Climate Change Response and Environmental Management

The response to carbon neutrality and climate change is having a significant impact on corporate sustainability management. Transitioning to a low-carbon economy under the Paris Accords has become the new global economic order, thus Korea's industries must make all-encompassing efforts to mitigate climate change by pursuing a carbon neutral society by 2050. In accordance with such trends, Hanmi Pharm has incorporated environment, health, and safety as an important part of our sustainable innovative management. To this end, we are improving our governance of environment, health, and safety, and are constantly seeking improvements to strengthen the efficiency of our operations, including the development of policies and guidelines for each area. Furthermore, we are thoroughly examining the global initiative for responding to climate change. We will actively participate in climate change response activities and exert every effort to achieve carbon neutrality.

Key Achievements in 2024

Reduced the amount of GHG emissions compared to 2023 due to activities such as improving the efficiency of processes.

477 tons of waste

3,636 tons of water

Response to initiatives

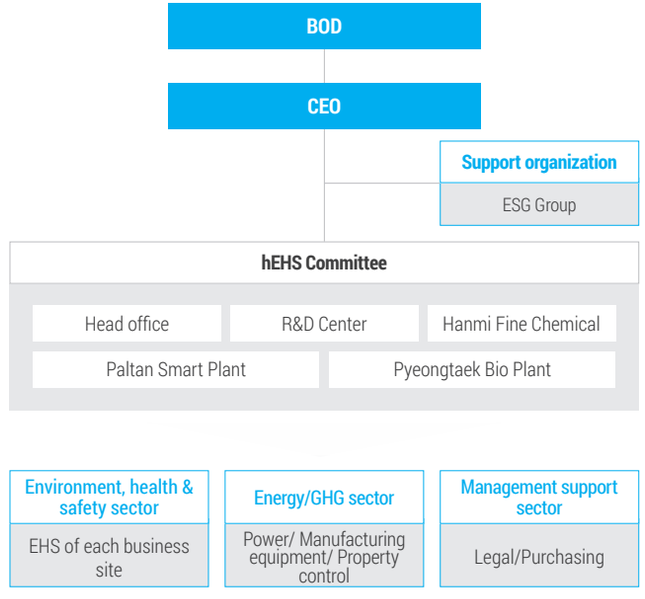
CDP grade B

I. Governance

Decision-making Structure

Hanmi Pharm operates the hEHS Committee, which is led by the CEO, to practice clear environmental management encompassing carbon neutrality, climate change response, etc. The hEHS Committee, Hanmi Pharm's EHS (Environment, Health, Safety) organization, which was established for the first time in the Korean pharmaceutical industry in 2019, identifies the negative factors and opportunities occasioned by environmental risks, such as carbon neutrality and the minimization of environmental impacts, and establishes strategies and plans for each set period. We emphasize the roles and responsibilities of top management in responding to carbon neutrality and climate change effectively. The CEO holds the responsibility and authority to make the final decisions on environmental management issues and serves as the chairman of the hEHS Committee. Key environmental management issues are reported periodically to the board of directors at least once a year.

In 2024, greenhouse gas emissions (Scope 1 & 2, 3) were reported. In 2025, an ESG Committee will be established within the board of directors to strengthen the decision-making structure.



Climate Change Management Committee

Method	Frequency
BOD	Annual regular report
hEHS Committee	Committee operation once every half year

Roles of the Dedicated Organization

Type	Roles
BOD	· Supervising key environmental management strategies and planning.
CEO	· Taking responsibility for the final decision on environmental management matters. · Approving the environmental management goals and implementation plan.
ESG Group	· Establishing key environmental management strategies and planning · Monitoring environmental management · Operating communication channels for each business site
hEHS Committee	· Discussing and reporting key issues related to environmental management.
Department dedicated to environment, health & safety	· Carrying out detailed environmental management activities such as waste, water quality, and air pollution control.
Department dedicated to energy/GHG matters	· Implementing detailed activities for energy/ greenhouse gas management, including equipment, production, and utility facilities.
Department dedicated to management support	· Providing support for environmental management activities.

Training to Strengthen Expertise in Responding to Climate Change

Hanmi Pharm submits to the BOD an annual report on our carbon emissions status and reduction plans to strengthen our executives' expertise in responding to climate change. We also provide education on global carbon neutrality regulations and will continue to offer various training programs to enhance executives' expertise in addressing climate change.

Climate Change Response and Environmental Management

II. Strategy

ESG Vision

Pursue Sustainable Management and Growth based on Creation, Challenge & Innovation

Environmental management strategy

Carbon Neutrality

h-Carbon Program | **2030 NDC** | **2040 Net Zero**

- Short-term: Expand environmental initiatives and strengthen management of the supply chain such as Scope 3, etc. → **Enhance the climate change response system.**
- Mid-term: Introduce renewable energy and set greenhouse gas reduction targets for the supply chain → **Reduce GHGs by 30% vs. 2018.**
- Long-term: Transition energy and introduce eco-friendly equipment → **Achieve carbon neutrality (for Scope 1 and 2).**

Minimization of Environmental Impacts

Conduct efficient environmental management | **Expand upcycling** | **Spread an eco-friendly corporate culture** | **Preserve biodiversity**

- Minimize discharge or emissions of pollutants and strengthen the safe management of chemical substances →**Minimize environmental impacts.**
- Minimize nature capital such as waste, water, etc. and increase recycling→ **Realize upcycling.**
- Strengthen eco-friendly campaigns and the Nagoya Protocol system→ **Expand our eco-friendly corporate culture.**

Environmental management key indicators and goals

Management indicator		2030 goals
Carbon neutrality	Greenhouse gas emissions	(Emissions) Reduce by 30% vs. 2018 / (Intensity) Reduce by 30% vs. 2018.
	Energy consumption	(Intensity) Reduce by 30% vs. 2018.
Conduct efficient environmental management	Air/water pollutants	(Emission/discharge concentration) Control to below 50%/30% vs. maximum legally acceptable level every year. (Emission/discharge) Reduce by 40% vs. 2018.
	Harmful chemical substances	(Amount used) Reduce by 2% every year vs. previous year.
Expand upcycling	Volume of water intake and reuse rate	(Volume of water intake) Reduce by 20% vs. 2018. (Intensity) Reduce by 25% vs. 2018. (Reuse rate) Achieve more than 12%.
	General/Hazardous wastes	(Intensity) Reduce by 15% vs. generated amount in 2018. (Treated amount) Reduce by 20% vs. 2018. (Recycling rate) Achieve more than 75%.
Spread an eco-friendly culture	Increase in eco-friendly purchases	Maintain an eco-friendly literature rate of more than 90%. Maintain 100% use of eco-friendly packaging boxes for produced medicines.
Preserve biodiversity	AMR framework activities	Comply with the AMR framework (API PEC/PNEC<1).
	Environmental protection activities	Carry out environmental protection activities more than 5 times per year, such as removing invasive species and planting trees. Plant a cumulative total of 7,000 trees to create the Hanmi Green Forest.

Participation in Initiatives

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

BNBP 기업과 생물다양성 플랫폼 Biz N Biodiversity Platform

CDP Discloser 2024

Climate Change Response and Environmental Management

II. Strategy_Detailed Carbon Neutrality Strategy

Hanmi Pharm has been carrying out the h-Carbon Program, the first phase of Climate Action, to reflect the reality of the domestic pharmaceutical industry since 2023.
The h-Carbon Program is the first step in our mid-to-long term strategy for responding to climate change, which aims to achieve the company's 2030 Nationally Determined Contributions (NDC) and 2040 Net Zero goals. This program seeks to restructure the decision-making process, identify and analyze climate risks and opportunities, and establish short-, medium-, and long-term objectives. Ultimately, it lays the foundation for implementing global-level environmental management by reorganizing systems for carbon neutrality and climate action.
Carbon neutrality is a critical issue for the survival and growth of us all. It must be addressed not only by businesses but also across supply chains and local communities, making it a global challenge. The h-Carbon Program represents our social responsibility and our commitment to achieving carbon neutrality across all our operations, supply chains, and local communities.

[Short-term] h-Carbon Program
- 2023 to 2025

Corporation
Supply Chain
Community

1. Advancing the carbon neutrality and climate change response system	· Expand global environmental initiatives. · Establish a measurement methodology and a verification system for Scope 3 emissions. · Review the introduction of renewable energy and eco-friendly technologies.
2. Creating a holistic culture for greenhouse gas reduction activities	· Corporation: Promote internal environmental management incentives to activate reduction activities. · Supply Chain: Increase ESG education across the supply chain. · Community: Increase in-house environmental campaigns and environmental protection activities.

[Mid-term] 2030 NDC
- 2026 to 2030

1. Reducing greenhouse gas emissions by 30% through the energy transition (compared to 2018)	· Introduce and expand renewable energy centered on Scope 2. · Review the replacement of eco-friendly facilities such as hydrogen and biomass.

[Long-term] 2040 Net Zero
- 2031 to 2040

1. Achieving Net Zero for Scope 1 and 2 emissions	· Completely convert to renewable energy sources and expand the new and renewable energy facility business. · Establish and promote a net zero inspection model for the value chain in order to expand to Scope 3.

Climate Change Response and Environmental Management

II. Strategy_Detailed Carbon Neutrality Strategy

Our Scope 1 & 2 Carbon Neutrality Roadmap

Hanmi Pharm has been carrying out the h-Carbon Program, the first phase of Climate Action, to reflect the reality of the domestic pharmaceutical industry since 2023. The h-Carbon program is designed to establish a foundation for executing environmental management at the global level by restructuring our decision-making structure as well as the system for responding to carbon neutrality and climate change, such as the assessment of climate change risks, the identification and analysis of opportunities, and the setting of targets. In addition, we plan to review renewable energy and eco-friendly equipment, and to work hard to realize 2030 NDC and 2040 Net Zero. Furthermore, we were designated as a company for allocation of greenhouse gas emission trading system in 2020 and continue to manage our greenhouse gas emissions by purchasing greenhouse gas emission rights.

Scope 1 & 2 Reduction Targets

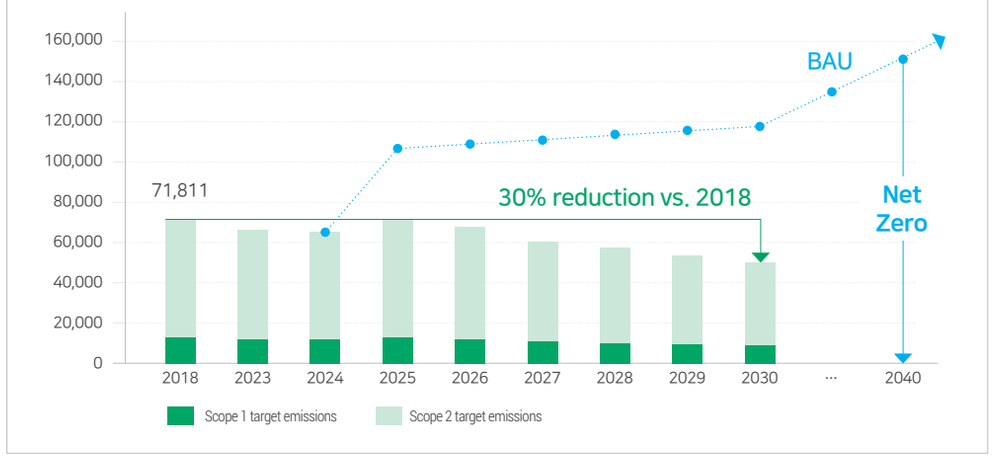
The majority of Hanmi Pharm's scope 1 greenhouse gas emissions originate from the use of LNG boiler fuel at the Paltan Smart Plant and the Pyeongtaek Bio Plant. As such, we are reviewing our mid-to- long term plan to fully replace these with eco-friendly fuel boilers that use hydrogen and biomass by 2040. In 2024, electricity usage accounted for 80.5% of our Scope 2 greenhouse gas emissions, while steam generation accounted for 19.5%. Therefore, we have designated scope 2 as the key management area for achieving carbon neutrality. By obtaining Renewable Energy Certificates (REC) and signing Power Purchase Agreements (PPA), we aim to reduce our greenhouse gas emissions by 30% compared to 2018 by 2030 and reach net zero by 2040.

Type	Unit	2025	2026	2027	2028	2029	2030	...	2040
BAU [1]	tCO_2eq	107,582	109,627	111,691	113,755	115,819	117,883		151,307
Target emissions (tCO_2eq)	tCO_2eq	71,810	68,220	61,039	57,448	53,858	50,267	...	0
Reduction rate compared to 2018	%	0%	5%	15%	20%	25%	30%		100%

→ Business As Usual (BAU) has been adjusted because the greenhouse gas emissions of the Pyeongtaek Bio Plant are expected to increase in 2025 due to operation of the second facility, and it is assumed that renewable energy will be introduced in 2026.

