change is causing sea levels to rise, and this partwork depicts humanity that has created an environment in which the glaciers are not melting. Part of those glaciers that have been lost are replaced by different glaciers, and the people who live on top of them find relief.



# Our Value to Society

SK hynix creates social value and makes social contributions by engaging with members of local communities. We not only offer economic support to those from socially marginalized groups but also develop technology-based solutions to address issues in local communities and build a social safety net. Furthermore, in an attempt to narrow the learning gap for members of local communities and promote a culture of science, efforts are being made to establish a platform for fostering global ICT talent. We also offer job opportunities to those with disabilities to help them stand on their own feet. All in all, we conduct various social contribution activities to achieve mutual growth with local communities in which we operate at home and abroad, thereby fulfilling our mission of “connecting humans with technology for a happier future.”

## Establishment of a social safety net

### Safety Fund

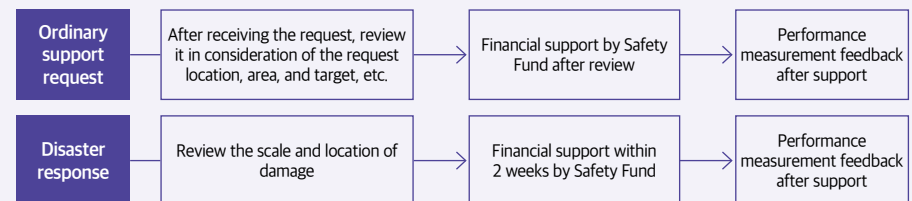
We have been looking after the local communities where SK hynix operates, and we continue to run social contribution programs for those in need. Notably, in 2021 we focused on establishing the Social Safety Net for the underprivileged, who are relatively more vulnerable in crisis situations. In so doing we have taken the initiative in leading the way toward resolving social problems. In December 2021, SK hynix established an internal policy for “Building a Social Safety Net and Operating the System.” In line with this, we have decided to create and run a Safety Fund worth KRW 20 billion. The fund maintains a set amount of financial resources that are immediately available when responding to crisis situations such as natural or human-made disasters. Not only can the funds be delivered where they are needed more quickly, the use history may be verified precisely because all of the external support funds are managed in a consolidated manner. Besides rescuing people from disasters, the Safety Fund is used to offer ICT solutions to inconveniences and difficulties faced by the socially disadvantaged, or to build infrastructure to train human resources for the future. The details on the kinds of support given by the fund will be disclosed transparently to the public on an annual basis.

### Building/operating principles of Social Safety Net

#### Priority group and area for support

- Information networks and ICT solutions to help vulnerable groups
- Education for nurturing future talents and infrastructure
- Customized support considering community characteristics, problems, and level of development
- Consistent social countermeasures for disaster and catastrophe

#### Process and manual for Social Safety Net



Safety Fund

KRW 20 billion



## Spotlight

### A project that works with young artists: Drawing for Green Future

SK hynix is trying out something new to convey more intuitively to the public the severity of the climate change crisis. With art used as a medium, we hosted an exhibition called Drawing for Green Future during October 2021. The theme was “A Future World that Overcomes the Climate Change Crisis.” The event also assisted young artists who were experiencing difficulties from not being able to show their works because of the COVID-19 pandemic. Visual artists aged 39 or younger were invited irrespective of genre (flat surface, plastic, installation, photography, or media), and 120 of them joined the contest. A panel of professional judges examined the entries and selected the work of ten artists who showed the greatest awareness of the theme and produced exceptional artistic quality. The selected works were then put on public display in a special exhibit.

Artist Son Mo-ah, one of the participants, said, “I heartily agree with SK hynix’s efforts to spread a positive influence through the medium known as art. I hope this exhibition serves as an opportunity to raise people’s interest in the environment.” Detailed descriptions of the winning entries can be found on the bridge pages of this report.



Drawing for Green Future exhibition, held under the theme  
“A Future World that Overcomes the Climate Change Crisis”



Young artists participating in the exhibit  
(from left to right) Kim Ji-soo, Regina Kim, and Son Mo-ah

## Community engagement

### ICT-based solutions for social issues

**Silver Friend** | The ICT-based Silver Friend program has been in operation since 2018 to look after senior citizens living alone. The service is equipped with an AI speaker function that allows recipients to interact, helping relieve their feelings of isolation and monitoring their individual health conditions. Silver Friend is also connected with the Fire Department's 119 emergency telephone service and can help in responding to emergencies. As of 2021, some 3,908 elders living by themselves nationwide were connected socially via Silver Friend.

**Happy GPS** | The Happy GPS program supplies tracking devices and covers with the telecom service charge in an effort to prevent Alzheimer's patients and people with developmental disabilities from getting lost. After the service launch in 2016, SK hynix signed a business agreement with the National Police Agency and provided more than 20,000 GPS trackers through 2020. In 2021, the agreement partnership was expanded to include the Ministry of Health and Welfare and delivered an additional 5,000 Happy GPS trackers. The program has returned 991 missing persons to their families as of 2021, and the average time per return has been reduced from 12.2 hours to just 60 minutes.



Senior (right) and employee volunteer (left) who participate the Silver Friend



Signed a MOU with the Ministry of Health and Welfare and the National Police Agency to supply Happy GPS trackers for free

### Cultivating talent for the future

**Heinstein** | SK hynix runs Heinstein to support classes for children and teens in coding, AI and software programming to cultivate talented scientists who will be able to tackle social problems after they grow up. Program participants exceeded 3,000 in 2021, more than three times the average annual number, and the classes were conducted online. The students who completed any of these courses could verify their accomplishment through the Olympiad examination, and the top performers were offered the opportunity to participate in a global education program.

### Ontact Meal-sharing Project

**Happy Meal-box** | SK hynix has offered free meals to needy children since 2012 through the Happy Meal-box program, serving an aggregate of about 580,000 meals by the end of 2021. Then in 2021, this program was used to invigorate the Ontact Meal-sharing Project underway throughout the SK Group. The recipient target was expanded to include elders who were living alone and having difficulty in getting meals after the operation of soup kitchens was suspended in the face of the COVID-19 pandemic. Over a three-month period, we provided 1,370 elders who lived by themselves with more than 400,000 lunchboxes with side-dishes or nutrition care kits. At the same time, we had people drop in on the elders to talk with them and see how they were faring.



2021 Online Heinstein Olympiad



Ontact Meal-sharing Project (Happy Meal-box)



## Employee volunteerism

**Happy Dreaming** | With Happy Dreaming, SK hynix employees introduce science and engineering occupations to middle and high school students and act as mentors to help them design their career paths. During 2021 the Employee Online Mentoring program, employee mentors discussed about careers with 2,200 students from 11 middle and high schools in the local community. The Online Career Live Concert gave more than 2,600 students the opportunity to hear various scientists speak and discuss issues with them.



The Online Career Live Concert from Happy Dreaming

**Community Service at Overseas Subsidiaries** | SK hynix America Inc. has been engaged in community service programs in cooperation with Hewlett Packard Enterprise, one of its clients, since 2020. Employees at the Silicon Valley-based US subsidiary also volunteered to sort through produce for delivery to a local food bank in 2021, helping local residents with problems getting food during the COVID-19 pandemic. Such activities have also served to raise trust with local client companies. The employees at the Wuxi site in China conduct “Loving Heart” charity events on a quarterly basis, such as painting murals on school walls with volunteering groups from school and students from special schools. The Chongqing site is also engaged in activities that spread happiness in the local community. The company covers the expense for hearing-impaired children to receive upgraded cochlear implants, and the employees visit children’s rehabilitation centers to hand out nutritional supplements and snacks.



Painting murals on school walls on Wuxi site’s “Loving Heart” event

**Happiness Sharing Fund** | The Happiness Sharing Fund operates according to the matching grant method, where the company will contribute the same amount that employees donate. The fund exceeded KRW 2.16 billion in 2021, and has raised a total of KRW 27.5 billion since 2011. The donations have been used to improve the lives of more than 65,000 members of local communities.



Ceremony for delivering Happiness Sharing Fund

## Spotlight

## Happymanbbang, a bakery bringing happiness to disabled persons

Happymore is a regular workshop for disabled persons that was established in 2016 as a subsidiary of SK hynix to make and clean smocks used in the semiconductor cleanrooms. Initially 84 disabled people were hired, and as of the end of 2021, 405 persons with disabilities work here as full-time employees, making this the nation's largest operation of its kind. Happymore goes beyond simply providing employment for the disabled: Individual employee cases are managed by dedicated social workers to ensure the workplace accommodates the workers adequately. Various award programs are also in place to motivate the workers, who receive training for specific job positions so that they can continue to grow professionally, helping employees achieve economic and social independence. As a result, Happymore was selected as an Exemplary Workplace by the Korean government in 2021, and the company was awarded the Silver and Iron Tower Industrial Medal of Merit at the 2021 Employment Promotion for Disabled Persons Conference.



SK hynix and Happymore expanded their business scope to include a confectionery and bakery operation that could assist even more disabled persons to achieve self-reliance in their lives. They established a new workplace, named it Happymanbbang and proceeded to take on a new set of challenges. Happymore & SK hynix, SPC Samlip Corp., the SPC Happy Foundation, and Korea Employment Agency for Persons with Disabilities brought together their respective forms of expertise to create a coexistence model that works among disparate business entities. Happymanbbang was built and is operated while multifaceted consulting was received on technology training for disabled persons, elevating the operation professionalism. As a result, Happymanbbang is equipped with a product selection and product quality that rival any in the marketplace. They provide a quick menu every morning and deliver small but warm bits of happiness to SK hynix employees. Happymanbbang was designed to go beyond providing disabled employees an opportunity to have economic self-sufficiency. We built a “model for self-reliance completion”<sup>o</sup> aimed at nurturing individual employees into experts in the confectionery and bakery field. Happymanbbang employees who have developed their expertise are able to advance into society at large through the company’s program for supporting career moves and venture startups. The vacant positions these people leave behind will be filled by newly hired disabled persons, helping to create a virtuous cycle in society. Happymanbbang is a pioneer in providing a regular workplace for persons with disabilities. We are dedicated to developing or people into happy and healthy members of society who lead independent lives.

# Robust Governance

## Reinforcing the BOD's independence and diversity

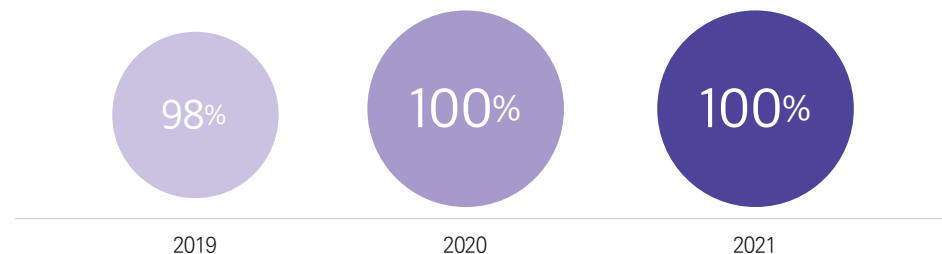
SK hynix ensures that the process for selecting independent directors is transparent and fair; candidates for the position are chosen after considering their independence, expertise, experience, and career. Moreover, we appointed a female legal expert as independent director in 2020, furthering the BOD's diversity. In early 2021, an independent director was also elected as the Board chair, elevating the BOD's independence.

Importantly, in March 2022, the Charter for the Independent Director Candidate Recommendation Committee, which is responsible for nominating, screening, and selecting independent director nominees, was revised to ensure that the independence of and diversity requirements for independent director nominees are judged more thoroughly, in accordance with global standards.

This action allows the SK hynix Board of Directors to oversee business operations from more independent and diverse points of view, which we expect will lead the company toward sustainable advancement. Please refer to [SK hynix's website](#) for the process of appointing independent directors.

The revised Charter for the Independent Director Candidate Recommendation Committee

## Average participation rate of BOD meetings



\* Minimum board meeting attendance requirement: 75%

## Expanding the BOD's expertise

SK hynix deliberates and delegates certain authority on specialized committees in the interest of the BOD's strategic operation, thereby securing expertise and objectivity. In addition, various in-house and outsourced training programs and workshops are held each year to raise the understanding about global trends and major management issues, and professionalism of the independent directors, while their exchanges with top management on pending management issues have been expanded. You may refer to [SK hynix's website](#) to learn more about the makeup of each specialized committees, details on their activities, and programs to strengthen the BOD's expertise.

## Transparent performance evaluation and remuneration policy

On the basis of Article 388 of the Commercial Act and the Articles of Incorporation, SK hynix remunerates the directors as approved by the BOD according to the base annual salary and performance-based bonus within the limit set at the general shareholders' meeting. Executive directors' remuneration is determined based on the indicators consisting of financial performance in the previous year, achievement of mid- to long-term goals, leadership, and contribution to the company within a certain limit. For independent directors, only the base salary is paid, without any performance-based compensation, to ensure their independence. Moreover, in May 2021, the authority was granted to the Board of Directors to assess the CEO's performance each year, and to set his or her remuneration accordingly. The Personnel Compensation Committee, a subcommittee of the Board of Directors, screens and assesses the CEO's key performance indicators each year and decides the compensation. In 2021, the deliberations and assessments related to the CEO's KPIs were conducted in three rounds. Such movements reflect SK hynix's efforts to reorient the governance structure around the BOD and strengthen the BOD's oversight function.

Corporate Governance Report Bylaws of the Board of Director Director's Code of Conduct

BOD Activities Training programs for Board Performance Standards for Director

## INTERVIEW

## Cho Hyun-jae and Han Ae-ra, Sustainable Management Committee members

The Sustainable Management Committee is responsible for establishing and reviewing the company's directionality about ESG issues.

Here are the voices of two of the Committee members, who are also serving as independent directors:

Cho Hyun-jae, who is knowledgeable on economic and industrial matters, as well as Han Ae-ra, an expert on legal issues.



I seek to utilize SK hynix's unique ESG strategy to strike a chord with stakeholders.

From corporate sustainability to enhancement in corporate value, corporate resources must be actively invested. Not just passively respond to external needs, we should strike a chord with stakeholders. My wish is for SK hynix to become a company that foresees the future in terms of bigdata, proposes new lifestyles through semiconductor chips, and leads change in the world.

**Cho Hyun-jae** Director

When you acquire diversity, you can gather a wide range of opinions during the decision-making process, and through these you can make the optimal judgments. Fortunately, SK hynix is making preemptive moves such as increasing the number of women on its Board of Directors and top management team, but I believe a still greater percentage of women is needed.

**Han Ae-ra** Director



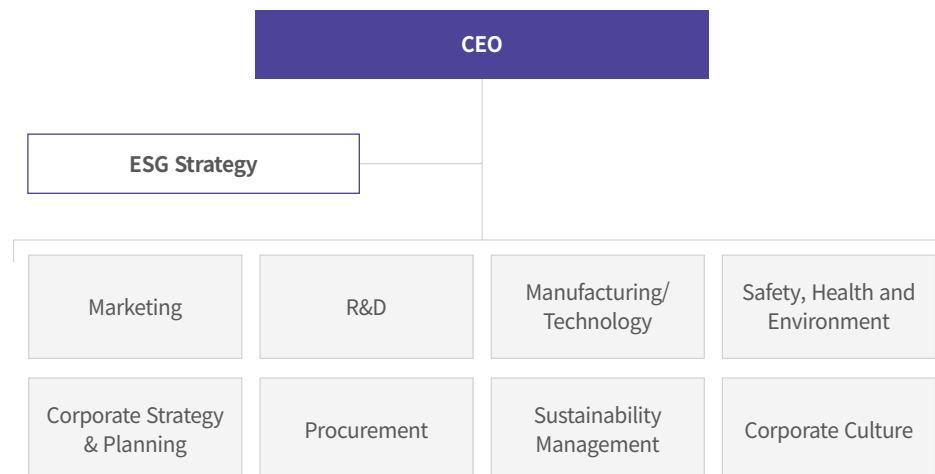
I will make rational decisions based on multiple viewpoints.

## ESG Management Committee: proactive leadership on managing ESG issues

SK hynix has aggressively pursued ESG management to generate the company's long-term value. From 2021, the ESG Management Committee has been at the heart of in-depth discussions on various ESG issues. The Committee convenes once a month with more than ten executives in attendance, including the CEO and as well as people from key organizational units such as Chief Business Officer, R&D, Manufacturing/Technology, SHE. Core issues discussed here are submitted to the Sustainable Management Committee and Board of Directors for consideration. Major items debated among ESG Management Committee members during 2021 include the following:

- Review the Net Zero transition plan
- Establishment of plan to implement RE100<sup>+</sup>
- Plan to improve the system for controlling conflict minerals
- Plan for Taskforce on Climate-related Financial Disclosures (TCFD)<sup>+</sup> upgrade
- Water resource management status and improvement plan
- Proposal to improve BOD Bylaws

### ESG Management Committee



In 2022, we established the new Carbon Management committee, which operates under the ESG Management Committee, to respond more aggressively to the climate change. The Subcommittee is chaired by the chief of Manufacturing/Technology and serves as a working-level organization to carry out such tasks as setting GHG reduction targets, conserving energy and transitioning to renewable energy sources. The Subcommittee provides progress reports to the ESG Management Committee every month. Please refer to the [Climate Action section](#) of this Report for more details on the Carbon Management Subcommittee and the company's climate change response.

### A message from the chair of the ESG Management Committee

“As a leader of the global semiconductor industry, SK hynix is committed to building a sustainable future for mankind and society.”

Kwak Noh-jung CEO



As part of these efforts, the ESG Management Committee plays a pivotal role in fulfilling ESG-oriented decision making system. Senior management thoroughly review ESG issues to ensure that our decisions remain well-aligned with our mid- to long-term corporate strategies, thereby contributing to create more economic and social values and enhance continuous corporate values.

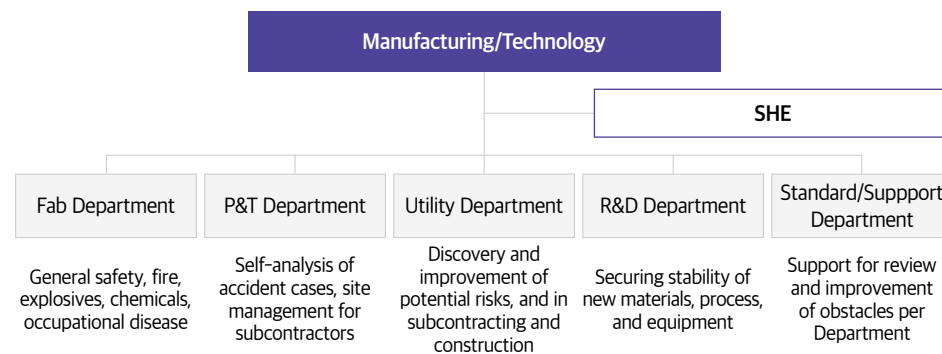
# Safety & Health at Work

## Safety First

### Activities by the Serious Accident Prevention TF

In January 2021, the Serious Accident Prevention Task Force was launched to take preemptive action on eliminating major risk factors at all worksites and ultimately preventing accidents. The Manufacturing/Technology chief also serves as the head of the taskforce, while the members of the SHE organization are responsible for its operation day to day. The TF consists of five departments, including Fab and Packaging & Testing (P&T). Since its launch, the Task Force has been extremely busy. The members have meticulously identified safety and health risks inside the company, coming up with some 1,400 improvement tasks, inspecting how the accident prevention activities are currently conducted, and bolstering the company's safety-related processes. Moreover, Serious Accident Prevention Task Force II was inaugurated in January 2022 to ensure continuity in Task Force actions and internalize the items of improvement. TF II is continuing to carry out various activities: inspecting how the improvement items produced by the TF I are being implemented at the worksites, reinforcing the work safety system, improving emergency evacuation processes at suppliers, and preventing accidents of the same kind from recurring.

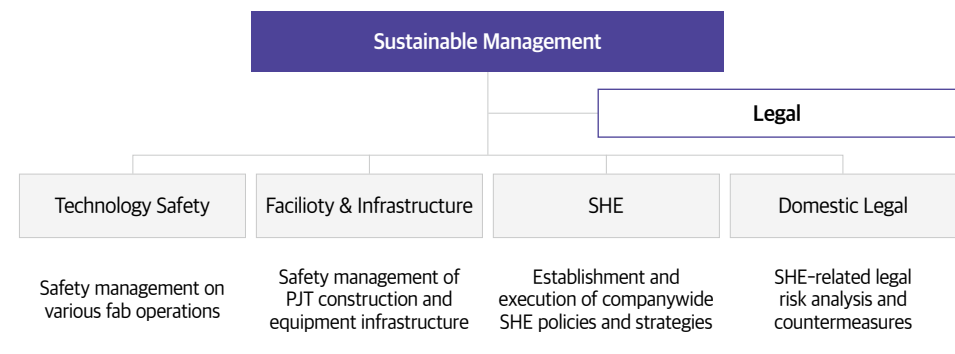
#### Serious Accident Prevention TF I



### Activities by Safety Management System Improvement TF

We are fulfilling all our obligations to ensure worker health and safety at SK hynix. The Safety Management System Task Force was incorporated into the organization in Marcy 2021 to inspect whether the safety and half management system was operating properly and to take corrective action whenever needed. The mission of this TF is to be carried out in three phases: (1) analyze the current status of the safety and health management system, (2) establish a plan for making corrections, (3) put the plan into practice and inspect progress. The plan drawn up on the basis of the Phase 1 analysis called for the launch of a new organizational unit led by the Chief Safety, Product & Production Officer, or CSPO. This unit acts as the control tower that manages safety and health issues companywide. The SHE Management Committee, which the CSPO chairs, continuously examines major safety and health issues, strategies, and results. Regular meetings are held within the SHE organization, as the safety and health management system is monitored constantly.

#### Safety Management System Improvement TF





## Spotlight

## Major activities of the Serious Accident Prevention TF in 2021

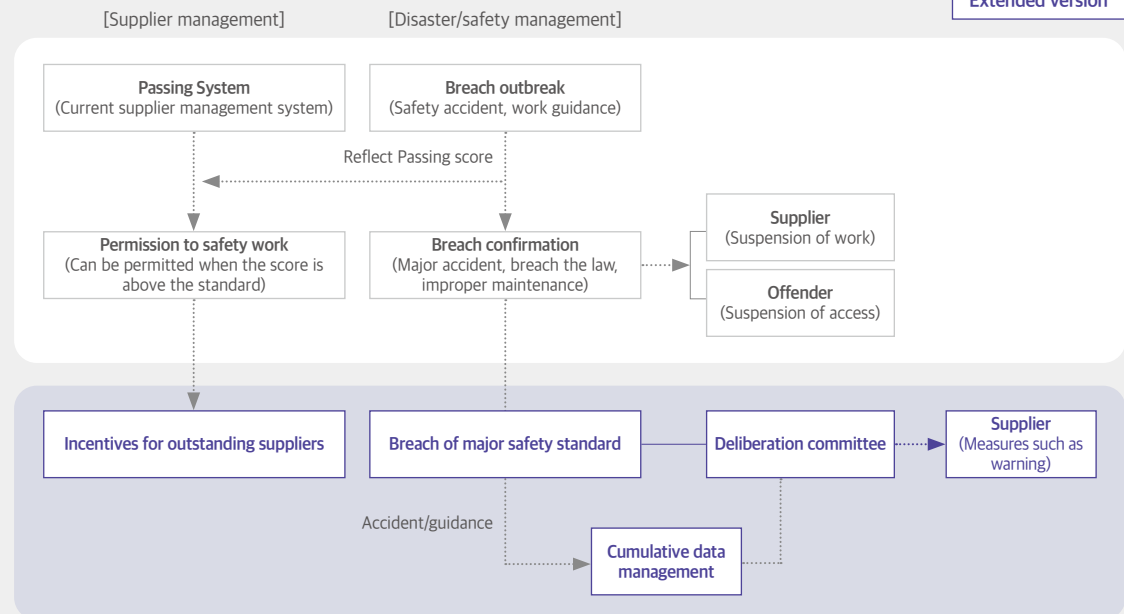
### 1 Inspecting the status of accident prevention activity implementation

- **Law-based onsite inspections** These inspections are conducted to ascertain whether safety laws are being kept and to identify and correct any areas that need supplementation
- **Reviewing accident cases and inspecting measures for preventing recurrence** Case studies of past accidents inside and outside the company are examined; the root causes are analyzed, and measures are established for preventing recurrence. In addition, inspections are made to confirm whether the recurrence prevention measures that are already in place are adequate and whether they are being conducted well.

### 2 Promulgating a “Culture of Safety” among employees

- **Operating the Top-Partner program** The Top-Partner program was instituted to ensure the safety of the supplier company employees who work on SK hynix business sites. A safety index is calculated for each supplier based on its safety management history, and incentives are provided to those suppliers with an excellent safety management performance. On the other hand, if a supplier is found to have committed serious safety standard violations, then the review board may issue a warning or impose some other form of sanction.
- **Building a safety culture platform** This platform was created to provide workers with ready access to safety information. Our people can now easily find online safety-related training contents, safety information in real time, SHE standards and various other materials.

#### Top-Partner system



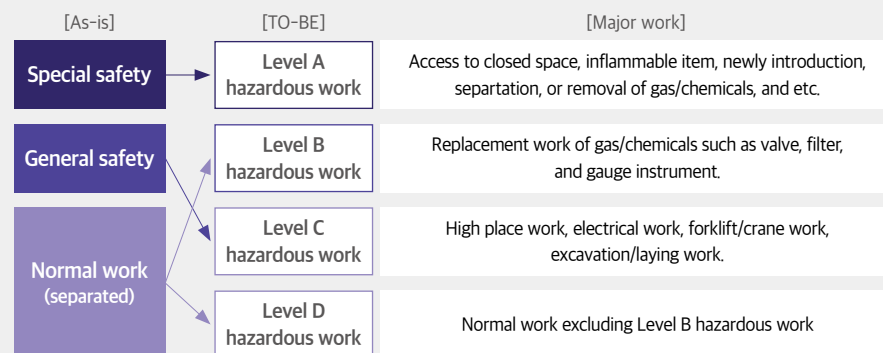
## Spotlight

## Major activities of the Serious Accident Prevention TF in 2021(Cont'd)

## 3 Strengthening safety-related processes

- **Strengthening the safe work permit system** This system ranks operations by risk level, and permission to proceed is granted only after the necessary safety measures or procedures applicable to the assigned risk level have been completed. The system originally consisted of three ranks (“special safety,” “general safety,” and “simple routine”) but now has been made more robust with four ranks (A-D), and the operation types have been rearranged. Importantly, operations ranked at the highest risk levels (A and B) now require the supervision of a safety specialist.

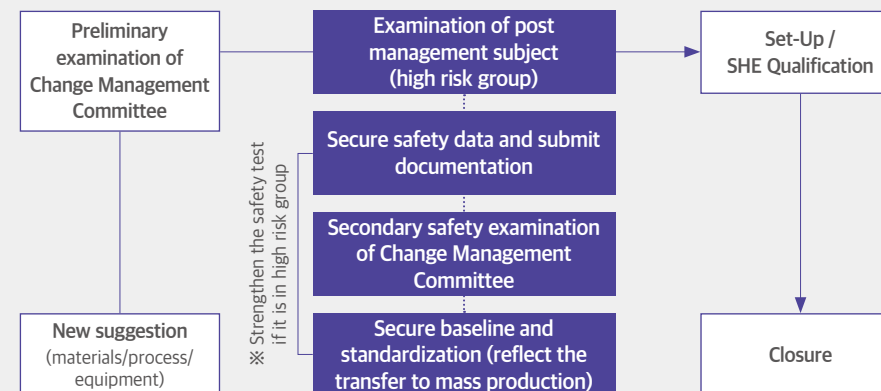
## Classification on level of safe work permit



- **Strengthening operational safety systems** A cross-verification process has been adopted companywide involving both the Serious Accident Prevention TF and the relevant company unit in determining whether the necessary safety measures have been taken before operations involving chemical substances are conducted. In addition, 37 types of operations have been identified as being high risk, and employees who conduct any of these are given safety specialist training. Those who complete the training are named “specialist” operators who also play the role of safety supervisor.

- **Stronger safety inspections for new materials, processes, and equipment** The safety verification procedures have been expanded for newly-acquired chemical substances, processes, and equipment. The Change Management Committee begins with a preliminary review, and when the conclusion is “high risk,” an additional “deliberation on targets for follow-up management” and a “secondary safety deliberation by the Change Management Committee” are conducted. The new items are only accepted after their safety has been confirmed without a doubt.

## Safety inspection of new materials/process/equipment



## CASE

## Lowering the hazardousness of high-k dielectrics<sup>o</sup>

Capacitors perform the state storage function in DRAM chips, and materials with a high dielectric constant (K, kappa) are used to increase the storage capacity. Various byproducts are produced when high-k materials are used in equipment, and most of these byproducts vaporize, pass through pumps and scrubbers and are discharged safely.

The development of DRAMs with ever-higher densities has been accompanied by the increased use of high-k dielectrics, and after they vaporize, part remain behind in the form of liquid, solid (powder) or gel, and these residues can accumulate in the piping system. When that happens, operational efficiency suffers, while the risk level rises because static electricity in the pipes can touch off these flammable materials.

The conventional solution has been either to install equipment that eliminates the byproduct materials or to adjust the temperature of the piping layout, changing the condition of the byproduct residues. However, the forms and types of such residues are diverse, so the effectiveness of these methods is only temporary. The Serious Accident Prevention TF drew up an improvement assignment: “lowering the ignition risk of high-k material byproducts,” which involved identifying and resolving the fundamental causes of this problem. Specialists from Manufacturing/Technology, the Revolutionary Technology Center, Technology Safety and other relevant organizational units came together, collected samples of the byproducts, studied them, and identified the materials and mechanisms that lead to an explosion. They also measured the conditions under which these materials could ignite, and established quantitative indicators.

