DS DANSUK

MIX
Paper | Supporting responsible forestry
FSC® C159581

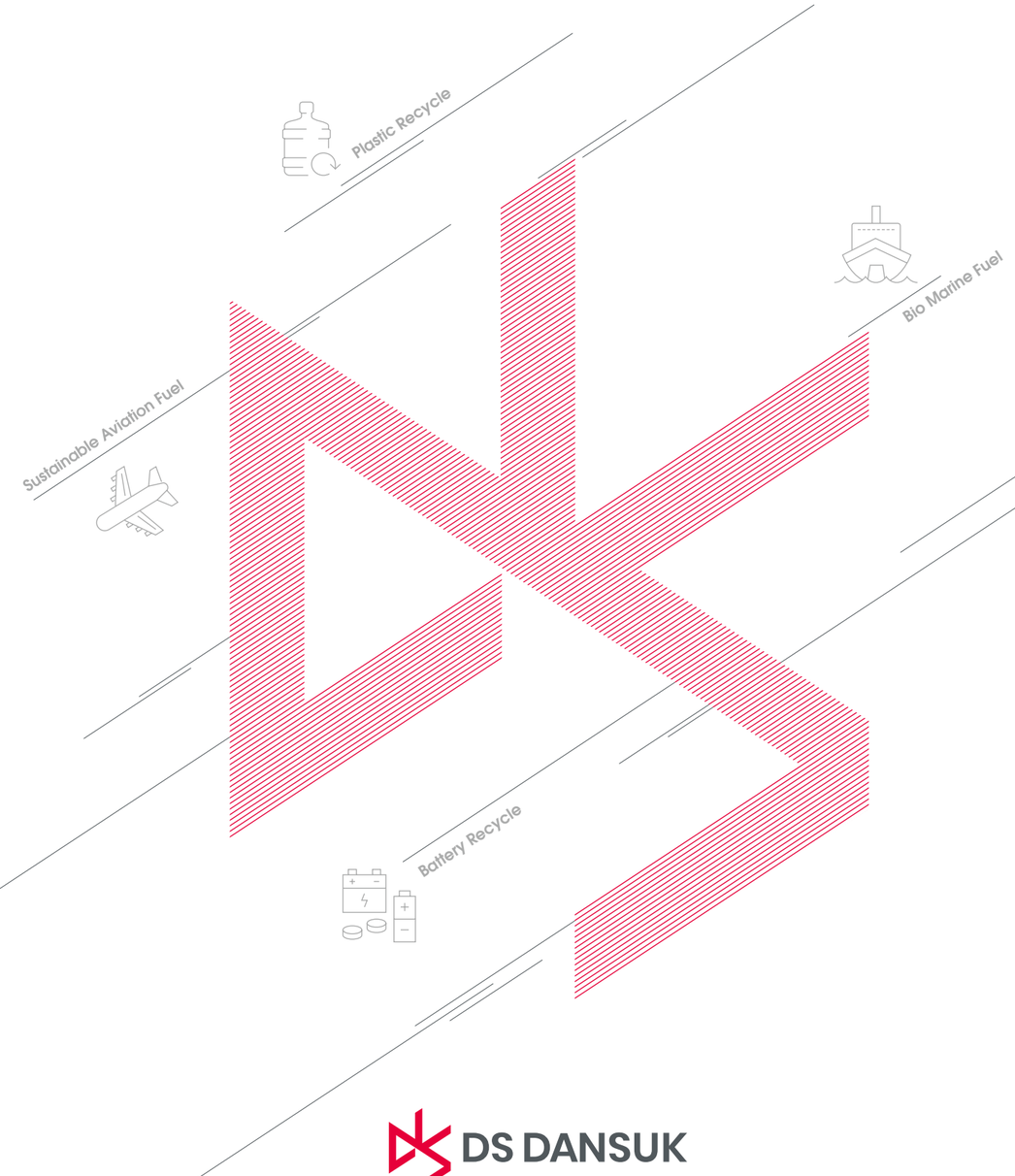
PRINTED WITH SOY INK

DS DANSUK Sustainability Report 2023 was printed on FSC® (Forest Stewardship Council®)-certified paper in soy oil ink.

2023 DS DANSUK SUSTAINABILITY REPORT

DS DANSUK

2023 DS DANSUK SUSTAINABILITY REPORT



DS DANSUK

About This Report

Report outline

In order to actively communicate with stakeholders about the current status and performance of our sustainability management activities, DS Dansuk has been publishing a sustainability report every year since 2021. This report, which is DS Dansuk's third sustainability report, aims to transparently disclose ESG management goals and strategies and key ESG performance and activities.