1) BAU (Business As Usual): Refers to the figure for GHG emissions predicted when no special measures are taken to reduce them and reflects the future production plan outlook and the average GHG emission intensity in the past.

Unit: tCO_2eq



Expected Scenario of Hanmi Pharm's Scope 3 Carbon Neutrality

Hanmi Pharm aims to establish a carbon neutrality framework across our entire value chain by calculating our scope 3 emissions for 2024. Our scope 3 emissions in 2024 amounted to 88,703 tCO2eq, with products and services accounting for approximately 56% of the total. To strengthen the management of greenhouse gas emissions within our supply chain, we plan to expand carbon neutrality education for our partners and encourage them to join carbon neutrality initiatives.

Hanmi Pharm's GHG Emissions in 2024

Total GHG (Scope 1+2+3)

160,473tCO_2eq

Scope 1	13,515tCO_2eq (8.4%) (Boilers: 13,031 tCO_2eq | Vehicles/ Other sources: 484 tCO_2eq)
Scope 2	58,257tCO_2eq (36.3%) (Electricity: 46,899 tCO_2eq | Steam: 11,358 tCO_2eq)
Scope 3	88,703tCO_2eq (55.3%) (Upstream: 70,834 tCO_2eq | Downstream: 17,869 tCO_2eq)

Climate Change Response and Environmental Management

II. Strategy_Key Carbon Neutrality Activities

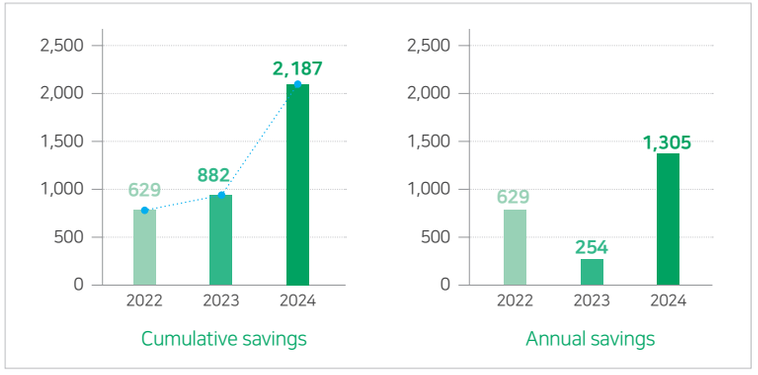
To achieve our 2030 NDC and 2040 Net Zero goals, Hanmi Pharm conducts activities aimed at reducing our greenhouse gas (GHG) emissions and energy consumption each year. As of 2024, these efforts have reduced our GHG emissions by a cumulative total of 2,187 tCO2eq and our energy consumption by 43,085 GJ. Starting in 2025, we will strengthen our eco-friendly equipment purchasing practices by factoring carbon emissions into pricing before acquisition. We will also consider annual carbon emission costs in our purchase decisions. By integrating carbon costs into procurement expenses, we aim to encourage investment in low-emission equipment and remain committed to long-term carbon reduction efforts.

Estimated Annual Reduction through Reduction Activities in 2024

Greenhouse gases	1,305tCO$_2$eq
Energy	25,162GJ
Saved amount	KRW 305 M

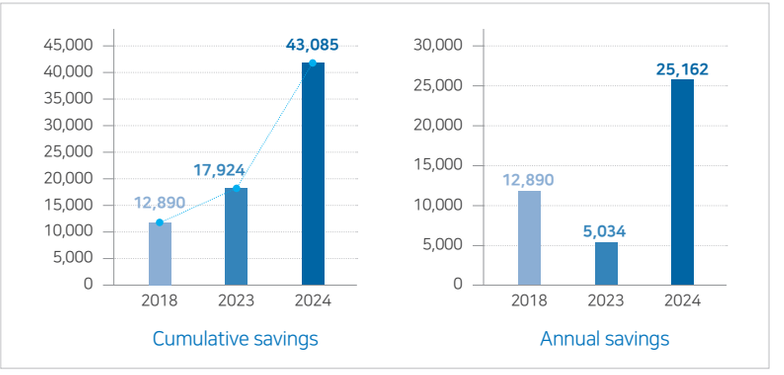
Reduction of GHG Emissions Over the Past 3 Years

Unit: tCO$_2$eq



Reduction of Energy Consumption Over the Past 3 Years

Unit: GJ



Cost Innovation

Hanmi Pharm has reduced our use of energy, water, and steam through the efficient use of utilities, and has implemented the Cost-Innovation initiative since 2020 in order to foster a cost-saving culture among our employees. We are identifying and executing innovative practices centered on energy efficiency and greenhouse gas reduction and rewarding employees' performance in proportion to the extent (%) to which they achieve their targets. A grade is awarded based on quantitative effects, such as cost reduction, and the amount of energy saved from the evaluation of innovative practices, and then incentives are provided to managers and employees every quarter after a review by an executive.

Type	Activities in 2024	Type	Saved amount (KRW 100 M/year)	GHG reduction amount (tCO$_2$eq/year)	Energy savings (GJ/year)
Paltan Smart Plant	The clean steam generation system was turned off during periods when clean steam was not being used to produce eye drops.	Steam	0.13	37	608
	Power consumption was reduced by installing chiller water pumps at building G.	Electricity	0.10	26	553
	Air conditioners were turned off at night/on weekends.	Electricity	0.25	68	1,412
Pyeongtaek Bio Plant	Converted stabilizer rated power.	Electricity	0.01	3	66
	The supply pipeline for -5°C ethylene glycol in the second plant was integrated with the 0°C ethylene glycol system for unified operation.	Power & steam	2.50	1,155	22,186
	The streetlights in the industrial complex were replaced with solar streetlights.	Electricity	0.06	16	336
Total			**3.05**	**1,305**	**25,162**

Climate Change Response and Environmental Management

II. Strategy_Key Carbon Neutrality Activities

Major Activities at the Paltan Smart Plant in 2024

Turned off the steam generator during unused hours

- Constant operation of the clean steam generation system (continuous inflow of plant steam).
- Increased energy use and greenhouse gas costs

- The clean steam generation system is now turned off during unused hours (plant steam is not used).
- Energy consumption and greenhouse gas costs have been reduced.

Hanmi Pharm found energy-saving opportunities by turning off the clean steam generation system during periods when clean steam was not being used for eye drop products, thereby reducing plant steam consumption. As a result, Hanmi Pharm reduced our energy use by 608 GJ our GHG emissions by 37.08 tCO_2eq, and costs by KRW 13,182,000 in 2024.

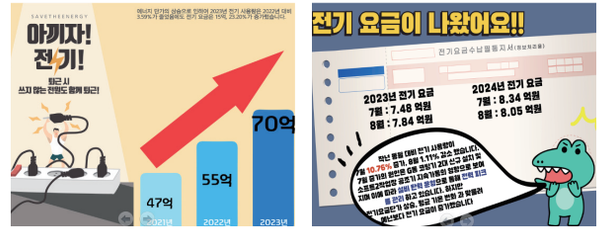
Improved the method of operating the chiller water pumps in building G

- Simultaneous activation and operation of three chillers at building G during the summer season.
- Reduced energy efficiency due to unbalanced chiller load when operating at 60Hz.

- Operated after adjusting to the chilled water pump Hz according to the chiller load ratio
- Increased energy efficiency and reduced costs by resolving imbalances.

Hanmi Pharm also optimized the operation of the cold-water pump in building G to improve energy efficiency. By adjusting the inverter frequency of the circulating pump from 60Hz to 50Hz, Hanmi Pharm successfully reduced power consumption, leading to annual savings of 553 GJ of energy and KRW 9,792,000 in costs, as well as a 26.46 tCO2eq reduction of greenhouse gas emissions.

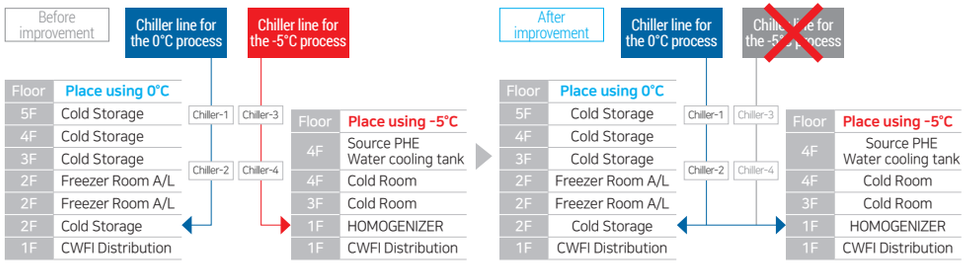
Conducted energy saving campaigns



Hanmi Pharm has been conducting campaigns aimed at promoting awareness of the importance of energy conservation. We regularly post notices and posters encouraging employees to participate actively in such campaigns by, for example, turning off lights when leaving work and unplugging unused devices.

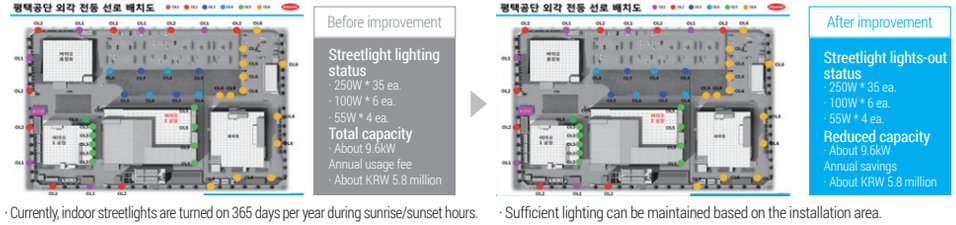
Major Activities at the Pyeongtaek Bio Plant in 2024

Integrated operation of 0°C and -5°C ethylene glycol supply at the 2nd plant



Hanmi Pharm attempted to reduce energy consumption by integrating the existing -5°C ethylene glycol supply pipeline in the second plant with the 0°C ethylene glycol system for unified operation. This initiative not only decreased the energy usage of the -5°C process chiller but also saved energy consumption by the associated equipment - such as supply pumps, circulation pumps, and cooling towers. This led to an annual savings of 22,186 GJ of energy and KRW 249,865,714 in costs, as well as a 1,155 tCO2eq reduction of greenhouse gas emissions.

Changing to solar street lights



- Currently, indoor streetlights are turned on 365 days per year during sunrise/sunset hours.
- Lights are always on in unnecessary areas, so improvements are needed.

Improvement activities were carried out after investigating which areas could be changed.

- Sufficient lighting can be maintained based on the installation area.
- Initial installation cost: KRW 1,942,000 (KRW 107,910 (unit price) *18 (ea.)).

Solar streetlights can be used to the maximum by taking advantage of streetlight brightness overlapping the industrial complex.

Due to increased solar radiation resulting from climate change, Hanmi Pharm anticipated energy savings by replacing the streetlights at our industrial complex with solar-powered streetlights. We also conducted an assessment to identify areas for change by leveraging the lighting levels of streetlights overlapping with the Pyeongtaek Bio Plant. As a result, 18 solar-powered streetlights were installed, leading to an annual reduction of 336 GJ of energy, 16 tCO2eq of greenhouse gas emissions, and KRW 6,132,000 in costs.

Climate Change Response and Environmental Management

II. Strategy_Detailed Strategy for Minimizing Environmental Impact

Hanmi Pharm continuously identifies and improves environmental issues that may arise during the product manufacturing process. Since 2012, we have implemented the ISO 14001 certification for environmental management systems, establishing a robust direction for environmental management and building a global-level system to minimize pollution and negative impacts. We set environmental targets across various management areas, including greenhouse gas emissions, energy/water usage, waste, air pollutants, and water pollutants, and regularly reports the results to the BOD for approval. To prevent environmental risks and accidents, we have established risk management regulations and operate a preventive environmental incident system. In particular, we use an Environmental Information Disclosure System to transparently share environmental data and actively expand our environmental management and green business initiatives.

	Management indicators		2030 target
Minimizing environmental impacts	Improving environmental management efficiency	Air/water pollutants	· Reduce pollutants by 40% compared to 2018. / Manage them to below 50%/30% of the legally permitted threshold.
		Harmful chemical substances	· Reduce their use by 2% every year.
	Expanding the circulation of resources	Water	· Reduce by 20% compared to 2018 / Achieve a reuse rate of 12% or more.
		Waste	· Reduce the generation of waste by 15% compared to 2018 / Achieve a recycling rate of 75% or more.
	Spreading an eco-friendly culture	Increasing eco-friendly purchasing	· Achieve an eco-friendly literature ratio of 90% or more / 100% eco-friendly packaging boxes.
	Preserving biodiversity	AMR framework activities	· Comply with the AMR Framework (API PEC/PNEC<1).
		Environmental protection activities	· Plant more than 1,000 trees annually in Hanmi Green Forest / Conduct environmental protection activities more than 5 times annually.