The method for measuring byproducts was also improved. Sensors were installed in the byproduct discharge pipes, allowing operators to verify the presence of flammable materials without having to shut down the equipment and open up the pipes directly. In addition, the pipe layout was reconfigured in a “Y” shape, connecting multiple pipes and enabling all the byproduct to collect in one place, and sensors were installed inside the final discharge pipe. These sensors can measure the total amount of byproduct material that has accumulated, and if the conditions for a possible ignition are reached, the equipment operation will shut down or an alarm will sound, helping to ensure operational safety. This project not only reduced operational risk significantly but also shortened equipment shut-down time, thereby raising operational efficiency.



Preventive maintenance work on the inside of scrubber chamber

## Striving to enhance workplace safety

SK hynix engages in multifaceted efforts to make the workplace ever safer. Workers can access on the company intranet the new fab safety specifications (NFSS) necessary when building or remodeling a fabrication plant. Manuals are also published and distributed so that they are available to operators whenever needed. Operators must follow these guidelines when they begin a project, and safety supervisors visit the worksite to make inspections as well.

Part of the emergency response processes have been upgraded, too. The use of emergency warning broadcasts has been expanded so ensure that workers onsite will be informed immediately should an emergency situation occur. The Code of Conduct has been laid out in greater detail with respect to each emergency scenario. The number of safety supervisors on each team has been increased from one to two.

We have mobilized the system for issuing the necessary safety permits before beginning an operation. Previously, the operators had to write down all the items involved and print out the text on paper, a time-consuming task. Now, the mobile the safety permit system is used at all worksites, so printed documents do not get lost and the occurrence of data omissions or errors has been diminished. At the same time, the operator's work status can be shared in real time and safety management gaps between the worksite and the administration office has been narrowed.

The Smart Safety IoT Task Force is in operation to identify internet of things (IoT) technologies that are needed to ensure safety on worksites. The closed-circuit TV network onsite has been replaced with an AI-based version so that TF activity results are understood and responded to quickly. Sensors to detect residual chemicals have been developed and are now being tested. Four-legged walking robots, augmented reality for inspecting equipment, and other smart technologies are now being studied for potential application in workplace safety matters. Furthermore, in a bid to raise employees' awareness on safety, we run quarterly safety and health education sessions for all employees. We conduct training and campaigns to educate employees on our safety policies including the one ensuring that no disadvantages are given to an employee who suspends work to prevent safety accidents. Also introduced are exemplary cases of compliance with such policies.

## CASE

### Installing intelligent video surveillance

Accidents due to human error can happen without warning. A brief lapse in attention can lead to a major accident, so we continue to develop advanced technologies that can compensate for such moments. We try out these new technologies to ascertain their potential, and adopt them when the prove to be promising.

For example, the CCTV network originally installed in our business sites was replaced with an intelligent model, which is now in operation. The new system features an AI capability that analyzes video images and sounds an alert when unusual situations are detected. Over 5,000 surveillance cameras are now in operation on SK hynix business sites, and the volume of video images they produce would be impossible for people to examine intently 24 hours a day. The intelligent CCTV automatically detects people falling, things dropping, and people entering into restricted areas, and the system will verify whether workers are wearing protective helmets and other gear. Whenever something is amiss, a safety supervisor is alerted, and an immediate response can be made.

The intelligent CCTV system was installed for testing at M16 in February 2021, and it proved to be very effective in detecting worker traffic flow and worker falls. From that December, the new cameras were set up mainly in areas that workers do not frequent and thus are difficult for safety supervisors to monitor directly. Currently the system has a recognition rate of at least 80%, and the performance is expected to near 100% as the volume of data accumulates. Going forward, we aim to have all newly stalled CCTV cameras be intelligent, and we are considering a plan for upgrading the existing cameras with AI technology.

## Employee health and wellness

### SHE Cohort

SHE Cohort conducts studies to prevent diseases and develop customized healthcare solutions for employees. With an employee participation rate of around 90%, SHE Cohort identifies those with high health risks and seeks to provide them with necessary support.

Utilizing the SHE Cohort to promote employees' health, we have set a target to reduce prevalence rates for metabolic syndrome by 10% by 2030. For reference, metabolic syndrome is a cluster of conditions that occur together (such as obesity, hypertension, and diabetes), often increasing the risk of many chronic illnesses.

While the prevalence rate of metabolic syndrome in employees participating in the SHE Cohort may currently be lower than the national average, the figure is likely to further increase over time. Given this situation, we will conduct health check-ups and bolster drug administration management for existing metabolic syndrome patients among our employees, and launch various campaigns to promote healthy lifestyles to prevent new cases.



Employees participating in our online home training program

### Major health improvement campaigns conducted in 2021

#### Smoking cessation-related campaigns

Noting that alcoholic drinks make it harder to quit smoking, we conducted an alcohol abstinence campaign as part of our smoking cessation program. Employees participating in the campaign developed their own slogan to express their will to refrain from drinking, and were recommended to use their slogan as an email signature to be kept motivated. In addition, to help participants find alternative activities to smoking, we held an illustration contest using the coloring books published by the Ministry of Health and Welfare.

#### Online home training program “LikeFit. App”

We operated a smartphone-based online home training program for employees unable to participate in in-class exercise programs amid COVID-19. This program also provided employees with opportunities to bond and spend time with their family while doing exercise together at home. To encourage employee participation, we gave rewards to those who achieved their targets and held a photo event.

#### Mobile healthcare program “Lifestyle Care”

Lifestyle Care is a non-face-to-face program to promote a healthy lifestyle. Among employees who were diagnosed in 2020 to be at moderate risk of cardio and cerebrovascular diseases, we designated a group for lifestyle improvement, and recommended the group members to perform health missions using our mobile healthcare app. Such missions included having one salad meal a day, and walking 100,000 steps or more every week. To keep participants motivated, we offered awards to those who proved their mission accomplishments on the app.

# Restore

## the environment to preserve the planet

Protecting the global environment, the foundation of our lives, is a big challenge for a sustainable future. SK hynix has set a goal to maintain greenhouse gas emissions in 2030 at 2020 levels with the aim to achieve net zero emissions by 2050, and established the Carbon Management Committee to focus on our efforts to reduce GHG emissions and reflect them in management strategies. We have also set an interim goal of achieving over 33% renewable energy consumption by 2030, and are working to expand the use of renewable energy, save energy, and increase energy efficiency.

We also strictly manage water resources, one of the most important resources in the semiconductor industry. In addition to reducing water withdrawal intensity and saving water resources, we strive to preserve the ecosystem around our manufacturing sites and increase biodiversity by controlling the effluent quality.

We aim to achieve ZWTL Gold(99%) certification for all operations by reducing the amount of waste generated in the manufacturing process as well as in the entire product life cycle, and by increasing recycling rates.

### Achievements in 2021

186 GWh

Energy savings in domestic operations

49,814,051 tons

Water conservation in 2021

98 %

Total waste recycling rate in domestic operations

**Material issues in 2022:** climate change and GHG emissions, energy management, waste & hazardous materials management, ecological impacts, and natural capital



An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

**Park Ji-hye** | Vine Landscape #22

New foliage and grass are sprouting, and flowers are budding in a place where life has struggled to thrive. The withered and dead plants represent the pessimistic thoughts of the past, while the new plants are the present in which such negativity has been overcome. New foliage covering over the dead grass conveys the message that we can overcome crises such as climate change and grow.



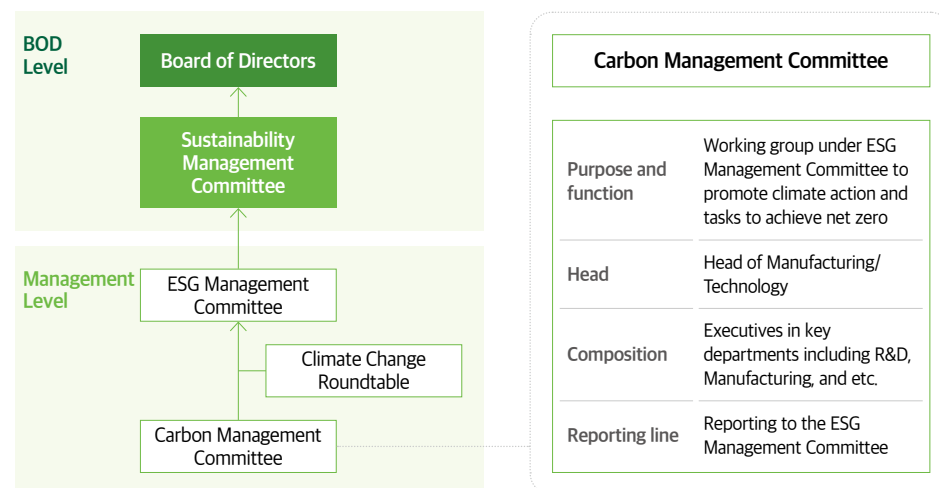
# Climate Action

## Response to climate change

### Enhancing climate change governance

SK hynix established the Carbon Management Committee under the ESG Management Committee in an effort to more actively respond to climate change. The committee is chaired by the head of Manufacturing/Technology and composed of working groups tasked with setting GHG reduction targets, reducing energy consumption, and procuring renewable energy. The progress is reported to the ESG Management Committee. SK hynix also operates the Climate Change Roundtable to systematically analyze risks and opportunities associated with climate change and their financial impact.

### SK hynix's climate change governance

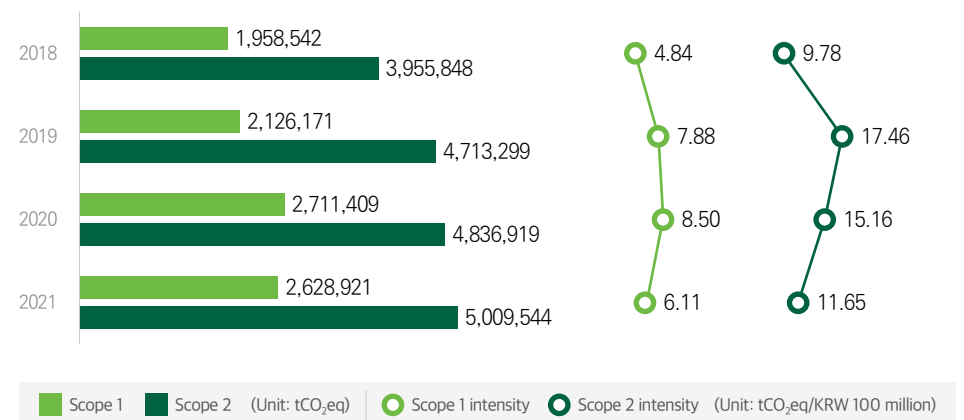


### Publishing our first stand-alone TCFD Report

Our company recognizes the severity of the impact that climate change is having on the earth's environment and humanity, and we are working continuously to help resolve the pending problems. In 2022, we applied various scenarios to analyze the impact of climate change risk on SK hynix, and we published our first TCFD Report, which covers our efforts and plans with respect to addressing. Going forward we will become every more precise in our analysis of the climate change risk impact, and our findings will be reflected in our mid-/long-term business strategies. Our climate change risk management system will be continuously upgraded, and this entire process will be disclosed transparently and accurately through our TCFD Report and other such documents.

SK hynix TCFD Report 2022

### Scope 1 & 2 GHG emissions

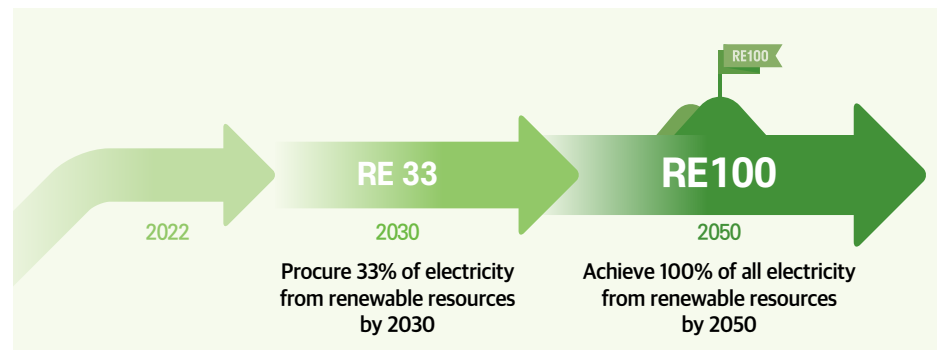


## RE100 implementation

SK hynix joined the RE100 initiative in 2020 and announced plans to achieve the 100% renewable energy target by 2050. Electricity consumption is relatively high in the semiconductor industry, so procuring all the power from renewable sources is a challenge. Despite this, we publicly declared our pledge to 2050 RE100 because we recognize that the global climate crisis is serious, and we wish to express our firm resolve to respond.

### The RE100 implementation plan

The scope of the company's RE100 implementation covers production in Korea (Icheon and Cheongju sites) and China (Wuxi and Chongqing sites) as well as the US subsidiary (San Jose). Of these, the US subsidiary already switched completely over to renewables in 2021. Global operations will procure 33% of its energy from renewables by 2030 as an interim goal, and the effort will continue in order to achieve 100% renewable energy by 2050.



### Renewable energy procurement plan<sup>o</sup>

SK hynix operates inhouse power generation facilities such as solar panels and hydroelectric generators at the Icheon business site, but the semiconductor industry by nature requires massive amounts of electricity, so limitations exist on supplying the entire electricity demand inhouse.

Therefore, SK hynix intends to achieve the RE100 goal by purchasing renewable energy at a green premium either through renewable energy certificates (RECs) or power purchase agreements (PPAs). In this case, the renewable energy purchase policy or system will differ by country and geographical region, so establishing plans tailored for each location is important. In 2020 SK hynix formed region-specific taskforces on renewable energy to monitor respective changes in market conditions and government policies. Each task force has established a rolling review process and made efficient plans for procuring renewable energy in the region under its purview. The company works closely with the host country's government and local communities to propose various policies, remains in communication with renewable energy producers, and continues to search for the optimal implementation measures.

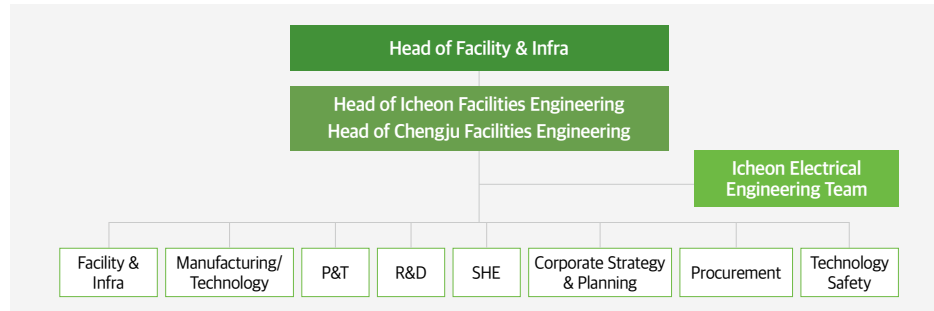
### Renewable energy use (Unit: GJ)



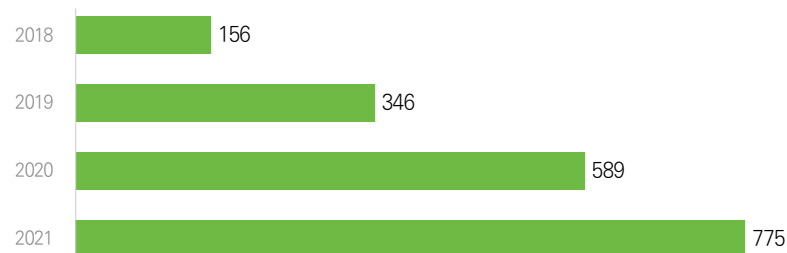
## Energy conservation task force activities

The Energy Conservation Task Force was created to manage energy at the corporate level. The TF, has been operating since 2012, sets energy reduction targets for the company as a whole, and identifies energy reduction items for achieving those targets. Regular meetings are held each month to discuss implementation status and monitor performance. In addition, this team secures new investments aimed at raising energy efficiency, oversees and energy management system(EMS) based on the ISO 50001 standard, and organizes energy conservation campaigns to raise energy awareness among all organizational members. A total of 255 energy conservation items were identified in 2021, including the optimization of the warm water temperature at the M14 Fab, resulting in a drop in energy consumption equivalent to 186 GWh. This figure surpassed by 105% the energy reduction target set at the beginning of the year.

### Energy conservation task force



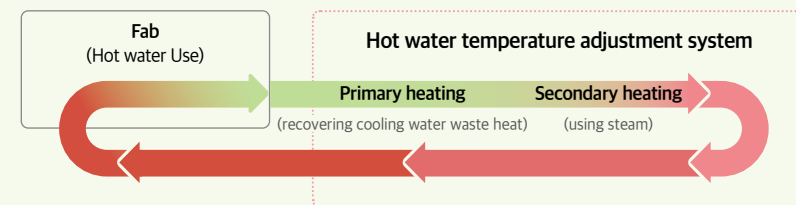
### Energy conservation volume (accumulated from domestic sites, Unit: GWh)



## CASE

### Lower energy consumption by optimizing warm water temperature at M14 Fab

Lukewarm (33–40°C) water is continuously delivered to the semiconductor fabrication plant (or fab), where it is used in production processes or for indoor heating. The temperature of this water is initially raised by transferring through a heat exchanger any waste heat remaining in cooling water taken from the plant's water supply. When necessary, steam is used to elevate the temperature further. Heated water used in semiconductor production processes must be kept at a constant temperature, but the volume and permissible temperature range of the water needed for indoor heating will vary depending on the temperature of the air outside. In other words, during the summer, when the ambient temperature is high, the volume of hot water for heating will fall, while it will rise during the winter. The Icheon Air Conditioning/ Exhaust Technology Team examined how much of the heated water supplied to M14 Fab was being used for indoor heating, and the team members determined that energy conservation was possible. They tried to flexibly adjust the temperature range of the water according to the season. Moreover the results of multiple tests showed the optimal adjustment to the temperature range, allowing for lower energy consumption without having an effect on the production processes. As a result, less steam was needed in the secondary temperature rise, while the heat exchanger for the initial heating became more efficient. Heat exchanger efficiency naturally improves as the temperature disparity grows because the hot water loses temperature after it is used inside the fab, and the difference between the water temperature and the waste heat temperature increases. Thus, optimizing the hot water temperature at M14 lowered the annual volume of steam used by 120,000 tons, which lowered the consumption of energy by 331 TJ.



# Water Stewardship

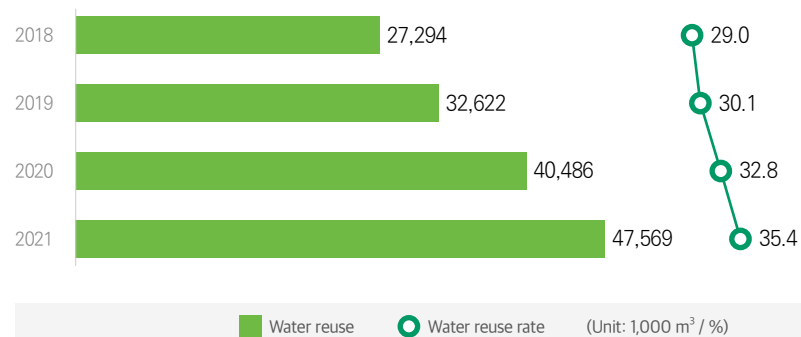
## Taking leadership in water resource conservation

### Reducing water consumption

Semiconductor manufacturing consumes large amounts of water in a range of processes, including cleaning steps. The scrubber used to treat and discharge process gases is one of them. SK hynix developed a “water-free scrubber” in 2018 and has continued to expand its application, while actively reducing water consumption by optimizing the operating conditions of existing scrubbers. As a result, we reduced water consumption by 2.24 million tons in 2021.

We also aim to achieve cumulative water savings 600 million tons by 2030 reduce water withdrawal intensity by 35% by 2026 compared to 2020.

### Water reuse/rate

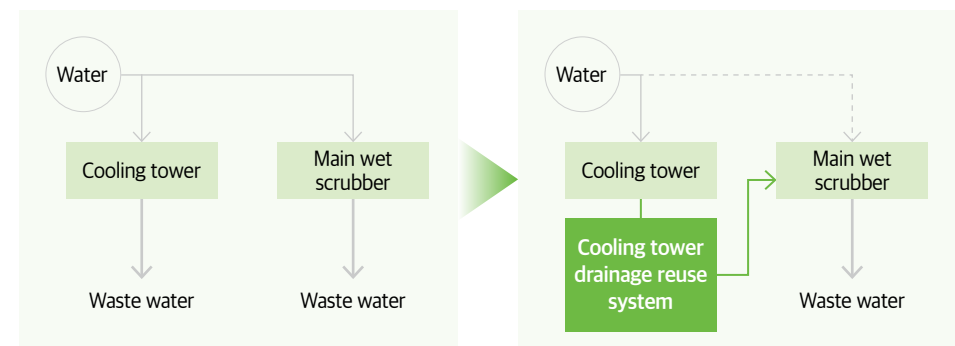


### Increasing water reuse

SK hynix is actively working to reduce water consumption as well as increase water reuse. In February 2021, we installed an additional wastewater reuse system at the Icheon plant, increasing the daily reuse capacity to 60,000 tons.

In 2021, we started using a cooling tower drainage reuse system. The cooling tower drainage reuse system is a facility that recycles water used in the cooling tower and supplies it back to the main wet scrubber, etc. We installed this system at the Icheon plant in 2021 and increased the reusable capacity to about 10,000 tons/day (based on the summer season). In addition, by expanding the reuse capacity through the reuse of condensate water from outdoor air control (OAC), increasing the reuse of low-concentration wastewater, and improving the efficiency of existing facilities, we reused about 47.5 million tons of water in 2021, which is a 17% increase compared to the previous year.

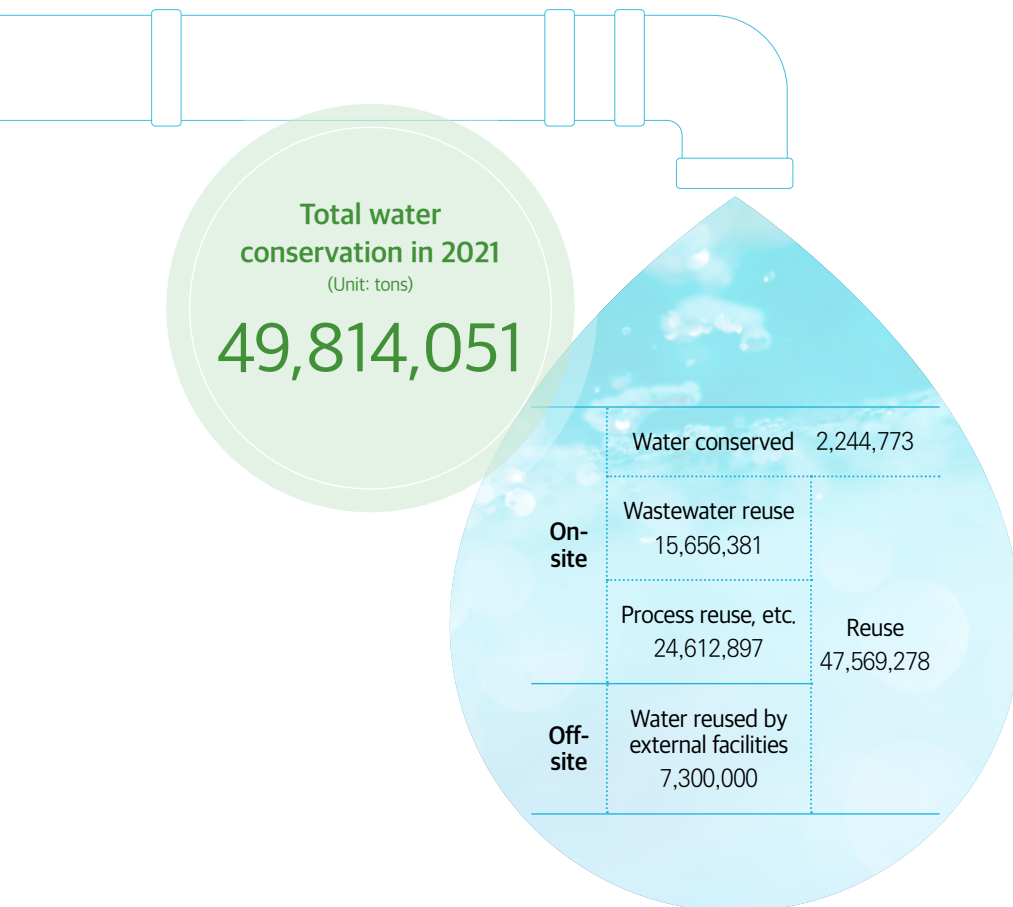
### Cooling tower drainage reuse system





In 2021, SK hynix conserved about 49.81 million tons of water resources by reducing water consumption, reusing wastewater, and supplying reused water to external facilities.

Our efforts to better manage water resources will continue in 2022. We plan to additionally install a wastewater reuse system and a cooling tower blowdown water reuse system and expand reuse capacity by supplying reused water to external facilities, while continuously working to reduce water used for scrubbers and replacing equipment with eco-friendly alternatives.



## Spotlight

### Cooling tower drainage reuse systems

SK hynix has been using a cooling tower drainage reuse system since 2021 to increase water reuse.

The cooling tower maintains the temperature and humidity at certain levels to block the inflow of external pollutants. In summer when the outdoor temperature is high, the water consumption of the cooling tower almost doubles compared to that in winter, so we have continued to make attempts to reduce it. As a result, we have established a system that reuses cooling tower blowdown water through micro filters (MF) and ultraviolet (UV) sterilization processes. The MF process filters and removes suspended matter, and UV sterilizes more than 90% of microorganisms. Water that is treated through the MF and UV processes is supplied back to the scrubber.



Cooling tower drainage reuse systems



## Ensuring a healthy aquatic ecosystem

### Biodiversity<sup>o</sup> protection efforts conducted with stakeholders

SK hynix strives to understand and preserve the impact of biodiversity on the entire ecosystem. We are particularly focused on the river-based ecosystems in the vicinity of our fabs, considering the nature of the semiconductor industry, which uses large volumes of water. As part of this effort, SK hynix signed an MOU with Microsoft in October 2021 for the Biodiversity Research and Human Resources Development Project. This project is expected to allow SK hynix to take advantage of Microsoft's AI technology to scientifically observe and document changes in the river ecosystem near the Yongin Semiconductor Cluster. Local residents and our own people collect data via their smartphone cameras and other IT devices, and that data are run through an AI program that identifies and categorizes the various plant and animal species. The data collected in this way will be used by specialists to conduct research on biodiversity and plans call for the research findings to be made public through forums. In addition, we provide local students and other young people with environmental and data analysis training opportunities to help them grow into environmental and data professionals. In the second half of 2022, we plan to host a data analysis contest for local students and residents, and we aim to steadily expand the target locations for ecological monitoring going forward. This project is made all the more meaningful because various stakeholders, to include SK hynix, the local community, and foundations, are taking part in the effort to preserve biodiversity. In the future, SK hynix will continue to cooperate with various stakeholders, communicating with them transparently, and strive to create healthier ecosystems.



Signing an MOU with Microsoft for a project for research on biodiversity and the cultivation of talented individuals in the field

### Continuous monitoring through a biomonitoring system

SK hynix continuously monitors the surrounding environment to minimize any negative impact we may have on the ecosystem around our plants, and make restoration efforts if any damage is incurred. To this end, we have installed and operated a biomonitoring system as well as a telemonitoring system (TMS) that measures the physicochemical properties of effluent in the automatic water quality monitoring system. Biomonitoring uses organisms to overcome the limits of physicochemical analysis. It can prevent negative effects on the water ecosystem/biodiversity by detecting toxic effects before discharge. The species observed by the biomonitoring system are three kinds - daphnia, algae, and sulfur oxidizing bacterium - each with different sensitivities to pollutants. Changes in the behavior of daphnia, differences in photosynthetic activity of *algae*, and the degree of bacterial activity are used as indicators. The monitoring results are classified into four stages according to our own standards, and appropriate measures such as operating an emergency storage facility are taken according to the response plan for each stage. When abnormal water quality is detected, the emergency storage facility stops the discharge and the discharge is made after the safe water quality is guaranteed. SK hynix seeks to understand the impact that we can have on biodiversity from various angles, offset any negative impacts resulting from our business from a mid- to long-term perspective, and promote biodiversity by creating a better ecological environment.



A biomonitoring system

## Spotlight

## Local environmental improvement program at the Cheonju site

The SK hynix Cheongju business site has been organizing tree-planting events along the shores of Daecheong Lake, the drinking water source for the Chungcheong region, since 2009. To date, some 36,000 saplings have been planted over an area of some 100,000 square meters. The carbon neutral belt thus created has improved the quality of the water in the water supply, removes some 1.3 tons of fine dust from the air each year, and absorbs at least 160 tons of CO<sub>2</sub> annually.

We are also at the forefront of the effort to preserve ecosystems in local communities. For example, the red-spotted apollo butterfly (*Parnassius bremeri*) inhabits parts of Yeongdong County, North Chungcheong Province. In December 2020 we signed an agreement with the Geum River Basin Environmental Office, local governments, and environmental groups to participate in the Project to Save Endangered Species in the Yeongdong Region.



The red-spotted apollo butterfly, a Level 1 endangered species



Tree-planting along the shores of Daecheong Lake since 2009

The red-spotted apollo butterfly is native to Northeast Asia, very rare in the world, and classified as a Level 1 endangered species. In accordance with the agreement, SK hynix released eighty of the butterflies in the wild in May 2021, and the company is providing a fund of KRW 30 million a year through 2023, participating in cleanup drives inside the habitat area, and continues to work to establish the red-spotted apollo butterfly stably.

The SK hynix Cheongju business site is engaged in programs like this to improve the environmental quality of local communities as well as other activities to reduce solid waste volume and lower fine dust emissions. These ecofriendly efforts were recognized with the presentation of the prestigious Presidential Citation for Environmental Conservation at the Environment Day Ceremony in June 2021.



Cheongju Environment Team, recipient of the Presidential Citation for Environmental Conservation

# Circular Economy

## Managing waste

SK hynix is committed to reducing waste by improving processes and continuously discovering ways to recycle waste resources in a bid to minimize the environmental impact of waste generated from our business operations. All final waste is handled by designated waste disposal companies. For safe disposal, we select disposal companies through a rigorous screening process, and ensure that waste is stored and disposed of appropriately in accordance with environmental laws and regulations through an annual evaluation of the companies.