Reporting period and scope

This report contains information from January 1 to December 31, 2022. Financial performance was prepared based on K-IFRS information (K-GAAP in 2020), and non-financial performance includes 6 domestic business sites (Sihwa Plant, Pyeongtaek Plant #1 and #2, Jecheon Plant, Gunsan Recycling Plant, Gunsan Fine Chemical Plant).

In case attention is needed on the scope/boundary of the report and matters subject to change at the time of reporting, they are clearly indicated in separate notes for the reference of stakeholders. Data for the previous three years or more was presented for quantitative date for identification of time series trends.

Report writing standards

This report has been prepared in accordance with the 2021 revision of the Global Reporting Initiative (GRI) Standards, an international sustainability reporting standard. The report was also prepared according to the Sustainability Accounting Standards Board (SASB) standards for reporting on key issues suitable for the nature of the industry. The financial information of the report has been prepared based on the consolidated financial statements. In addition, our goals, activities, and achievements related to climate change responses have been linked to the TCFD (Task Force on Climate-related Financial Disclosures) recommendations.

Report assurance

In order to secure the reliability of the contents of the report, BSI, an independent external verification agency, conducted assurance. Report verification was conducted in accordance with AA1000AS, an international verification standard. The assurance details can be referred to in the third-party assurance statement in the appendix section of this report.

COVER STORY
DS Dansuk is constantly innovating and creating new values to strengthen sustainability and the circular economy. DS Dansuk's logo and icons representing eco-friendly business are connected with a line to express DS Dansuk's continued efforts to achieve business continuity and a sustainable society.

Inquiries
Department
Office of External Cooperation
+82-31-488-0700

E-mail
sustainability@dsdansuk.com

Website
http://dsdansuk.com

Table of Contents

Business Overview

CEO Message

We Create a Sustainable Future.

“DS Dansuk takes a leap forward as a company specializing in global resource circulation.”

Dear esteemed stakeholders,

On the occasion of the publication of our third sustainability management report in 2023, I would like to express my deepmost gratitude to all stakeholders for their unwavering support and trust. We hope to communicate deeply with stakeholders through our stakeholders while transparently disclosing corporate ESG activities.

Dansuk Industrial, which started as Nobel Industry Company in 1965, now aspired to open the future as a global leader with the new company name of ‘DS Dansuk’. DS Dansuk promises to build a more diversified new business model and secure corporate sustainability and future growth engines together as a resource circulation specialist in the bioenergy, battery, and plastic recycling industry.

Despite global uncertainties, DS Dansuk achieved excellent business performance last year, with sales exceeding KRW 1 trillion and exports exceeding USD 300 million. This proves that DS Dansuk’s management capabilities and the company’s eco-friendly business portfolio have the fundamentals to overcome market volatility. This year, DS Dansuk will again prove itself as a company finding opportunities in crises and presenting solution.

The ongoing climate crisis is entrusting all countries and companies the task of carbon neutrality. DS Dansuk will strengthen its business characteristic of recycling waste resources as well as advancing energy saving, greenhouse gas and pollutant reduction activities. In particular, we plan to quantitatively evaluate the environmental impacts (LCA) that occur throughout the entire Product Life Cycle to find more practical improvement points.

DS Dansuk is also sparing no effort in creating social values. As well as operating workplaces with environment, safety and health as the top priority, win-win growth with suppliers, and social contribution activities, we aim to be a company where all executives and employees are able to grow together. In addition, in the area of governance, we are strengthening the capabilities of the board of directors, such as recruiting outside directors in 2023. In the area of ethical management, we are building a system of concrete actions beyond declarations.

Dear esteemed stakeholders of DS Dansuk, we ask for your continued attention and encouragement in our innovations and challenges to build DS Dansuk’s sustainable future.

Thank you.