Climate Change Response and Environmental Management

II. Strategy_Environmental Management Efficiency

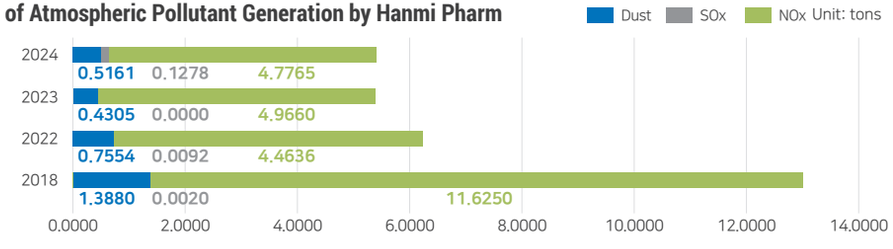
Pollutant Management

Hanmi Pharm has successfully carried out diverse activities aimed at minimizing pollutant emissions/ discharge and has achieved our goal of limiting air pollutants to below 50% and water pollutants below 30% of the maximum legally permissible level. Especially in the case of dust emissions, we have reduced them by 63% compared to 2018. In addition, we monitor and manage water pollutant discharges by using the TMS (automatic measuring instrument) and share the data with the Ministry of Environment. We plan to continue various activities by establishing the goal for 2025 of maintaining discharges at levels below 30% of the maximum legally allowable level.
Additionally, we plan to install a biological treatment tank (i.e. a membrane bio-reactor tank) coagulant injector at the Paltan Smart Plant's wastewater treatment facility in 2025 in order to enhance our treatment performance and prevent the release of water pollutants.

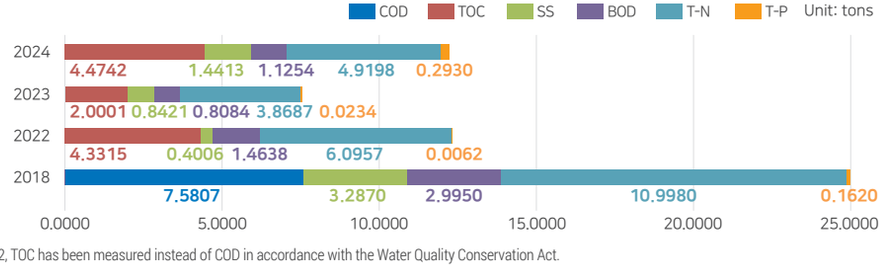
Risks	Financial impact (KRW 100 M/year)				Countermeasures
	Details	Short-term (2025)	Mid-term (2026~29)	Long-term (2030~40)	
Increase of pollutants due to increase of yield	Increased generation of pollutants, Increased costs of pollutant management	46.9	48.2	52.7	Manage below the legally acceptable level; Strengthen management of the filter medium of the air quality pollution prevention system; Monitor water pollutants constantly via the TMS.

Air pollutant reduction performance	· NOx - 59% reduction vs. 2018 · Dust - 63% reduction vs. 2018	Water pollutant reduction performance	· BOD - 62% reduction vs. 2018 · SS - 56% reduction vs. 2018

Status of Atmospheric Pollutant Generation by Hanmi Pharm



Status of Water Pollutant Generation by Hanmi Pharm

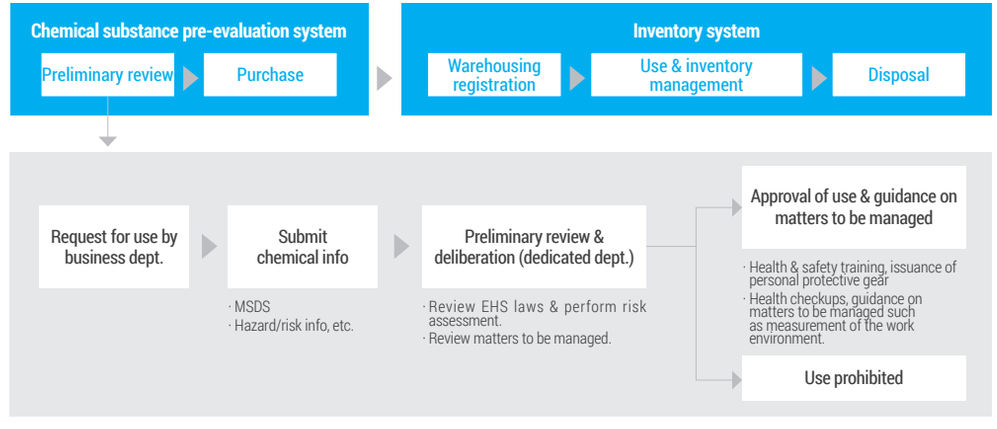


* Since 2022, TOC has been measured instead of COD in accordance with the Water Quality Conservation Act.

Management of Harmful Chemical Substances

As laws and regulations related to chemical substances, such as the Chemical Substances Control Act and the Act on the Registration and Evaluation of Chemical Substances, are being strengthened day by day, the importance of managing chemical substances safely is growing. In 2019, Hanmi Pharm established a company-wide integrated MSDS management system in order to protect the health of employees and prevent damage due to accidents related to chemical substances, and we are striving to strengthen our capacity and processes for securing MSDS materials every year. In addition, we have established and begun operating an internal medicine raw material management system to strengthen the harmful chemical purchasing process and the MSDS management system. In addition, we have eliminated the human and environmental impacts of harmful chemicals at the source, and have adopted and begun operating a system for pre-evaluating harmful chemical substances to prevent various risks related to the environment, health, regulations, etc. Notably, we are making efforts to prevent accidents from diverse aspects by actively conducting chemical substance risk assessments of the substances used at each business site, accepting periodic inspections of our facilities for storing and handling harmful chemicals, and conducting education and training on chemical leak risks according to the worst-case/alternative scenarios.
Additionally, we have established an on-site inspection system for forty hazardous chemical handling facilities at the Paltan Smart Plant in order to strengthen our management and handling of hazardous chemicals, and we have also conducted on-site training and patrols to ensure compliance and safety.

Chemical Substance Management Process



Status of hazardous chemical use by Hanmi Pharm

Unit: tons

Classification	2021	2022	2023	2024
Amount of chemical substance used	106	193	178	832

Climate Change Response and Environmental Management

II. Strategy_Expanding Resource Circulation

Management of Waste

Waste Policy

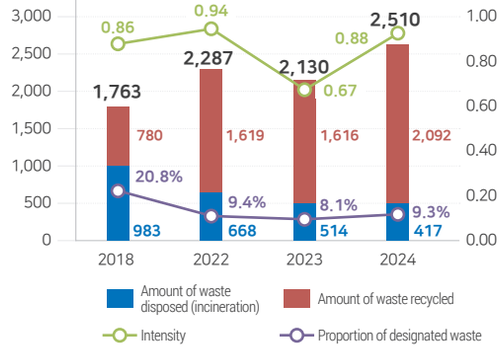
Hanmi Pharm fully complies with waste management regulations prescribed by laws such as the Waste Control Act and makes it a general rule to transparently disclose the entire process encompassing the generation, transportation, and processing of hazardous waste, including general waste and harmful substances, through Allbaro (Legitimate Waste Treatment System). Especially in the case of medicines, because they must be disposed of and treated as hazardous waste, they are strictly managed by a qualified waste management company. We are seeking and performing various activities to check the amount of waste generated and recycled, and to raise our waste recycling rate. Since 2021, we have treated waste acids and waste alkalis - previously disposed of as hazardous wastes - as substances for controlling the pH of the wastewater treatment plant and have been reducing the amount of waste generated every year.

In 2024, our R&D Center conducted regular inspections and strengthened the monitoring of medical waste disposal, achieving a 10.6% reduction in medical waste emissions compared to 2023 (42.2 tons → 37.7 tons). Additionally, Hanmi Fine Chemical expanded the separate disposal of recyclable waste solvents, achieving a recycling rate of over 90%. In 2025, Hanmi Pharm plans to launch a waste separation campaign and limit the volume of waste sent to incineration facilities, further enhancing our waste management efforts.

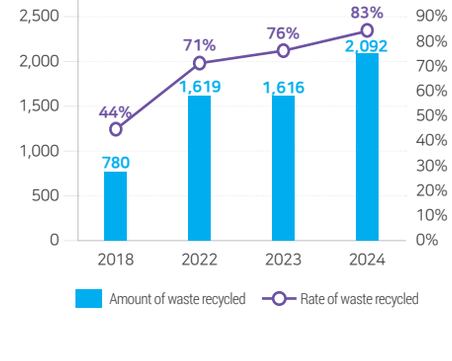
Risks	Financial impact (KRW 100 M/year)				Countermeasures
	Details	Short-term (2025)	Mid-term (2026~29)	Long-term (2030~40)	
Increase of pollutants due to increase of yield	Increase in the cost of managing pollutants	2.3	2.4	2.5	Improve the waste recycling rate; Increase recognition of circulating resources; Implement the upcycling performance management system.

Amount of waste treated	60% reduction vs. 2018	Waste recycling rate (%)	39% increase vs. 2018

Status of Hanmi Pharm's Waste Management



Status of Hanmi Pharm's Waste Recycling Rate



Waste Management Status

Hanmi Pharm's Pyeongtaek Bio Plant and Hanmi Fine Chemical are businesses subject to the upcycling performance management system to achieve the national mid- to long-term upcycling targets, which are set and monitored every year. The relevant business sites manage the final disposal rate and the reuse rate according to the amount of indirect landfill under the upcycling performance management system, and there is no disposal direct to landfill.

Classification	Reuse rate (%)	
	Goal	Performance
Pyeongtaek Bio Plant	52.74	89.08
Hanmi Fine Chemical	58.97	89.58

Classification	Final disposal rate (%)	
	Goal	Performance
Pyeongtaek Bio Plant	25.73	2.35
Hanmi Fine Chemical	21.97	1.75

Reuse rate (%)

$$\frac{\text{Amount actually recycled + Amount of circulation resources recognized}}{\text{Amount of waste generated + Amount of circulation resources recognized}} \times 100$$

Final disposal rate (%)

$$\frac{\text{Amount of final disposal}}{\text{Amount of waste generated + Amount of circulation resources recognized}} \times 100$$

Major Waste Impacts

Classification		Occurrence	Impact
Paltan, Pyeongtaek	Wastewater treatment sludge	Wastewater treatment	Discharge into sea results in marine pollution.
Paltan, Pyeongtaek, Fine Chemical	Waste synthetic resin	Product production & disposal	Incineration results in the generation of microplastics and emission of dioxins.
	Waste organic solvents	Waste fluid after experiment/ culture process, etc.	Results in chemical leakages.
	Halogenated waste organic solvents	Product production	Incineration generates endocrine disruptors.

Status of Major Waste Recycling Efforts

Classification		Details of recycling
Paltan, Pyeongtaek	Wastewater treatment sludge	Used in agricultural production.
	Waste synthetic resin	Used to manufacture intermediate processed wastes.
	Waste plastic	Converted to raw materials after crushing/pulverization
Pyeongtaek	Wastewater treatment sludge	Used in agricultural production / Used to improve soil quality.
	Waste synthetic resin	Used to manufacture raw materials, fuel, and solid fuel products.
	Waste absorbents	Used to manufacture intermediate processed wastes.
Fine Chemical	Halogenated waste organic solvents	Direct product manufacturing.
	Other waste organic solvents	Direct product/fuel & solid fuel product manufacturing.

* Waste generated from the business is being recycled and incinerated through the reported disposal company.

Climate Change Response and Environmental Management

II. Strategy_Expanding the Circulation of Resources

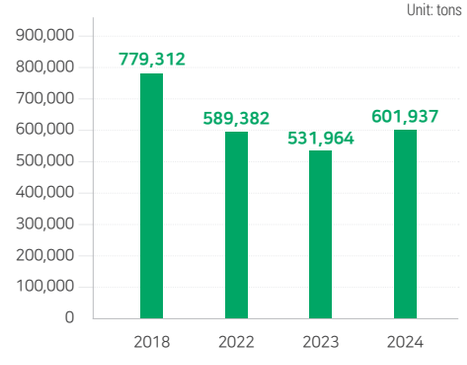
Water Resource Management

Hanmi Pharm is actively working to minimize water consumption in our manufacturing processes and increase the rate of water reuse. In 2024, we reduced our water intake by 23% compared to 2018, while also increasing water reuse by 6.8% compared to 2023, achieving a total reuse of 57,438 tons (i.e. a reuse rate of 9.6%). At the Paltan Smart Plant, all R/O concentrate water is used as make-up water for the cooling towers, with reuse increasing by 60% compared to 2023, for a total of 32,434 tons. At Hanmi Fine Chemical, R/O water is reused as scrubber water. In Building C, general water discharge in 2024 was 43,805 tons, marking a 12.4% reduction compared to 2023, demonstrating the company's strong commitment to water conservation.