### Developing wafer reclamation technology inhouse to reduce solid waste volume

Wafers are used to make the products that are sold, of course, but large volumes of these silicon substrates are also used in processes outside of chip production, to include testing and monitoring the equipment as well as in R&D activities. An outside company can be contracted to reclaim wafers<sup>○</sup> that have already been used once to create test and dummy wafers<sup>○</sup>. However, this arrangement requires time and money, while the quality of the wafers drops somewhat after reclamation. Most of the wafer reclamation services are located outside Korea, and so a significant quantity of the reclaimed wafers is damaged during shipping.

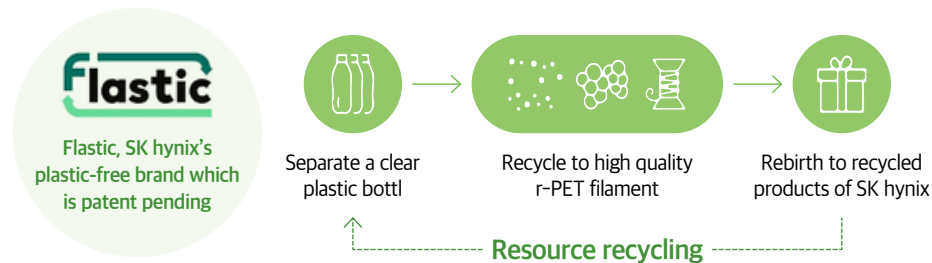
To address these problems, SK hynix has developed an improved reclamation technology inhouse. This new technology minimizes the amount of grinding required, improves the quality of the reclaimed wafers, and increases the number of times they can be reused, which helps to reduce the volume of waste generated. At the same time, the volume of waste substrates has been lowered because in-transit damage has been reduced. As a result, the material can now be reclaimed at least 100 times, which is 20 percentage points or higher than before. Moreover, idle equipment has been put back into service to perform the reclamation process, resulting in less waste in the form of retired equipment. Inhouse wafer reclamation at the Icheon, Cheongju and Wuxi business sites have brought an aggregate of over KRW5.4 billion in cost savings from 2020 to 2021. Plans call for phased increases in the areas of reclaimed wafer use and processing volume going forward.

### Reducing waste sulfuric acid through collaborative efforts among various organizational units

Sulfuric acid is the cleaning chemical most commonly used during the chip washing process because of its excellence. However, a special process is required for its disposal, which is not only expensive but also generates a hazardous gas. For these reasons, SK hynix has taken on the challenge of reducing the volume of it. To start, we reduced the amount of sulfuric acid being used. The R&D department examined alternatives for sulfuric acid. Then, experiments were run dozens of times to verify the conditions that could satisfy all the many processes, and an optimized approach was found for reducing the volume of sulfuric acid without affecting productivity. However, the overall volume of waste sulfuric acid did not drop in proportion to the gains made in lowering sulfuric acid use, prompting us to try to reduce waste sulfuric acid in new ways. A company-level task force was formed with the mission of “optimizing the deionized water in waste sulfuric acid.” People from the C&C (Chemical Mechanical Polishing & Cleaning) Technology, Facilities Engineering, Environment, Water Supply and Treatment, and Procurement brought their heads together to mull over the problem, and they managed to decrease the amount of waste sulfuric acid by adjusting the valves on the tanks used when treating it. Ultimately, the volumes of both the sulfuric acid used and the waste sulfuric acid generated were lowered 20% compared to 2020, which in turn enabled us to cut the number of trips taken by the collection trucks and the amount of pollutants such as sulfur dioxide that are generated.

## Raising the recycling rate of non-hazardous waste through the “Flastic” program

SK hynix runs a “Flastic” (from a combination of “free” and “plastic”) program that breathes new life into plastic being thrown away thoughtlessly every day, helping to foster the right kind of virtuous cycle with respect to resources. This waste plastic recycling program unique to SK hynix began in 2021 with the focus on removing from the non-hazardous waste those items made of clear PET plastic, which is relatively easy to reprocess into quality resources for new products. If the clear PET is not separated from the rest of the solid waste, most of it will end up being consumed as solid refuse fuel; however when collected separately it can be turned into a value-added long-fiber material. Therefore, SK hynix signed a work agreement with the Ministry of Environment, recycling businesses, and finished product makers “to build a system for recycling clear PET into quality materials.” The system covers everything from reprocessing the PET into long-fiber material to manufacturing the finished products.



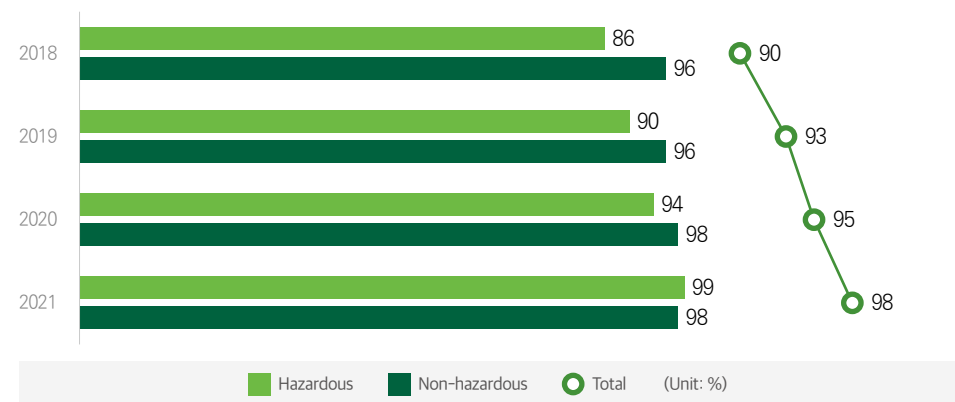
The clear PET that has been sorted out and collected is then pulverized, washed, and processed into small PET flakes. These recycled PET (r-PET) flakes are then processed further into r-PET chips, which are spun into filament. The filament is woven to make items used inside the company such as umbrellas and duty uniforms. Besides creating a system for recycling, the company encourages employees to separate out the clear PET bottles for collection. To this end, campaigns such as “Flastic Market” and “Empty, Rinse Out, Separate and Don't Mix In” are run to raise employee awareness, while waste separation bins on company grounds are classified by various waste categories.

As a result of this effort, five tons of PET plastic waste were recycled into r-PET filament, which was then turned into useful products during 2021. The company's CO<sub>2</sub> footprint from plastic material use was lowered by 80 percent in the process. (I.e., the amount of CO<sub>2</sub> generated while producing 1kg of r-PET is less than 1.7 kg equivalent to the carbon dioxide volume compared to the regular filament.)

## Half-chips: recycling memory chips with defects

Starting from 2020, SK hynix has applied proprietary technology to commercialize and sell memory chips that had been discarded after being rejected in wafer testing for certain performance shortcomings. These “half-chips” passed part of their function tests and can be used at half of their originally intended capacity. Their sales in 2021 reached USD 50 million, a two-fold increase year on year.

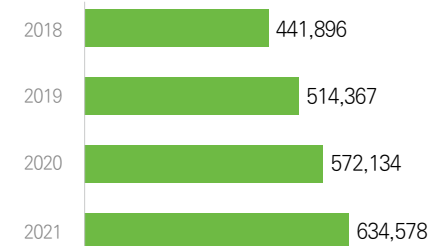
### Recycling rate of waste



### Zero Waste to Landfill (Unit: %)



### Volume of waste generated (Unit: ton)

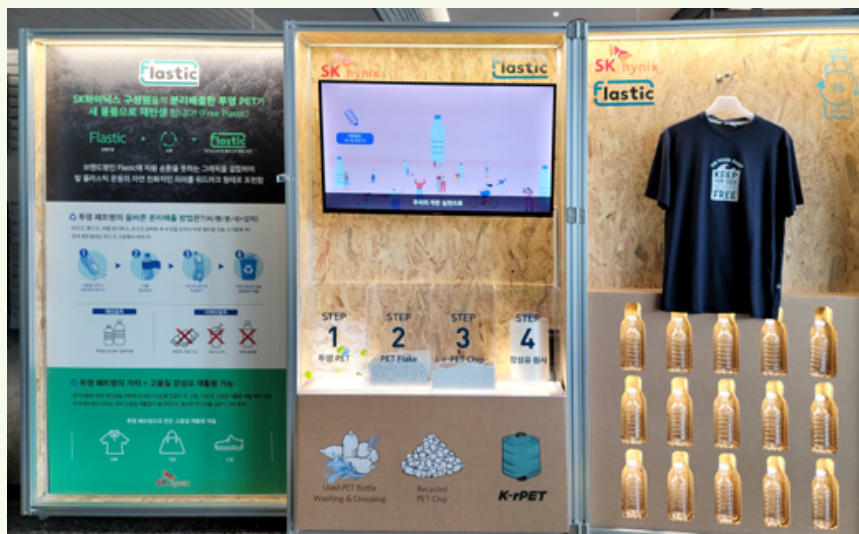




## CASE

## Flastic Market: resource recycling with employee participation

SK hynix conducts various campaigns in which employees play an active role. One of these is the Flastic Market, launched in 2021. Employees collect items of clear PET plastic, bring them in, and exchange them for fleece jackets, vests, T-shirts, and other clothing articles made of r-PET filament. The number of items they receive depends on the volume of clear PET they deliver. The campaign aims to get employees in the proper habit of separating waste for disposal and, at the same time, let them experience first-hand the positive effects of resource recycling. Employees applied in advance to join the campaign in September, and in a week more than 1,000 people were taking part, including those waiting in line to have their donations received. In that time over 10,000 PET bottles were turned in—enough to produce more than 600 T-shirts.



Display of a manufacturing process of r-PET clothing and a sample of r-PET clothing

Gwon Min-ji and Lee Ji-seon from the R&D, who took part in the campaign, said: “Interest in the Flastic Market was very high among our fellow workers. We were able to see with our own eyes the recycled results of the clear PET we had separated out and turned in. We think we should all be more diligent in separating waste not only at the company but at home and everywhere else.”

Choi Gyeong-jin from Cheongju Environment Team, who helped plan the campaign, expressed her expectations: “Recycling the waste that is generated in the administration space is impossible unless employees separate their waste properly. Just like the great response we’ve seen to Flastic Market, I believe that going forward the quality of the r-PET products will keep getting better with our employees taking part in the effort to properly separate waste.”



Gwon Min-ji and Lee Ji-seon, participants in the Flastic Market campaign

## Systematic environmental management system

### ISO 14001-certified environmental management system

SK hynix operates an environmental management system that meets domestic and international regulations as well as customer requirements through ISO 14001 certification. We review compliance on a quarterly basis by establishing operational policies for chemical management, discharge of water and air pollutants, waste treatment, and energy management. We also monitor problems uncovered from regular inspections, conduct improvement activities, and assess the level of implementation in accordance with internal audit guidelines. The ISO 14001 certificate can be found on [our website](#).

### Eco-conscious management with employees and local communities

SK hynix has established environmental policies, advanced environmental management standards, and practices environmentally conscious management to minimize the environmental impact caused by business operations based on environmental policy. The issues related to our eco-conscious management are handled by the ESG Management Committee and the Carbon Management Committee, and strictly overseen and deliberated by the Board of Directors, the highest decision-making body.

The environmental policy established based on the SK hynix Sustainability Guidelines is our commitment to protecting the environment around our operations and local communities. SK hynix employees, subsidiaries, contractors, suppliers, and joint venture employees have all pledged their compliance. We also collect opinions from stakeholders in the local communities where our manufacturing sites are located.

SHE Policy



SK hynix Sustainability Guidelines



### SHE chemical substance qualification system

SK hynix protects employee safety by exhaustively managing all chemical substances used in production processes. Importantly, we manage hazardous chemical substances according to standards that are more rigorous than the domestic laws and regulations require. Our management standards are established and run in accordance with related agreements such as the Stockholm Convention<sup>o</sup> as well as institutional guidelines and client requests.

We use our SHE Chemical Substance Qualification System to verify the components in all the materials and products provided by our suppliers and to examine whether the management standards for hazardous chemical substances are being met. All suppliers who deliver products to SK hynix are required to submit a material safety data sheet (MSDS)<sup>o</sup>, product certificate, and component analysis report to our material management system (MMS). To confirm the veracity of the data, the supplier's CEO must sign every document submitted, and the component analysis must be conducted by analysis firm of our choosing. Suppliers who submit incomplete documentation or deliver products that do not measure up to our hazardous chemical material management standards will be notified that their delivery is restricted from our warehouse and that they must find replacements.



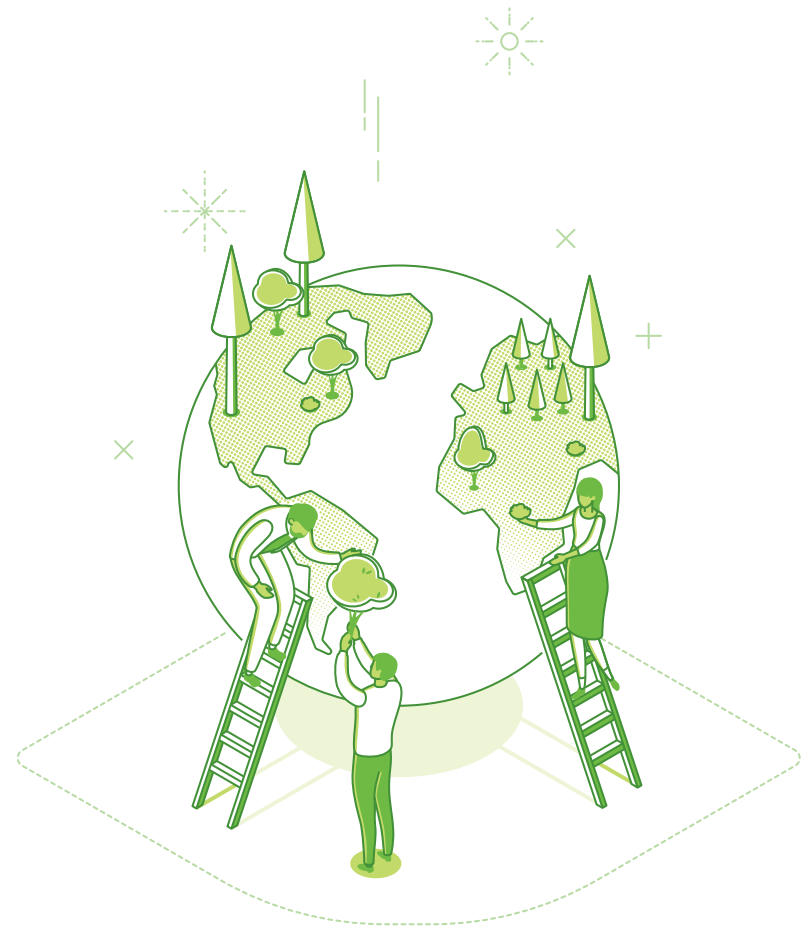
## Building an integrated environmental management system

Our integrated environmental management system (IEMS) operates according to the stipulations in Korea's Act on Integrated Pollution Prevention and Control. We have replaced the conventional method where the release of pollutants is managed separately for air, water, soil, and waste with an integrated management approach that covers each business site as a whole.

In 2021 the semiconductor industry was added to the list of industries subject to integrated environmental management, and SK hynix completed an inhouse IEMS version in January of that year. Our Icheon business site was the first among Korean chipmakers to have the new system approved, and the Cheongju business site going through the necessary procedures, with the aim of receiving approval by the end of 2022.

Our first step in building the IEMS was to conduct a pollution discharge impact analysis, which combines the background concentration and process contribution to calculate the predicted environmental concentration. "Background concentration" refers to the pollution levels that exist in the local community before pollution-emitting facilities go into operation, while "process contribution" is the pollutant concentrations after the emissions from the plant site have been factored in. The next step was to build a system that grasps the pollutant data and flow being generated during all processes and install a monitoring system at all discharge ports. With these in place we were able to verify the degree of pollution being generated during production processes.

Going forward, SK hynix will automatically compute the substance-related data for all semiconductor production processes, and will also build an integrated IT system that draws conclusions from the gathered data. These tools will allow us to monitor the major factors involved in the running of our facilities and equipment, grasp the big picture of the operational status of pollution-emitting facilities, and manage environmental data more systematically.



# Innovate our technology for tomorrow

As a global ICT leader, SK hynix strives to provide solutions that are not only excellent in performance but also environmentally sustainable.

We endeavor to develop alternative gases to minimize our environmental impact from the manufacturing process as well as to develop technologies to improve energy efficiency. We take the lead in digital transformation to build more efficient and optimized infrastructure and systems.

In 2021, we declared our new vision “Memory ForEST” for next-generation semiconductors, and are aggressively investing in R&D, with a research focus on low-power, high-efficiency products and new technologies such as HBM. Our technological assets developed in this way are strictly managed based on a robust security system.

## Achievements in 2021

82,488 tCO<sub>2</sub>eq

Scope 1 GHG emissions reduction in 2021  
(3% reduction compared to 2020)

KRW 4 trillion  
R&D investment

The Carbon Trust certification  
First certified in SK hynix SSD products family

**Material issues in 2022:** climate change and GHG emissions, energy management, and innovation&technology

An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

**Lee Woong-chul** | Island within an Island

In this work, stones that were 3D scanned and printed fill a water tank to present an island within an island that is reminiscent of a glacier. Repetitive geometric shapes convey the message that climate change and related environmental problems can be eradicated, and the earth restored through human effort.



# Sustainable Manufacturing

## Operating the low-carbon manufacturing system

### Development of alternative gases and improvement of scrubber efficiency

A variety of chemicals and gases are used in semiconductor manufacturing. For example, process gases such as  $N_2$ ,  $NF_3$ , and  $CF_4$  are used for pattern etching, wafer cleaning, etc. The used process gas is detoxified through a treatment process using scrubbers before being discharged, and GHG gases are generated in this process. In general, carbon dioxide ( $CO_2$ ) is the most known greenhouse gas, but there are additional types of greenhouse gases such as methane ( $CH_4$ ), nitrous oxide ( $N_2O$ ), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride ( $SF_6$ ). Among these, fluorinated gases (F-gases) such as HFC, PFCs, and  $SF_6$  have a high global warming potential (GWP).



Point of Use (POU) scrubber

Recognizing the importance of F-gas management, SK hynix has also set a goal to reduce GHG emissions from process gases such as F-gases by 40% by 2030. Although this is a challenging goal in the semiconductor industry, which is in need of continuous expansion in facilities and production to meet the surging demand, we aim to achieve this goal by reducing the use of process gases with high GHG emissions or developing alternative gases and improving scrubbers.

To this end, we have calculated GHG emissions by the types of process gas and established a reduction plan focused on gases with the highest emissions. Among them, we are strongly considering replacing  $NF_3$  gas currently used in the dry cleaning process with  $F_2$  gas that does not emit greenhouse gases. In addition, we are continuing our technology research to develop alternative gases for various processes.

We are also working on improving scrubbers that treat process gases. We have been additionally installing water-free scrubbers, and in 2021, we installed 25 De- $NO_x$  and 6 De- $NH_3$  systems in the middle wet scrubber, reducing air pollutant emissions by 74% compared to 2020. In addition, we are reviewing intensive investment in  $NO_x$  reduction equipment in the existing fabs that emit relatively high GHG and  $NO_x$  due to aging equipment, as well as seeking to reduce the power required for the operation of scrubbers by adjusting power consumption according to the required flow rate. We are also expanding wastewater-reducing scrubbers, and researching low-temperature catalytic scrubbers that are highly efficient even at low temperatures, and low power scrubbers that use reaction gases. We are also working to develop a range of technologies to increase the scrubber's process gas treatment efficiency from 90% (based on domestic sites) as of first half of 2022 to 95% (based on global sites) by 2030.

## CASE

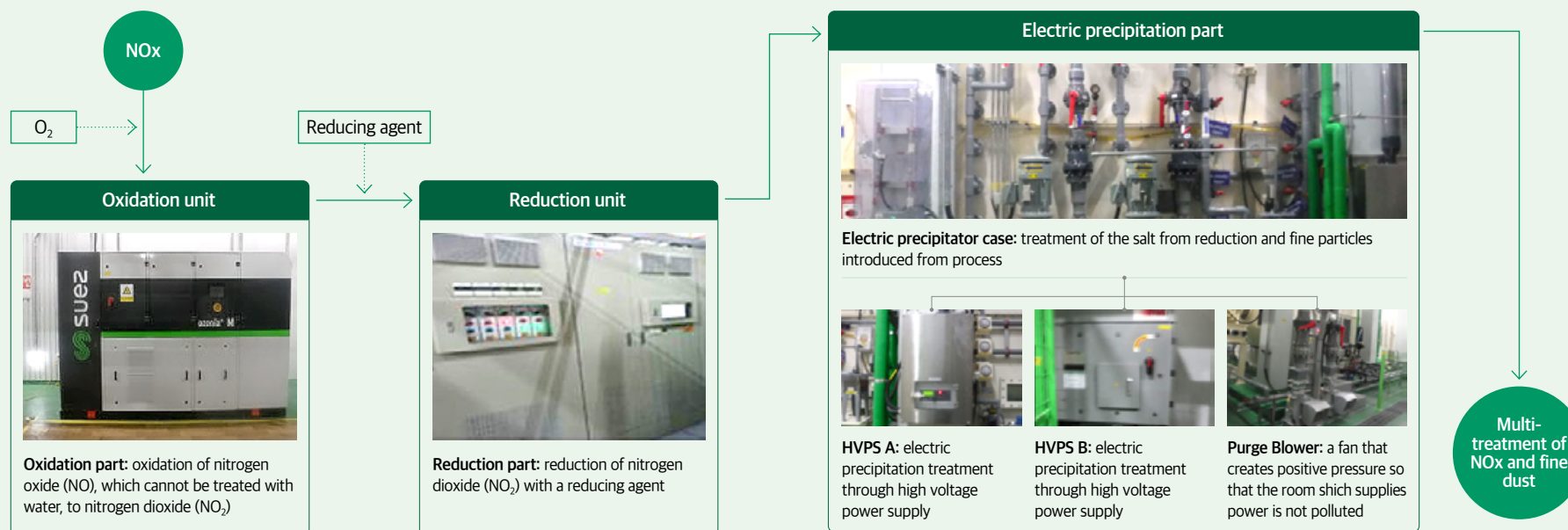
## Developing De-NOx and De-NH<sub>3</sub> systems for keeping the skies blue

SK hynix is committed to developing various process gases and substance treatment technologies that can reduce greenhouse gas and air pollutant emissions. Among our recent successes are De-NOx and De-NH<sub>3</sub> systems codeveloped with our partner Eco Energen.

The technology behind the De-NOx system involves multiple principles like oxidation/reduction/electric precipitation to remove nitrogen oxide compounds and fine dust from the process at ambient temperature. The system oxidizes nitric oxide (NO) to create nitrogen dioxide (NO<sub>2</sub>) and reduces it again with a reducing

agent. The salts generated during this process and the fine dust particles that flow in are both simultaneously removed through electric precipitation. This approach can remove the nitrogen oxide compounds that cannot be treated using the conventional wet scrubbing process. The new De-NOx unit is installed at the Middle Wet scrubber. Instead of the usual treatment with sulfuric acid, our De-NH<sub>3</sub> system eliminates ammonia by applying a carbonated solvent with microbubbles and using a neutralization reaction inside the scrubber tank.

**De-NOx system** | A technology that simultaneously removes nitrogen oxide compounds and fine dust at ambient temperature by applying the multiple principles like oxidation/reduction/electric precipitation



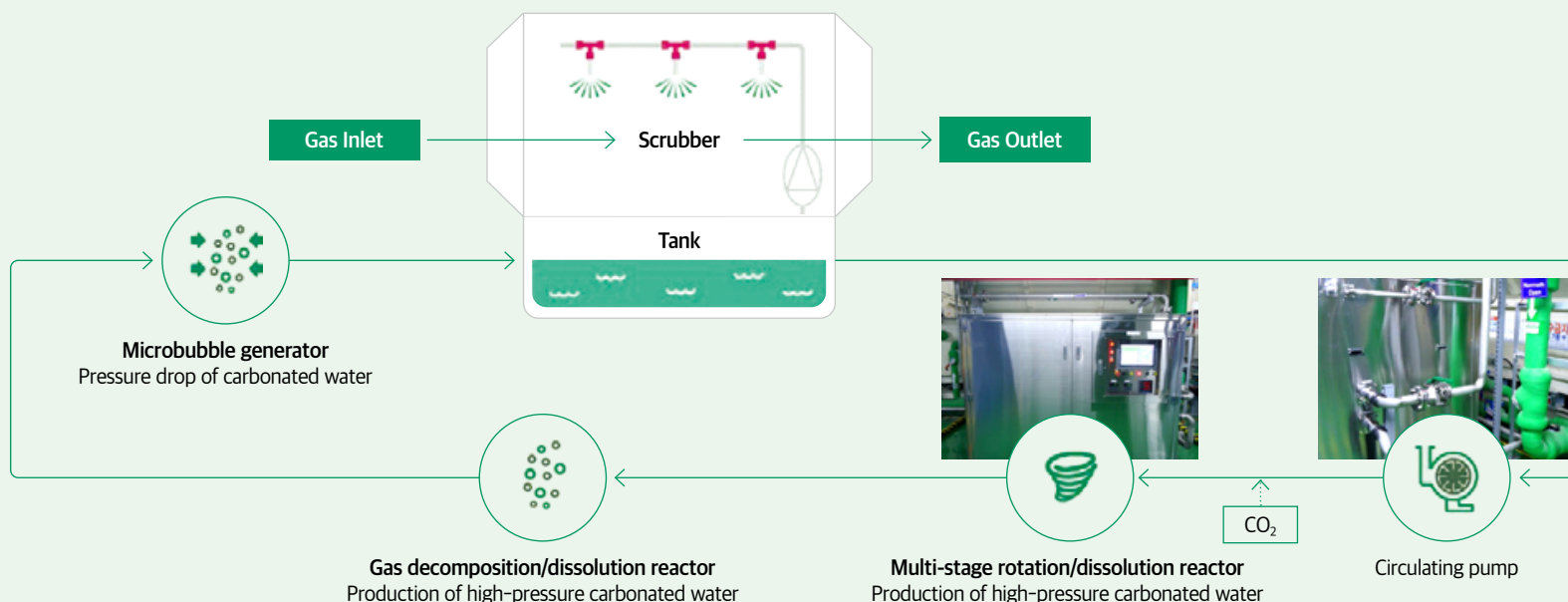
## CASE

## Developing De-NO<sub>x</sub> and De-NH<sub>3</sub> systems for keeping the skies blue(Cont'd)

Two ecofriendly technologies are now available for reducing air pollutant emissions while at the same time lowering the cost of operation. In addition, we continue to work closely with partner companies, taking advantage of the trusted relationships we share to achieve technology development successes. This fact illustrates how the semiconductor ecosystem has also been strengthened.

Besides the new De-NO<sub>x</sub> and De-NH<sub>3</sub> systems, SK hynix and Eco Energen are jointly developing technology to reuse the main scrubber solvent. This technology is applied in equipment outside the scrubber tank for extracting salts through the use of ultrasonic waves. It cleans the extracted salts from the circulating water so that the water can be reused, and as such is expected to play a significant role in our maintaining productivity while reducing water resource use.

**De-NH<sub>3</sub> system** | A technology that eliminates ammonia by applying a carbonated solvent with microbubbles and using a neutralization reaction inside the tank





## Optimization & efficiency

### Digital Transformation

**Collecting and analyzing data efficiently** | SK hynix is bolstering the role of the Data Science Team to discover which data are valuable out of the vast volumes of bigdata, expand data applications to business in general, and make accurate decisions rapidly. The DS Team is building the Hadoop infrastructure environment that enables the gathering of data generated at each production facility and brings multiple computers together to work as one to process massive data volumes. A data lake has been established as a database platform for searching and acquiring the data collected through Hadoop as well as for developing and learning to use algorithms. In addition, the Team has reorganized the master data to raise data collection and analysis efficiency and is performing innovation tasks at various worksites to automate and upgrade production processes.

**Building systems and infrastructure** | SK hynix is transitioning to cloud computing to raise the efficiency, agility, and expandability of data management. Corporate security is a priority at chipmakers, which makes the move to the cloud more difficult, but we have partially adopted a private cloud platform in order to acquire the reliability and flexibility that cloud computing systems can offer.

**Optimizing work processes** | SK hynix is building a product lifecycle management system at the corporate level to optimize how work is done. Each organizational unit has been operating its own system inside the company, and the new PLM project aims to integrate those systems and give completeness to work processes companywide. Meanwhile, M16 Fab's system architecture is being upgraded to a flexible service structure at the platform base so that it can be extended to the Yongin Semiconductor Cluster in the future. Moreover, system automation is being expanded so that both the production operation and the various kinds of engineering work can both be conducted more smoothly.



## Getting M16 Fab off to a strong start as a new growth driver

SK hynix broke ground for the state-of-the-art M16 Fab in November 2018, completed construction in December 2020, and started up operation in January 2021. This unique facility stands 105 meters tall, equivalent to a 37-story apartment building, and includes multiple operational units, to include DRAM production, research and development (R&D), the company's first extreme ultraviolet (EUV) lithography, and packaging and testing (P&T).

M16 employs an earthquake-resistant design that can withstand a magnitude of 7 and is equipped to mass-produce DRAMS with 4th generation 10 nanometer processing as well as conduct EUV processes. As such, this new DRAM production base represents the outstanding technologies and production capabilities that SK hynix possesses, serving as a case study in successful digital transformation by grafting on numerous cutting-edge technologies.

### Spotlight

## Automated parts warehouse at M16

The parts warehouse at M16 is a classic example of digital transformation, adopting the latest automated material handling system to upgrade the parts management operation. Here, the operator inputs the requested parts information into the material handling system, and the part is retrieved by a robot. Parts taken out of the warehouse are automatically moved via conveyor belt, sorted out, and transferred to the desired production line on dedicated elevators. The same automated system is in play when parts are unloaded in the warehouse. The operator does not have to verify parts one by one, for a scanner automatically identifies and sorts them.