CEO and Chairman, DS Dansuk Co., Ltd. **Han Seung-uk**

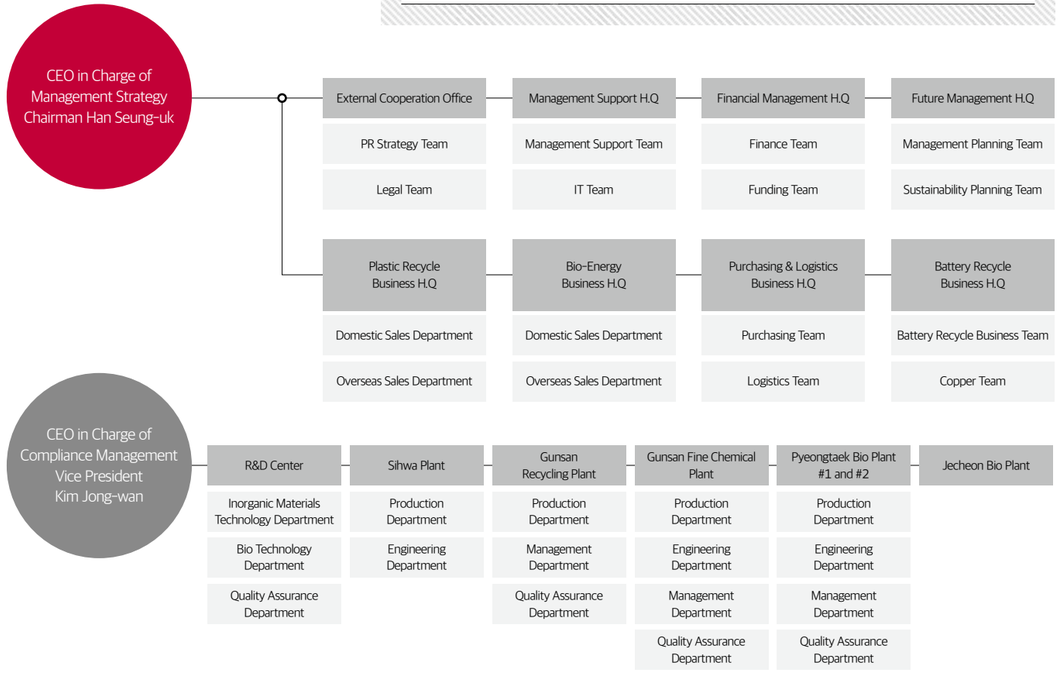
Company Introduction

General Status

Since its foundation in 1965, DS Dansuk has been serving as an eco-friendly energy and materials company engaging in the business of bioenergy (biodiesel/bio heavy oil, etc.), battery recycling (recycled lead, etc.), plastic recycling and precision materials (PVC stabilizers, etc.). As Korea's largest bioenergy producer, we are diversifying our business portfolio based on our strong supply network and business capabilities. We aim to become a company trusted by all stakeholders based on trust and responsibility for customers, and furthermore, to become a company contributing to the development of local communities and the nation.

Company name	DS Dansuk Co., Ltd.
Establishment date	July 1, 1965
CEO	Han Seung-uk & Kim Jong-wan
No. of employees	373 persons (as of December 31, 2022)
Head office location	• Sihwa Head Office 165, Hyeomnyeok-ro (Jeongwang-dong), Siheung-si, Gyeonggi-do, Republic of Korea • Seoul Head Office 6th floor, Seogo Building, 18, Saimdang-ro (Seocho-dong), Seocho-gu, Seoul, Republic of Korea
Website	http://dsdansuk.com
Business area	Bioenergy, battery recycling, plastic recycling and precision materials

Organization



DS Dansuk's Value Chain - Efforts to Deliver the Best Eco-friendly Values

Core Business Areas

A Company Leading the Field of Bioenergy 20-22P	A Company Leading Eco-friendly Circular Economy 46-51P	Establishment of 2050 Carbon Neutrality Roadmap 43-44P
DS Dansuk produces biodiesel, bio heavy oil, and bio marine fuel, which are eco-friendly energy sources contributing to carbon reduction. We plan to supply bio aviation fuel through construction of a next-generation bio-diesel (HVO) plant in the future.	DS Dansuk aims to realize a decarbonized society as well as maximization of efficiency through reuse of resources such as waste plastic and waste batteries and strengthen circular recycling solutions to build a sustainable economic system.	DS Dansuk is actively seeking goals and response strategies for GHG reduction and energy conservation through environmental management in order to actively respond to climate change faced by mankind.

Value Delivery

Customers
DS Dansuk is striving to improve the satisfaction of major customers home and abroad with our products and business offerings. We will continue our focus on improving customer satisfaction and trust through accurate understanding of needs of customers and industries and providing high-quality, eco-friendly, and safe products.