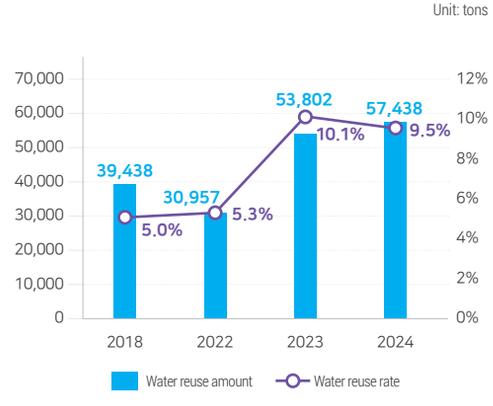
Volume of water intake	23% reduction vs. 2018

Water reuse rate (%)	4.5% increase vs. 2018

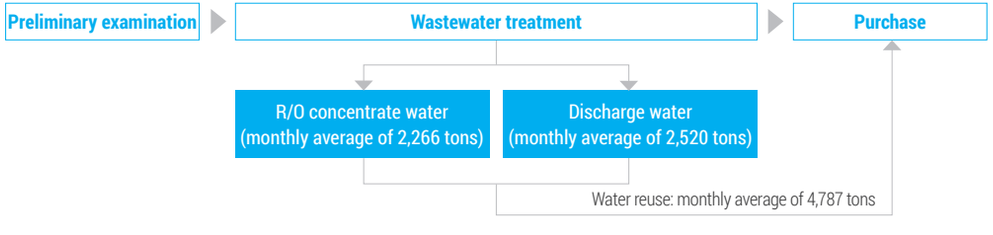
Status of Hanmi Pharm's Water Intake



Status of Hanmi Pharm's Water Reuse Rate



Water Reuse Process



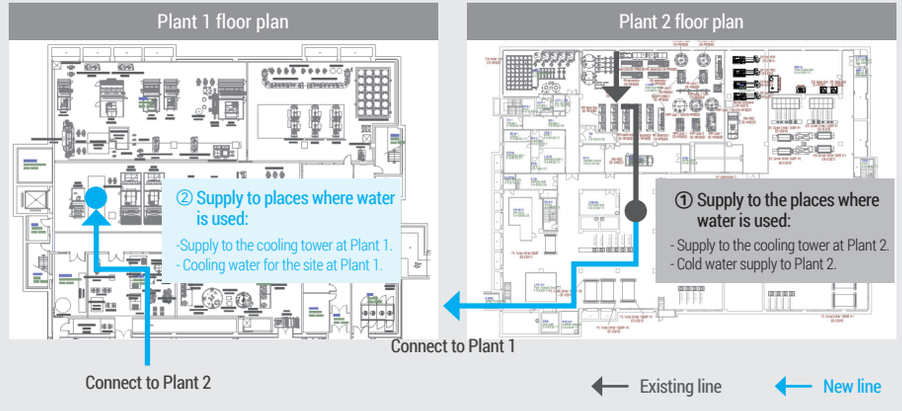
Examples of Water Saving

Improved PWG concentrated water supply piping at Plant 2

In 2024, Hanmi Pharm's Pyeongtaek Bio Plant minimized the increase in the generation of concentrate water despite the rising equipment operation rate due to increased production at Plant 2. An additional pipeline was installed to transfer PWG concentrate water from Plant 2's supply line to Plant 1's recycling tank, resulting in an annual reduction of approximately 16,000 tons of freshwater and wastewater and cost savings of KRW 1.6 billion per year.

Annual water savings	16,000 tons

Annual cost savings	KRW 161,600,000



Climate Change Response and Environmental Management

II. Strategy_Spreading Eco-friendly Corporate Culture

Increasing Green Purchasing

Since 2019, Hanmi Pharm has continuously explored various ways of replacing pharmaceutical packaging materials with eco-friendly alternatives. Through extensive testing, we converted all our product packaging boxes into 100% recycled paper in 2020. As part of the Green Hanmi Campaign, promotional brochures and other literature are now produced using environmentally responsible methods to minimize our environmental impact. In 2024, we established the Green Purchasing Management Guidelines, which prioritize the use of green-certified products. Additionally, instead of traditional paper inserts, e-labels were introduced for three pharmaceutical products, reducing paper consumption and carbon emissions. We remain committed to strengthening our green purchasing procedures and fostering an environmentally responsible corporate culture.

Green Purchase Literature Production Status

Green Purchase Policy

Classification	Unit	2022	2023	2024
Total production	cases	160	161	218
Green purchase literature	cases/%	147/91.9	151/93.8	190/87.2
Total production amount	KRW 100 M	4.1	4.5	5.9
Green purchase literature amount	KRW 100 M/%	3.1/74.7	4.1/92.6	4.4/74.6

* Green purchase literature: Materials that do not undergo post-processing and hence do not harm the environment, such as environment & forest certified paper and printing with eco-friendly ink.

Status of Eco-friendly Packaging Box Usage

Classification	Unit	2022	2023	2024
Total amount used	EA	384,440	394,960	395,620
Total amount used	tons	291	298	299
GHG reduction	tCO_2eq	154	158	158

* Applied domestic eco-labeled waste disposal emission factor.

FSC Certification for Forest Protection

The Company's Commitment to Biodiversity and Deforestation

FSC certification, which is administered by the Forest Stewardship Council, certifies forests that are committed to sustainable management, and also certifies that a product is made with raw materials originating from such forests. Hanmi Pharm has our major printed materials produced by printing houses that have acquired FSC certification using paper certified by the FSC as being the product of sustainable forestry.

Environmental Training and Emergency Response Training

Hanmi Pharm educates our technical personnel in accordance with related laws and regulations, such as the Act on the Allocation and Trading of Greenhouse-gas Emission Permits, the Clean Air Conservation Act, the Water Environment Conservation Act, and the Chemical Substances Control Act. In addition, we conduct safety training on harmful chemical substances for all employees at the business sites responsible for handling such substances and report the contents and results of the training to our chemical substance safety personnel.

Status of Environmental Training

Classification	Unit	2022	2023	2024
Environmental engineer job training	hours	118	28	66
Harmful chemical substance manager/handler training		1,824	4,400	1,328
Harmful chemical substance worker training		250	374	348
Other types of training (ISO, ESG, etc.)		906	944	960
Total		3,098	5,746	2,702

Regular Emergency Response Training for Environmental Accidents

Hanmi Pharm has strengthened our environmental accident prevention and response capabilities by developing scenario-based emergency plans and conducting regular emergency drills. In 2024, we carried out response training exercises for various potential incidents, including chemical spills or leaks (sodium hydroxide) and damaged waste liquid pipelines. At Hanmi Fine Chemical, emergency drills were conducted to prepare for hazardous chemical leaks during manufacturing processes, ensuring a swift and effective response to minimize damages in the event of a real environmental incident.

Climate Change Response and Environmental Management

II. Strategy_In-house Green Campaign

Introducing Reusable Cups in the Company Café

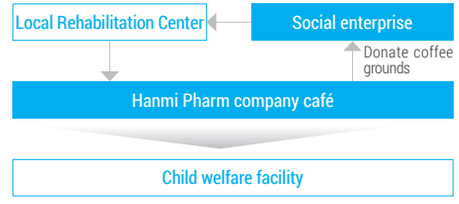
Hanmi Pharm has introduced reusable cups in employee lounges and "THE H" (the company café) in order to reduce the use of wasteful single-use cups. These eco-friendly, reusable cups are made from materials that do not release environmental hormones. After using the cup, employees return them to collection stations, where a specialized company collects, washes, and manages them. In 2024, THE H used 43,786 reusable cups, which is expected to reduce greenhouse gas emissions by approximately 1 ton per year.

Total reusable cup usage in 2024: 43,786cups

Contribution to CO2 reduction 1.007ton

* 1 reusable cup = 23g of GHG emissions from the process of producing and disposing of one plastic cup [Basis for calculation: Ministry of Environment]

Campaign Linking Upcycling with Donations



Year	Amount of coffee grounds donated	Contribution to CO2 reduction
2021	358.5kg	0.121 tons
2022	348kg	0.118 tons
2023	441kg	0.149 tons
2024	442kg	0.150 tons

Since 2021, Hanmi Pharm and Coffee Cube have been collaborating through a resource recycling platform to regularly donate coffee grounds generated at THE H (the company café) for recycling into various products. To realize the values of "resource recycling" and "job creation for vulnerable social groups," we not only donate coffee grounds but also purchase products made from recycled coffee grounds and donate them to organizations in need, actively fostering a circular recycling system.

1) Coffee Cube produces and sells eco-friendly coffee products such as coffee clay and coffee pencils made from the coffee grounds collected by using a coffee train (a device for manufacturing coffee clay). It is a certified "good company" that contributes to the creation of jobs by selecting business sites where senior citizens and people with disabilities are employed at production sites.

* 1g of coffee grounds = 0.338g of carbon dioxide [Basis of calculation: National Statistical Office, Ministry of Environment].

Zero Disposable Products Campaign & Hanmi Plogging

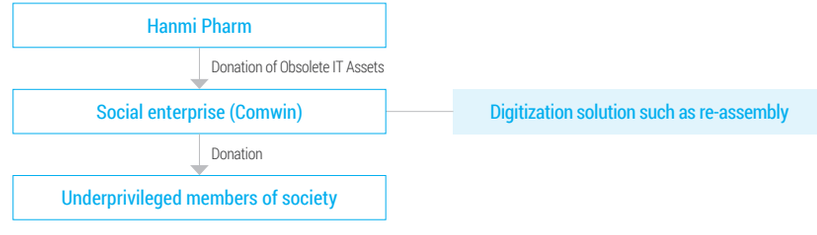
Hanmi Pharm has launched the "Zero Single-use Products Campaign" in a drive to reduce the use of disposable products while increasing the use of reusable items. Employees who participate in the campaign reaffirmed their commitment to environmental protection by pledging their dedication to sustainable practices in daily life on a "Pledge Tree". Additionally, as part of our environmental cleanup efforts, we continue to run the "Hanmi Plogging" campaign, encouraging employees to pick up litter while walking or jogging near their workplaces, homes, or vacation spots—promoting both personal health and environmental conservation

Eco-friendly Donation Campaign Utilizing Obsolete IT Assets

Hanmi Pharm recycles our obsolete IT assets to facilitate the smooth circulation of resources. We support an information service project for the underprivileged by recycling computers in cooperation with Comwin, a social enterprise.