Delivering the needed parts rapidly eliminates the need to store parts separately in advance for use on the line. Space utilization efficiency increase if robot movements are the sole concern when designing a warehouse. As a result this warehouse can store at least twice the parts per unit area that can be accomplished in a conventionally-designed warehouse. Moreover, the warehouse is located inside the fab, and the delivery channels are optimized, cutting the delivery time by at least half that needed using the usual methods.

Safety is enhanced in addition to the productivity gains. The operation of intracompany delivery vehicles is reduced, which in itself means a lower chance for accidents. In addition, emergency machine off buttons (EMOs) are positioned within three meters of each operator, so the equipment can be shut down immediately should a dangerous situation arise. More than thirty EMOs are deployed along the conveyor belts inside and outside the warehouse. Safety spaces separate the areas where the robots move completely from the areas where the operators work, and a safety light curtain<sup>o</sup> is installed to detect the movement of employees who happen to approach a dangerous area and shut the equipment down.

Choi Jae-pil from Warehouse Infrastructure Team says: "The response at the site is excellent. The convenience of the warehouse operators at work is very good, but more importantly, delivery time has been reduced. Going forward, we will aggressively examine and adopt diverse new technologies to create an even more efficient and safe material handling system."

## Raising product completeness and development efficiency by building a DRAM Quality Design system

The SK hynix DRAM Design Team is pursuing innovative working methods that can build up diverse data forms and use them most effectively in an effort to acquire future product competitiveness. They began by quantifying and standardizing rules in order to build a Quality Design system. When designing DRAMs, set procedures are followed for verifying circuit composition and product operation. The verification findings list certain items (categories) that can clearly judge whether there are defects on the system, but the boundaries are vague and other items are unable to render a judgment for the system overall. In the event of the latter case, the engineer in charge has had to decide on the basis of personal experience or competencies, and this practice has been singled out as a cause for product quality deviations to occur.

The objective of Quality Design is to establish detailed judgment standards (rules) that all the engineers agree upon with respect to the items in which a system-wide judgment was impossible. These rules are then quantified so that verdicts can be made on what passes or fails on the system. To this end, a total of eighty quality design rule categories were elicited as of the first half of 2021, and new rules will continue to be brought out in the days ahead.

Moreover, an integrated DRAM database, called DAM, has been created to amass and store the data necessary for new product development and to make that data readily accessible to all developers. The data stored in DAM is being used to build the Quality Design system, improve signal quality, and secure multiple-signal robustness. Going forward, data that have been changed in connection to risk assessment methodologies for new products will be shared on the system, and DAM will become firmly established as the core system for DRAM development. In the longer term, the system's reach will be spread to help improve the completeness of all semiconductor products.

Product recall in 2021

0 Case

## Analysis Technology Center

The analysts who were working on each of the SK hynix campuses and the infrastructure have gathered at one location with the establishment of the Analysis Technology Center. Originally, the analysis function and personnel as well as equipment were scattered among five different buildings at the Icheon business site. They experienced difficulties in coordinating their work, while some redundancies existed in equipment investments and operation. Even for equipment maintenance and repair, the ways that operators had to go were long and time consuming. Making matters worse, inefficiencies abounded. The demand for analysis would be heavy at one location, causing delays, while the equipment at other locations stood idle. The situation prompted SK hynix to decide to bring all the assets together at one place, the Analysis Technology Center, in the interest of overall optimization. The project began in 2019 and took about two years to complete the construction of the various facilities and environment. Analytical laboratory personnel and equipment that had been spread out were integrated into one operation. The overall analysis processes and personnel flow movement were elaborately redesigned, while the positioning of the people and equipment was rearranged to raise operational efficiency among the different facilities. Meanwhile, the Solutions Laboratory was installed on the second floor for the building housing the Analysis Technology Center, and it is of the same scale, in a bid to raise the competitiveness of solutions companywide.

Since the launch of the Analysis Technology Center, analysis specialists from various disciplines have found themselves together in the same physical space, a "one-lab" environment, and can collaborate more actively from the comprehensive analysis perspective. Moreover, they all have access to the same broad range of equipment, elevating the reliability of their analysis work and resolving analysis problems. Ultimately, the new arrangement is expected to take R&D and product competitiveness to the next level.

## Role of the Analysis Technology Center

### Process analysis

- Solving process problems
- Assessment of new process

### Device failure analysis

- Product failure analysis
- Major alien substance analysis

### Materials analysis

- Subject matter membrane assessment
- Wafer assessment

### Mass product analysis

- Failure mechanisms
- Process assessment
- Yield improvement

### Development of analysis technology

- Solving analysis conundrum
- Developing elemental technology
- Analysis standardization

### Market analysis

- Competing product analysis
- Response to patent disputes

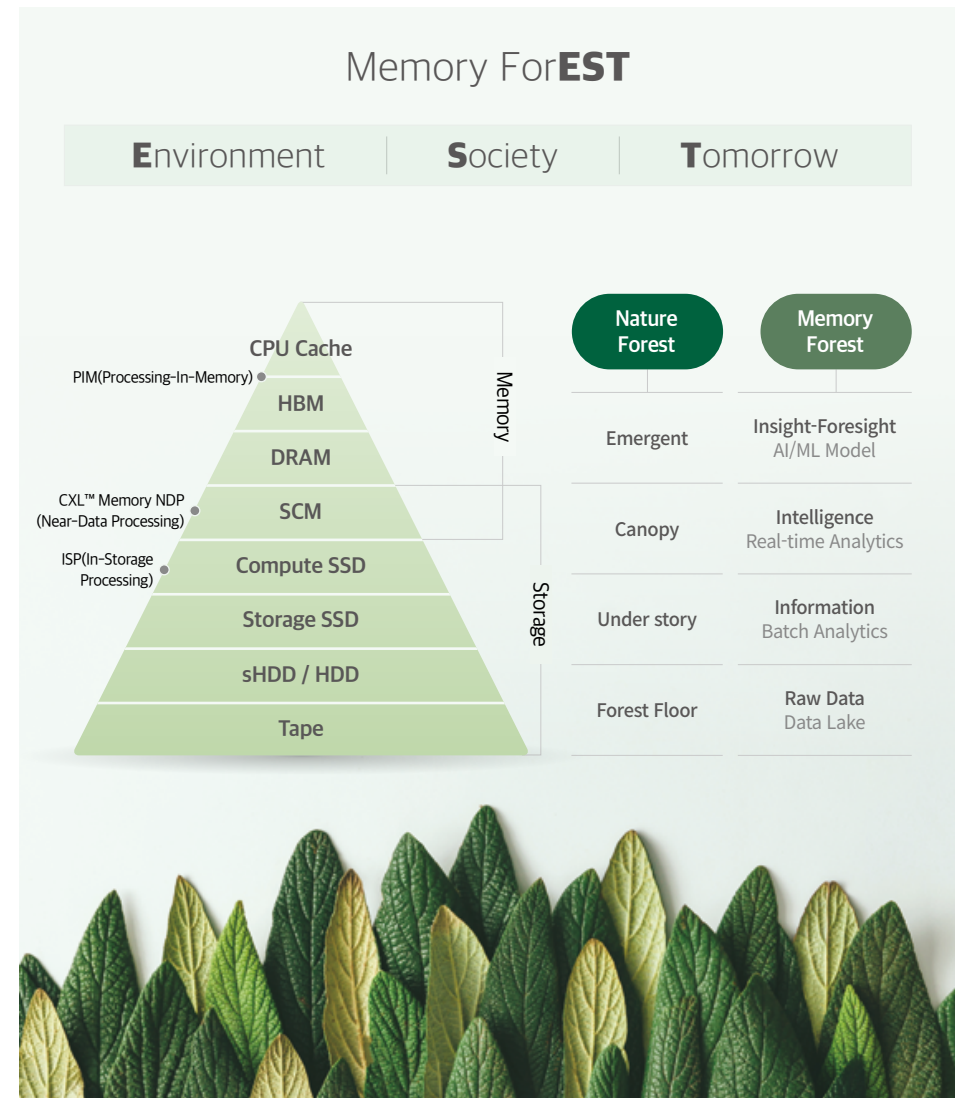
# Green Technology

## Memory ForEST - New Roadmap for Tomorrow's Tech Ecosystem

The entire world is rapidly evolving into a data-centered society, and so the ICT industry is confronted with the task of having to offer solutions that perform superbly while being environmentally sustainable. SK hynix offers a new vision called Memory ForEST in response to the need that clients and partners have for the establishment of a sustainable ecosystem.

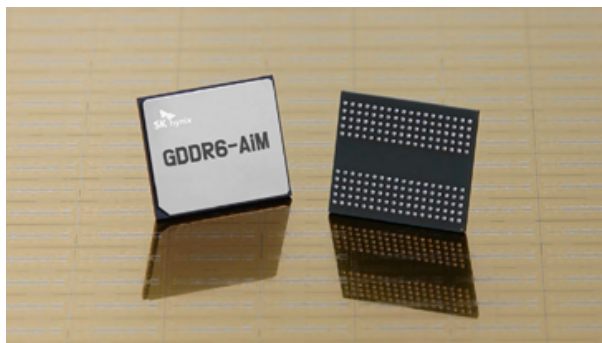
# MEMORY FOR EST

Memory ForEST is a forward-looking semiconductor initiative that takes advantage of SK hynix's innovation and competitiveness to support the growth of an ecosystem of future technologies. The "E-S-T" in the name stands for Environment, Society, and Tomorrow. Memory ForEST, modeled after a natural forest inhabited by diverse fauna and flora, is aimed at providing a rich and lush ecosystem for the IT industry. We are constructing a computing architecture that encompasses each memory layer, to include SK hynix's solid state drives, storage-class memory and high-capacity memory, main memory, and high-bandwidth memory. It is like forming a great ecosystem with each role served fully, from the soil and grass on the forest floor to the densely foliated trees. In addition, at the very bottom Memory ForEST lies a data lake, repository for unprocessed data. In this way SK hynix memory semiconductors faithfully fulfill their role in terms of performance, capacity, and added functions for each category, and as a group they will advance the ecosystem known as the ICT forest.



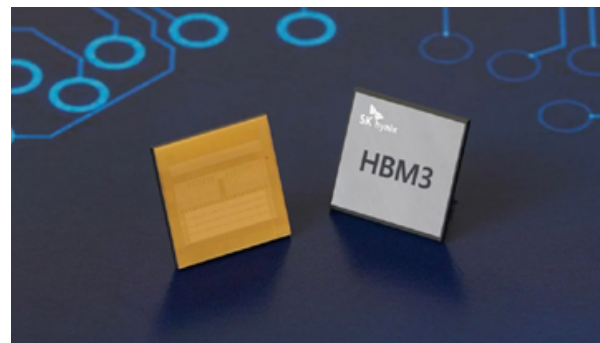
## Developing new low-power, high-efficiency products

**Developing next-generation technologies: PIM** | In February 2022, SK hynix completed the development of processing-in-memory (PIM), a next-generation technology that adds the computational function to the memory as a way to resolve the latency problem. PIM is a “next-generation smart memory” that shatters this fixed notion and shares the computational function between the memory and the central processing unit (CPU). The evolution of this new technology is expected to enable memory chips to perform memory-centric computing, which will play a central role in the operation of smartphones and other ICT devices. At the same time, SK hynix has completed samples of the GDDR6<sup>+</sup>-AiM (accelerator<sup>+</sup> in memory), the company's first PIM application. This new device can process data at 16 Gbps, making it a likely candidate for use in machine learning and high-performance computing, in addition to bigdata computing and storage. The GDDR6-AiM connected with a CPU or GPU can run computations up to 16 times the speed that the same CPU or GPU can accomplish when paired with a regular DRAM. In addition, the new chip operates on 1.25V, lower than the 1.35 volts required to run the GDDR6 DRAM, which means that power consumption can be reduced by as much as 80 percent.



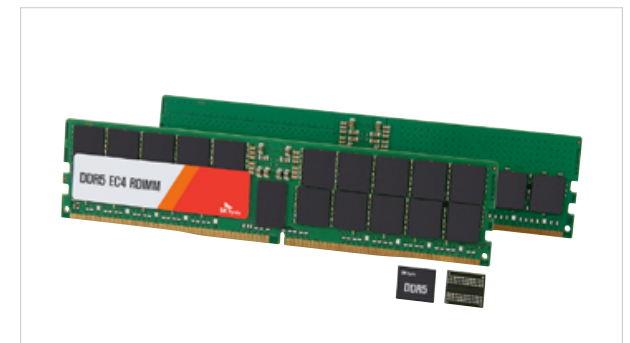
PIM(Processing-In-Memory)

**Developing and mass producing the HBM3** | In October 2021, SK hynix became the first in the world to come out with the third-generation version of the high-bandwidth memory (HBM3) interface. This happened just one year and three months after we started mass producing the HBM2E DRAM in 2020. After 7 months of development, mass production began in the first half of 2022 and started the delivery to customers. The HBM3 runs about 78 percent faster than its second-generation counterpart and goes on the market with an industry-leading capacity of 24GB. In addition, an error correction code is built in that can automatically revise any data errors sent to the DRAM cells, greatly raising reliability.



HBM3

**Delivering samples of the industry's first 24Gb DDR5** | In 2020, SK hynix became the first in the world to complete the DDR5 DRAM, and samples of a 24Gb version were shipped out in December 2021. The 24Gb DDR5 is fabricated with 4th generation 10 nanometer (nm) processing, increasing chip capacity, improving production efficiency, and increasing speed by up to 33% compared with DDR5 chips that use second-generation 10nm. Importantly, the new chip consumes about 25% less power than the earlier versions do, and the energy input during production is also lower, with means lower carbon emissions. We are confident that SK hynix will maintain leadership in the DDR5 market segment going forward, as the technology evolves, and as new products are developed that are beneficial on the ESG front.



24Gb DDR5



## Acquisition of The Carbon Trust's carbon footprint certification

In June 2022, SK hynix received carbon trust carbon footprint certification for eSSD and cSSD products for the first time in our SSD family. The Carbon Trust, a non-profit organization founded by the U.K. government to combat climate change and cut carbon emissions, certifies products whose total carbon emissions from manufacturing to disposal have been measured based on the carbon footprint calculation standard. The organization provides an internationally recognized carbon footprint certification that assesses the impacts of carbon emissions throughout the entire lifecycle of a product. We believe that the acquisition of a globally trusted certification has helped us to provide more reliable environmental data for our products. Moving ahead, we plan to acquire the Carbon Trust's certification for low carbon products as part of our efforts to reduce carbon emissions from the entire process of product manufacturing.



The Carbon Trust's carbon footprint label

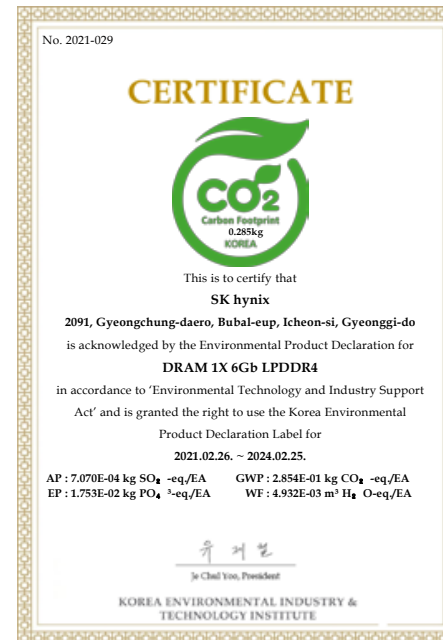


## Certification of Environmental Product Declaration

With global companies accounting for a large part of our clients, Environmental Product Declaration (EPD) certifications have become an integral part of our response to their calls for climate action and disclosure of environmental information.

In general, the scope of EPD data encompasses pre-manufacturing, manufacturing, use, and disposal stages. As for semiconductors, however, given that they represent intermediate goods used to manufacture end-products, EPD data for semiconductors consist of those from pre-manufacturing and manufacturing stages. We gather data for input materials with 95% or more contribution in terms of cumulative mass and calculate relevant energy consumption figures, which are then used to measure a product's carbon and water footprints.

Thanks to these efforts, in 2021, we obtained carbon and water footprint certifications for our flagship products DRAM 1X 6Gb LPDDR4 and NAND 3D-V4 256Gb TLC.



Certifications of Environment Product Declaration





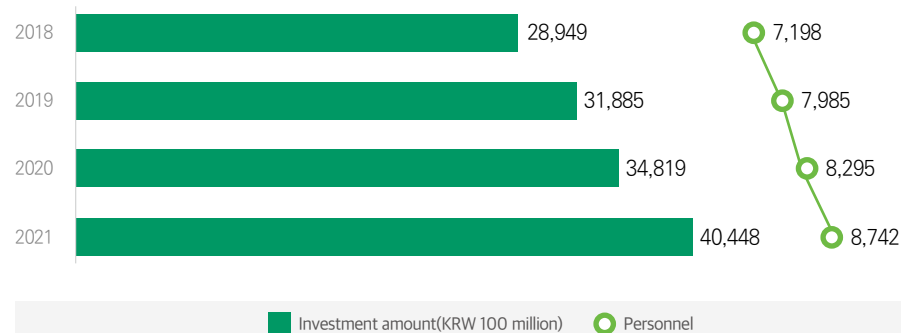
## Reinforcing R&D competitiveness

### Establishing the new Revolutionary Technology Center

In 2021, SK hynix established a new R&D organization called the Revolutionary Technology Center to secure technological competitiveness going forward. The RTC goes a step beyond being the first to develop the latest product versions; the unit is on a mission to acquire technologies for the future. To this end, the researchers here are working on next-generation semiconductors such as new DRAM and NAND structures that operate faster and have greater capacities, new memory forms such as phase-change memory<sup>o</sup>, magnetic random access memory<sup>o</sup> that break through existing limitations, and new materials that have not been used to date at semiconductor makers.

To develop these new memory forms and materials, SK hynix is investing generously in the future, recruiting specialists, conducting tasks in cooperation with universities, and supporting a wide range of academic studies. We are not complacently satisfied with our position as a predominant player in the semiconductor business; instead, we continue to pioneer new technologies and pursue innovation so that we can maintain our technological dominance.

### R&D investment



### SK hynix academic conference

The SK hynix academic conference is a venue for employees to share case studies with colleagues on the technology research findings and applications they have achieved at work. The company has been holding the annual event since 2013, helping to build a database of the best research results and secure proprietary assets. It is also an opportunity to let employees learn more about cutting-edge technologies and motivate them to engage in R&D projects. Between 800 and 1,000 research papers are submitted each year, and around 300 of them are selected for presentation during the conference. To date, over 6,000 papers have been presented, with patents pending on the technologies described in some 200 of them. Around 1,000 employees attend the conference on top of the panel of 300 judges, making this comparable in scale to world-class events of this kind. The judges are management level personnel—executives and team leaders who are specialized in their respective fields. They judge the papers for theoretical considerations & academic value, logicity, creativity, and utility of the research results, and the screening process is carried through three rounds. In addition, the participants have an opportunity to hear about the latest technologies and research trends in academia from outside specialists who are invited to give lectures. In 2021, the COVID-19 situation caused the event to be held online, but this served to increase the number of participants. Employees working in China, Japan and Belarus were able to take part.

In the future, SK hynix intends to continue increasing the scale and elevating the level of the academic conference, making it a cause for celebration among engineers as well as a venue for them to communicate with one another.



The 9th SK hynix academic conference award

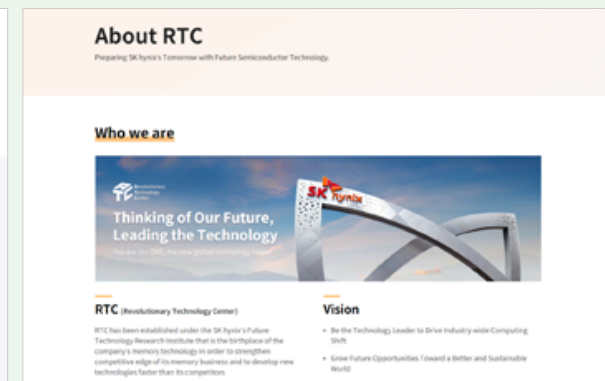
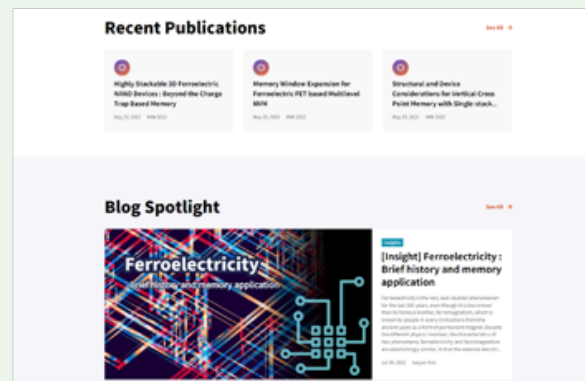
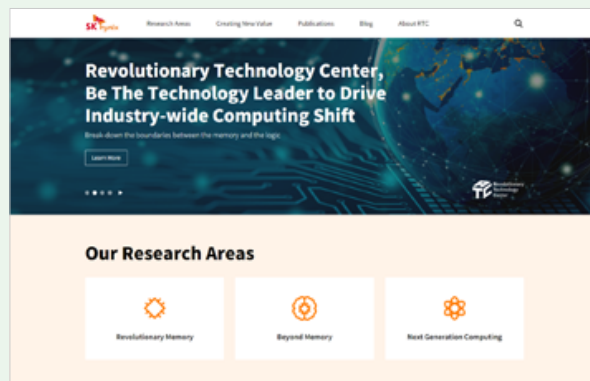
## CASE

## Research Website

SK hynix opened the Research Website in April 2022 to expand the research ecosystem by sharing the future direction of memory research. Site visitors are introduced to new memory and other areas under research at SK hynix. They can peruse academic papers related to future memory research and learn the insights that SK hynix has regarding the semiconductor industry.

The site is accessible to everyone. You can confirm for yourself the kinds of semiconductors SK hynix envisions as well as the various research data related to them. Song Yeon-jae from RCT Team, who oversaw the website opening, explains the intention behind it: “We expect the Research Website will help expand the semiconductor industry ecosystem and strengthen partnerships.

SK hynix, as a technology leader in the semiconductor industry, plans to continue sharing research data in the interest of advancing the memory research ecosystem as a whole.



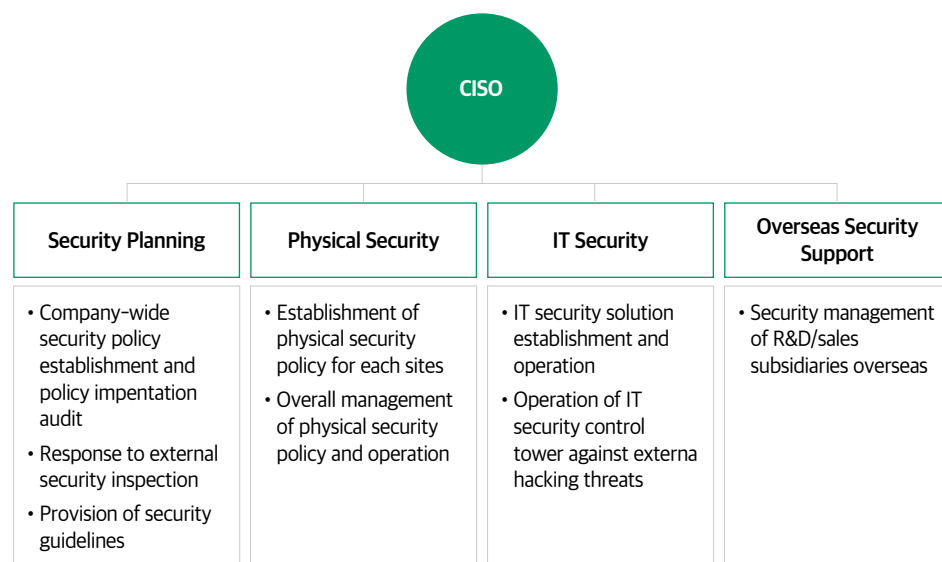
## Protecting corporate security and intellectual property

### Strengthening the corporate security apparatus

SK hynix is building solid security infrastructure and raising employee awareness of security concerns, meticulously managing the corporate security system.

The Corporate Security department at SK hynix includes Security Planning, which establishes security policy, as well as the Physical Security and IT Security units. Overseas Security Support was newly added in 2019 to bolster capabilities outside corporate headquarters and the production subsidiaries in China. The OSS elevates security levels at the overseas technology and sales subsidiaries and provides them with the ability to respond immediately to any security threat.

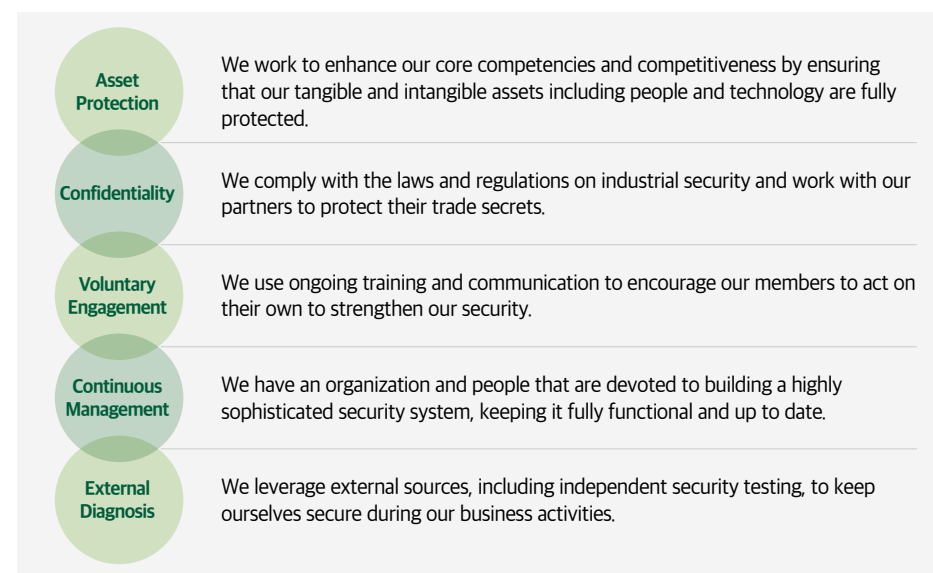
#### Corporate security organization



### Inculcating the corporate culture with security

When it comes to security, getting all employees to have a high level of security awareness in their everyday lives is even more important than building a physical security system or monitoring employee compliance with security protocols. To make this happen, SK hynix has created and distributed to employees the "Hygiene Security Regulations" and "Guide for External Communication," providing the behavioral rules for safeguarding security. Employees receive training on the company's security policy, and we have adopted some approaches for making the points fun and easy to remember. For example, we composed a "Security Song" with security procedures as the lyrics to remind listeners of what steps to take. Illustrated scenarios are also presented in an online learning game format, and the players are asked to identify the examples of what not to do.

#### Corporate Security Policy



## Stepping up protection of personal information

In accordance with legal regulations such as the Personal Information Protection Act, SK hynix puts great effort into safeguarding personal information obtained in the course of business operations. In addition to the existing codes for personal information protection, we set forth in 2021 internal management plans for privacy protection to further strengthen information security.

Our personal information protection rules apply to everyone entering our business sites including our own and suppliers' employees. Internal inspections and audits by external entities are conducted at least once a year, and any breaches or leaks of personal information are penalized with zero tolerance.

### CASE

## Building systems that take both security and job efficiency into account

SK hynix is creating various security solutions and going all out to manage technology assets. Some of these solutions are introduced below:

- **Smart-device Security Management** SSM automatically disables the camera function of smartphones when the user enters the company premises. This system eliminates the need for the troublesome task of applying security stickers on smartphones upon entry, adds convenience for employees, and blocks the leakage of sensitive company information to the outside.
- **Cooperation Information Security Management** CISM is a solution for transmitting data outside the company when the job requires it. All processes have been systematized and procedures streamlined for greater work efficiency, from examining and approving the security of the data to be transmitted to confirming the destruction of relevant documents after their designated validity period has expired. In the process, a log is produced that verifies who transferred what data over the system and when the transmission occurred. The record of the data taken out of the company is easy to track. These features serve to prevent data leaks from ever happening.
- **HyCon** HyCon is a network system that provides employees who are at home with a secure connection to servers inside the company. This capability is essential for remote work, to include doing one's job from home. A new VPN architecture improves accessibility to the business system, creating an environment in which employees are no longer confined by location and can work with ease from wherever they are.



## Intellectual property rights

Uncountable patented technologies go into a single semiconductor chip. Therefore, a chipmaker that applies proprietary technologies in the process of developing new products is also required to pay enormous royalties to use patents that belong to other companies. Thus, patents are a powerful asset for a company, given the nature of the semiconductor industry, and being at the cutting edge of technology and securing patents are the key for responding to a fast-changing marketplace and nurturing competitiveness. SK hynix has built a system for recording patents inside the company, simplified the patent application procedures, and assisted engineers so that they can devote their attention entirely to new technology development. Moreover, the Innovation Patent Awards program is in place to motivate and reward employees who invent patented technologies. SK hynix currently holds more than 20,000 registered patents worldwide, and we aim to continue strengthening the lineup of semiconductor patents that are competitive globally.

## A national standard bearer for intellectual property

SK hynix has remained committed to strengthening competitiveness related to intellectual properties mainly through the activities of the organizational unit dedicated to patent issues. The Chief Patent Officer, who heads that unit, was appointed Chairperson of the Korea Intellectual Property Association (KINPA) in 2020, elevating the company's stature in the IP arena. The Korea Intellectual Property Association is a corporate consultative group that strengthens the competitiveness of Korean companies who possess intellectual property rights and shares information on how to respond to patent disputes. The Association currently has a membership of more than 170 companies, and as a spokesperson to the related government agencies and NGOs, conveys the opinions that reflect the corporate position in government policy. KINPA is the leading organization representing the IP area for Korea's private sector and is active in international exchanges as well as one of the IP5, a forum that includes the largest intellectual property office in Korea, the US, China, the EU, and Japan. KINPA's capabilities to assist its members and support government policy establishment have been strengthened by having an SK hynix executive serving as the chair. He will work not only on behalf of SK hynix but also to raise Korea's overall IP management competencies to the global standard.