Executives and Employees
DS Dansuk pursues fostering of talent and strengthening of employee capabilities to boost corporate competitiveness. In particular, we plan to develop training programs taking position and job characteristics into account to maximize organizational capabilities. We will support our executives and employees in growing as experts in different business sectors and jobs by improving a stable work environment and organizational culture.

Suppliers
DS Dansuk supports suppliers with various programs to promote long-term win-win partnership with its suppliers. In particular, we will continue our activities to secure business stability and promote win-win cooperation by considering the environment, from procuring raw materials to transporting products within the business value chain.

Local Community
DS Dansuk pursues various social contribution activities to realize its founding philosophy of 'we must contribute to human society'. We will continue to support local communities to realize a sustainable society by solving problems faced by local communities and promoting development.

Shareholders and Investors
DS Dansuk will realize the creation of eco-friendly and pro-social profits by expanding existing business structure and eco-friendly business to prevent corporate business from being impacted by unstable environments home and abroad. Furthermore, we will continue to strive to find and implement ways to improve shareholder value.

Financial Performance

Total assets

KRW **565.6** billion

Total liabilities

KRW **425.8** billion

Total capital

KRW **139.7** billion

2022 sales

KRW **1,133.7** billion

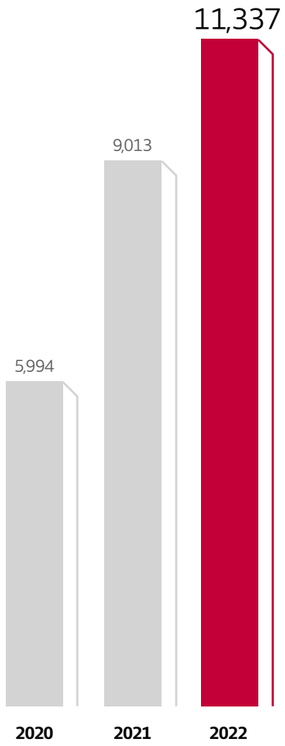
Operating profit

KRW **74.0** billion

Net profit

KRW **27.2** billion

Sales over 3 years (Unit: KRW 100 million)



Achieved CAGR of 37.5%

Domestic/Overseas Sales

Domestic

KRW **616.3** billion

Overseas

KRW **438.4** billion

Sales by Division in 2022

Sales by division and domestic/overseas sales in 2022 are based on separate financial statements

Bioenergy	Battery Recycling	Plastic Recycling & Precision Materials
KRW 859.2 billion	KRW 151.4 billion	KRW 89.1 billion

Management Ideology

Under the founding philosophy of "A company must continue to thrive and develop as it contributes to human society.", DS Dansuk is advancing toward becoming a world-class company in line with the company's core mission and a company-wide consensus based on the unique value system as well as creating an organizational culture of communication.

DS Dansuk will leak forward as a company growing together with stakeholders while keeping in mind the roles and responsibilities of a company for realizing a sustainable society.

Founding Philosophy

A company must continue to thrive and develop as it contributes to human society.

Mission

Contribute to human happiness and the improvement of quality of life by creating unique values with eco-friendly technologies and creative thinking.

Core Values

Innovation

We pursue new things, are active in change, and pursue innovations inspiring others.

Challenge

We pursue best performance with an active spirit of challenge not afraid of failure.

Passion

We aim to create better value by carrying out our duties with enthusiasm and responsibility.

Sympathy

DS Dansuk's belief is to be considerate, listen, and aim for common goals based on mutual trust.

Brand Idea

The Road We Have Walked

Insightful Challenger for Green

The Road We Will Walk Together

Creator for Sustainable happiness

reator

Life

A creator of a virtuous cycle creating happier lives

1965
Nobel Industry Company

1984
Nobel Industrial Co., Ltd.

1989
Dansuk Industrial Co., Ltd

A creator constantly repeating **positive impact**

A company creating the basis for a virtuous cycle of happiness for

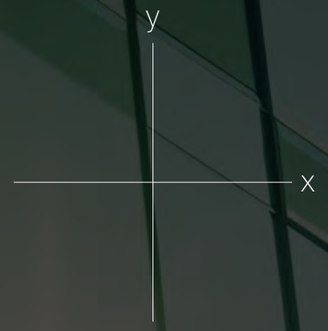
people, society, and the earth

2023 DS Dansuk Co., Ltd.

DS DANSUK CO., LTD.

New Corporate Identity

Our technologies come together with new ideas to discover previously unavailable possibilities and create a new standard to make our lives more abundant.