IT assets donated in 2024: 376units

Cumulative IT assets donated: 2,614units



Climate Change Response and Environmental Management

III. Risk Management

Key indicator	Risk and opportunity monitoring	Monitoring period	Monitoring target	Monitoring method	Management and supervision
Response to climate change	Third-party verification and monitoring of greenhouse gas management (emission trading scheme, target management system)	Once a year	Hanmi Pharm business sites, Hanmi Fine Chemical	· Monitoring of the carbon neutral roadmap by estimating and verifying scope 1 and 2 emissions calculation. · Planning for the establishment of a scope 3 carbon neutrality roadmap.	ESG Group, EHS Team at Hanmi Fine Chemical
	Cost-innovation activities	Ongoing	Hanmi Pharm business sites	· Method of reducing the consumption of energy, water, and steam, and calculating the savings. · Encouraging employees' involvement in such activities through incentive systems.	Energy/Greenhouse gas management department at each business site
	Analysis of the impact of climate change on finance	Once a year	Hanmi Pharm business sites, Beijing Hanmi Pharm	· Comprehensive review of negative impacts on business operations, changes in the external environment, financial impacts, etc. · Identifying and reviewing transition/physical risks and opportunity factors by considering the likelihood of their occurrence in the short/medium/long term, and the severity of their impact on the company, etc.	ESG Group
	Analysis of climate change scenarios	Once a year	Hanmi Pharm business sites, Hanmi Fine Chemical	· Selecting and applying climate change scenarios that reflect the characteristics of each risk (transition/physics) after identifying key climate change risks.	ESG Group
Minimize environmental impact	Management of pollutants	Ongoing	Hanmi Pharm business sites, Hanmi Fine Chemical	· Controlling air/water pollutants below 50%/30% of the legal allowable standards.	Department responsible for Environment, Safety, and Health (EHS) at each business site
	Management of hazardous chemicals	Ongoing	Hanmi Pharm business sites, Hanmi Fine Chemical	· Managing hazardous chemicals through the chemical management process.	Department responsible for Environment, Safety, and Health (EHS) at each business site
	Management of waste	Ongoing	Hanmi Pharm business sites, Hanmi Fine Chemical	· Carrying out various activities to determine the amount of waste generated and recycled and to increase the recycling rate.	Department responsible for Environment, Safety, and Health (EHS) at each business site
	Management of water resources	Ongoing	Hanmi Pharm business sites, Hanmi Fine Chemical	· Introducing a water reuse process to minimize the volume of water used in the manufacturing process and increase the reuse rate.	Department responsible for energy/GHG management at each business site
	Management of green purchasing	Ongoing	Hanmi Pharm business sites, Hanmi Fine Chemical	· Operating and monitoring the green purchasing process, which consists in replacing the materials used in manufacturing pharmaceuticals with eco-friendly ones.	Department responsible for energy/GHG management at each business site

Climate Change Response and Environmental Management

IV. Indicators and Goals

Carbon Neutrality: Performance in 2024, Target for 2025

2024 target	2024 achievement	Achievement rate	2025 target
Reduce greenhouse gas emissions by 9% compared to 2018 (65,347 tCO_2eq). **Reduce energy consumption by 9% compared to 2018 (1,262,092 GJ).**	· Greenhouse gas emissions: 71,770 tCO2eq (decrease of 0.06% compared to 2018)[1)] · Energy consumption: 1,429,271 GJ (increase of 3% from 2018)[1)]	0% 0%	· Greenhouse gas emissions: 71,810 tCO2eq (maintain the 2018 level). · Energy consumption: 1,386,914 GJ (maintain the 2018 level).
	· **[Company-wide] -** Responded to the greenhouse gas emissions trading system and CDP evaluation (grade B) / Calculated scope 3 emissions and analyzed scenarios. · **[Paltan Smart Plant]** - Reduced steam usage by approximately 220 tons per year by turning off the system during periods of non-use of clean steam. · **[Pyeongtaek Bio Plant] -** Acquired "green company" certification (postponed to 2025). - Reduced energy usage by changing stabilizer rated power, integrating -5°C and 0% chiller, and replacing streetlights with solar streetlights. · **[R&D Center]** - Replaced the old laboratory fume hood controllers (33 units).	100% 100% 0% 100% 100%	· **[Company-wide]** – Undergo a third-party verification of scope 1 to 3 emissions, respond to the CDP evaluation, and establish the ESG Committee. · **[Paltan Smart Plant]** - Install a central compressed air control system to reduce equipment operating rates. · **[Pyeongtaek Bio Plant]** - Reduce Pyeongtaek's greenhouse gas emissions by 2% (approximately 783 tCO2eq) compared with 2024.
[Hanmi Fine Chemical] Lower emissions below the greenhouse gas emission allowance (17,050 tCO_2eq).	· **Greenhouse gas emissions**: 14,605 tCO_2eq (14.3% of the allowable amount was not emitted).	100%	· Lower emissions below the allowable greenhouse gas emissions rate (16,086 tCO_2eq)
	· Inverter overhaul · Replaced capacitors to improve the power factor at building D and maintained a power factor of 95% (achieved a 1% reduction of the basic electricity contract rate). · Increased energy efficiency by carrying out activities to minimize on-site heating and cooling heat source emissions.	100% 100% 100%	· Overhaul inverters, replace with high-efficiency motor equipment. · Maintain a 95% power factor in building D. · Conduct an electricity cost-saving campaign twice a year.

Amount of investment related to carbon neutrality		
2024	**Execution rate[2)]**	**2025**
Plan: KRW 380 million | Execution: KRW 280 million	72%	Plan: KRW 620 million

1) In 2024, greenhouse gas emissions and energy consumption increased compared to the previous year due to the trial operation of Pyeongtaek's second plant.
2) Execution rate: The rate of execution decreased due to a decrease in the cost of purchasing a greenhouse gas emission permit.

Climate Change Response and Environmental Management

IV. Indicators and Goals

Performance in 2024 and Target for Minimizing Environmental Impact in 2025

Management indicator	2024 target	2024 performance	Achievement rate
Strengthening pollutant management	· Control air/water pollutants below 50%/30% of the legal allowable standards. · Reduce major air/water pollutant emissions by 30% compared to 2018 (4 tons/8 tons).	· Controlled air/water pollutants below 50%/30% of the legal allowable standards. · Reduced major air/water pollutant emissions by 58%/51% (7.6 tons/12.8 tons) compared to 2018.	100% 100%
		· **[Paltan Smart Plant]** - Replaced and maintained the filtering media of air pollution prevention facilities (7 adsorption towers / 12 dust collectors were replaced) to keep air pollutant emissions at 60% or less of the allowable standard. · **[Hanmi Fine Chemical]** - Reduced air pollutant emissions by changing the method of replacing washing water, achieving a decrease of more than 3% compared to the previous year. - Installed Internet of Things (IoT) devices in air pollution prevention facilities (i.e. in the remaining sections of Production Building C).	100% 100% 100%
	· Reduce the use of hazardous chemicals by 2% compared to 2023 (2 tons).	· The use of hazardous chemicals increased by 368% compared to 2023 (654 tons).	0%
		· **[Paltan Smart Plant]** - Developed a hazardous chemical patrol system and built an on-site inspection system for 40 hazardous chemical handling facilities. · **[Pyeongtaek Bio Plant]** - Implemented preventive measures against NaOH leaks in the DS Carrier section. / Due to the trial operation of Plant 2, chemical usage increased by 457% compared to 2023 (target: 2% reduction). · **[R&D Center]** - Installed sealed reagent storage cabinets and waste liquid storage containers (externally ventilated) for laboratories.	100% 100%/0% 100%
Minimizing natural capital and increasing recycling	· Reduce the water withdrawal volume by 9% compared to 2018 (70,138 tons). · Achieve a water reuse rate of 7% or more.	· Reduced the volume of water withdrawal by 23% compared to 2018 (177,375 tons) and achieved a water reuse rate of 9.6%.	100%
		· **[Paltan Smart Plant]** - Increased the rate of wastewater discharge reused as cooling tower water, instead of using fresh water, leading to a 58% increase in the reuse rate compared to the previous year (actual: 30,245 tons / target: 40,000 tons). · [Hanmi Fine Chemical] - Recovered approximately 10 tons of RO concentrate and used it as inflow water for the scrubber in Production Building C, thereby reducing general water discharge in Production Building C by 12% compared to the previous year.	58% 100%
	· Reduce the volume of general/designated waste disposal by 9% compared to 2018 (63 tons/25 tons). · Achieve a waste recycling rate of 72% or more.	· Reduced the volume of general/designated waste disposal by 60%/52% compared to 2018 (422 tons/145 tons).	100%
		· **[Paltan Smart Plant]** - Developed a hazardous chemical patrol system and built an on-site inspection system for 40 hazardous chemical handling facilities. · **[Pyeongtaek Bio Plant]** - Implemented preventive measures against NaOH leaks in the DS Carrier section. / Due to the trial operation of Plant 2, chemical usage increased by 457% compared to 2023 (target: 2% reduction).	0% 100%
Spreading an eco-friendly culture	· Use 100% eco-friendly packaging boxes for pharmaceutical products. · Maintain an eco-friendly literature ratio of more than 90%.	· Reduced CO emissions by 2,247 kg through social contribution activities and used eco-friendly packaging boxes for all manufactured pharmaceuticals. · Achieved an eco-friendly documentation rate of 87.2%. Notified the marketing and other relevant departments about the increase in non-eco-friendly document production cases.	100% 97%
		· **[Company-wide]** - Donated 442 kg of coffee grounds; planted 1,290 trees and rare plants; used green products for printed materials; conducted an energy-saving campaign; and established and operated green purchasing guidelines. - Introduced 3 e-label items to replace paper manuals.	100% 100%

Climate Change Response and Environmental Management

IV. Indicators and Goals

Target for Minimizing Environmental Impact in 2025

Management indicator	2025 target
Strengthening pollutant management	· Manage air and water pollutants at 50% and 30% or less of the legally permitted standards, respectively. Reduce major air and water pollutant emissions by 30% compared to 2018 (4 tons / 8 tons).
	· **[Paltan Smart Plant]** - Install foam injection units in the biological treatment tank (MBR tank) of the wastewater treatment plant. · **[Pyeongtaek Bio Plant] -** Expand the application of organic carbon sources (100%). · **[Hanmi Fine Chemical]** - Install Internet of Things (IoT) devices in air pollution prevention facilities (i.e. remaining devices at Production Buildings A, B, and D).
	· Strengthen the management of harmful chemical substances.
	· **[Pyeongtaek Bio Plant]** - Improve safety of workers at hazardous chemical handling facilities. · **[R&D Center]** - Replace the filter in the sealed reagent cabinet and install additional storage tanks for waste organic solvents. · **[Hanmi Fine Chemical]** – Obtain a business license for harmful chemical substances.
Minimizing natural capital and increasing recycling	· Reduce the volume of water withdrawal by 10% compared to 2018 (77,931 tons) and achieve a water reuse rate of 7.5%.
	· **[Pyeongtaek Bio Plant]** - Reduce the water intake volume by 2% compared to the previous year. · **[R&D Center]** - Replace hot water circulation pumps and install booster pressure pumps. · **[Hanmi Fine Chemical]** - Increase activities to reduce the use of scrubber water and the generation of on-site wastewater.
	· Reducing general/designated waste disposal volume by 10% compared to 2018 (70 tons/28 tons) and achieving a waste recycling rate of 72.5% or more
	· **[Paltan Smart Plant]** - Obtain recognition as a circular resource by satisfying Article 9, Paragraph 1 of the Framework Act on Resource Circulation. · **[Pyeongtaek Bio Plant]** - Reduce waste discharge by 2% compared to the previous year. · **[R&D Center]** - Improve the waste disposal and storage environment. · **[Hanmi Fine Chemical]** - Conduct waste separation campaigns.
Spreading an eco-friendly culture	· Maintain an eco-friendly literature rate of 90% or more. / Use 100% eco-friendly packaging boxes for producing pharmaceuticals.
	· **[Company-wide]** - Conduct social contribution activities for carbon neutrality such as donation of coffee grounds. / Introduce an equipment purchase process that considers carbon emissions. · **[Pyeongtaek Bio Plant]** - Participate in the Environmental Doctor System (environmental management support consulting for SMEs).

Amount of investment related to minimizing environmental impact		
2024	**Execution rate**	**2025**
Plan: KRW 340 million | Execution: KRW 320 million	95%	Plan: KRW 210 million

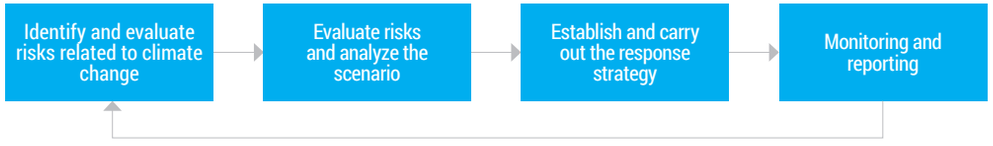
Climate Change Response and Environmental Management

V. Analysis of Climate Change Risks

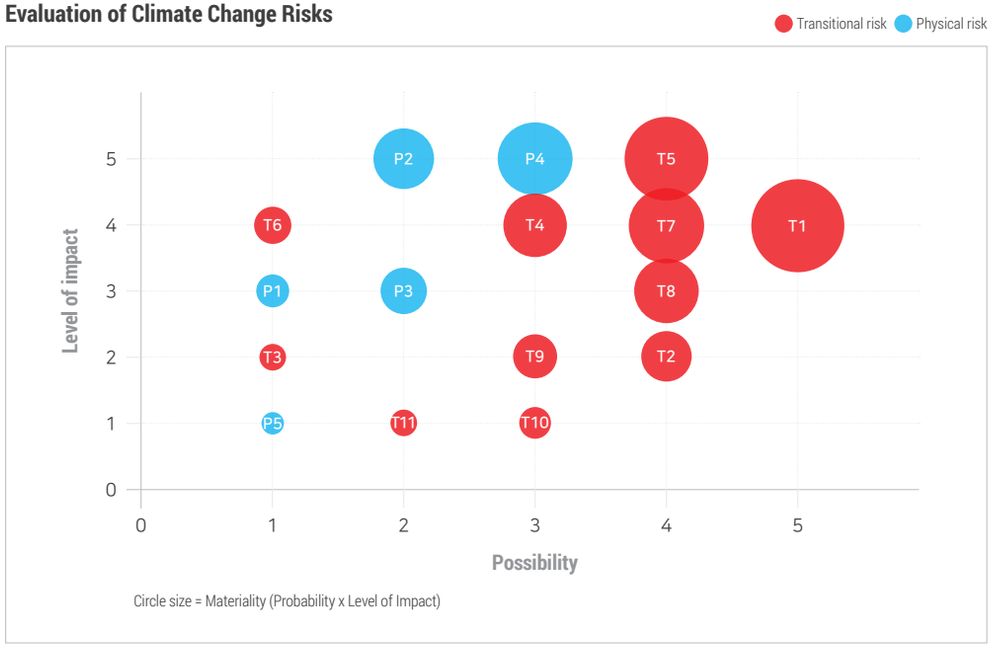
Hanmi Pharm conducts an annual assessment of climate change risks and opportunities by comprehensively reviewing negative impacts on business operations, changes in the external environment, and financial implications. The transition/physical risks and opportunity factors of the business sites and the organization for evaluation are identified and reviewed by considering the likelihood of occurrence in the short, medium, and long term, and the severity of the impact on the company, etc.