Number of patent  
registrations in 2021

16,535

## CASE

## Running the 4th Innovation Patent Awards

SK hynix has been conducting the Innovation Patent Awards since 2018 to stimulate employees' desire to conduct research and to identify patent successes within the company. The program examines the registered SK hynix patents found in products sold during the previous year and selects those patents that have helped to boost sales significantly or resolve technology problems. The researchers who created these technologies while at work are then presented with an award. The Awards were held for the fourth time in 2021, with ten innovation patents selected. The researchers credited with creating these patented technologies were each presented with a plaque and a total of KRW 240 million in cash prize. Two Gold Awards (the top prize) were conferred this time. One went to the members of the DRAM Development Team who managed to reduce the circuit area while improving the refresh<sup>①</sup> function, while the other was given to the Revolutionary Technology Center researchers who found a way to lower the contact resistance<sup>②</sup> within the DRAM wiring, reducing the defect rate.





# Synchronize

## sustainability efforts with our partners

Producing semiconductors requires the assistance of many suppliers. We are striving to build a sustainable ICT ecosystem in which our suppliers grow together with us. SK hynix recognizes that risks occurring along the supply chain can reach the parent company. Therefore, we include the ESG risk factors of our suppliers with our own, and we provide support to help the suppliers at high risk to improve.

Moreover, we practice a responsible mineral policy in order to prevent human rights violations or environmental pollution that can happen in the process of mining minerals in conflict or high-risk regions. We also perform regular onsite inspections to monitor compliance.

We help our suppliers resolve their difficulties through tailored consulting and Shared Growth programs. In the process we seek to develop win-win partnerships to strengthen the semiconductor ecosystem.

### Achievements in 2021

1206

Suppliers participated in supply chain  
ESG assessments

100 %

RMAP certification for 3TG metals as part of  
responsible mineral sourcing efforts

KRW 330 billion

Investment in technological cooperation  
with suppliers

**Material issues in 2022:** Sourcing efficiency/management

An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

**Jung Ji-hyun | A Nostalgic Place**

Climate change threatens the extinction of many plant and animal species as well as the disappearance of cultural heritages. A beautiful scene of restoring fauna and flora in nature and coexistence, serves as a wake-up call to prevent a culture and history that embraces nature from becoming a thing of the past.



# Responsible Engagement

## Strict supply chain management

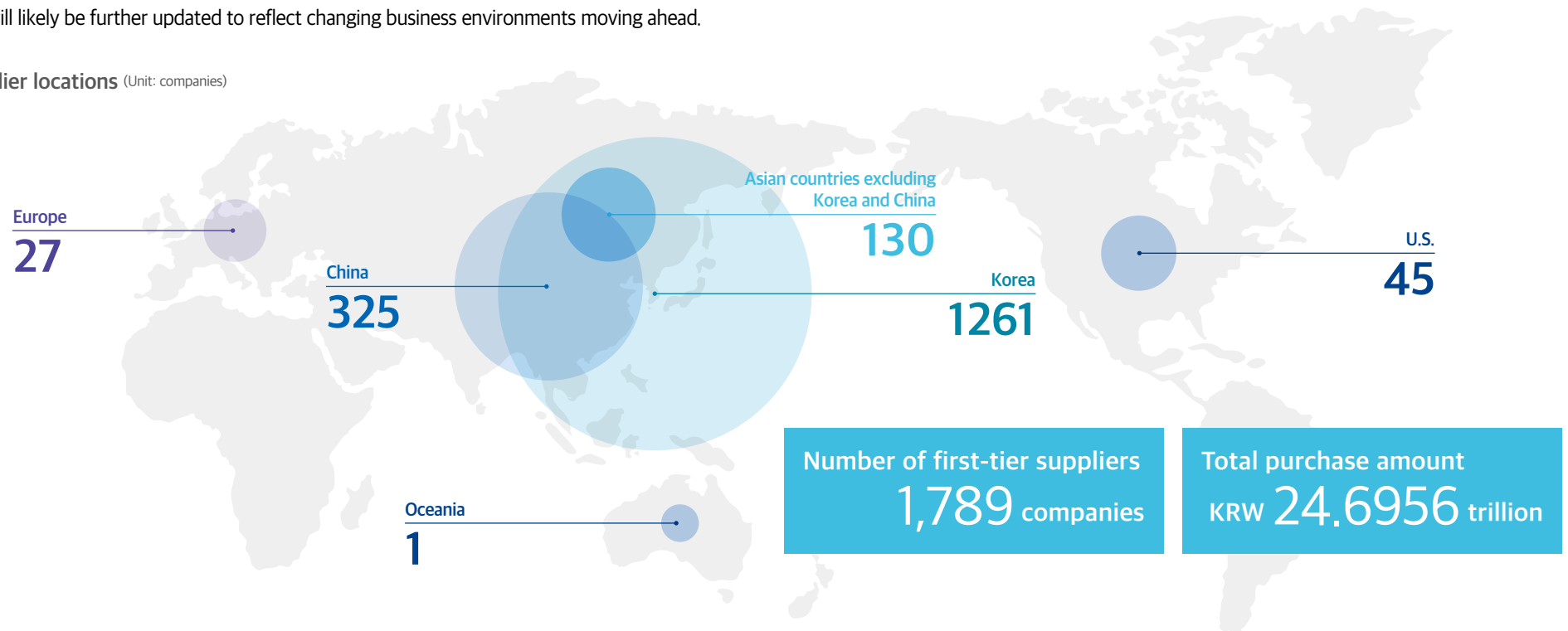
### Systemization of Procurement Policy

In order to systemize our purchase policies, we have set key directions for purchase and supply chain management practices, and established specific rules with regards to all elements in our supply chain network, including ESG factors. In doing so, we have sought to standardize and improve the performance of members of our purchase department, and share our values with suppliers. Efforts to systemize purchase policies are made through discussions among members within the purchase department, as well as consultations with ESG strategy, legal, and public relations-related departments. Scheduled to be completed by end-2022, our purchase policy systemization scheme is to be released on our website and purchase portal, and will likely be further updated to reflect changing business environments moving ahead.

### Our supply chain network

In 2021, we overhauled our criteria for selecting critical suppliers to better manage our supply chains. Under the revised criteria, critical suppliers are selected among first-tier suppliers that represent around 80% of critical purchases based on factors related to strategic importance (such as market position, business competitiveness, technological competence, and irreplaceability) and management efficiency. A total of 59 critical suppliers have been selected based on the new standards.

Supplier locations (Unit: companies)

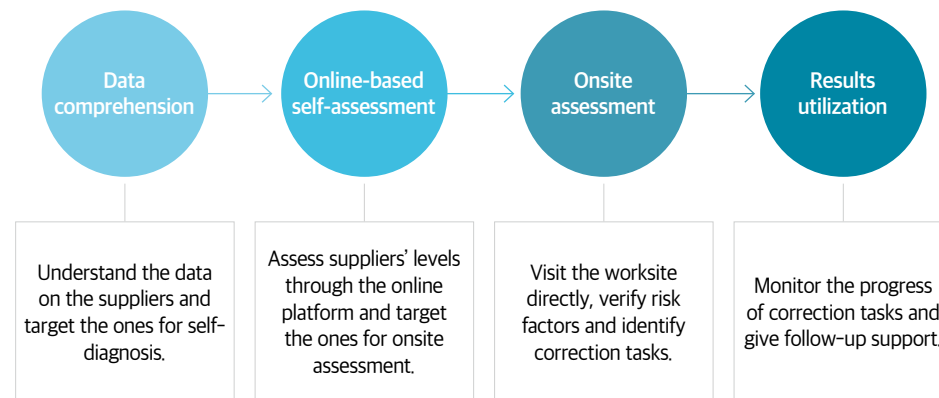


## Supply chain sustainability

### Supply chain ESG assessment

SK hynix operates a supply chain ESG assessment system to identify and mitigate potential ESG risk factors, including those in labor and human rights areas. In an effort to further improve our assessment, we revamped our criteria in 2021 for high-risk and critical suppliers, and updated assessment cycles for online self-evaluations and on-site assessments.

Furthermore, we developed our own ESG evaluation index for supply chains to assess our suppliers' ESG performance against global standards for supply chain ESG evaluation (such as those from RBA<sup>®</sup> or EcoVadis<sup>®</sup>). Our ESG evaluation index consists of five categories—labor/human rights, safety/health, environment, ethics, and management system.



### Online ESG self-assessment for supply chains

SK hynix has organized online ESG self-assessments for first-tier suppliers (excluding those who are not suitable for assessments such as simple service providers).

Assessment results showed that suppliers with relatively low sales and a small number of employees tend to have weak ESG capabilities which do not meet our standards.

We classify suppliers whose self-assessment results fall into the bottom 10% level and those who experienced ESG-related issues as high-risk suppliers, and select companies subject to on-site evaluation mainly from high-risk and critical suppliers by factoring in ESG risks and business impact such as market position, competitiveness, and irreplaceability. We also provide systematic support to those with inadequate assessment results in an effort to improve the overall ESG performance of our suppliers.

We plan to hold online ESG self-assessments on a biannual basis, and computerize the entire ESG assessment process to enhance the efficiency of supply chain ESG risk management, while gradually expanding the scope of assessment.

For more details on supply chain ESG self-assessment in 2021, please refer to [page 12 in our SK hynix Human Rights Report 2022](#).



## On-site ESG assessment for supply chain

In order to bolster our suppliers' overall ESG management competency, we conduct on-site ESG assessments for high-risk suppliers, who are identified based on the results of online ESG self-assessments, and for critical suppliers, who are selected based on a range of criteria including portion size in our overall purchases. Given the COVID-19 situation over the past few years, preliminary briefing sessions prior to on-site assessments have been held online. In the sessions, suppliers subject to on-site assessments have been briefed on self-assessment results, on-site evaluation plans, as well as ESG-related trends and implications of ESG issues. Of note, On-site ESG assessment are conducted through partnerships between related experts at SK hynix and external consultants. Following kick-off meetings, self-evaluation results are reviewed, and suppliers who give answers that fail to meet our ESG standards are provided with training designed to help them establish basic ESG management policies for improving their ESG performance. After reviewing the assessment results in each area, interviews and wrap-up meetings are held to verify core issues and share future plans.

Going forward, SK hynix will continue to perform on-site assessments through partnerships with ESG-related institutions. On-site assessments undertaken based on the results of online ESG self-assessment in 2021 are scheduled for completion in 2023. By conducting supply chain ESG assessments, we will continue to identify and address potential risk factors as part of our efforts to create a sustainable supply chain network.

## Awarding suppliers with outstanding ESG assessments

We run various programs aimed at strengthening ESG competencies at suppliers. One of these has been our Shared Growth Day event, hosted by the Procurement Team. Awards have been presented each year to those suppliers singled out for exceptional performance in the Technology, Quality and Shared Growth categories, and starting in 2021, ESG has been added as a new category for awards. This change highlights the importance of ESG issues; we are offering our suppliers inducements for improving their ESG performance, as the risks at suppliers and along the supply chain are directly linked to risks for SK hynix. The selection of the award winners is based on a comprehensive judgment that factors in the results of online ESG self-assessment, suppliers' SHE (safety, health, and the environment) assessments, and whether the supplier has participated in RBA Code of Conduct consulting. The suppliers that win awards all rank within the top 3% of the online ESG self-assessment scores.



Kickoff meeting for on-site supply chain ESG assessment



## Pursuing ecofriendly management together with suppliers

SK hynix launched the ECO Alliance in 2019 as a coalition of SK hynix and our first-tier suppliers that work together to build an ecofriendly semiconductor ecosystem. As of July 2022, a total of 43 companies including SK hynix, are the members of the Alliance and member companies are participating in various environment-related programs to raise the environmental competencies of participating companies, including environmental consulting, small group activities, workshops, and a newsletter publication. In particular, from 2022, we plan to establish and promote the joint goal of ECO Alliance for Net Zero. To this end, there are some companies participating in the national renewable energy programs for the use of renewable energy from the first half of 2022, and a majority of members are participating in the CDP Supply Chain to assess the GHG emissions and reduce them gradually.

We also strive to manage Scope 3 GHG emissions in the supply chain. In 2021, our focus was on upgrading category 1 calculations. Category 1 refers to the GHG emissions from purchased goods and services, from the extraction of raw materials to their production, assembly, and processing as well as their waste disposal. In 2021, SK hynix applied an Average-data method for all products purchased, and you can see the results on the [ESG Data page in this Report](#).

Importantly, in 2021 cases of suppliers in the ECO Alliance who improved their ESG performance were selected as ESG management best practices for small and medium enterprises (SMEs) by the Korea Chamber of Commerce and Industry. The KCCI distributed a video series entitled ESG Best Practices to further the public's understanding of ESG management at SMEs, and the case studies involving ECO Alliance members Eugene Technology and Comico were included in the series. We share environmental, safety, and health policies with the relevant suppliers via the SHE Portal and offers them a checklist of legal compliance issues with respect to SHE that the suppliers can use to perform self-inspections. This helps the suppliers to upgrade their procedures and standards by continuously monitoring energy consumption, checking waste disposal facilities and so on. Exceptional examples are shared, providing an opportunity for the positive influence to spread to other suppliers.

In the future, SK hynix will contribute to higher ecofriendly management standards across the entire semiconductor ecosystem, further strengthening the environmental management programs at suppliers, starting with those in the ECO Alliance.



CO Alliance workshop held in November 2021 (conducted online because of the COVID-19 pandemic)



KCCI's ESG Best Practice video series, featuring small and medium enterprises



## SHE consulting

We have been providing consulting on SHE issues since 2018, and now we are sharing the know-how we have amassed over the years with our suppliers. SHE consulting is a program that is run jointly by SK hynix and an outside consulting firm, examining the SHE areas at suppliers and providing them with tailored solutions.

Specialists for each SHE area visit the supplier and ascertain whether the rules concerning SHE are being followed. When incidents of noncompliance are discovered, we provide advice on how to correct the problems, and deal with any trouble spots. In addition we offer training to the supplier's safety and health managers as well as to their supervisors. Intensive one-on-one coaching and technical support are provided to high-risk worksites in order to help them improve. Importantly, when investments in new facilities are considered necessary for employee safety and occupational health reasons, we conduct an evaluation and provide up to KRW10 million to each company to help improve the working environment.

SHE consulting represents our commitment to suppliers. The program allows their employees to work in a safer and healthier setting, raising their competitiveness and ultimately building a sustainable semiconductor ecosystem.

## Convening safety meetings for suppliers

The management at suppliers must also take interest and make efforts for their employee safety levels to rise. To this end, we established the safety meeting for suppliers in 2021. The Manufacturing/Technology chief oversees these safety meetings, and the supplier CEOs are invited to attend. They provide training on actual accident case studies and potential accident scenarios, and they end with all participants declaring their firm commitment to employee safety.

## Spotlight

## The SHE Experience Hall

The SHE Experience Hall is a training facility designed to cultivate employee awareness of safety and health matters. The 1,013m<sup>2</sup> Hall is located on the Icheon business site and consists of fourteen sections, introducing our environmental management system, providing first-aid training and giving trainees a first-hand look at the fab safety systems. In addition to SK hynix employees, supplier employees, local students and other members of the public are allowed to submit requests for a training visit.

Lessons on using fire extinguishers, escaping the scene of a fire, administering CPR, and other general safety topics are provided at the SHE Experience Hall, and employees also come here to find out what to do should an accident occur inside a fab. Trainees can receive instruction on the types of safety systems in the fabs as well as how to use them. These include (1) the "detection system," which sounds an alert when gas concentrations are above normal in the air or when a chemical substance leak occurs and (2) the "emergency wash system," which is employed when an employee comes into contact with a chemical substance. Importantly, the training props are just like the actual facilities and equipment inside the fabs, helping to increase employee responsiveness to emergencies.

Recently, a new training program has been introduced with virtual reality (VR) contents. The trainees put on VR goggles and gloves, and a scene appears before them that is just like what they see when entering into an actual fab. The trainees are required to complete certain safety missions in VR space such as putting out a cleanroom fire or preventing an explosion in the piping system. SK hynix will continue to study and develop specialized safety training contents for workplace environments and create more effective training methods.



VR experiential learning facility inside the SHE Experience Hall at the Icheon site

## Center for Working Environment Health

The Center for Working Environment Health is staffed by doctors specialized in occupational & environmental medicine, occupational health nurses, physical therapists, and counselors. SK hynix and this dedicated institution have been jointly running an occupational health management program since 2019, and as of 1Q 2022, employees from 169 suppliers were taking this program.

The occupational health management program begins with visits by professionals from the Center for Working Environment Health to supplier business sites to understand the employee health management standards there. Next, those areas of management that are determined to be weak are selected as the top priority for corrective action. A tailored program is established for each supplier, and the professionals either visit the business site or the supplier employees go to the Center for Working Environment Health to take part in the program. First the occupational and environmental medicine specialists interview the employees to determine whether they are suffering from any psychological or physical problems. When necessary, an assessment is done on their risk of developing a cerebrovascular or cardiovascular disease, and once the employees' conditions are understood, a regimen of improvement activities is worked out together with the medical professionals. The musculoskeletal disorder prevention program analyzes the employee's symptoms and body type, and then a personalized prevention program is offered that includes stretching and small prop exercises to address specific ailments.

The Center for Working Environment Health also informs the supplier companies of the employee safety and health measures that they are legally obligated to take. The officials at the center appreciate the difficulties that small companies have in complying with the regulations, and they will work with those employers to find ways to raise the level of their safety and health management efforts.



The Center for Working Environment Health

## Co-prosperity & Cooperation Program

SK hynix operates the Co-prosperity & Cooperation Program in partnership with the Korea Occupational Safety & Health Agency (KOSHA) to share success with suppliers and prevent accidents caused by human error. The most important goal of the Program is to build a tripartite relationship among SK hynix, the suppliers, and the relevant government offices and prevent serious accidents from occurring. More than ten different programs are included, and a consultative group has been formed that meets regularly with suppliers. The participants select and discuss various agendas related to co-prosperity and cooperation. Also included are diverse activities such as workplace inspections, guidance and support for employee safety and occupational health training, risk assessments, supplier conferences and award presentations. All these efforts are aimed at improving the suppliers' safety and health competencies and raising the safety and health standards in the workplace. In 2021 the Cheongju business site received an "S" grade in the Co-prosperity & Cooperation Program assessment hosted by the Ministry of Employment and Labor and KOSHA, and that result received special recognition. SK hynix continues to run the Program in an effort to strengthen the suppliers' safety and health management capabilities. Plans now call for all the suppliers who participate in the Program at the Icheon and Cheongju business sites to obtain the relevant certifications (ISO 45001, KOSHA-MS) and risk assessment approval (supervised by KOSHA).

## Building a Supply Chain Risk Monitoring system

SK hynix completed an internal Supply Chain Risk Monitoring system in October 2021. The SCRM generally classifies external environmental risks in one of three categories (natural disasters, regional issues, or global trends) and regularly gather related information of each. The collected data are analyzed, and the effects that any new developments have on the company are determined. When the findings are identified as risk, they are conveyed immediately to the people in charge of procurement.

For example, when a natural disaster occurs, relay servers at the Ministry of the Interior and Safety or the Global Disaster Alert Coordinating System (GDACS) automatically input the disaster-related data into the SCRM system. The SCRM system then categorizes the risk level based on the data received, and predicts the regions that will suffer damage. Next, the supplier data that is already in the system are used to classify the suppliers in the affected region, and an alarm is sent immediately to the people in charge at the suppliers. The managers who receive the alarm then access the SCRM system to see detailed information at a glance, including a list of the suppliers that are expected to suffer damage, details on their transactions, and the status of their warehouse inventories.

A broad range of data in trends within industry and the latest geopolitical issues must be comprehensively monitored to stay on top of what is going on regionally and globally. To proactively address potential risks in supply chains, our expatriate managers and members of the purchase department regularly publish Market Intelligence (MI) reports. In addition, we are developing an AI-based market information sensing tool, which will further help us in promptly responding to fast-changing supply chain environments.

## Enhancement of the G-SCM system

Global Supply Chain Management (G-SCM) refers to the process of establishing management plans by taking into account such factors as customer demand, market environments, and production capabilities and implementing production and purchase decisions based on such plans. Using the G-SCM system, SK hynix comprehensively analyzes a variety of data (including customer requests, product development schedules, fab production capacity, and parts inventories) to adjust overall supply plans based on market demand. This analysis helps us to systematically manage inventory levels and secure fab capacity for the future, enabling us to flexibly respond to possible supply chain risks.

In 2021, we integrated the Global Planning Office (GPO), the main operating body of G-SCM, to the Global Sales & Marketing (GSM) arm to better connect supply chain management with sales and marketing operations. The move has enabled us to establish consistent production, inventory management, and investment plans in line with our market forecasts and sales strategies. In June 2022, GPO moved to under Chief Business Officer with GSM to strengthen its role in the optimal operation of sales and production. We have also developed G-SCM indicators, which include target sales rates, achievements of monthly/weekly plans, and customer RTF (Return to Forecast) values to boost the on-site execution of plans established under the G-SCM system.

We continue to strive to better respond to rapidly changing customer needs and market environments. We are revisiting our material sourcing system to ensure stable material procurement, and plan to expand the scope of data analyzed by the G-SCM system to effectively respond to the evolving market landscape.

SK hynix will continue to enhance the G-SCM system to brace for and respond to possible challenges at home and abroad, in turn securing more flexibility in management plans.

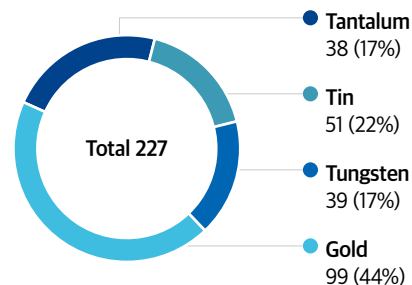
## Responsible minerals sourcing

### Striving to source minerals responsibly

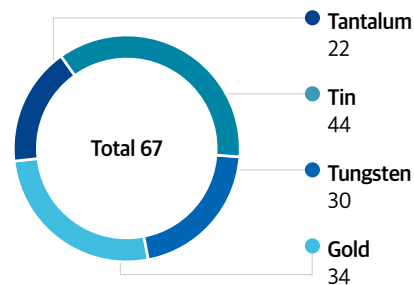
Our 3TG minerals (tin, tantalum, tungsten, and gold) procurement achieved 100% Responsible Minerals Assurance Process (RMAP) certification, and we intend to maintain this status in order to procure responsibly all the minerals we need to produce semiconductors. The suppliers who procure raw materials for us are required to sign a “Declaration of compliance of Supplier’s Code of Conduct and responsible mineral use,” promising not to purchase minerals from conflict and high-risk regions, and we remain fully informed about our mineral supply chains. In 2021, we built our own computerized system to manage conflict minerals, and it is used to conclude pledges and conduct inquiries. Suppliers who provide false information or refuse to take measures to correct identified risks are considered to have breached their pledge, and their transactions with SK hynix are suspended. Additionally, we provide our suppliers with consulting and training programs to raise their awareness of the responsible mineral issue. The mineral supply chains are constant monitored so that ultimately the human rights and environmental issues of conflict and high-risk regions are resolved. Moreover, we continue to improve and implement the concerned policies and activities as part of our effort to fulfill all our obligations to society.

SK hynix Responsible Minerals Policy

Number of smelters



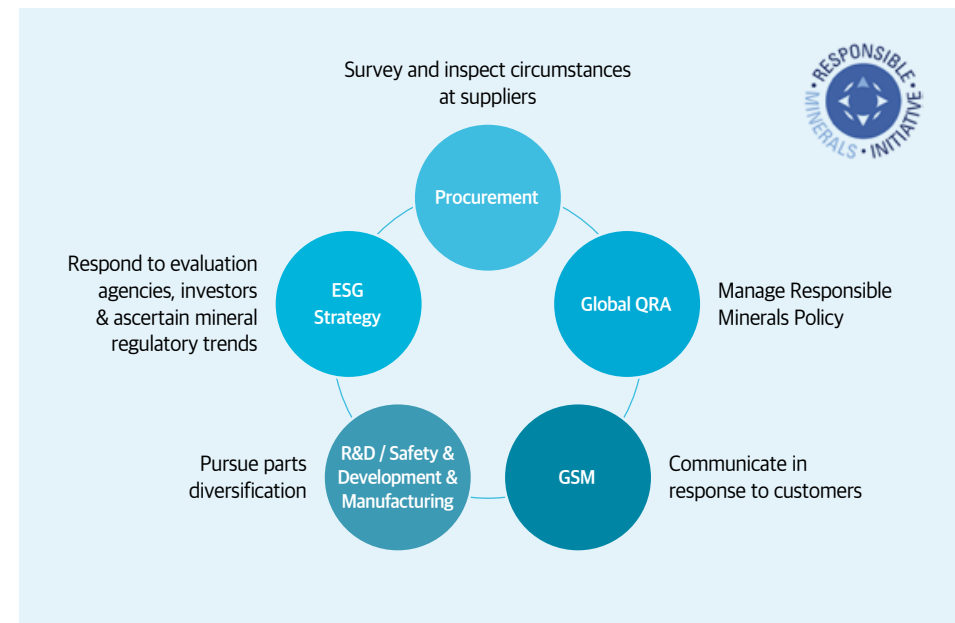
No. of suppliers using conflict minerals



### Expanding the Minerals Council operation

SK hynix maintains a Minerals Council to make responsible mineral management more systematic, with three organizational units participating: ESG Strategy, and Global Quality & Reliability Assurance (Global QRA). The Council is tasked staying being informed on the latest mineral regulatory trends inside and outside Korea, updating the company’s responsible minerals policy and processes, and managing the raw material suppliers accordingly. Efforts to diversify parts used from a mid-/long-term perspective are necessary to make responsible minerals management even more thorough. Thus, SK hynix expanded the units participating in the Minerals Council from January 2022. The new Council members are the R&D, Safety, Development & Manufacturing, and Global Sales & Marketing, and their role is focused on parts diversification and customer response.

### Makeup and roles of Minerals Council

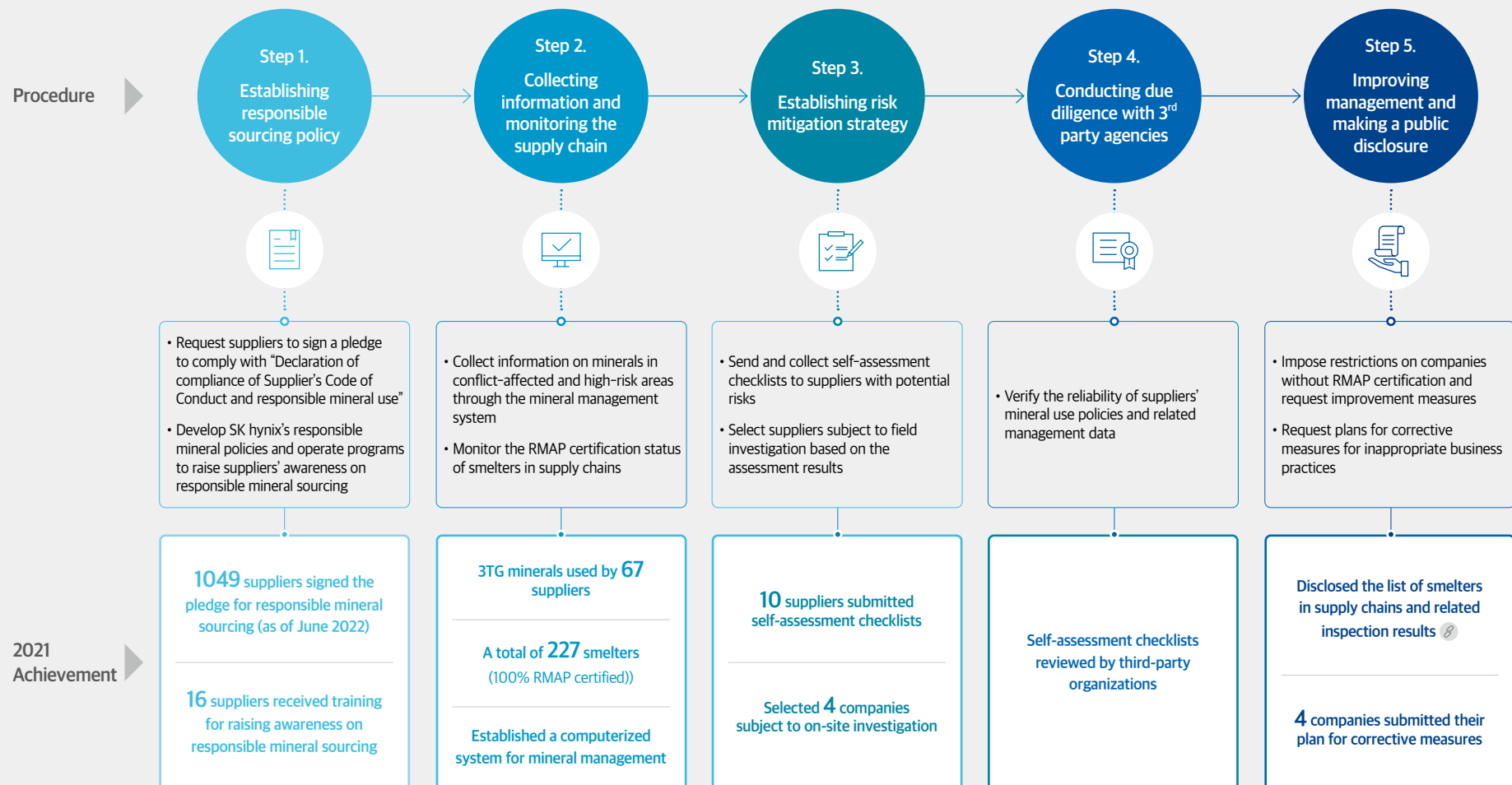




## Spotlight

## Steps for responsible minerals management

Based on the five-step process prescribed in the OECD's Due Diligence Guidance, SK hynix adheres to responsible mineral management. We examine the use of responsible minerals at suppliers twice a year, and immediately address any identified risks.