X-axis and Y-axis making up the world

Defining the new standard (Z-axis)

Define Standard

DS DANSUK, Defining the New Standard

DS DANSUK

Company History

2016~2023 PART. 4 Securing future growth engines and globalization

2020
Awarded the USD 200 Million Export Tower

2021
Started bio-diesel facility operation at Jecheon plant

2022
First export of eco-friendly marine fuel (SMF) to Europe

2022
Awarded the USD 300 Million Export Tower

2023
Changed company name to DS Dansuk Co., Ltd.

2016
Started bio-diesel facility operation at Pyeongtaek 2 Plant

2017
Acquisition of affiliated company Samil Innocom (current Dansuk Advanced Materials)

2018
Started bio-diesel facility operation at Pyeongtaek 1 Plant

2019
Started Pakistan Plant operation, acquired Malaysia Plant

2005~2014 PART. 3 Challenges and changes through business diversification

2012
Completed refined oil system

2013
Completed LDH manufacturing Plant (Osikdo-dong, Gunsan-si, Jeollabuk-do)

2013
Awarded the USD 100 Million Export Tower

2014
Completed bio heavy oil production Plant

2005
Completed plant in the High-Tech Industrial Development Zone of Hunan Province, China

2007
Completed bio-diesel production Plant and facility construction
Established of glycerin production system

2011
Completed remelted lead manufacturing Plant (Soryong-dong, Gunsan-si, Jeollabuk-do)

DS DANSUK HISTORY

Since its establishment in 1965, DS Dansuk has continued its contribution to the development of the Korean industry. The company has inherited and developed the founder's founding philosophy into Dansuk's value management system, using it as a milestone in advancing towards becoming a century-old company.

1965~1989 PART. 1 Establishment, laying the foundation for fine chemistry

1965
Founded as a Nobel Industry Company, developed and manufactured manganese sulphate

1972
Developed and manufactured cuprous oxide and copper oxide

1973
Developed and manufactured red lead and litharge

1982
Designated as a prioritized small/middle sized company for modernization

1984
Developed and manufactured PVC stabilizer, founded Nobel Industrial Co., Ltd. acquired KS for red lead

1989
Changed company name to Dansuk Industrial Co., Ltd.

1991~2001 PART. 2 Secured a foothold for growth through concentration of competitiveness