* The physical financial impact reflects the results after analyzing the 2024 scenario, updated with only certain variable values such as the exchange rate as of December 2024 and the current asset value.

Framework for Managing Climate Change Risks



Evaluation of Climate Change Risks



Circle size = Materiality (Probability x Level of Impact)

Classification			Risk details	Priority
Transitional risks	Policy / Regulation	T1	Rising costs of the greenhouse gas emissions trading scheme.	1
		T2	Spread of mandatory climate change disclosures.	9
		T3	Imposition of fines on greenwashing companies.	14
		T4	Strengthening of the obligations and regulations for existing products and services.	6
	Technology	T5	Increasing cost of transitioning to low-carbon technologies.	2
	Market	T6	Changes in customer behaviors.	11
		T7	Uncertainty in the power market.	3
		T8	Uncertainty in the LNG market.	5
		T9	Rising raw material prices.	8
	Reputation	T10	Increasing consumer consideration of environmental impact and preference for eco-friendly products.	12
		T11	Increasing demand among investors and stakeholders to address climate change and biodiversity.	15
Physical risks	Acute	P1	Damages to facilities and equipment due to natural disasters such as typhoons, earthquakes, etc.	13
		P2	Damage to facilities due to urban flooding and overflowing rivers and streams.	7
	Chronic	P3	Increase in wildfires around business sites.	10
		P4	Rising abnormal temperature phenomenon.	4
		P5	Rising risk of water shortages and drought.	16

Classification			Risk details	Priority
Opportunity factors	Policy / Regulation	O1	Reduction of cost of responding to emission rights regulations on the reduction of GHG emissions.	1
		O2	Reduction of electricity charges due to efficient management of demand for power, seeking out PPA contracts, etc.	4
	Technology	O3	Reduction of GHG emissions and carbon cost through transition to carbon neutrality.	2
	Reputation	O4	Rising global business competitiveness due to the response to climate change.	3
	Market	O5	Preservation of biodiversity and restoration of ecosystems in local communities.	5

Climate Change Response and Environmental Management

V. Climate Change Risk Analysis_Transitional Risk

Assessment of Climate Change Transitional Risks

The global response to climate change, including strengthened regulations related to global carbon emissions and the increased burden of carbon prices, is having a significant impact on our sustainable management and growth. Hanmi Pharm has established and disclosed our mid-to-long-term carbon reduction target and implementation plan, taking into account the domestic infrastructure for climate change and the nature of the pharmaceutical industry based on the prevailing global standards. We aim to continuously disclose the status of our Climate Action, starting from the h-Carbon Program and leading to 2030 NDC and 2040 Net Zero, and intend to actively communicate with our stakeholders about the efforts we are making to reduce our impact on the environment.

Type	Period	Risk	Financial impact	Mitigation measures
Policy/ Regulations	Short-term	**T1. Rising costs of the greenhouse gas emissions trading scheme** - Strengthening of the emissions trading scheme, a key measure for greenhouse gas reduction policies, due to young people's filing of a climate lawsuit with the Constitutional Court, and the transition to a global decarbonized economy.	- Increase in greenhouse gas emissions due to operation of Pyeongtaek Bio Plant 2, resulting in an increase in the emission allowance purchase amount. - Increase in the cost of purchasing emission allowances due to the increase in emission allowance prices and changes in the proportion of paid allocations.	**[Present]** - Perform own greenhouse gas reduction activities by making energy/process efficient. - Monitoring of emission markets and related policies/laws **[Future]** - Analysis of financial impact by considering the increase in the price of emission allowances.
	Mid-term	**T2. Spread of mandatory climate change disclosures** - Spread of global climate disclosure systems such as IFRS S2, SEC climate disclosure, and ESRS. -Rising demand among stakeholders for a response to CDP initiatives.	- Increasing costs of estimating, verifying and disclosing emissions.	**[Present]** - Response to the global initiative "CDP". - Estimation of scope 1, 2, 3 emissions and verification by third parties. - Analysis of climate change scenarios and financial impacts. **[Future]** - Advancement of climate change scenarios and analysis of financial impacts.
	Mid-term	**T3. Imposition of fines on greenwashing companies** - Increasing number of greenwashing lawsuits every year.	- Imposition of fines in the event of violations.	**[Present]** - Verification of public data such as legal eco-friendly certification marks.
Technology	Long-term	**T4. Strengthening of the obligations and regulations for existing products and services** - Increasing carbon regulations with the implementation of EU CBAM. - Introduction of refrigerant regulations for chillers that use HFCs. - Transition from fossil fuel-based vehicles.	- Rising compliance costs. - Imposition of charges and fines when regulations are strengthened. - Increasing charges and refrigerant replacement costs when refrigerant regulations are introduced. - Increasing costs of transitioning to vehicles that use alternative forms of energy.	**[Present]** - Establishment and implementation of mid-to-long term greenhouse gas reduction targets. - Monitoring of performance related climate changes every year. **[Future]** - Continuous monitoring of carbon tax introduction including CBAM. - Monitoring of global refrigerant regulations and review of alternative refrigerants. - Review of transition to eco-friendly vehicles/Increased monitoring of regulations on internal combustion engine vehicles.
Market	Long-term	**T5. Increasing costs of transitioning to low-carbon technologies** - Increasing investment costs in energy transition and greenhouse gas reduction facilities to achieve carbon neutrality by 2040.	- Increasing capital expenditure due to the self-generation of renewable energy, REC purchases and PPA contracts. - Increasing investment costs in energy efficiency and process optimization.	**[Future]** - Review of waste heat reuse and transition to eco-friendly fuel for boilers. - Review of the introduction of low-carbon technologies for production facilities and equipment. - Review of the introduction of renewable energy (REC, PPA, etc.). - Purchase of equipment in consideration of carbon emissions. - Formulation of a response strategy by establishing an ESG Committee under the BOD.
	Mid-term	**T6. Changes in customer behavior** - Increasing number of global pharmaceutical and bio companies that consider climate change response capabilities as a factor in selecting and extending contracts with CDMOs.	- Loss of sales if a contract is not maintained due to failure to respond to the customers' demands for a response to climate change. - Rising costs of joining and implementing climate change initiatives.	**[Present]** - Adhesion to the Korea TCFD Alliance. **[Future]** - Participation in more climate change response initiatives.
	Mid-term	**T7. Uncertainty in the power market** - Rising electricity costs and intensifying volatility.	- Increasing energy costs due to rising electricity costs.	**[Present]** - Participation in the Demand Side Management policy.. **[Future]** - Identification of prospects for PPA contracts.
	Mid-term	**T8. Uncertainty in the LNG market** - Intensifying volatility due to global politics and climate factors such as exchange rate increases, war, and cold waves.	- Increasing energy costs due to rising LNG costs.	**[Present]** - Reduction of LNG purchase costs through energy/process efficiency. **[Future]** - Increase of activities to reduce LNG purchase costs through energy/process efficiency.
	Mid-term	**T9. Rising raw material prices** - Increasing costs due to stricter plastic and biodiversity regulations (e.g. packaging materials). - Increasing need to address climate change in the supply chain.	- Increasing operating costs due to the use of sustainable raw materials and compliance with environmental regulations. - Increasing active ingredient procurement costs due to increased low-carbon transition costs in the supply chain.	**[Present]** - Estimation of scope 3 emissions and setting of the reduction target. **[Future]** - Engagement activities with key partners within the supply chain. - Establishment of an LCA-based emissions estimation system.
Reputation	Short-term	**T10. Increasing consumer consideration of environmental impact and preference for eco-friendly products**	- Decline in brand value in the event of a delay in responding to climate change. - Decrease in sales due to failure to meet demands to respond to climate change.	**[Present]** - Disclosure of accurate information based on third-party verification (ESG report, environmental information disclosure, etc.). - Participation in the Korea TCFD Alliance. **[Future]** - Acquisition of the Green Company certification. - Acquisition of the Carbon Footprint and Environmental Product Declaration product certification.
	Short-term	**T11. Increasing demand from investors and stakeholders to address climate change and biodiversity**	- Reduced availability of capital when investor requirements are not met.	**[Present]** - Continuous running of in-house Green Hanmi campaigns. - Management of safe LMO research laboratories. - Compliance with the AMR Framework. **[Future]** - Strengthening of biodiversity, community-targeted ecosystem conservation and restoration projects.

Climate Change Response and Environmental Management

V. Climate Change Risk Analysis_Physical Risks

Assessing the Opportunity Factors of Climate Change

Hanmi Pharm identifies and evaluates physical risks at each business site and strives to minimize negative impacts from a long-term perspective. Urban flooding, overflowing rivers, and rising temperatures caused by extreme climate events have been recognized as major risks. Based on global management systems such as ISO 14001, 22301, and 45001, we continue to implement emergency response plans and risk mitigation activities. We will focus on managing negative risks related to biodiversity and local communities, with the aim of contributing to sustainable growth through shared value.

Type	Period	Risk	Financial impact			Countermeasure
			Contents	Short- & Mid-term (2025-2029)	Long-term (2030-2040)	
Urgent	Short-term	P1. Damage to facilities and equipment due to natural disasters such as typhoons and earthquakes.	1) Costs incurred in restoring business sites damaged by natural disasters. 2) Profit reduction due to disruptions to production.	1.1	1.29~1.47	**[Present]** - Establishment of BCP and regular training based on the ISO 22301 certification. - Regular inspection of facilities. **[Future]** - Step-by-step replacement based on a comprehensive survey of outdated facilities. Advancement of the BCP tailored to the pharmaceutical industry and infrastructure.
	Long-term	P2. Damage to facilities due to urban flooding and overflowing rivers.	1) Costs incurred in restoring damaged business sites. 2) Profit reduction due to disruptions to production.	23.4~23.9	29.8~32.3	
Chronic	Short-term	P3. Increase in wildfires around business sites.	1) Costs incurred in restoring wildfire damages.	3.9~4.1	5.8~6.5	**[Present]** - Acquisition and operational management of ISO 14001 certification/Implementation of emergency training for environmental incidents every year. - Monitoring legal standards and compliance with GMP. **[Future]** - Strengthening of environmental goals and the performance management system, and assessment of the environmental impact of each business site.
	Long-term	P4. Increase in abnormal temperature phenomena.	1) Increase in heating and cooling operating costs and greenhouse gas emissions due to rising temperatures (air conditioners, etc.).	260.99~269.77	322.17~359.37	**[Present]** - Establishment of the BCP and regular training based on the ISO 22301 certification. - Monitoring legal standards and compliance with GMP. **[Future]** - Advancement of facilities and regulations, such as central control of heating and cooling.
	Long-term	P5. Increasing risk of water shortages, including droughts.	1) Increasing investment costs for water reuse facilities. 2) Increasing investment costs for water quality management	-	-	**[Present]** - Management based on the ISO 14001 certification/Activities such as reusing water from the manufacturing process. **[Future]** - Strengthening of the water reuse process.

* The risk impact period is divided into short-term (2025), medium-term (2026 to 2029), and long-term (2030 to 2040). The financial impact amount is calculated as an annual average amount.

Assessing the Opportunity Factors of Climate Change

Hanmi Pharm has identified the materiality of climate change by assessing the impact and the likelihood of its potential impact on business.