# Shared Growth

## Innovative Tech Companies

Innovative Tech Companies is a classic shared-growth project at SK hynix. Every year since 2017, we have selected Korea suppliers that have a high potential for product localization and targeted them for intensive nurturing. In the process the semiconductor ecosystem grows stronger and win-win cooperation is accomplished. From 2021, we began to expand the business scope of the support recipients and extend the support period, thereby broadening the ESG management base throughout the semiconductor ecosystem. Previously, the companies eligible for support were limited to materials, parts, or equipment makers, but now the field has been broadened to include facilities engineering firms and others with technology that can create value for society. The cooperation period, which has always been fixed at two years, has also become more flexible, allowing up to five years to complete certain tasks, depending on the level of technology difficulty and development schedule. In May 2021, Eco Energen was selected as an “innovative tech company” that has the technological expertise to reduce or eliminate environmental pollutants generated during production, and over the next three years, SK hynix and Eco Energen will jointly develop technology that allows the solvent used in the main scrubber to be reused multiple times. A support package comes with the arrangement, providing an interest-free loan to fund the technology development effort as well as a business consulting service.

SK hynix is working with outstanding suppliers to develop new technologies and put in place a virtuous cycle structure that can generate results continuously.

Invested in technological  
cooperation with suppliers  
**KRW 330.4 billion**

## CASE

### Win-win Town, anyone with an idea is welcome

We established the new Win-win Town program to search out competitive partners and strengthen the supply chain. This is an open communication venue for people to freely introduce new technologies related to semiconductor materials, parts, or equipment or to offer ideas on ways to improve competitiveness. This is a way to lower the entry barrier, providing the process for making business proposals to companies that lack clear procedures for suggesting projects, even when they come with technological expertise or great ideas. The Win-win Town program had received thirty-three business project ideas as of February 2022, and twenty-one of them were from new companies rather than existing suppliers. The program consists of two parts. The “think of your own ideas” corner is open to suggestions on ways to make improvements, regardless of the topic, while the “think together” corner is for offering solutions to topics raised by SK hynix. Companies that want to propose a project can register their ideas through the Win-win Town website, and if the submitted idea passes successfully through the examination and screening process by a panel of experts from Procurement and other related organizational units, then a decision is made on whether to adopt it. Hong Myeong-il (team leader) and Bae Taek-ill from Component SCM Team, who are in charge of the program, reveal their plans: “In the future, we will add more corners and steadily expand the transaction areas, growing Win-win Town into a platform that leads a virtuous cycle in the semiconductor ecosystem.”



Hong Myeong-il (team leader) and Bae Taek-ill from Component SCM Team

## Establishing an ESG Fund for suppliers

SK hynix has established a KRW 100 billion fund to support ESG management at suppliers. Suppliers can receive loans at interest below market rates to finance improvement objectives in the environmental and social realms. Up until now, we have run a KRW 300 billion Shared Growth Fund as a win-win arrangement that gives primary, secondary, and tertiary suppliers access to funds for facilities investment or operation. Our financial support was maintained at this scale in 2021, while about KRW 100 billion of the total was used to establish an ESG Fund. The ESG Fund is available to primary suppliers who need capital for improving either (1) the environmental realm by building facilities for lowering energy consumption or treating pollutants or (2) the social realm by raising safety and health standards and upgrading work environments. Going forward we will analyze the shifts in the use of the ESG Fund for a year's time and review the possibility of increasing the Fund's scale as part of our ongoing effort to strengthen the semiconductor ecosystem.

### Financial support programs for suppliers

Shared Growth Fund		ESG Fund	
Facility investment	IT investment	Environmental investment	Social investment
<ul style="list-style-type: none"> <li>• Productivity improvement</li> <li>• IT investment</li> <li>• R&amp;D</li> </ul>	<ul style="list-style-type: none"> <li>• Materials procurement</li> <li>• Promotion of new market / marketing</li> <li>• Introduction of technology and commercialization</li> <li>• Improvement of management and technology innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Energy saving facility investment</li> <li>• Eco-friendly logistics</li> <li>• Pollution treatment facility investment</li> <li>• Trading of emission permits and consulting</li> </ul>	<ul style="list-style-type: none"> <li>• SHE improvement</li> <li>• Labor condition improvement</li> <li>• Hiring social vulnerable groups</li> <li>• Support education</li> </ul>

## Reinforcement of semiconductor materials/components/equipment ecosystem

SK hynix contributes to strengthen the semiconductor ecosystem and increase the sales of suppliers by providing various shared growth programs to materials, components, and equipment companies. As part of it, in January 2021, SK hynix made an 'Industry/financial cooperation agreement' with financial institutions such as Korea Development Bank, Korea Exim Bank, and NH Nonghyup Bank. We raised the fund amount of KRW 100 billion and contribute to the win-win and development of the entire semiconductor industry ecosystem.

## CASE

### Publishment of “An Understanding of Semiconductor Manufacturing Technologies”

In order to share our accumulated knowledge and expertise on semiconductors with the world, we released the book “An Understanding of Semiconductor Manufacturing Technologies.” Having published in March 2020 “Packaging and Testing that Drive Up Semiconductors' Added Value,” a book focused on back-end processes such as packaging and testing, this time, we provided an overview of semiconductors and looked at front-end processes. Notably, cartoons that summarize the content of the chapters were added at the end of each part to arouse readers' interest. A total of 10 experts at SK hynix participated in writing the book, and related professionals reviewed the content to ensure the accuracy of information.

Hoping that the book will contribute to building the expertise and knowledge of researchers and students in the field of semiconductors, we held a book delivery ceremony with the Department of Semiconductor Engineering of Korea University. Proceeds from book sales are to be used as scholarships for children of employees at our suppliers. SK hynix will continue to develop high-quality semiconductor learning materials that would contribute to the development of semiconductor talent and strengthen suppliers' competitiveness.



Copy of “An Understanding of Semiconductor Manufacturing Technologies”

## Spotlight

## Social value creation through pursuit of mutual growth

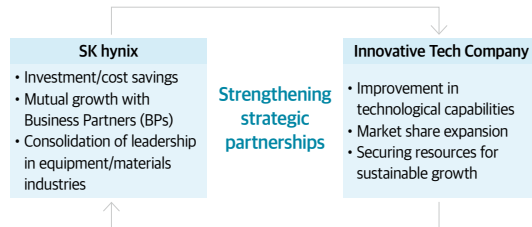
In 2021, SK hynix created social value worth KRW 9,417.3 billion. In particular, social contribution through philanthropic activities increased 44% versus the previous year's level, backed by improvements in labor environments, shared growth efforts, and increased social contribution activities. Our efforts to boost the Korean semiconductor ecosystem, including support for suppliers, created social value worth around KRW 100 billion. We have outlined below how we have calculated the social value generated from three of our mutual growth programs last year: Innovative Tech Company, Analysis/Masurement Support Center, and Semiconductor Academy.

## Innovative Tech Company

Support materials, components, and equipment suppliers with strong technological potential

2021 SV KRW **67.3** billion

Sharing of our resources  
(e.g., technological knowhow, analysis equipment, raw materials)



Sharing co-development results

## Calculation formula and data

Purchase amount for products jointly developed with companies designated as Innovative Tech Companies<sup>1)</sup> × joint development contribution<sup>2)</sup> × value added ratio for semiconductors<sup>3)</sup>

1) Internal data of SK hynix, 2021

2) Based on the social value measurement guidebook of the Center for Social Value Enhancement Studies (50%)

3) Value added ratio for the semiconductor industry classified under the category of manufacturing/mining in Statistics Korea's system (62.56%)

## Analysis/Masurement Support Center

Enhance suppliers' competency by sharing SK hynix's analysis resources and know-how

2021 SV KRW **24.2** billion

Platform for technological cooperation

- Provision of opportunities to utilize high-price equipment in assessments



- Partnership for development of new technologies and materials
- Minimization of trial and error through early application of SK hynix's quality standards

## Calculation formula and data

**Texture analysis:** Replaceable market value per case of texture analysis<sup>1)</sup> × number of cases - fee charged for suppliers' texture analysis<sup>2)</sup>  
**Chemical analysis:** Replaceable market value per case of chemical analysis<sup>3)</sup> × number of cases - fee charged for suppliers' chemical analysis<sup>4)</sup> + support for chemical analysis consultations<sup>5)</sup>

1) Based on TORAY Research Center's unit prices

2), 4), 5) Internal data of SK hynix, 2021

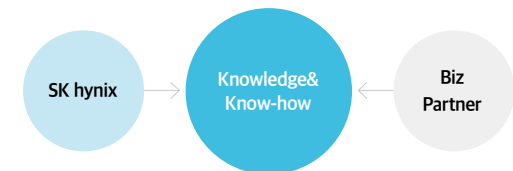
3) Based on the Korea Research Institute of Chemical Technology and Korea Institute of Science and Technology's unit prices

## Semiconductor Academy

Operate an industry-first education institution specializing in semiconductors to provide training programs to suppliers' employees

2021 SV KRW **8.5** billion

Provision of technological education for strengthening our suppliers' competitiveness through fostering talent



Developing SK hynix's engineering/equipment capabilities

## Calculation formula and data

Replaceable market value for the Semiconductor Academy<sup>1)</sup> × number of participants - fee charged for enrolling at the Semiconductor Academy<sup>2)</sup>

1) Based on average expenses charged by comparable private education institutions (for introductory semiconductor courses and process/equipment-related programs)

2) Internal data of SK hynix, 2021

# Motivate our people toward excellence

SK hynix's history and achievements have been guided by our pursuit of happiness and respect for humanity. Fostering the world's top-level semiconductor experts, we strive to ensure that they work in a happy work environment to help them fully unleash their potential.

A company with diverse employees can take into account various viewpoints in making decisions, which enables it to accomplish differentiated achievements. For this reason, SK hynix hires talent through various methods such as industry-academic partnerships and innovative recruitment programs, while ensuring that there is no discrimination in the recruitment process. We also put great effort into securing and fostering female talent in order to uphold a corporate culture that embraces diversity. From childcare leaves to support for fertility treatments, our family-friendly policies are designed to make sure that female talent's career advancement is not hindered by having children. We also offer step-by-step training courses specifically designed for the semiconductor industry to help employees build their job expertise. Furthermore, flexible working schemes and various welfare policies are in place to promote a happy working environment for employees. By doing so, we seek to create a corporate culture in which employees can achieve their full potential based on communication and empathy.

## Achievements in 2021

32 %

Female employees (based on engineering and office staff)

16,551 employees

Working flex time

107 hours per person

Self-development training (based on engineering and office staff)

**Material issues in 2022:** human rights and workforce management



An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

Yu Ji-hee | imagery 11

A scene of fading beauty and a peaceful Earth as viewed from far away.  
The artwork expresses the disappearance and rediscovery of Nature.



# Inclusive Workplace

## Diversity, equity, and inclusion

### Women in Leadership Program

The Women in Leadership Program is a training program run throughout the SK Group to support and encourage the growth of female employees. Some of the exceptional women employees who have been promoted to team leader within two-three years are selected for the WLP, which sixteen employees from SK hynix taking part during 2021. The eight-week WLP includes segments on improving strategic thinking, working with problem-solving methodologies, and enhancing leadership skills. The program's educational effectiveness has been raised by going beyond simply listening to lectures to include in-depth discussion sessions and small-group activities. Importantly, the WLP has been connected with the Minerva School<sup>®</sup>, 1 which is renowned for its innovative curricula and operational methods, and offers quality contents. The trainees' satisfaction level is very high as a result. At the end of the program, the trainees get to spend time talking with female executives from SK Group companies. They serve as role models for capable female employees to grow within the organization and provide a positive influence on them.

### Expanding facilities that protect motherhood

SK hynix operates special nursing rooms (dodami-bang in Korean) for expecting or new mothers to relax at 39 locations on the Icheon, Cheongju, and Bundang campuses. These comfortable and relaxing facilities include a bed, sofa, breastfeeding room. They are available women to employees for up to one year after giving birth, for up to three months after having a miscarriage, and for up to one month after starting infertility treatment. Renovation of aging nursing rooms at Icheon began in 2021, and the construction work was completed on two of them that year. The rest are scheduled to be remodeled in 2022. Meanwhile, a "Pink Zone" parking facility was added at the Incheon site in September 2021. It is located near entrances and reserved for pregnant women or disabled persons to use.



Dodami-bang: a comfortable and safe place to rest

### Expanding family-friendly programs

SK hynix offers generous support to women who are about to give birth or those who are caring for infants and has expanded the family-friendly programs to allow women employees to maintain a healthy work-life balance. These programs are generally classified into three different types (pregnancy, childbirth, and infant care).

For pregnant employees, the special days off have been expanded from three (one paid and two without pay) to five days (all paid), and the company covers the medical expenses for infertility treatment, including non-paid support. Employees who are about to give birth now receive a congratulatory gift package that includes special blankets to block electromagnetic radiation, cream to prevent stretch marks, and swaddles for infants. The shortened workhour schedule that used to be applicable during part of the woman's pregnancy now covers the entire pregnancy period. The declining birthrate has become a social issue today, so the payment of a special bonus for having a baby has been extended to having multiple children. In the past, a set amount was paid as a bonus when having a baby, but now the amount is increased depending on the number of children in the family. The time off and adjusted workhours for mothers who are caring for an infant are now also applicable around the time the child enters primary school so that the mothers are able to pay extra attention. In this event, the female employee may choose to take three months off to make sure their child is adjusting well to school.

#### Pregnancy

- Fertility leaves and support for related medical expenses
- Pregnancy congratulation package
- Reduced working hours during pregnancy
- Prenatal diagnosis leaves
- Unpaid leaves for pregnant employees

#### Childbirth

- Cash gift for employees who have given birth to a child
- Maternity leaves (including for spouses)

#### Childcare

- Leaves for caring children first entering school
- Leaves for household work
- Reduced working hours for childcare
- Childcare leaves

## Fair hiring

### Principles for recruiting talent

SK hynix selects people with specialized capabilities for specific jobs, focusing on the competencies and expertise required for the position. In addition, we never discriminated unfairly because of gender, physical disabilities, or other such reason. At least 99.8 percent of the workforce is hired for permanent positions, providing a settled and reassuring environment in which people can work.

### Attracting talent for the future

We maintain ties with prominent universities inside and outside Korea through which talented people are cultivated to satisfy future requirements. Starting with the establishment of the Department of Semiconductor Engineering at Korea University in 2020, we expand the partnerships with the establishment of the Department of Semiconductor Engineering at Hanyang University and the Department of System Semiconductor Engineering at Sogang University in 2022. This allows us to identify exceptional individuals early and cultivate them into specialists, and the scale of these programs is increasing steadily. We also run internships at the universities with which we have ties, offering students studying semiconductor-related majors to earn school credits while they experience life at the company and providing them with an opportunity to explore the kinds of work positions that are available. Such initiatives are helping to nurture core personnel to work in future technology areas.

### Recruiting Junior Talent

We adopted the Junior Talent program in 2021, organizing large-scale job fairs three times a year. “Junior Talent” refers to screening applicants with less than five years’ work experience. In today’s Korean job market, people who have left their job before five years have to start over as a new recruit when they are hired for a second job. The Junior Talent initiative was begun to recognize the experience that people have accrued although their work history is under five years and support their treatment in their new jobs accordingly. In the future, SK hynix will select people through a variety of screening methods in order to secure the people who have the very best capabilities.

### Youth Hope ON Project

In October 2021, SK Group signed a partnership with the government to participate in Youth Hope ON, a project designed to create more jobs for young people. Youth Hope ON supports the creation of 32,000 jobs for young people from various backgrounds over the next three years through a wide array of programs aimed at fostering semiconductor talent, supporting the recruitment of young people with disabilities or from underserved communities, nurturing innovative young entrepreneurs, and much more. Among them, SK hynix will participate in programs to develop semiconductor talent and support young people with disabilities as part of efforts to improve employee diversity.

New hires in 2021

3,549

Percentage of women hired in 2021

(based on engineering and office staff)

32 %

# Empowering People

## Talent development

### SK hynix talent growth program

#### Job expertise programs

Joining SK hynix



SKHU Undergraduate Programs



SKHU Graduate School Programs



#### Leadership programs

Cultivating leaders



#### Common curriculum

Fostering future technology experts



Online education platform



## HiGarage

HiGarage is a program that supports venture projects within the company, fostering an organizational culture that is creative and willing to take on challenges. The goal is to raise technological competitiveness through internal innovation efforts. Employees submit their business startup ideas through a dedicated site; the ideas go through a selection process and, when accepted, receive commercialization assistance. The range of ideas is unlimited, covering both semiconductor-related areas and areas outside semiconductors. The program was launched in 2019, and six teams are selected each year for a total of 24 teams in 2022, the fourth year of the program. Both a panel of specialists and an evaluation group of employees take part in the selection process. Thus the employees cheer on their colleagues for daring to start up a business, while the entire organization is motivated to take on new challenges. The selected teams receive various forms of support from the company for two years as they proceed to commercialize their ideas. In addition, people who leave the company to tend to their startup business are guaranteed the opportunity to rejoin the company within three years if things do not work out. As such, employees are encouraged to display their creativity freely without having to fear the consequences of failure. To date, fifteen teams have successfully started a thriving business of their own. Going forward, SK hynix will continue to respect and support the valuable ideas of employees, while in the process strengthening the semiconductor ecosystem and supporting the employees' challenging spirit.

### Goals of HiGarage

Solve technical conundrums  
Overcome obstacles from  
new technologies



Spread creative corporate  
cultures  
Create the atmosphere to  
speak up ideas

Establish the corporate  
culture that not afraid  
of failure



Build a friendly ecosystem  
for SK hynix



## Spotlight

## Some of the startup successes through HiGarage



Alsemy | Cho Hyeon-bo CEO

Alsemy is a startup that develops artificial intelligence (AI)-based semiconductor modeling technology.

Alsemy is a venture that develops AI-based modeling technologies for semiconductors. Cho Hyeon-bo worked as an engineer in the Modeling unit at SK hynix, and he thought up the ideal of applying artificial intelligence to semiconductor modeling. He proceeded with a project inside the company, while the time and personnel invested in the project became great. Just as the idea reached the point where it would grow, the HiGarage program was launched, and he boldly took on the task of making his own business. The trial version of his modeling program, Ali, has been developed and now improvements are being made on it.



CHAGO Engineering | Kim Hyeong-gyu CEO

CHAGO Engineering specializes in chiller, a thermostat for semiconductor equipment.

CHAGO Engineering specializes in chillers, which are used to control the temperature in semiconductor production equipment. While working as an engineer at SK hynix, Kim Hyeong-gyu, the CHAGO Engineering CEO, realized that most of the chillers used in Korea were of foreign origin, and he began on his own to research the localization of these machines. The realization of his ambition was helped along by HiGarage. Currently, CHAGO Engineering has a lineup of three chiller models and has become a company that offers customers diverse refrigeration solutions and can produce customized models to satisfy customer requests.



MHD | Lee Seong-jae CEO

MHD is a high-tech materials company that provides process-efficient solutions through new materials and process development.

MHD is an advanced material specialist, offering solutions for more efficient work methods by developing new materials and processes. The CEO, Lee Seong-jae, is an expert whose job has been to develop materials used in photolithography and oversee quality control. He has conceived of an approach for shortening the photolithography process, replacing the conventional vapor deposition for producing spacer patterning<sup>o</sup> with a spin-coating method. Now he is working to turn his idea into a viable product. In the future, his aims to go beyond semiconductor materials and expand the scope of his business into diverse industrial areas.

## Digital transformation training

### Training to improve data analysis capabilities

SK hynix has launched the Data Analysis Level Certification system to build an organizational culture that operates on the basis of data. This system motivates employees to improve their data analysis capabilities in stages, and their efforts are recognized by issuing certificates that correspond to degree of their expertise. The certifications are arranged in five levels, the qualifications for which include completing the data analysis related training program, performing certain data analysis tasks, earning a Master's degree in the relevant study program, or having one's thesis accepted upon review. As of 2021, a total of 2,362 employees, or 14.8 percent of all the technical or administrative personnel, were certified at Level 3 or higher. In 2022, public recognition of and trust in the system was raised when the Level 4 qualification was linked with the educational program at Yonsei University and the certification by the Korean Institute of Industrial Engineers. In addition, we are offering various training programs to improve the data analysis competencies of our people. Lectures are delivered online via the self-learning platform, while offline classes are available through arrangements with leading universities in Korea. In 2021, a total of 1,765 employees took part in one of 37 courses offered inhouse, including a live class in real time, or one of the four courses connected to universities (three non-degree courses and one as part of a degree program) to improve their data analysis skills. We have been hosting data analysis competitions since 2019, providing our employees a chance to show off the data analysis skills that they have been developing. An aggregate 1,001 people have participated during the ten rounds that have been run between 2019 and 2021, and they have submitted solutions to eighteen different tasks. Meanwhile, we opened h:lab, a platform that can amass diverse data analysis materials, in 2021, and all employees are invited to practice solving data analysis tasks and share their results. As such this site provides a virtual cycle for employees to hone their skills on their own.



An agreement with SK hynix, Yonsei university, and Korean Institute of Industrial Engineers to develop advanced data analysis experts

### Program to cultivate the ability to analyze bigdata

Human resources who are both skilled in data science and well versed in the semiconductor domain are needed if quality data acquired in the semiconductor business is to be used well and the digital transformation is to be accomplished. Therefore, we are running various programs to nurture citizen data scientists<sup>9</sup>, with the goal of having 1,000 of them by 2023

Among these, the fast-track Bigdata Analyst Training Program is linked to universities and other specialized educational institutions and organized to enable intensive study of data analysis-related subjects. The program targets engineers who want to analyze onsite data from a statistical perspective or apply machine learning theory to process control.

Employees who participate in the training build up their data analysis competencies through both theoretical learning and practical application. After that they are dispatched for twelve weeks to worksites, where they apply data analysis methodologies to real problems in the field. Over time, data-related competencies will be spread companywide, playing a role in disseminating a data-based work culture.

Industrial and Management Engineering Professor Baek Jun-geol from Korea University was giving a lecture in a program that opened in July 2021. He said: "I hope that engineers will acquire the capabilities to define on their own, without the support of a specialized organization, the problems in semiconductor processes that can be resolved through data analytics as well as to process and analyze the data they need from the data source with AI and machine learning modeling." The Professor added: "At the same time they can strengthen their abilities to quickly and accurately verify various data analytics techniques as well as their competencies for correctly interpreting the analysis results and quickly grasping the necessary conditions for applying them to the system."

## Cultivating the happiness of our people

The SK Management System for the SK Group stipulates that employee happiness is the goal of corporate management. The management philosophy of SK hynix states that employees must stand in the midst of change, and so we are committed to continuously cultivating the happiness of our people.

### Changing work methods

We adopted a flexible workhour system at SK hynix in 2018, and we have led changes in work methods to guarantee autonomy for our people and allow them to engage in increase their work engagement as well as to pursue happiness. In 2021 we eliminated the mandatory “core time” to be at work, and expanded the flex hours, which has furthered work efficiency. Starting in April 2022, the minimum daily worktime requirement was also dropped, and the Happy Friday program was introduced where employees are free to design their own workday. So long as an employee puts in an average of forty workhours per week, he or she may choose to stay home one Friday per month, which provides time for developing one’s skills or recharging one’s energy.

The COVID-19 pandemic prompted us to open the remote work system and we are also promoting the ‘Global work from anywhere’ to provide employees with a work environment without time and space restrictions. To prevent security leaks that can occur while working at home, the company has loaned notebook PCs to employees for home use, or they can use the work-from-home portal called [HyCon](#). This online access and security service allows the employee to work on the company intranet from a location outside the company. HyCon also runs a long-distance support system that allows employees to work uninterrupted with overseas suppliers. SK hynix has elevated work freedom and established a working environment that is centered on autonomy and responsibility. We adhere to a culture of performance-oriented evaluation as part of our ongoing effort to allow our people to work happily.

### CAFÉ-H and Through the Eyes of a Hygineer

SK hynix launched Café-H and Through the Eyes of a Hygineer (TEH) as speaking events that seek to comfort employees with heartwarming stories and bring a bit of happiness. Café-H is a non-face-to-face healing performance that employees can enjoy in real time. Under the theme “Factors that Affect Happiness,” outside experts are invited to share their experiences and spread positive thinking. TEH, on the other hand, is a venue for sharing knowledge through communication. The employees can participate as speakers themselves, and impart their personal experiences. The employees, with their diverse backgrounds and experiences, share stories, thereby creating a culture of happiness in which they recognize the diversity among themselves and understand one another. A total of ten presentation sessions (Café-H four times, and TEH six times) were organized in 2021, helping to foster a culture of happiness. In the future, we plan on continuing these events with under a wider range of themes.

### The Happiness Column

The Happiness Column was begun in 2021 to spread happy facts about employees as well as their happy stories. Published here are such sections as Leadership Coaching, for making employees happier; Empathy Toons, which share employee stories; and Heart Toons, which analyze and share happy facts about employees. A total of 52 columns were published in 2021, spreading happy news to all.

Employees on flexible working  
16,551

## Spotlight

### Activities of the Communication & Consensus Planning Group

SK hynix established the Communication & Consensus Planning Group (CCPG) in August 2021 to improve the organizational culture by innovating intracompany communication. Employees throughout the company who wanted to take part in the CCPG were brought together, and seventy-two of them were selected to be members. The selections were made in consideration of having balanced representation with respect to employee age, gender, rank, and organizational unit. The members met with consultants and discussed ways to improve intracompany communication for about three months. The CCPG members defined the problem by framing it in a design thinking approach and collected employee opinions through a survey. Thirty-two ideas were taken away from the rigorous debate on the proper direction for a corporate culture upgrade on the basis of communication and consensus. These ideas were organized into groups and in the end nine tasks were identified. Concrete action plans were established, in cooperation with the organizational units in charge, for carrying out these selected tasks. All the processes related to the CCPG activities were shared to employees companywide on a weekly basis via the company intranet, and the employee opinions gleaned from surveys and interviews were fully reflected in the reporting. The company concluded that the continuity of activities was important for true improvement in communication. Communication and consensus cultural activities are expected to continue with employee participation in the form of something like CCPG Part 2.

Here are three tasks that were elicited from the CCPG activities in 2021:



#### The Sensible HyTong Lifestyle

This campaign seeks to establish lively yet responsible communication habits, improving the operation of various inhouse employee communication channels. HyTong is an online anonymous communication channel that reaches companywide. Now, a message writer “manner temperature” indicator is being adopted to assign communication responsibility. The “Happiness+” communication board, which is designed to keep employees informed on company life or fringe benefit programs, has been run under the principle that all questions sent in by employees will be answered within 48 hours. In addition, the Dodream whistleblowing channel is supported by counselors specialized in HR to offer emotional understanding and advice to employees with grievances.



#### The Hyioneer Pledge

An employee consensus was formed that a set of communication guidelines was needed in order to remedy certain communication pain points that arise through CCPG activities. In response, SK hynix decided to lay down basic communication principles to further a corporate culture in which all employees can communicate and share feelings together. Guidelines were developed by a group of outside specialists on the basis of the results from a communication status analysis and the opinions of the CCPG members. These guidelines are to be shared and disseminated through leadership workshops and programs to change the organizational culture.



#### All Hands meeting 2.0

The All Hands Meeting is a quarterly communication venue through which top management explains the company's operational status and pending matters directly to employees. The intention is to use AHM not so much as a one-way information channel but rather an opportunity for a harmonious exchange between top management and the employees generally. Employee questions are collected in advance for top management to answer, and an on-the-spot Q&A segment is also provided so that employees can play an active role in the proceedings.

# ESG Data

An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

**Son Mo-ah** | Idealistic greenery 21

The painting delivers the message that nature represents a resting place for human beings.  
Atypical white objects floating amid the scenery signify a  
mindset to lead a composed and balanced life.





# Financial Highlights

## Key financial performance

(Unit: KRW billion)

Classification	2018	2019	2020	2021
Sales	40,445	26,991	31,900	42,998
Gross profit	25,264	8,172	10,811	18,952
Operating profit	20,844	2,719	5,013	12,410
Profit before corporate tax	21,341	2,433	6,237	13,416
Corporate tax	5,801	424	1,478	3,800
Cash taxes paid <sup>1)</sup>	3,568	5,153	371	1,015
Net profit	15,540	2,009	4,759	9,616
Total assets	63,658	65,248	71,174	96,386
Total borrowings	5,282	10,524	11,252	17,624

1) For cash taxes paid, it is based on the corporate tax expense set in the previous year. Cash taxes paid in 2020 is 15% of the corporate tax in 2019, and cash taxes paid in 2021 is 16% of the corporate tax in 2020.

## Shareholders' status

(As of the end of 2021, common stocks)

Classification	No. of Stocks	Shareholding(%)
SK square <sup>1)</sup> and 9 others <sup>2)</sup>	146,104,782	20.1
National Pension Service <sup>3)</sup>	65,801,201	9.04
Others	475,714,690	65.3
Treasury Shares	40,381,692	5.5
<b>Total</b>	<b>728,002,365</b>	<b>100</b>

1) The largest shareholder of SK Square is SK Inc., at which members of the founding family represent the largest shareholders.

2) 4,782 shares are owned by executives and related parties.

3) SK hynix does not issue golden shares for government institutions.