1991
Founded Dongyoon Industrial Co., Ltd. a subsidiary in the same field (Current Dansuk Metal Materials Co., Ltd.)

1995
Relocated to Sihwa Industrial Complex and secured modern manufacturing infrastructures and research facilities

1996
Selected as 'Proud Small/Middle-sized Company' by the Department of Trade and Industry

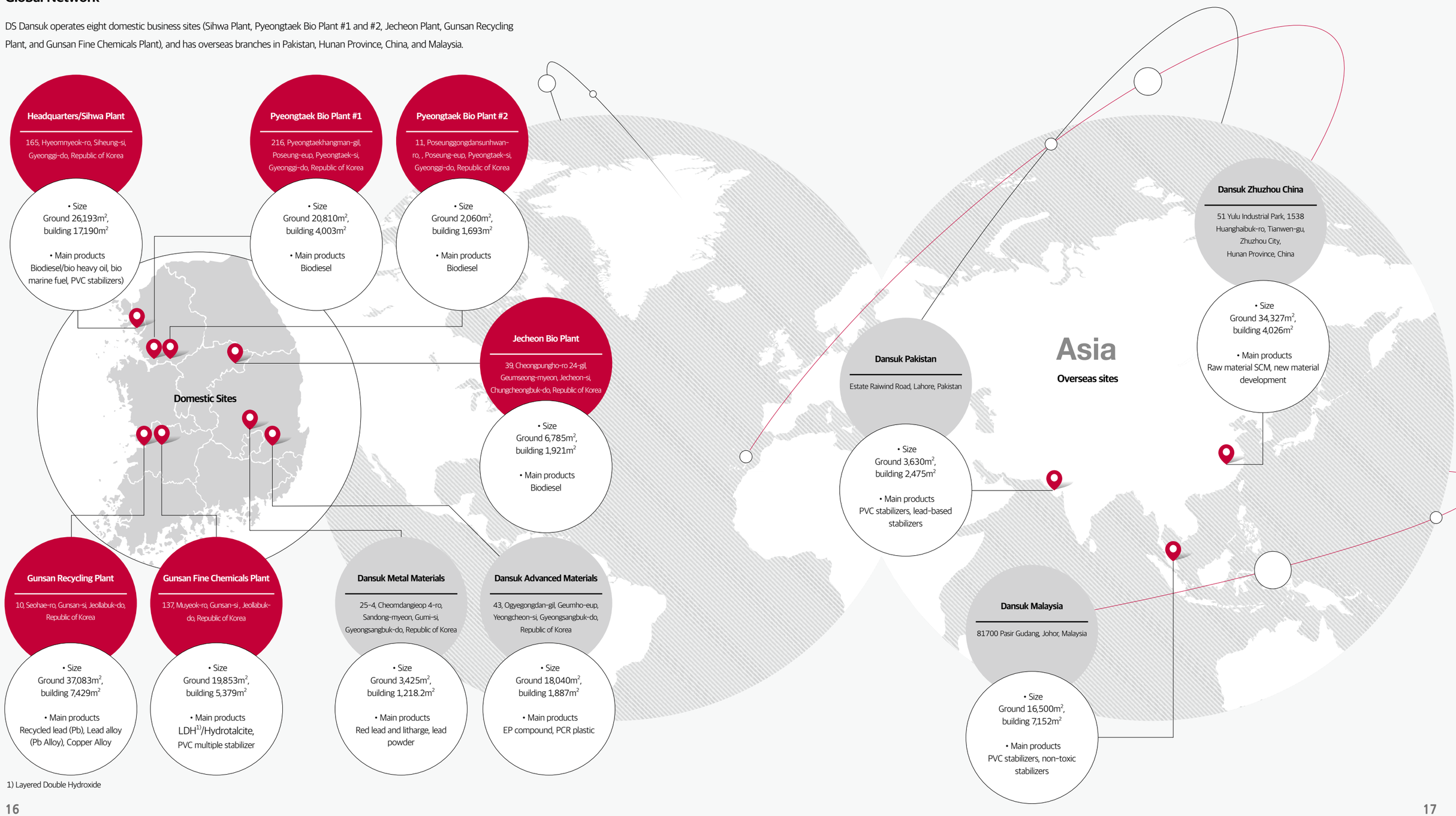
1999
Awarded the National Productivity Grand Prize (R&D), by the Minister of Commerce, Industry and Energy, and also designated as 'Excellent Company with Improved Productivity'

2000
Received presidential award for contributor to productivity improvement

2001
Acquired patent on manufacturing technology using electricity and certified as a venture business (new technology developing company), completed construction of fine chemical building plant
appointed as a Company with Superior Technologies

Global Network

DS Dansuk operates eight domestic business sites (Sihwa Plant, Pyeongtaek Bio Plant #1 and #2, Jecheon Plant, Gunsan Recycling Plant, and Gunsan Fine Chemicals Plant), and has overseas branches in Pakistan, Hunan Province, China, and Malaysia.



1) Layered Double Hydroxide

2022 Highlights

2022
Achievements

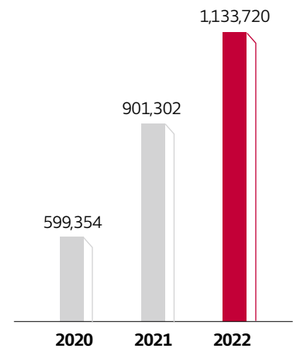
DS DANSUK

Performance Growth

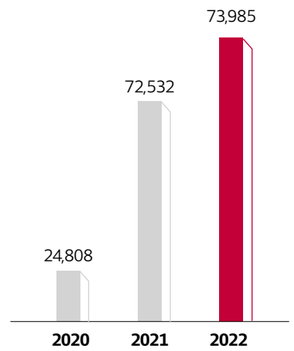
DS Dansuk achieved sales of KRW 1 trillion in 2022 and exports of USD 300 million in 2022. In particular, amid difficult internal and external environments due to rising raw material prices and costs, we are promoting advancement of our R&D portfolio to strengthen the eco-friendly circular economy model by strengthening the fundamentals of each business.