Type	Period	Risk	Financial impact	Countermeasure
Policy/ Regulations	Short-term	01. Reduction of the cost of responding to the emission allowance regulations for reduced greenhouse gases.	Reduction of the cost of responding to the emission allowance regulations for reduced greenhouse gases.	- Carry out self-reduction activities through cost innovation. - Consider annual carbon emissions costs when purchasing new/replacement equipment.
	Long-term	02. Reduction of electricity bills using the Demand Side Management policy; exploring PPA contract opportunities, etc.	Reduction of electricity bills by expanding the Demand Side Management policy; exploring PPA contract opportunities, etc.	- Participate in the Demand Side Management policy/Monitor PPA contract monitoring (planned). - Deliberate and resolve strategies and policies through the ESG Committee within the BOD.
Technology	Mid-term	03. Reduction of greenhouse gas emissions and carbon costs by implementing carbon neutrality.	Reduction of carbon costs by implementing carbon neutrality, including the use of renewable energy	- Establish the 2040 carbon neutral roadmap and strengthen monitoring activities. - Review the introduction of renewable energy (REC, PPA, etc.).
Reputation	Short-term	04. Increase of global business competitiveness by responding to climate change.	Increase in sales by meeting demands to respond to climate change.	- Disclose ESG reports based on TCFD/Respond to CDP climate change disclosure.
Market	Long-term	05. Conservation of community biodiversity and restoration of the ecosystem.	Increase of corporate brand value.	- Carry out environmental protection activities, such as Hanmi Green Forest/environmental cleanup activities/BEE HAPPY Project.

* The period of opportunity factor impacts is divided into short-term (2025), medium-term (2026 to 2029), and long-term (2030 to 2040).

Climate Change Response and Environmental Management

V. Climate Change Risk Analysis_Analyzing the Financial Impact

Classification	Transitional risk		Physical risk		Opportunity factor	
Details	**T1. Rising carbon emission rights prices**		**P2. Damage to facilities due to urban flooding, and stream flooding**		**O1. Reduction of the cost of responding to emission rights regulations on the reduction of GHG emissions**	
Financial impact analysis standards	Hanmi Pharm became subject to the greenhouse gas emissions trading scheme in 2020, and when the price of carbon emission rights increases and the paid-in allocation ratio expands, the cost of purchasing the shortfall in emission rights increases in tandem. Accordingly, we have estimated the amount of financial impact through the predicted price of emission rights according to the consecutive expansion of the paid-in allocation ratio (30-50% assumed) and the transition scenario.		To analyze the impact of river flooding according to the IPCC AR6 (The Sixth Assessment Report) scenario, we have applied a statistical model of the volume and depth of river basin flooding by using 3 climate variables (annual number of days of frost, number of days of drought, rainfall over 5 days), and 4 geographical variables (watershed area, slope, etc.) Accordingly, as a result of analyzing the impact based on annual frequency exceeding the flooding standard over the past 100 years, property losses of KRW 2.08-2.13 billion may occur in the 2020s, and KRW 2.65-2.88 billion in the 2030s.		We operate the Cost Innovation system and discover innovative cases of energy saving in order to use our utilities more efficiently. We have reduced our GHG emissions by approximately 700 tCO2eq every year through our Cost Innovation activities and have estimated the cost of responding to the regulatory emission rights saved by reflecting the carbon price predicted by the scenario.	
Results of the financial impact analysis	Assumption of NDC reduction target achievement (based on the NDCs scenario)	Assumption of fulfillment of 2050 Net Zero (based on the Net Zero 2050 scenario)	Average temperature in 2100: +1.3-2.4°C (based on SSP1-2.6)	Average temperature in 2100: +3.3-5.7°C (based on SSP5-8.5)	Assumption of fulfillment of the NDC reduction target (based on the NDCs scenario)	Assumption of fulfillment of 2050 Net Zero (based on the Net Zero 2050 scenario)
	Short-term (2025): KRW 5.74 B Mid-term (2026-2029): KRW 8.01 B Long-term (2030-2040): KRW 8.13 B	Short-term (2025): KRW 4.33 B Mid-term (2026-2029): KRW 7.9 B Long-term (2030-2040): KRW 23.41 B	Short to mid-term (2025-2029): KRW 2.39 B Long-term (2030-2040): KRW 2.98 B	Short to mid-term (2025-2029): KRW 2.34 B Long-term (2030-2040): KRW 3.23 B	Short-term (2025): KRW 200 M Mid-term (2026-2029): KRW 340 M Long-term (2030-2040): KRW 520 M	Short-term (2025): KRW 150 M Mid-term (2026-2029): KRW 340 M Long-term (2030-2040): KRW 1.52 Bs
Details	**T5. Increased cost of transitioning to low carbon technology**		**P4. Rising abnormal temperature phenomenon**		**O3. Pursuit of carbon neutrality to reduce the carbon cost**	
Financial impact analysis standards	Hanmi Pharm has established a mid-to-long term roadmap to achieve our 2040 carbon neutrality goal. To reach carbon neutrality, investments in renewable energy self-generation, REC purchases, and PPA agreements will lead to increased capital expenditures. Additionally, the cost of implementing reduction measures such as energy efficiency improvements and process optimization will rise. We have calculated the costs of RE100 implementation through solar power facilities and REC purchases, based on the assumed average price in 2025.		We calculated the annual frequency of the highest daily temperatures, extreme changes of temperature, for the period 1980-2000 based on the location of assets in order to analyze the impact of abnormal temperatures according to the IPCC AR6 (Sixth Assessment Report) scenario, the results of which show that asset losses of KRW 23.22-24 billion may occur in the 2020s, followed by losses of KRW 28.67-31.97 billion in the 2030s.		We have analyzed the difference in the cost of purchasing the emission allowance shortfall by reflecting the carbon price of each scenario of the NGFS in the greenhouse gas emissions projected for the point when BAU and carbon neutrality will have been implemented by 2040 and have derived the amount by which emissions can be reduced when implementing carbon neutrality as an opportunity factor. We will make efforts to achieve 2040 Carbon Neutrality by increasing our use of renewable energy with the adoption of REC, PPA, and solar power equipment.	
Results of the financial impact analysis	Mid-term (2026-2029): KRW 12.05 B Long-term (2030-2040): KRW 20.05 B		Average temperature in 2100: +1.3-2.4°C (based on SSP1-2.6)	Average temperature in 2100: +3.3-5.7°C (based on SSP5-8.5)	Assumption of fulfillment of the NDC reduction target (based on the NDCs scenario)	Assumption of fulfillment of 2050 Net Zero (based on the Net Zero 2050 scenario)
			Short to mid-term (2025-2029): KRW 26.977 B Long-term (2030-2040): KRW 32.217 B	Short to mid-term (2025-2029): KRW 26.099 B Long-term (2030-2040): KRW 35.937 B	Short-term (2025): KRW 3.96 B Mid-term (2026-2029): KRW 5.91 B Long-term (2030-2040): KRW 8.08 B	Short-term (2025): KRW 2.94 B Mid-term (2026-2029): KRW 5.9 B Long-term (2030-2040): KRW 24.02 B

* The financial impact analysis results are calculated based on the annual average amount.

Climate Change Response and Environmental Management

VI. Climate Change Scenario Analysis

Hanmi Pharm has analyzed climate change scenarios in order to identify the financial impacts that risks and opportunities related to climate change will have on our company, and to devise measures for responding to the international community's request for carbon neutrality based on this.

Climate Change Scenario Analysis Process

Identify the key risks
↓
Select the scenarios
↓
Apply the scenarios

Identify transitional risks and physical risks and select the climate change scenario that reflects the characteristics of each risk.

Hanmi Pharm analyzed the potential financial impacts of the 'strengthened GHG emission regulations and the rise in carbon emission rights prices' in terms of transitional risks among the major risk factors, and eight types of acute and chronic risks in terms of physical risks.
The analysis of transitional risks was based on the NDCs of the NGFS (Network for Greening the Financial System), Below 2°C, and the Net Zero 2050 scenario, and assumptions were made by applying the content of the 2030 NDC (Nationally Determined Contributions) and 2050 Carbon Neutrality Scenarios A & B (Nov. 2021).
In the case of physical risks, an analysis was conducted based on the SSP (Shared Socioeconomic Pathway) scenario, an emission scenario adopted in the AR6 (Sixth Assessment Report) of the IPCC (Intergovernmental Panel on Climate Change). It is a pathway in which changes in future socioeconomic systems, such as future population, economy, and energy consumption, were applied along with the intensity of radiative force as of 2100.

Selection of Climate Change Scenario

Transitional risks

Classification	Expected temperature rise	Source
NDCs Assumes the achievement of the current NDC GHG reduction target.	+ 2.6℃	NGFS
Below 2℃ Assumes a reduction carried out in order to achieve the goal of keeping the rise in global temperature below 2°C.	+ 1.6℃	NGFS
Net Zero 2050 Achievement of 2050 Net Zero through continuous engagement in Carbon Neutrality activities.	+ 1.4℃	NGFS

Physical risks

Classification	Expected temperature rise	Source
SSP5-8.5(High) A scenario in which emissions are reduced by a relatively small amount, with total GHG emissions tripling by 2075.	+3.3-5.7℃	IPCC AR6
SSP2-4.5(Medium) A powerful reduction scenario in which emissions are maintained at the current level up to 2050 and then reduced up to 2100.	+2.1-3.5℃	IPCC AR6
SSP1-2.6(Low) An aggressive reduction scenario that matches the requirements of the Paris Accord, achieving Net Zero by 2050.	+1.3-2.4℃	IPCC AR6

Climate Change Response and Environmental Management

VI. Climate Change Scenario Analysis_Transitional Risk

Process of Analyzing Climate Change Scenarios

Hanmi Pharm has estimated our BAU[1)] scenario by reflecting our energy consumption and emission allowance allocations based on our production plans, utilizing NGFS (Network for Greening the Financial System)-based NDCs, Net Zero 2050, and Below 2°C transition scenarios. Based on this BAU scenario, we have analyzed the potential carbon costs[2)] under the national emissions trading system regulations and various climate change scenarios.

We assume a linear achievement of 2050 Carbon Neutrality scenarios A and B, which target an 80.4% reduction in industrial sector emissions. Accordingly, emission allocations are estimated to decrease by 54%, while the proportion of paid allocations is expected to increase to 50%. The potential carbon price in the NGFS scenario is derived using an integrated assessment model that ensures compliance with the IPCC SSP (Shared Socioeconomic Pathway) reduction pathway at minimal cost. This estimated price takes into account both the socio-economic damage caused by greenhouse gas emissions and the costs required for mitigation efforts.

1) BAU: BAU (Business As Usual) refers to the projected greenhouse gas emissions if no special reduction measures are applied.
2) Potential carbon costs: A shadow price that is used to establish strategies and assess investments by identifying potential business risks arising from future carbon regulations.

Results of the Transitional Risk Analysis

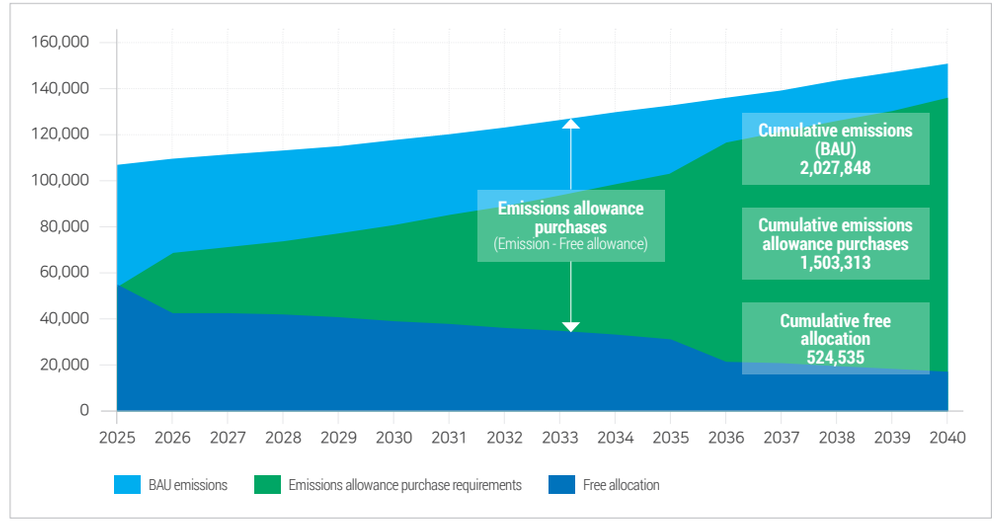
Regarding the outlook for Hanmi Pharm's allocation of greenhouse gas emission allowances, it is expected that 74% of the projected cumulative emissions of 2.03 million tCO2eq by 2040, which is equivalent to 1.5 million tCO2eq, will need to be purchased as emission allowances. Hanmi Pharm's estimated carbon costs, when assuming the NGFS Korea carbon price as the emission allowance price, indicate that by 2040 the price per ton of CO2eq will rise to anywhere from approximately KRW 70,000 to 300,000. Accordingly, the annual carbon cost burden is expected to be around KRW 9.37 billion under the NDCs scenario and KRW 39.95 billion per year under the Net Zero scenario.