## Shareholding by executives and special affiliated investors

(As of the end of 2021)

Classification	Name	No. of Stocks
CEO	Park Jung-ho	2,090
	Lee Seok-hee	42
Executive director	Oh Jong-hoon	1,450
	Ha Yung-ku	200
	Song Ho-keun	200
Independent director	Shin Chang-hwan	200
	Yoon Tae-hwa	200
	Cho Hyun-jae	200
	Han Ae-ra	200
<b>Total</b>		<b>4,782</b>

## Stock types and voting rights

(As of the end of 2021)

Classification	Issued Stocks	Ratio(%)	Remarks
Preferred stocks	0	0	No voting right
Common stock with voting right	687,620,673	94.5	Voting right
Common stock - Treasury stock	40,381,692	5.5	No voting right
<b>Total</b>	<b>728,002,365</b>	<b>100</b>	

## Key financial performance by international region in 2021

(Unit: KRW 100 million)

Company name	Country	Type of business	No. of employees (persons)	Sales	Profit before tax	Corporate tax (accrual basis)	Corporate tax (cash basis)
SK hynix Semiconductor (China) Ltd.	China	Semiconductor production	4,317	50,191	4,217	358	960
SK hynix Semiconductor (Chongqing) Ltd.	China		2,816	10,032	967	157	148
SK hynix Semiconductor (Shanghai) Co., Ltd.	China		0	171	45	16	29
SK hynix (Wuxi) Semiconductor Sales Ltd.	China		226	130,490	1,621	433	347
SK hynix America Inc.	U.S.	Semiconductor sale	309	172,116	887	44	46
SK hynix Deutschland GmbH	Germany		27	3,423	7	2	18
SK hynix UK Ltd.	U.K.		12	13,282	14	-	-
SK hynix Japan Inc.	Japan		53	7,653	92	16	18
SK hynix Asia Pte. Ltd.	Singapore		29	32,051	25	2	-
SK hynix Semiconductor Hong Kong Ltd.	Hong Kong		17	25,707	35	-	-
SK hynix Semiconductor Taiwan Inc.	Taiwan		56	30,399	65	16	12
SK hynix Semiconductor India Pvt. Ltd. <sup>1)</sup>	India	Semiconductor R&D	5	1,221	6	2	1
SK hynix memory solutions America Inc.	U.S.		288	1,544	110	0	-
SK hynix memory solutions Taiwan Ltd.	Taiwan		45	83	6	0	0
SK hynix memory solutions Eastern Europe LLC.	Belarus		220	202	13	0	0
SK hynix Italy S.r.l.	Italy			85	6	1	1

1) Business year of India subsidiary: From April 1st 2021 to March 31st 2022.

\* Due to different financial audit schedules for each country, some subsidiaries' financial figures are before the audit and there may some changes after the audit.

## Ratio of CEO compensation in 2021

Classification	Unit	CEO	Employees	
			Mean	Median
Compensation	KRW million	2,549	110	104
CEO compensation divided by the employee compensation	times	-	23.2	24.5

\* Part of short-term incentives for CEOs are paid in stock.

## BOD compensation in 2021

(Unit: KRW million)

Classification	No. of directors (persons)	Total compensation (KRW million)	Average compensation per person (KRW million)
Executive director	3	4,625	1,542
Independent director (excluding members of the Audit Committee)	2	235	117
Members of the Audit Committee	4	469	117

# Environment

## Greenhouse gas emissions

Classification	Unit	2018	2019	2020	2021 <sup>1)</sup>
Scope 1	CO <sub>2</sub>	254,988	103,208	106,640	111,567
	CH <sub>4</sub>	4,086	475 <sup>2)</sup>	515	496
	N <sub>2</sub> O	113,306	151,415	146,593	72,920
	HFCs	131,402	171,672	236,172	253,753
	PFCs	420,583	671,204	1,036,958	961,220
	SF <sub>6</sub>	152,365	169,250	232,692	248,419
	NF <sub>3</sub>	881,814	852,883	951,838	980,546
	<b>Total</b>	<b>1,958,542</b>	<b>2,126,171</b>	<b>2,711,409</b>	<b>2,628,921</b>
Scope 2	CO <sub>2</sub>	3,948,968	4,706,167	4,829,381	4,988,932
	CH <sub>4</sub>	798	1,257	1,317	1,001
	N <sub>2</sub> O	6,082	5,875	6,221	19,611
	<b>Total</b>	<b>3,955,848</b>	<b>4,713,299</b>	<b>4,836,919</b>	<b>5,009,544</b>
Scope 3	Purchased raw materials (upstream) <sup>3)</sup>	–	2,623,411	2,801,363	3,092,433
	Upstream transportation and distribution	58,992	33,565	26,849	55,269
	Downstream transportation and distribution	20,650	23,598	29,447	26,832
	Waste generated in operations	8,481	6,655	6,197	228,419
	Business travel	2,136	1,687	167	144
	Employee commuting	18,841	23,454	37,105	29,680
	<b>Total</b>	<b>109,100</b>	<b>2,712,370</b>	<b>2,901,128</b>	<b>3,432,777</b>
Scope 1	Emissions intensity <sup>4)</sup>	4.84	7.88	8.50	6.11
Scope 2		9.78	17.46	15.16	11.65

1) Based on a market-based method starting from 2021, and Scope 2 emission based on location-based method is 5,302,908 tCO<sub>2</sub>eq.

2) According to the change in internal calculation logic, the CH<sub>4</sub> emissions in 2019 was revised from 6,540 to 475, but the total emissions maintained based on the verification result.

3) Disclosed after the completion of verification for data including those for 2019 and 2020

4) Based on sales on consolidated financial statements in Annual Report

\* Global Warming Potential (GWP) figures in the Fifth Assessment Report (AR5) applied

\* F-GHG emissions assessed in accordance with the Electronic Product Environmental Assessment Tool (EPEAT) standards: 2,686,543 tCO<sub>2</sub>eq

\* Data scope: Icheon, Cheongju, Bundang, Wuxi, Chongqing

## Energy consumption

Classification	Unit	2018	2019	2020	2021
Consumption by energy source	LNG	4,818,131	2,100,857	2,026,936	2,199,591
	Electricity <sup>1)</sup>	78,421,166	78,617,897	83,403,131	95,498,700
	Steam <sup>2)</sup>	739,437	4,551,895	4,733,947	5,801,655
	Other <sup>3)</sup>	–	–	–	59,725
	<b>Total</b>	<b>83,978,734</b>	<b>85,270,649</b>	<b>90,164,014</b>	<b>103,559,671</b>
Consumption by intensity <sup>4)</sup>	LNG	11.91	7.78	6.35	5.12
	Electricity	193.90	291.28	261.45	222.10
	Steam	1.83	16.86	14.84	13.49
	Other	–	–	–	0.14
	<b>Total</b>	<b>207.64</b>	<b>315.92</b>	<b>282.64</b>	<b>240.85</b>

1) Electricity consumption includes from renewable sources

2) Data scope: Wuxi in 2018, and Icheon and Wuxi sites in 2019

3) Newly disclosed from 2021; including gasoline, kerosene, and etc.,

4) Based on sales on consolidated financial statements in Annual Report

\* Data scope: Icheon, Cheongju, Wuxi, Chongqing

## Energy savings

Classification	Unit	2018	2019	2020	2021
Target		189	171	177	177
Achievement	GWh	156	190	243	186

\* GHG emissions reduced from energy savings in 2021: 85,468 tCO<sub>2</sub>eq.

(1MWh=9600MJ; power emission coefficient of 0.4594 tCO<sub>2</sub>eq./MWh applied based on Enforcement Regulation of Energy Act in Korea)

\* Data scope: Icheon, Cheongju

## Air pollutant emissions

Classification	Unit	2018	2019	2020	2021
Icheon	SOx	12.3	8.8	6.8	7.7
	NH <sub>3</sub>	21.1	46.8	33.1	20.6
	NOx	29.6	100.1	363.5	241.3
	HF	5.5	2.7	1.7	3.0
	HCl	5.3	8.6	5.6	2.7
	VOC <sup>1)</sup>	0.2	0.8	–	–
	Dust	0.3	0.1	0.0	0.0
Cheongju	SOx	0.9	3.4	4.8	7.9
	NH <sub>3</sub>	8.6	34.2	21.2	26.7
	NOx	210.8	347.1	341.7	248.8
	HF	2.3	1.9	2.1	3.5
	HCl	1.7	8.0	10.4	10.1
	VOC <sup>1)</sup>	0.2	1.8	–	–
	Dust	12.1	35.9	32.1	37.8

Classification	Unit	2018	2019	2020	2021
Wuxi	SOx	0.3	3.3	3.3	2.6
	NH <sub>3</sub>	6.1	9.1	10.6	6.6
	NOx	0.3	7.9	4.7	0.0
	HF	0.7	1.1	0.2	0.2
	HCl	3.8	12.2	13.4	28.6
	VOC	17.3	10.6	9.7	0.6
	Dust	–	–	–	–
Chongqing	SOx	0.0	0.1	0.0	0.0
	NH <sub>3</sub>	–	–	–	–
	NOx	1.1	1.4	6.9	6.8
	HF	–	–	–	–
	HCl	3.4	3.7	0.4	0.4
	VOC	0.8	0.6	0.2	0.1
	Dust	8.6	3.8	9.8	8.5

1) Not a substance used in the process, and it is judged that the emission does not affect the overall emission of pollutants, so it is excluded from the Icheon/Cheongju air pollutant emissions from 2020

\* Meet all legal emission standards for each sites

## Water management

Classification		Unit	2018	2019	2020	2021
Domestic sites	Withdrawals	Municipal water	29,064	34,910	36,162	39,630
		Surface water	33,718	30,950	30,960	32,343
		Reclaimed water	–	–	–	–
		<b>Total</b>	<b>62,782</b>	<b>65,860</b>	<b>67,123</b>	<b>71,973</b>
	Consumption		11,725	11,470	10,423	13,512
	Wastewater discharge		51,057	54,390	56,699	58,461
	Ultra pure water consumption		23,242	25,376	27,437	29,254
Overseas sites	Withdrawals	Municipal water	14,146	18,777	21,272	24,770
		Surface water	–	–	–	–
		Reclaimed water	3,906	5,919	7,320	7,300
		<b>Total</b>	<b>18,052</b>	<b>24,696</b>	<b>28,592</b>	<b>32,070</b>
	Consumption		2,129	3,242	2,369	2,929
	Wastewater discharge		15,923	21,454	26,223	29,141
	Ultra pure water consumption		7,121	8,925	9,936	10,925
Total	Withdrawals	Municipal water	43,210	53,686	57,434	64,400
		Surface water	33,718	30,950	30,960	32,343
		Reclaimed water	3,906	5,919	7,320	7,300
		<b>Total</b>	<b>80,834</b>	<b>90,556</b>	<b>95,715</b>	<b>104,043</b>
	Wastewater discharge		13,854	14,712	12,792	16,441
	Discharge		66,980	75,844	82,922	87,602
	Ultra pure water consumption		30,363	34,301	37,373	40,179

\* The amount of water discharged to the source of water intake that is similar quality to that of the source water came to 2.936 million m<sup>3</sup> in 2018, 2.773 million m<sup>3</sup> in 2019, 2.904 million m<sup>3</sup> in 2020, and 2.902 million m<sup>3</sup> in 2021.

## Water reuse and reuse rate

Classification		Unit	2018	2019	2020	2021
Water reuse	Domestic sites	1,000m <sup>3</sup>	18,644	21,631	26,932	34,463
	Overseas sites		8,650	10,991	13,554	13,106
	<b>Total</b>		<b>27,294</b>	<b>32,622</b>	<b>40,486</b>	<b>47,569</b>
Water reuse rate	Domestic sites	%	27	28	32	37
	Overseas sites		35	34	34	31
	<b>Total</b>		<b>29</b>	<b>30</b>	<b>33</b>	<b>35</b>

## Wastewater discharge quality

Classification		Unit	2018	2019	2020	2021
Domestic sites <sup>1)</sup>	COD	ton	204.8	235.6	234.2	203.9
	BOD		183.6	172.5	140.7	116.6
	T-P		2.0	1.6	1.6	1.0
	SS		117.1	106.0	113.8	97.1
Overseas sites	COD		76.6	69.4	365.9	296.2
	F		6.0	7.7	19.2	34.0
	NH <sub>3</sub> -N		3.2	11.3	65.6	52.7

1) The quality of water discharged from our domestic operations is being kept at a level that more than satisfies Korea's 'Good Water' management indicators. (COD of less than 5 mg/L, BOD of less than 3 mg/L, SS of less than 25 mg/L, and T-P of less than 0.1 mg/L)

\* Total wastewater discharge quality: Total amount of pollutants discharged after treatment at the wastewater treatment facility in annual basis

## Water stressed area (Icheon/Wuxi)

Classification		Unit	2018	2019	2020	2021
Withdrawals	Amount	1,000m <sup>3</sup>	57,732	60,790	64,552	69,008
	Rate	%	71	67	67	66
Consumption	Amount	1,000m <sup>3</sup>	9,223	9,544	8,705	12,057
	Rate	%	67	65	68	70



## Total waste

Classification	Unit	2018	2019	2020	2021
Domestic sites	Total waste generated	373,993	390,763	402,280	430,932
	Recycled (%)	356,449(95%)	378,780(97%)	391,851(97%)	422,229(98%)
	Incineration/neutralization	17,373	11,856	10,110	8,523
	Landfill/solidification	171	128	319	180
Overseas sites	Total waste generated	67,903	123,604	169,854	203,646
	Recycled <sup>1)</sup> (%)	42,379(62%)	97,268(79%)	153,464(90%)	201,251(99%)
	Incineration/neutralization <sup>2)</sup>	–	–	–	2,395
	Landfill/solidification	0	0	0	0
Total	Total waste generated	441,896	514,367	572,134	634,578
	Recycled (%)	398,828(90%)	476,048(93%)	545,315(95%)	623,480(98%)
	Incineration/neutralization <sup>3)</sup>	17,373	11,856	10,110	10,918
	Landfill/solidification	171	128	319	180

1) Includes energy recovery from waste disposal

2) Newly disclosed from 2021 due to changes in the scope of overseas waste management

3) Data scope: domestic sites from 2018 to 2020

## Waste incinerated with energy recovery<sup>1)</sup>

Classification	Unit	2019	2020	2021
Total waste	ton	2,357	2,695	2,730
Hazardous waste <sup>2)</sup>	ton	0	0	0

1) The amount of waste that recovered energy such as generating steam or electricity using heat from waste incineration, and it includes in the amount of recycled waste

2) Hazardous waste: The definition and category of hazardous waste prescribed by individual national laws are different, and it is named as “designated waste” in Korea and “hazardous waste” in China. SK hynix unifies the vocabulary both domestic and overseas sites as “hazardous waste”

## Hazardous waste

Classification	Unit	2018	2019	2020	2021
Domestic sites	Total waste generated	206,780	226,059	220,118	214,432
	Recycled (%)	193,505(94%)	219,203(97%)	214,349(97%)	210,181(98%)
	Incineration/neutralization	13,105	6,728	5,449	4,071
	Landfill/solidification	171	128	319	180
Overseas sites	Total waste generated	47,516	74,863	111,589	139,751
	Recycled <sup>1)</sup> (%)	24,748(52%)	52,107(70%)	96,436(86%)	139,520(99.8%)
	Incineration/neutralization <sup>2)</sup>	–	–	–	230
	Landfill/solidification	0	0	0	0
Total	Total waste generated	254,296	300,922	331,707	354,183
	Recycled (%)	218,253(86%)	271,310(90%)	310,785(94%)	349,701(99%)
	Incineration/neutralization <sup>3)</sup>	13,105	6,728	5,449	4,301
	Landfill/solidification	171	128	319	180

1) Waste incinerated with energy recovery does not reflected by SASB standards

2) Newly disclosed from 2021 due to changes in the scope of overseas hazardous waste management

3) Data scope: Domestic sites from 2018 to 2020

## SHE investment result (Korea)

Classification	Unit	2018	2019	2020	2021
Invested capital	KRW million	102,398	103,611	82,456	74,354

## Breach of environmental laws

Classification	Unit	2018	2019	2020	2021
Breach of law	Cases	0	0	0	0

\* Based on violations of USD 10,000 or more

# Social

## Employee status

Classification		Unit	2018	2019	2020	2021
Number of employees			33,587	36,484	37,195	38,352
Type	Regular		31,066	34,053	35,205	36,243
	Temporary		2,521	2,431	1,990	2,109
Gender	Male		20,855	22,845	23,381	24,255
	Female		12,732	13,639	13,814	14,097
Age group	~29	Persons	11,099	11,956	11,615	11,934
	30~49		21,655	23,432	24,182	24,603
	50+		833	1,096	1,398	1,815
Nationality	Korea	Persons	26,367	28,609	29,345	30,484
	U.S.		6,325	6,906	6,855	6,909
	China		27	36	43	38
	Others		868	933	952	921
Location	Korea	Persons	25,970	28,244	29,006	30,123
	Americas		446	476	484	464
	China		6,758	7,320	7,246	7,309
	Others		413	444	459	456

\* Figures from 2018 to 2020 revised to correct simple errors

## Hires

Classification		Unit	2018	2019	2020	2021
New hires			5,020	4,343	2,003	3,549
Gender	Male	Persons	3,470	2,606	996	2,483
	Female		1,550	1,737	1,007	1,066
Age group	~29	Persons	2,224	2,177	1,195	2,550
	30~49		2,705	2,117	763	936
	50+		91	49	45	63
Internal hires(Korea)	Persons	Persons	7,462	8,614	7,306	10,501
	Rate	%	94	95	97	95
Average hiring costs <sup>1)</sup> (Korea)		KRW	1,230,670	806,782	1,620,516	952,538
Average length of service (Korea)		Years	10.9	10.8	11.4	11.7

1) Figures from 2018 to 2020 revised owing to the application of a new formula for calculating average recruitment expenses  
(Average recruitment expense = Recruitment expense of a given year / number of recruited employees in a given year)

## Employee status by type and gender in 2021 (Korea)

Classification		Unit	Type		
			Regular	Temporary	Total
Gender	Male	Persons	19,476	41	19,517
	Female		10,575	31	10,606
	Total		30,051	72	30,123

## Turnover (Korea)

Classification		Unit	2018	2019	2020	2021
Voluntary turnover rate	Total		1.7	2.2	1.9	3.6
	Gender	Male	–	2.3	2.0	4.1
		Female	–	2.2	1.8	2.5
	Age group	~29	–	3.3	3.4	5.7
		30~49	–	0.3	1.3	2.7
		50+	–		1.8	2.8
Non-voluntary turnover rate	Total		0.5	0.3	0.3	0.3
	Gender	Male	–	0.3	0.4	0.4
		Female	–	0.2	0.1	0.1
	Age group	~29	–	0.2	0.3	0.1
		30~49	–	0.2	0.1	0.1
		50+	–	4.1	5.6	4.2
Turnover rate	Male		1.4	1.6	1.5	2.9
	Female		0.9	0.9	0.7	0.9
	Total		2.2	2.5	2.2	3.8

\* Figures from 2018 to 2020 revised owing to the application of a new formula for calculating employee turnover rates  
 [Employee turnover rate = (Number of employees who left the company in a given year / number of employees at the end of the previous year) \* 100]

## Diversity (Korea)

Classification		Unit	2018	2019	2020	2021
Representation of female <sup>1)</sup>	Total		37.8	36.3	35.5	35.2
	Leadership	Top managers	–	–	–	1.9
		Middle managers	29.4	28.1	28.0	28.8
	Revenue-generating functions	Total	26.5	25.6	25.5	26.3
		Management level	27.0	27.9	27.4	28.9
		Non-management level	38.7	38.2	36.9	37.2
Others	STEM-related positions		12.5	13.4	14.2	15.1
	Employees with disabilities (Own operation)		165	183	194	189
	Employees with disabilities (Subsidiaries <sup>2)</sup> )	Persons	286	616	781	800
	National veterans		287	306	319	320

1) Figures from 2018 to 2020 revised owing to changes in boundaries for managers, profit-generating departments, and STEM areas  
 - Top managers: Executives (excluding executive directors)  
 - Middle managers: TL/PL, head of independent part, field manager, line leader  
 - Revenue-generating functions: Departments that directly contribute to sales or product manufacturing (excluding support departments)  
 - STEM-related positions: Engineering and office staff in R&D, manufacturing, IT, and logistic arms

2) HappyMore

\* Figures of employees with disabilities (Own operation) is calculated based on the third clause of Article 22 of the Act on the Employment Promotion and Vocational Rehabilitation of Persons with Disabilities.

## Parental leave (Korea)

Classification			Unit	2018	2019	2020	2021
No. of employees who used a maternity leave <sup>1)</sup>				825	744	662	646
Childcare leave	No. of valid employees for childcare leave	Male	Persons	–	–	7,588	7,306
		Female		–	–	4,856	4,808
		Total		–	–	12,444	12,114
	No. of Employees on parental leave	Male		37	61	91	117
		Female		932	853	765	724
		Total <sup>2)</sup>		969	914	856	841
	No. of employees who returned to work after childcare leave	Male		29	55	74	107
		Female		941	870	822	779
		Total		970	925	896	886
	Return to work rate after parental leave	Male		96.7	96.5	96.1	99.1
		Female		99.3	98.8	99.6	99.5
		Total		99.2	98.6	99.3	99.4
	No. of employees who worked for at least 12 months after returning to work (%)	Male	Persons (%)	28(80.0)	26(86.7)	51(89.5)	65(84.4)
		Female		900(93.7)	882(93.0)	818(92.8)	772(93.6)
		Total		928(93.2)	908(92.8)	869(92.6)	837(92.8)

1) Figures from 2018 to 2019 revised to correct simple errors

2) Figures from 2018 to 2019 revised to exclude overlapping values

## Labor (Korea)

Classification			Unit	2018	2019	2020	2021
Working hours	Annual working hours per person <sup>1)</sup>	Hours		2,209	2,229	2,277	2,180
	Average weekly working hours <sup>1)</sup>			42.5	42.9	43.8	41.9
	No. of employees on flexible working <sup>2)</sup>	Persons		10,904	14,311	15,382	16,551
Share of labor union membership <sup>3)</sup>	Icheon	%		97	98	97	96
	Cheongju			99	99	99	99

1) Data from 2018–2020 updated owing to changes in working hours (in reflection of excess and non-working hours)

2) Data from 2018 to 2020 revised in line with changes in flexible working hour policies

3) Terms of the collective agreement drawn between labor and management are fully applied to all of our employees

## Compensation (Korea)

Classification			Unit	2021
Equal pay ratio <sup>1)</sup>	Executive level	Base salary only	%	100
		Total <sup>2)</sup>		99
	Team leader level	Base salary only	%	95
		Total <sup>2)</sup>		103
	Non-management level	Base salary only		100
New hires	Monthly starting salary		KRW	4,200,000
	Percentage of monthly starting salary to legally required minimum		%	230
No. of employees applies to long-term incentives <sup>3)</sup>			Persons (%)	28,805(95.6)

1) Ratio = salary for female employees / salary for male employees

2) Base salary + other cash incentives

3) Employee stock ownership program and etc

\* Samples collected to analyze whether employees of the same rank receive the same wages; based on data in 2021 for newly appointed executives/team leaders and new employees who started to work in January

## Employee training (Korea)

Classification	Unit	2018	2019	2020	2021
Total trainees	Persons	208,024	283,680	302,430	293,640
Expenses	Total	KRW 7,204,227	7,545,583	53,227,246	51,349,240
	Per person	1,000 277	267	1,835	1,705
Hours	Total	1,914,191	2,667,967	2,140,827	2,241,422
	Per person	76	94	74	74

\* Figures from 2019 revised to correct simple errors

## Details of employee training hours in 2021 (Korea)

Classification	Unit	Average hours of training per employee
Gender	Male	88
	Female	53
Age group	~29	87
	30~49	68
	50+	128
Job positions	Management level <sup>1)</sup>	116
	Non-management level	73

1) Management level: Including top managers and middle managers

## Employee engagement (Korea)

Classification	Unit	2018	2019	2020	2021
Total		71	72	72	70
Gender	Male	-	-	72	72
	Female	-	-	68	58
Job positions	Top managers	-	-	78	93
	Middle managers	-	-	76	91
	Others	-	-	71	68

## Occupational safety management

Classification	Unit	2018	2019	2020	2021
Industrial accident rate	Icheon	0.09	0.10	0.11	0.03
	Cheongju <sup>1)</sup>	0.10	0.23	0.10	0.11
	Wuxi <sup>2)</sup>	0.16	0.09	0.07	0.25
	Chongqing	% 0.10	0	0	0
	Suppliers (Icheon)	0.02	0.06	0.05	0.11
	Suppliers (Cheongju)	0.07	0.08	0.09	0.13
Lost time injuries frequency rate	Employees	Cases/200 thousand working hours 0.074	0.100	0.108	0.049
	Suppliers	0.072	0.080	0.084	0.009
Fatalities	Employees (Korea)	Persons 0	0	0	0
	Suppliers	0	0	0	0

1) Figures from 2018 to 2020 revised following the confirmation of the Cheongju branch of the Employment and Labor Office

2) Figures from 2018 to 2019 revised to correct simple errors

## Occupational safety and health management system (ISO 45001)

Classification	Icheon	Cheongju	Wuxi	Chongqing
Valid of certification	2021.01.07~ 2024.01.06	2021.01.07~ 2024.01.06	2021.08.03~ 2024.08.02	2022.01.18~ 2025.01.18

\* Scope of application of the safety and health management system: All SK hynix employees in Korea and China (37,432 persons) and employees at suppliers (32,137 persons; average figure for 2021)

## Supplier status

Classification	Unit	2018	2019	2020	2021
Total suppliers (first-tier) <sup>1)</sup>	Companies	1,618	1,659	1,747	1,789
Critical suppliers (first-tier) <sup>2)</sup>		-	-	-	59
High risk suppliers (first-tier) <sup>3)</sup>					46
New suppliers <sup>4), 5)</sup>		151	167	203	185
Total purchase amount <sup>6)</sup>	KRW 100 million	233,473	193,350	210,213	246,956

1) Includes equipment, raw material, infrastructure, and parts providers

2) Disclosed from 2021 owing to changes in criteria for critical suppliers

3) Disclosed from 2021 based on ESG assessment results

4) Data from 2018 to 2020 revised owing to changes in criteria for new suppliers (first-tier suppliers that have signed a contract in a given year)

5) Assessments for SHE adequacy (human rights/labor, environment, safety) passed by all new suppliers

6) Data revised from 2018 to 2020 identifying some duplicate calculate values

## Supplier ESG assessment<sup>1)</sup>

Classification	Unit	2021
Suppliers ESG assessment <sup>2)</sup>		1,206(67% <sup>3)</sup> )
Critical suppliers ESG assessment	Companies	1(1.7% <sup>4)</sup> )
ESG assessment		25(54.3% <sup>4)</sup> )
High risk suppliers		25(100%)
	With corrective action plans	
	Fulfill corrective action plans	% 11
RMAP certification	%	100

1) ESG assessments results for over 2019-2021

2) Includes SHE consultations and RBA audits focused on specific parts of ESG elements

3) Percentage out of all first-tier suppliers

4) Percentage out of all high-risk suppliers and critical suppliers designated in 2021; on-site assessments to be performed for high-risk and critical suppliers by 2023

## Supplier management

Classification	Unit	2018	2019	2020	2021
New suppliers that agreed with the Code of Conduct	%	100	100	100	100

## Shared growth

Classification	Unit	2018	2019	2020	2021
Total amount of support	KRW 100 million	1,752	2,685	2,705	2,800
No. of companies on Shared Growth Agreement	Companies	108	117	123	123
No. of companies that joined Shared Growth Committee		61	79	79	82

## Ethical training status

Classification	Unit	2018	2019	2020	2021
SK hynix	Participation rate	% 100%	100%	100%	100%
	No. of participations per person	Number 1.7	1.9	1.8	1.9
Subsidiaries	Subject	-	-	3	4
	Respondent		-	3	4

## Ethical grievance status

Classification	Unit	2018	2019	2020	2021
Reports	Total	116	126	191	266
	Valid	40	41	57	61
Measures <sup>1)</sup>	Against unethical conduct <sup>2)</sup>	34	91	86	21
	Severe disciplinary actions <sup>3)</sup>	15	45	51	14

1) Three cases of discrimination and harassment handled through severe disciplinary actions

2) Measures against unethical conduct: Includes those implemented through the risk prevention system aside from those handled through ethical management reporting

3) Severe disciplinary actions: Wage cut, suspension, demotion, dismissal measures against unethical conduct



## Customer satisfaction survey

Classification	Unit	2018	2019	2020	2021
Overall score		4.46	4.43	4.60	4.54
Level by application	Computing DRAM	4.32	4.38	4.66	4.66
	Mobile DRAM	4.57	4.67	4.52	4.54
	Mobile Solution	4.52	4.30	4.45	4.62
	Storage Solution	4.60	4.58	4.50	4.24
	Points (out of 5)				
Level by subsidiary	China	4.52	4.29	4.56	4.53
	Americas	4.19	4.69	4.72	4.50
	Japan	4.20	4.63	Not conducted	Not conducted
	Korea	4.68	4.58	Not conducted	Not conducted
No. of recalled products	cases	0	0	0	0
No. of complaints from customers	cases	0	0	0	0

\* Figures from 2020 revised owing to changes in collection of customer satisfaction score.

## Contributions to relevant institutes

Classification	Unit	2018	2019	2020	2021
Total amount	KRW 100 million	19.9	22.4	22.1	23.6

## Community support

Classification			Unit	2018	2019	2020	2021
Expenditure	Investment	Social contribution	KRW 100 million	619	614	736	710
		Cash		602	440	559	600
	Donations	In kind		4.4	8.1	4.4	0.1
		Total		606	448	564	600
	Employees fund raising	Amount raised	30	29	28	21.6	
		Employee participants	Persons	15,906	16,224	15,979	11,070
Employee participants	5,088	4,884		1,991	400		
Employee volunteering	Time spent	Hours	18,897	16,737	13,027	7,127	
	Time spent per person	Hours	0.73	0.59	0.45	0.24	
	Participation rate	%	20	17	7	1	

\* Figures from 2020 revised to correct simple errors

## Details of contributions to relevant institutes in 2021

Classification	Unit	Amount
Korea Semiconductr Industry Association	KRW million	579.5
Information Technology Industry Council		291.5
Korea Enterprises Federation		288.8
The National Academy of Engineering of Korea		200
Si2(Silicon Inegration Inititative)		158.7

\* Funds for lobbying and interest groups, as well as political funds are not provided.

# Appendix

An award-winning work from 2021 SK hynix climate change exhibition,  
'Drawing for Green Future'

**Park Ji-soo | Blue Island**

The painting features a debris barrier built in the middle of a mountain to prevent landslides. Painted in white, the barrier serves as a metaphor for the very existence of nature, signifying creation as well as the possibility of survival.