Business Performance

Sales by year (Unit: KRW 1 million)



Operating profit by year (Unit: KRW 1 million)



ESG Performance

GHG reduction(diesel + heavy oil)	GHG emissions intensity	Amount of waste battery collection and recycling	Waste & residue raw material consumption
1,102,450tCO_2-eq	17% reduction compared to previous year	85,706MT	323,618MT
Social contribution activities	Traceability management of smart UCO refined raw material	Achievement of ZERO severe disaster	Issuance of ESG bonds/ green guarantees
KRW 308 million	Enhancement of smart system	2,200 days	KRW 25.415 billion

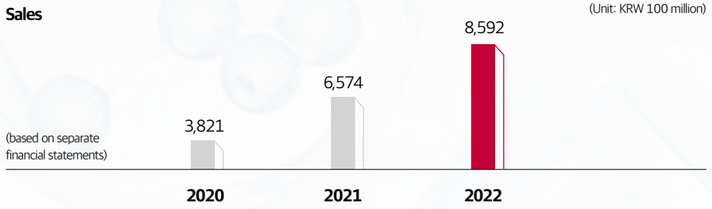
Business Portfolio

While leading the fine chemical material market based on continuous research and development and eco-friendly technology, DS Dansuk is striving to become a global company through preemptive strategy establishment. Our business divisions consist of bioenergy business, plastic recycling & precision materials business, and battery recycling business. We are also continuous our promotion of new businesses to create a sustainable future.

Bioenergy Business

Sales

(Unit: KRW 100 million)



Biodiesel

As an eco-friendly new and renewable transportation fuel, biodiesel is produced by synthesizing waste cooking oil and animal and vegetable oils as raw materials, unlike general diesel produced from refined crude oil. In addition, biodiesel is a popular next-generation energy source due to its fuel performance similar to that of diesel, perfect compatibility with diesel engines, and excellent lubrication properties. Currently, domestic biodiesel takes up 3.5% of diesel fuel for transportation according to the Renewable Fuel Standard (RFS).

Generation

DS Dansuk has been manufacturing and selling biodiesel meeting the quality standards of domestic oil refineries since 2007. In addition, DS Dansuk's biodiesel is being actively exported to global oil companies after entering overseas markets by meeting the strict certification requirements of advanced countries such as the US and EU countries.

Characteristic

Biodiesel effect (when replacing 1㎘ of diesel)
- Reduction of 2.6 tons of GHG
- No SO_2 generation during use as fuel
- Reduction of exhaust gas (carcinogenic substances) emissions including fine dust, CO and HC

Purpose

- Diesel automobiles • Heavy construction equipment

Korea's largest scale in pretreatment and biodiesel production	Raw material pretreatment processing (300,000 tons/year): Pretreatment of various waste resources and by-products (Alcohol-Chemical neutralization / Glycerolysis)		
	Biodiesel production (300,000 tons/year): Operation of 4 biodiesel production plants nationwide (Sihwa / Pyeongtaek #1 / Pyeongtaek #2 / Jecheon)		
Compliance with international certification export to both EU and US	EU	UCOME, FWME, POMEME, (BMF)	ISCC-EU, DDC(Dutch Double Counting)
	US	UCOME, TME	LCFS in California. CFP Greet 3.0 in Oregon, EPA in US
Establishment of a global raw material supply chain	Domestic	UCO, animal fat, food waste oil, biodiesel process by-products	Establishment of a supply chain circulation system through cooking oil business Expansion of supply chain through market bolt-on strategy
	Overseas	UCO, Tallow, POME, SBEO, REM, poultry fat, food waste	China, Japan, Indonesia, Philippines, Vietnam, Thailand, etc.
Building of storage infrastructure utilizing geographic advantages	Storage of 200,000KL (62 tanks)	Owns 41 tanks for storage of raw materials and products (500KL~13,000KL)	
		Establishment of Pyeongtaek Port infrastructure: Geographic advantage with China and Southeast Asian countries, the largest suppliers of raw materials	

(UCOME: Used Cooking Oil Methyl Ester, FWME: Food Waste Methyl Ester, POMEME: Palm Oil Mill Effluent Methyl Ester, TME: Tallow Methyl Ester, BMF : Bio Marine Fuel)

Bio Heavy Oil

Bio heavy oil is a new renewable energy source produced from unused waste resources such as biodiesel byproducts (pitch), animal fat, food waste oil, and palm byproducts

Generation

DS Dansuk's bio heavy oil is being supplied to Korea Midland Power Co., Ltd., Korea Southern Power Co.,Ltd., Korea East-West Power Co., Ltd., as replacement of heavy oil (B-C oil) for the purpose of fulfilling the mandatory supply received by power generation companies according to the Renewable energy Portfolio Standard (RPS) in 2012.