Scenario	Carbon price (Unit: KRW/tCO2eq)				Carbon cost (Unit: KRW 100 M)				NPV of cumulative carbon cost in 2040[3)]
	2025	2030	2035	2040	~2025	~2030	~2035	~2040	
NDCs	110,580	114,241	63,692	69,661	58	469	853	1,273	945
Below 2℃	45,949	73,072	103,801	135,991	24	252	679	1,450	990
Net Zero 2050	82,076	138,714	205,267	297,126	43	469	1,302	2,934	1,988

3) NPV (Net Present Value): The present value of future cash flows discounted at an interest rate to reflect their worth at the current time. A weighted average discount rate of 3.65% has been applied for the past three years.

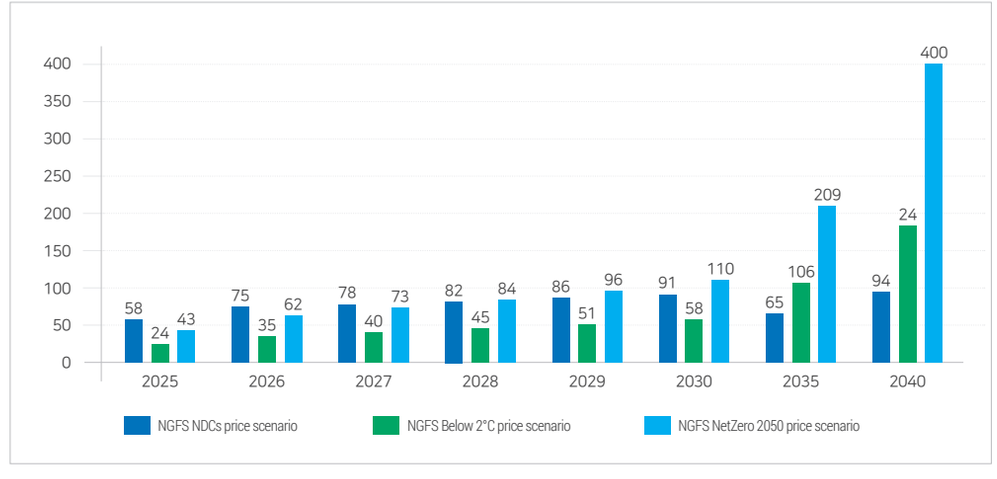
Our Outlook for GHG Emission Allowance

Unit: tCO_2eq



Our Outlook for Carbon-cost

Unit: KRW 100 M



Climate Change Response and Environmental Management

VI. Climate Change Scenario Analysis_Physical Risk

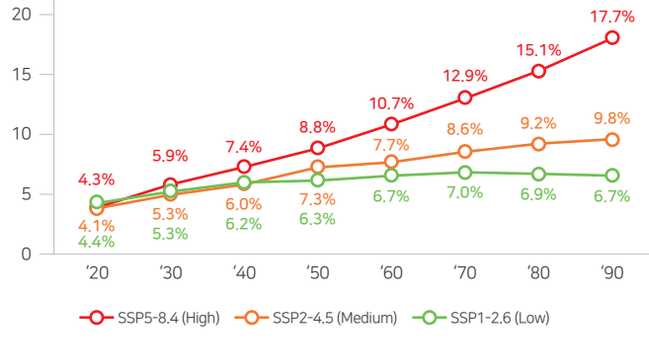
Hanmi Pharm has conducted a physical risk analysis of the Paltan Smart Plant[1] and the Beijing Hanmi Pharm business site based on the SSP (Shared Socioeconomic Pathway) using the Climanomics[2] of S&P Global Sustainable 1. Physical risks were modeled by applying each variable, such as temperature and rainfall, to eight physical risks including abnormal temperatures, urban flooding, and forest fires according to acute and chronic risks. The mean annualized absolute loss (MAAL) includes the impact of business disruptions that lead to operating costs, capital costs, and losses on the direct financial impact of climate risks on specific types of assets.

1) The Paltan Smart Plant and Pyeongtaek Bio Plant business sites are located close by to each other (Scope is included within an analysis grid) and have similar locations in inland downtown areas and industrial conditions. Thus, the Paltan Smart Plant was analyzed as a representative business site.
2) A climate change scenario analysis platform for physical climate risk analysis published by S&P Global.

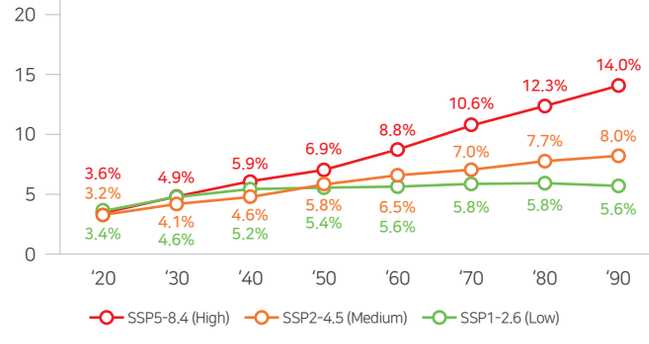
Results of Analysis of Physical Risks (by Asset)

Paltan Smart Plant's asset loss rate could increase by anywhere from 6.3% to 8.8% in the 2050s and 6.7% to 17.7% in the 2090s, while that of Beijing Hanmi Pharm could increase by anywhere from 5.4% to 6.9% in the 2050s and 5.6% to 14.0% in the 2090s.

Paltan Smart Plant



Beijing Hanmi Pharm



Results of Analysis of Physical Risks (by Risk)

The results of the analysis of acute and chronic risks show that the impact of asset loss due to abnormal temperatures was the most significant, and that the asset loss rate due to abnormal temperatures would increase from 5.66% to 7.66% in the 2050s.

Unit: %

Classification		SSP1-2.6(Low)				SSP2-4.5(Medium)				SSP3-8.5(High)			
		'20	'30	'40	'50	'20	'30	'40	'50	'20	'30	'40	'50
Acute	Coastal flooding	-	-	-	-	-	-	-	-	-	-	-	-
	River flooding	-	-	-	-	-	-	-	-	-	-	-	-
	Urban flooding	0.36	0.44	0.51	0.55	0.33	0.43	0.54	0.65	0.35	0.48	0.67	0.87
	Typhoons	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Chronic	Drought	-	-	-	-	-	-	-	-	-	-	-	-
	Abnormal temperatures	4.04	4.79	5.52	5.66	3.72	4.75	5.32	6.52	3.88	5.34	6.52	7.66
	Water stress	-	-	-	-	-	-	-	-	-	-	-	-
	Forest fires	0.06	0.09	0.11	0.12	0.05	0.09	0.12	0.15	0.06	0.10	0.15	0.20

MAAL (Mean annualized absolute loss) N.A | 0~1% | ~5% | ~10%

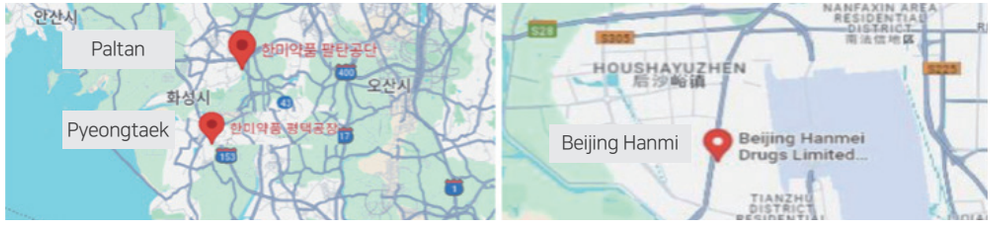
Climate Change Response and Environmental Management

VI. Climate Change Scenario Analysis_Analyzing the Financial Impact

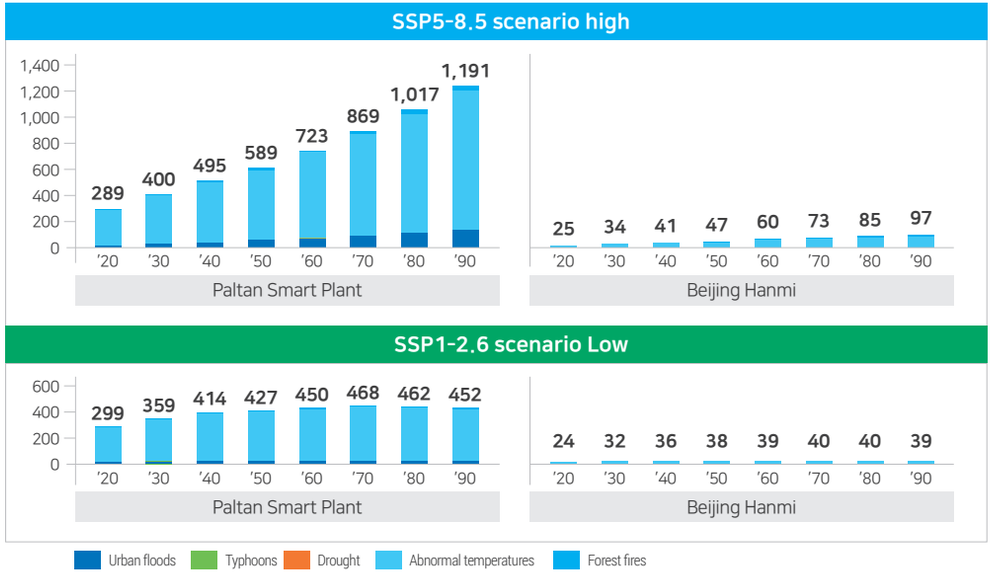
Results of Financial Impact Analysis Based on Climate Change Scenarios_Physical Risk

Since both the Paltan Smart Plant and Beijing Hanmi Pharm are located in inland downtown areas, physical risks arising from abnormal temperatures and urban flooding were identified as primary risks, but no potential asset loss due to coastal flooding, stream flooding, or water stress was identified. The results of the analysis, based on the SSP1-2.6 and SSP5-8.5 scenarios, show that the Paltan Smart Plant may incur losses ranging from KRW 42.7 billion to 58.9 billion in the 2050s, and that Beijing Hanmi Pharm may incur losses ranging from KRW 3.9 billion to 4.7 billion in the same period. Hanmi Pharm has established and is operating BCP (Business Continuity Planning) for natural disasters and will strive to continuously enhance the direction of our response according to the level of exposure to physical climate change risks.

Business Site



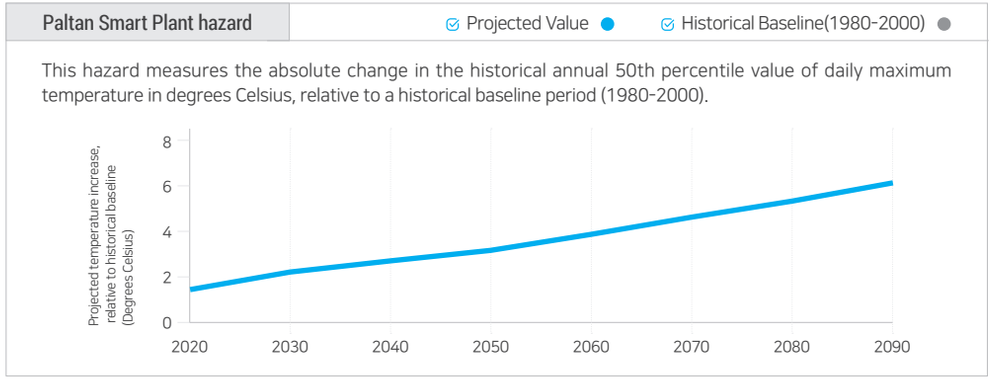
Predicted Annual Average Asset Loss by Business Site



Abnormal Temperature Impact Analysis

As a result of the physical risk analysis, the change (Absolute change in the past 50th percentile value of daily maximum temperature) in abnormal temperatures with the greatest impact was measured from 1980-2000 (historical baseline period). According to the report, the daily maximum temperatures at the Paltan Smart Plant and Beijing Hanmi Pharm will rise by about 4°C compared to the period from 1980-2000 by the 2050s.

Paltan Smart Plant hazard



Beijing Hanmi Pharm hazard