# TCFD

SK hynix TCFD Report 2022



## Governance

a) Describe the board's oversight of climate-related risks and opportunities

SK hynix's Board of Directors (BOD), the highest decision-making body of the company, oversees and ensures that ESG factors, including climate change issues, are reflected in the company's long-term business strategy. In particular, the Sustainable Management Committee, a subcommittee within the BOD, thoroughly reviews whether climate change response strategies are integrated into all business areas, and provides guidelines to create synergy by linking mid- to long-term business strategies with climate action plans. The Sustainable Management Committee, which consists of three independent directors and one executive director (CEO), specializes in deliberating on company-wide ESG strategies and activities, including climate change responses, and is convened once a quarter. The agenda of the Sustainable Management Committee can be submitted through the ESG Management Committee or directly from the working-level organization if necessary. In particular, climate-related issues that have a significant impact on management and financial strategies, such as the long-term climate goal "net zero," require discussion and decision-making at the board level. In 2021, the Sustainable Management Committee discussed the status of our plan for achieving net zero and the progress of RE100 implementation.

b) Describe management's role in assessing and managing climate-related risks and opportunities

SK hynix management has continued to improve its internal decision-making process to mitigate climate change risks and uncover new opportunities. First, in 2021, we launched a department dedicated to ESG strategy and created the ESG Management Committee chaired by the CEO. At monthly ESG Management Committee meetings, about 10 executives from major departments, such as Corporate Strategy&Planning, Manufacturing/Technology, and Safety Health & Environment (SHE), discuss ESG issues including climate change, establish concrete implementation strategies and goals, and regularly assess our progress and achievements. In 2022, the Carbon Management Committee was formed under the ESG Management Committee with the head of Manufacturing/Technology as the chairman. The Carbon Management Committee is composed of seven working groups dedicated to tasks such as setting GHG reduction targets, saving energy and procuring renewable energy, and reports the progress to the ESG Management Committee once a quarter. In addition, SK hynix operates the Climate Change Roundtable comprised of executives from marketing, finance, and other support functions such as IR/PR/CR, in addition to R&D and manufacturing. The Climate Change Roundtable analyzes climate-related risks and opportunities and their potential impact, and is responsible for pre-deliberation/review of climate-related issues that are referred to the ESG Management Committee.

## Strategy

a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term

SK hynix organized a pool of climate change risk and opportunity factors through regulatory policy and industry analysis, stakeholder surveys, studies, and expert opinion analysis, and conducted a materiality assessment based on likelihood and impact.

As a result of the materiality assessment, the top 10 factors with both high likelihood and impact were identified as key climate-related risks and opportunities for SK hynix. Specifically, we have derived six transition and physical risks - (1) Enhanced GHG emissions regulations and policies, (2) Unstable electricity supply and increasing electricity prices due to fossil fuel regulations, (3) Transitioning manufacturing processes and facilities to low carbon technologies, (4) Increasing customer demand for carbon reduction associated with climate change, (5) Heat waves, and (6) Rising mean temperatures, as well as four opportunities - (7) Eco-friendly and low-carbon policy incentives, (8) Gaining a competitive advantage by reducing our product carbon footprint, (9) Creating new demand for next-generation memory by developing low-power/high-efficiency products, and (10) Expanding renewable energy procurement in line with the RE100 initiative.

b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

Under the Korean Emissions trading System(ETS), SK hynix has an obligation to purchase emissions permits in the emissions trading market or to reduce emissions that exceed the allocated emissions allowances. Accordingly, "enhanced GHG emissions regulations and policies" was assessed as the risk where the potential financial impact is the greatest among several key climate-related risks for SK hynix. As of the end of December 2021, our GHG emissions liabilities stood at KRW 6.8 billion. Although this accounted for only 0.06% of the operating profit on a consolidated basis in 2021, if ETS regulations are further enhanced, the associated financial impact may also increase. For example, there could be a case that due to a change in a government policy, the semiconductor industry might become excluded from the sectors eligible for free allowance allocation. Since the current proportion of allowances through auctions in K-ETS is 10%, a hypothetical cost additionally incurred by the policy change would be estimated to be KRW 7.97 billion (4.42 million tons (free allowances allocated in 2021) x 0.1 (the proportion of allowances via auctions) x KRW 18,033 (the average of emissions trading prices in 2021)).

Although most of the key climate change risks were classified as transition risks, SK hynix also estimated the potential financial impact of a physical risk caused by heat waves. Increases in days with heat waves will lead to higher electricity costs for operating air conditioners and centrifugal refrigerating machines. For example, the increased costs incurred for every additional heat waves day in our domestic operations (Icheon and Cheongju) is estimated to be about KRW 400 million. The impact would be expected to increase in the future with the expansion of the Yongin cluster, which is yet to be completed. In 2021, the number of heat waves days relative to 2020 increased by 12 days at the Icheon site and 14 days at the Cheongju site. Consequently, the additional financial impact was assessed KRW 5.263 billion. The financial impact on the electricity costs for air conditioners and centrifugal refrigerating machines may continue to increase as the severity of heat waves may increase in the future.

We have also established a water resource management strategy from a long-term perspective by conducting a water stress analysis not only in the areas in which we currently operate but also in Yongin where our new Fabs will be built. The likelihood of drought is very low in the current locations of SK hynix's operations, so no separate assessment of financial impact was conducted, but due to the water-intensive nature of the semiconductor industry, we have reflected the results of our water stress analysis in our strategy.

In terms of opportunities, we believe that we can drive sales by gaining a competitive edge in the market through the development of energy-efficient products. At the same time, we seek to reduce energy costs by improving the energy efficiency of the manufacturing process to reduce our carbon footprint. We can also boost sales by creating demand for next-generation semiconductors, and increase operating profit with premiums for low-power/high-efficiency products.

To minimize the financial risks associated with climate change, SK hynix has closely monitored domestic and international climate-related policy/regulatory trends and established mid- to long-term GHG reduction goals and concrete action plans. First, we have established short-term and medium-term goals such as achieving 100% renewable energy at overseas operations by 2022 and 33% renewable energy in all operations by 2030. We have established and managed the ISO 50001 energy management system since 2014, and have expanded our energy reduction activities through real-time energy usage monitoring by an energy-saving task force since 2012. In 2021, we saved a total of KRW 23 billion in energy costs through activities such as optimizing the hot water temperature control for M14 and deploying high-efficiency chillers. Starting in 2022, led by working groups under the Carbon Management Committee, we have implemented company-wide task-force activities to reduce emissions, such as using low-GWP alternative gases for the manufacturing process and adopting high-efficiency energy equipment. In addition, we have utilized the funds raised by issuing a green bond in January 2021 for water resource management and energy-efficiency projects, such as the establishment of a water/wastewater recycling system and energy saving in manufacturing facilities (about KRW 590 billion was executed as of September 2021). Furthermore, SK hynix is actively proposing policies for carbon neutrality as a member of the Carbon Neutrality Committee for Semiconductor and Display Industries, a public-private consultative body dedicated to discussing the 2050 carbon neutrality commitment of the semiconductor and display industries.

<b>Strategy</b>	<p>For climate change scenario analysis, SK hynix classified climate change risks into transition risks and physical risks and selected appropriate scenarios. First, for the analysis of transition risks, we chose two scenarios (2050 Net Zero and Below 2°C) that are considered an orderly transition among six scenarios announced in June 2021 by the Network for Greening the Financial System (NGFS). The NGFS' climate change scenarios are recognized as credible around the world as they provide a comprehensive set of data at the granular level for a variety of plausible scenarios. In addition, we used the NGFS carbon price as the emission trading price in our climate change scenario analysis, assuming that the government would achieve the nationally determined contributions (NDC) by lowering the cap on emissions permitted in Korea. The carbon price of NGFS is a potential carbon price derived by taking into account the carbon-neutral targets and the marginal abatement cost of an incremental tonne of greenhouse gas emissions at the national level. The actual price forecast under the emissions trading system may differ from the scenario forecast. For physical risks, we used the Korea Meteorological Administration (KMA)'s detailed climate change scenario for South Korea that applied statistical downscaling based on the Representative Concentration Pathways (RCP) scenario. The RCP scenario is used in the Fifth Assessment Report (2014) of the Intergovernmental Panel on Climate Change (IPCC), which is deemed most credible for physical risk analysis. This scenario is suitable for analyzing physical risks such as natural disasters because it directly refers to rising temperatures based on the GHG concentrations. We have assessed the potential mid-term financial implications of each risk with the greatest impact among the transition risks and physical risks ("enhanced GHG emissions regulations and policies" among transition risks and "heat waves" among physical risks). We took into account only the primary impacts that are directly reflected in the income statement, and did not analyze secondary impacts (e.g., decreased sales due to lower productivity during heatwave days). As a result of the analysis, under the 1.5°C scenario (Net Zero by 2050), the potential financial impact of enhanced GHG emissions regulations and policies in 2030 was estimated to be about 1.4% of revenue. Based on the RCP 8.5 scenario, the financial impact of heat waves in 2030 was estimated to be 0.16% of the power cost. In conclusion, the impact of the transition risks and physical risks identified through this scenario analysis on our financial performance was found to be manageable. Climate change scenarios are a useful tool for an organization to develop an understanding of how the risks and opportunities associated with climate change may impact its businesses and strategies over time. This means that the purpose of climate change scenario analysis is not to accurately predict the future, but to find appropriate response strategies by identifying implications for uncertain future events. Since scenario analysis is based on probable hypotheses rather than a definitive future, it has its own uncertainties and limitations. SK hynix will continue to improve the quality of analysis by gradually expanding the scope and level of key considerations such as major assumptions and parameters required for scenario analysis.</p>
<b>Risk Management</b>	<p>SK hynix recognizes climate-related risks as material risks and has established the Climate Change Risk Management Framework to manage climate risks in an integrated way. Based on this framework, we derive key climate risks that can affect mid- to long-term business strategies and overall operations, and established mitigation strategies by identifying potential impacts through scenario analysis. Related departments implement tasks according to the established strategies and identify improvement areas by monitoring the progress. Key risks are reported to the management/BOD so that we can further enhance our mitigation of climate risks. In the risk identification stage of the climate change risk management framework, we organize a pool of climate risks to determined by internal and external analysis. In the risk identification stage of the climate change risk management framework, we organize a pool of climate risks determined by internal and external analysis. The internal analysis is done by the Climate Change Roundtable discussing climate-related issues specific to our business. We also conduct an external analysis through reviewing domestic and international climate policies, industry trends, stakeholder interests and demands, and expert opinions. Afterwards, we conduct a materiality assessment based on the likelihood and impact to identify key climate-related risks, for which we further estimate the potential financial impacts through climate change scenario analysis.</p> <p>Based on the analysis results of identified and assessed key climate risks, we establish response strategies by stages/areas and individual departments implement tasks to respond to climate change. We continuously monitor the progress and performance of responses to climate change, identify areas for improvement, and report risk assessment/analysis results to the management/BOD.</p> <p>Managing and responding to climate change risks cannot be done by one particular department. In order to prepare for risks in advance and respond appropriately, we need to take a company-wide approach to risks and analyze their long-term impacts. SK hynix operates an enterprise-wide risk management system in four steps - risk identification, risk assessment and analysis, establishment of response strategies and monitoring - and includes climate change risk management within the system. We define climate change as a key risk that has a significant impact on our mid- to long-term business strategy and proactively manage it to ensure business continuity in the short term. In the long term, we will not only minimize any negative impact on our business but also identify opportunities in this process to further increase our corporate value.</p>
<b>Metrics &amp; Targets</b>	<p>We make disclosures in the TCFD's seven cross-industry, climate-related metric categories: greenhouse gas (GHG) emissions, transition risks, physical risks, climate-related opportunities, capital deployment, climate-related opportunities, internal carbon prices, and remuneration. Additionally, we disclose information on "energy, water resources, and waste." As for GHGs, energy, water resources, and waste metrics, we disclose four years of quantitative data, as well as our targets and achievements in detail.</p> <p>We disclose four years of Scope 1, Scope 2, and Scope 3 emissions data of all operation sites through third-party verification. For more information, please refer to <a href="#">p.97, 'ESG Data' section</a>.</p> <p>In 2020, SK hynix became the first in Korea to join the RE 100 initiative along with other SK group companies, and in 2021, we announced our goal to achieve net zero emissions by 2050. To this end, we aim to maintain our absolute emissions (Scope 1 &amp; 2) at 2020 levels by 2030 through aggressive GHG reduction activities despite a significant increase in production with the operation of the Yongin Semiconductor Cluster, which is yet to be completed. For more information, please refer to <a href="#">p.22, 'PRISM 2030 Goals'</a>.</p>

# SASB

Classification	Index	Code	SK hynix's response activities						Page	
GHG Emissions	(1) Gross global Scope 1 emissions and (2) amount of total emissions from perfluorinated compounds	TC-SC-110a.1	Classification		Unit	2018	2019	2020	2021	97
			Scope1 emissions		tCO <sub>2</sub> eq	1,958,542	2,126,171	2,711,409	2,628,921	
			PFCs			420,583	671,204	1,036,958	961,220	
			* Data scope: Icheon, Cheongju, Bundang, Wuxi, Chongqing							
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	TC-SC-110a.2	In 2020, SK hynix became the first in Korea to join the RE 100 initiative along with other SK group companies, and in 2021, we announced our goal to achieve net zero emissions by 2050. To this end, we aim to keep our absolute emissions (Scope 1 & 2) in 2030 at 2020 levels through aggressive GHG reduction activities despite a significant increase in production with the operation of a new fab to be built in the Yongin semiconductor cluster. For more information, please refer to p.22, "PRISM 2030 Goals" section.						21~23, TCFD Report 2022	
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	TC-SC-130a.1	Classification		Unit	2018	2019	2020	2021	43~44, 97
			Total energy consumed			83,978,734	85,270,649	90,164,014	103,559,671	
			Total grid electricity consumed		GJ	-	-	-	89,652,551	
			Total renewable energy consumed			185,202	83,280	275,990	2,597,398	
			* Data scope: Icheon, Cheongju, Wuxi, Chongqing							
			* In general, 1KWh is converted into 3.6MJ, but for plants in Korea, 1KWh is considered 9.6MJ under local energy law.							
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	TC-SC-140a.1	Classification		Unit	2018	2019	2020	2021	99
			Total water withdrawn		1,000m <sup>3</sup>	80,834	90,556	95,714	104,043	
			Total water consumed			13,854	14,712	12,792	16,441	
			Withdrawals with 'High' or above water stress area ratio			71	67	67	66	
			Consumption with 'High' or above water stress area ratio		%	67	65	68	70	
			* Data scope: Icheon, Cheongju, Wuxi, Chongqing							
			* Regions with 'High' water stress: Icheon, Wuxi							
Waste Management	Amount of hazardous waste from manufacturing, percentage recycled	TC-SC-150a.1	Classification		Unit	2018	2019	2020	2021	100
			Amount of hazardous waste from manufacturing	Domestic	ton	206,780	226,059	220,118	214,432	
				Overseas		47,516	74,863	111,589	139,751	
			Hazardous waste recycling ratio	Domestic		93.6	97.0	97.4	98.0	
				Overseas	%	52.1	69.6	86.4	99.8	
			* Data scope: Icheon, Cheongju, Wuxi, Chongqing							
			* The scope of hazardous waste calculation varies depending on the waste law of the country where each plant is located.							

Classification	Index	Code	SK hynix's response activities	Page																	
Employee Health & Safety	Description of efforts to assess, monitor, and reduce exposure of employees to human health hazards	TC-SC-320a.1	Under the principle of "Safety First," SK hynix strives to create a workplace where all employees can work happily. We have integrated the safety and health management system (ISO 45001/KOSHA 18001), the environmental management system (ISO 14001), and the process safety management system into the Safety, Health, and Environment (SHE) management system to ensure that not only our employees but also employees of our suppliers work in a safe and healthy environment. We also operate the Serious Accident Prevention TF and the Safety Management System Improvement TF in an effort to detect potential risks in our manufacturing sites and continually improve them.	34~39																	
	Total amount of monetary losses as a result of legal proceedings associated with employee health and safety violations	TC-SC-320a.2	This is in accordance with "3. Sanction-related Matters (p.306)" in the 2021 Annual Report. The content includes administrative fine cases, and does not correspond to safety and health issues such as litigation or employee injury.	Annual Report p.306																	
Recruiting & Managing a Global & Skilled Workforce	Percentage of employees that are (1) foreign nationals and (2) located offshore	TC-SC-330a.1	<table><tr><th>Classification</th><th>Unit</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th></tr><tr><td>Percentage of foreign employees</td><td rowspan="2">%</td><td>0.1</td><td>0.2</td><td>0.2</td><td>0.2</td></tr><tr><td>Percentage of employees located offshore</td><td>23</td><td>23</td><td>22</td><td>21</td></tr></table> <p>* Foreign national employees are based on our sites in Korea (Icheon, Cheongju, Bundang).</p>	Classification	Unit	2018	2019	2020	2021	Percentage of foreign employees	%	0.1	0.2	0.2	0.2	Percentage of employees located offshore	23	23	22	21	101
Classification	Unit	2018	2019	2020	2021																
Percentage of foreign employees	%	0.1	0.2	0.2	0.2																
Percentage of employees located offshore		23	23	22	21																
Product Lifecycle Management	Percentage of products by revenue that contain IEC 62474 declarable substances	TC-SC-410a.1	SK hynix does not use substances in the IEC 62474 Declarable Substance List (DSL), and all substances the company uses comply with international standards. To learn more, please visit the "Eco-friendly Products" page of our website.	52																	
	Processor energy efficiency at a system-level for: (1) servers, (2) desktops, and (3) laptops	TC-SC-410a.2	N/A	-																	
Materials Sourcing	Description of the management of risks associated with the use of critical materials	TC-SC-440a.1	SK hynix recognizes that human rights violations, such as labor exploitation, damage to the ecosystem, and environmental pollution that occur in the mining process of conflict-affected and high-risk areas, are serious problems, and makes every effort to eradicate them. Since we do not purchase and procure all minerals used for semiconductor manufacturing directly from mines but source them through suppliers, we transparently track and manage the entire supply chain under our policy based on the OECD Due Diligence Guidance <sup>1)</sup> for responsible minerals sourcing. SK hynix requires raw material suppliers to sign a "pledge to use responsible minerals" to ensure that they will not purchase minerals from conflict-affected and high-risk areas. To ensure compliance, we use the Conflict Minerals Reporting Template (CMRT) provided by the Responsible Minerals Initiative (RMI) <sup>2)</sup> to verify information on our mineral supply chain on a regular basis. If a supplier provides information that is different from the facts or does not take measures to improve the identified risks, we regard it as non-compliance and suspend the transaction. SK hynix also provides consulting and training to suppliers to raise awareness of responsible minerals sourcing. As of December 2021, there were a total of 227 3TG smelters, and the RMAP certification rate was 100%.	79~80																	
Intellectual Property Protection & Competitive Behavior	Total amount of monetary losses as a result of legal proceedings associated with anti-competitive behavior regulations	TC-SC-520a.1	N/A	-																	



# GRI Content Index

Classification	Index	Detail	Page
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# Independent Assurance Statement

## LRQA Independent Assurance Statement

### Relating to SK hynix Inc.'s Sustainability Report for the calendar year 2021



This Assurance Statement has been prepared for SK hynix Inc. in accordance with our contract but is intended for the readers of this Report.

#### Terms of engagement

LRQA was commissioned by SK hynix Inc. to provide independent assurance on its 'SK hynix Sustainability Report 2022' ("the report") against the assurance criteria below to a "moderate level of assurance and materiality of professional judgement" using "Accountability's AA1000AS v3", where the scope was a Type 2 engagement.

Our assurance engagement covered SK hynix Inc.'s operations and activities in Korea and China, and specifically the following requirements:

- Evaluating adherence to the AA1000 AccountAbility Principles<sup>1)</sup> of Inclusivity, Materiality, Responsiveness and Impact
- Confirming that the report is in accordance with GRI Standards<sup>2)</sup> and core option
- Evaluating the accuracy and reliability of data and information for only the selected indicators in the GRI Content Index listed below:
  - GRI 200 (Economic): 201-2, 205-2
  - GRI 300 (Environmental): 302-1, 302-3, 303-1, 303-2, 303-3, 303-4, 303-5, 305-1, 305-2, 305-3, 305-4, 305-5, 305-7, 306-1, 306-2, 306-3, 307-1, 308-1
  - GRI 400 (Social): 401-3, 403-1, 403-2, 403-3, 403-4, 403-5, 403-6, 403-7, 403-8, 404-1, 404-2, 405-2, 406-1, 408-1, 409-1, 412-1, 414-1, 419-1
  - Product recall incidents, core technology protection policy and system, R&D investment

Our assurance engagement excluded the data and information of SK hynix Inc.'s suppliers, contractors and any third-parties mentioned in the report.

LRQA's responsibility is only to SK hynix Inc. LRQA disclaims any liability or responsibility to others as explained in the end footnote. SK hynix Inc.'s responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of SK hynix Inc.

1) <https://www.accountability.org>

2) <https://www.globalreporting.org>

#### LRQA's Opinion

Based on LRQA's approach nothing has come to our attention that would cause us to believe that SK hynix Inc. has not, in all material respects:

- Met the requirements above
- Disclosed accurate and reliable performance data and information as all errors or omissions identified during the assurance engagement were corrected
- Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a moderate level of assurance and at the materiality of the professional judgement of the verifier.

Note: The extent of evidence-gathering for a moderate assurance engagement is less than for a high assurance engagement. Moderate assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a moderate assurance engagement is substantially lower than the assurance that would have been obtained had a high assurance engagement been performed.

#### LRQA's approach

LRQA's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing SK hynix Inc.'s approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this through reviewing documents and associated records.
- Reviewing SK hynix Inc.'s process for identifying and determining material issues to confirm that the right issues were included in their Report. We did this by benchmarking reports written by SK hynix Inc. and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether SK hynix Inc. makes informed business decisions that may create opportunities that contribute towards sustainable development.
- Auditing SK hynix Inc.'s data management systems to confirm that there were no significant errors, omissions or mis-statements in the report. We did this by reviewing the effectiveness of data handling procedures, instructions and systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the report.
- Checking whether GHG emissions and energy consumptions in the report were transposed correctly from the GHG inventory which was verified by the third party assurance provider.
- Reviewing additional evidence made available by SK hynix Inc. at its office in Seongnam-si, Gyeonggi-do.
- Checking that the GRI Content Index allows stakeholders to access sustainability indicators.

## Observations

Further observations and findings, made during the assurance engagement, are:

- **Inclusivity:**

We are not aware of any key stakeholder groups that have been excluded from SK hynix Inc.'s stakeholder engagement process.

- **Materiality:**

We are not aware of any material issues concerning SK hynix Inc.'s sustainability performance that have been excluded from the report. It should be noted that SK hynix Inc. has established extensive criteria for determining which issue/aspect is material and that these criteria are not biased to the company's management.

- **Responsiveness:**

SK hynix Inc. has enhanced its governance to respond to climate change and declared its commitment of achieving carbon neutrality by 2050. We expect that SK hynix Inc. will report progress in this regard in the future.

- **Impact:**

SK hynix Inc. needs to consider additional indicators to report its significant impacts more appropriately in the process of selecting sustainability indicators for disclosures. For example, work-related ill health indicator needs to be considered as a highly relevant reporting indicator on occupational safety and health topics.

- **Reliability:**

SK hynix Inc.'s data management system for the selected indicators are well defined.

## LRQA's standards, competence and independence

LRQA implements and maintains a comprehensive management system that meets accreditation requirements for ISO 14065 Greenhouse gases - Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition and ISO/IEC 17021 Conformity assessment - Requirements for bodies providing audit and certification of management systems that are at least as demanding as the requirements of the International Standard on Quality Control 1 and comply with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants.

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

LRQA is SK hynix Inc.'s certification body for ISO 27001. We also provide SK hynix Inc. with a range of training services related to management systems. The verification and certification assessments, together with the training, are the only work undertaken by LRQA for SK hynix Inc. and as such does not compromise our independence or impartiality.

Dated: 21 July 2022

Tae-Kyoung Kim

LRQA Lead Verifier

On behalf of LRQA

17th Floor, Sinsong Building, 67 Yeouinaru-ro, Yeongdeungpo-gu, Seoul, Korea

LRQA reference: SEO00000814



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# Greenhouse Gas Verification Statement

## SK hynix Inc.

### Domestic Operation Sites under greenhouse gas emission verification

#### - Icheon Campus, Cheongju Campus & Bundang Campus

#### Scope:

- The annual GHG emission for the 2021 calendar year inclusive
- The physical scope is limited within the boundary of Domestic Area for SK HYNIX INC in Korea. (purchased products and services in Scope 3 emissions include Wuxi and Chongqing campuses in China)
- GHG emissions for Scope 1(Direct-emissions), Scope 2(Indirect-energy related) and Scope 3(Indirect-emissions from logistic, commuting etc.) as defined in WBCSD/WRI GHG protocol Chapter 4 "Setting Operational Boundaries"
- GWP (The 100-year time horizon global warming potential) applies the IPCC Fifth Assessment Report, 2014 (AR5) instead of the Second Assessment Report, 1995 (SAR) applied to the National Greenhouse Gas Emission Trading Scheme.

#### Data Verified:

Scope 1 and Scope 2 GHG emissions of domestic sites in 2021 with GWP of AR5 are as follows.

(Unit: tCO<sub>2</sub>e/y)

Scopes	Sites	Icheon Campus	Cheongju Campus	Boondang Campus	Sub Total
Direct Emissions(Scope 1)		307,053	122,956	479	430,488
In-direct Emissions(Scope 2)		2,637,439	1,445,106	3,742	4,086,287
Optional Information(Used the NF <sub>3</sub> )		451,184	385,780	-	836,964
Total		3,395,676	1,953,842	4,221	5,353,739

Emissions of each greenhouse gas in 2021 with GWP of AR5 are as follows.

(Unit: tCO<sub>2</sub>e/y)

GHG	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFC	PFC	SF <sub>6</sub>	NF <sub>3</sub>	Total
Emissions	4,162,917	1,040	40,436	46,044	199,890	66,447	836,965	5,353,739

Scope 3 GHG Emissions in 2021 with GWP of AR5 are as follows and Emission boundaries and calculation methods for each Scope 3 sector are described in the assurance report.

(Unit: tCO<sub>2</sub>e/y)

Category	International transport (Export)	International transport (Import)	Waste disposal	Business trip	Employee commuting	Purchased products and services	Total
Emissions	25,083	24,851	228,332	79	25,495	3,043,376	3,347,217

Category	Purchased products and services	
Emission Year	2019	2020
Emissions	2,623,411	2,801,363

**bsi.** Verification Opinion



#### GHG Criteria & Protocols used for Verification:

The verification was performed at the request of SK HYNIX INC. using the followings:

- Guideline for Reporting and Certification of Emissions in the Greenhouse Gas Emissions Trading Scheme
- WBCSD/WRI Technical Guidance for Calculating Scope 3 Emissions (version 1.0)
- 2006 IPCC Guidelines\_Volume 2\_chapter 3 Mobile Combustion
- IPCC Climate Change 2013\_chapter 08\_Anthropogenic and natural Radiative forcing (AR5)
- ISO14064-1:20218 & ISO 14064-3:2019
- Environmental Product Declaration Assessment Emission Factor - Korea Environmental Industry & Technology Institute, 2021
- EPA Center for Corporate Climate Leadership, Emission Factors for GHG inventories (EPA, 2022)
- BSI GHGEV Manual

The standard confidentiality principle of BSI Group Korea is applied to the all verification activities

#### Verification Opinion:

BSI Group Korea's verification opinions on the result of carrying out verification in accordance with the GHG criteria and protocols mentioned above are as follows.

- This verification of the sites in Korea were conducted to provide a reasonable level of assurance in accordance with the 'Guideline for Reporting and Certification of Emissions in the Greenhouse Gas Emissions Trading Scheme'.
- Scope 3 emissions have been verified with a limited assurance level.
- Data quality was considered acceptable in meeting the key international principles for greenhouse gas emissions verification.
- No material misstatement during the verification process for emissions was found, it was confirmed that relevant activity data and evidences were properly managed. Therefore, the BSI Group Korea Verification Team provides a verification opinion that is "appropriate".



For and on behalf of BSI:

Managing Director Korea, SeongHwan Lim

Issue: 25/05/2022

# Greenhouse Gas Verification Statement

## SK hynix Inc.

### Green premium renewable energy purchase and greenhouse gas reduction

#### Scope:

- Green premium purchases in 2021 at SK hynix's domestic business sites, Icheon and Cheongju campuses
- Greenhouse gas reduction through the purchase of electricity produced by solar power, wind power, and bioenergy generation, which are Green Power defined by the EPA
- GWP (The 100-year time horizon global warming potential) applies the IPCC Fifth Assessment Report, 2014 (AR5)

#### Data Verified:

The amount of green premium renewable energy purchases and greenhouse gas reductions at domestic business sites in 2021 to which AR5 is applied is as follows.

Site	Icheon Campus	Cheongju Campus	Total Amount
Green Power purchase	125,010MWh	83,340MWh	208,350MWh
Greenhouse Gas Reduction	57,386tCO <sub>2</sub> e	38,258tCO <sub>2</sub> e	95,644tCO <sub>2</sub> e

#### GHG Criteria & Protocols used for Verification:

The verification was performed at the request of SK HYNIX INC. using the followings:

- Guideline for Reporting and Certification of Emissions in the Greenhouse Gas Emissions Trading Scheme
- IPCC Climate Change 2013\_chapter 08\_Anthropogenic and natural Radiative forcing (AR5)
- ISO14064 Part 2 & 3 - Issued 2019
- BSI GHGEV Manual

The standard confidentiality principle of BSI Group Korea is applied to the all verification activities



#### Verification Opinion:

BSI Group Korea's verification opinions on the result of carrying out verification in accordance with the GHG criteria and protocols mentioned above are as follows.

- Renewable energy consumption and greenhouse gas reductions for domestic business sites have been verified with limited assurance levels
- Data quality was considered acceptable in meeting the key international principles for greenhouse gas emissions verification.
- No material misstatement during the verification process was found, it was confirmed that relevant activity data and evidences were properly managed. Therefore, the BSI Group Korea Verification Team provides a verification opinion that is "appropriate".

For and on behalf of BSI:

Issue: 25/05/2022

Managing Director Korea, SeongHwan Lim