Characteristic

- Compatibility with B-C oil power generation facilities
- Compared to B-C oil, bio heavy oil reduces fine dust by about 28%, nitrogen oxides by 39%, greenhouse gases by 85%, and sulfur oxides by 100% (Source: Korea Bio Energy Association website)

Purpose

- Thermal power and industrial power generation facilities • Industrial boilers

Bio Marine Fuel

Bio marine fuel is an eco-friendly fuel capable of completely replacing existing B-C fuel-based ships. DS Dansuk produces bio marine fuel using low-grade oil and fat byproducts as raw materials.

Generation

As the sulfur content of marine fuel is limited with the implementation of IMO 2020, global shipping companies are striving to reduce greenhouse gases through pilot operations using bio marine fuel. DS Dansuk took the lead in technology development after detecting this trend through the biodiesel export network. In addition, DS Dansuk has been discussing the certification system/quality standards of bio marine fuel with global oil refineries and shipping companies along with its own technology development. As a result, in June 2022, DS Dansuk succeeded in exporting bio marine fuel based on bio heavy oil for the first time in the world, setting a global standard. We are continuing to strengthen our position as an eco-friendly energy leader in the bio marine fuel market.

Characteristic

- Produced with ultra-low sulfur content and 100% biogenic materials
- Reduction of CO_2 generated in using marine fuel compared to existing fuel
- Complies with international ISO quality standards for existing marine fuel

Purpose

- Marine fuel

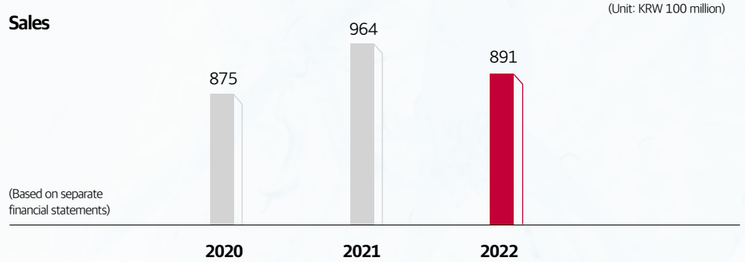
Asia biofuels&feedstocks Conference

2023 Argus Green Marine Fuels Conference

Plastic Recycling & Precision Materials Business

Sales

(Unit: KRW 100 million)



PVC Multiple Stabilizer

PVC multiple stabilizer is an additive improving the physical properties of PVC molded products by suppressing the decomposition of chlorine and increasing thermal stability during molding of PVC with excellent processability and economic value.

Generation

DS Dansuk has been leading the market by launching non-toxic stabilizer products through proactive research and development since development of lead-based stabilizers in 1984. In 2022, in order to unify the product production system, Sihwa Plant PVC multiple stabilizer facility was expanded and relocated to Gunsan Fine Chemical Plant.
PVC multiple stabilizer products are supplied to PVC processing companies such as LX Hausys, KCC, Hyundai L&C, Younglim, and PNS.

Characteristic

- Customized additives meeting customers' processing characteristic requirements
- Prevention of physical and chemical deformation and improvement of processability during PVC heat processing (extrusion and injection)
- Improvement of weather resistance by preventing oxidation and deterioration of molded products

Purpose

- Window Profiles • Cables & Compounds • Pipes & Fittings • Heterotype extrusion

Precision Chemical Gunsan Plant Multiple Stabilizer Automation Production Line

Basic Lead Stabilizer

Basic Lead stabilizers play significant roles by making up the majority of PVC multiple stabilizers, which are composed of stabilizers (anti-deterioration agents), internal/external lubricants, antioxidants, and mold release agents.

A lead stabilizer dryer

Generation

DS Dansuk has the largest production scale in Korea through strengthening its competitiveness in the quality and production facilities of basic lead stabilizer, and is also a competitive player in the multiple stabilizer business through vertical integration of the basic/multiple stabilizer business. The domestic market for basic lead stabilizers is shrinking due to environmental and health issues, but sales in markets overseas such as the Southeast Asian countries, the Middle East, and Russia are expanding.

Characteristic

- TLS (tribasic lead sulfate): A powerful acid sorbent with outstanding thermal stability, weather resistance, and electrical properties
- DLP (dibasic lead phosphite): Outstanding thermal stability, excellent weather resistance (absorption of ultraviolet rays)
- DBL (dibasic lead stearate): Good productivity with excellent activation
- Pb-St (lead stearate): Excellent activation, economical

Purpose

- TLS : Opaque product • DLP : Manufacturing of fine, pure white products
- DBL : Hard extrusion and injection molding formulation • Pb-St : Stabilizer/lubricant

Metallic Soap Materials

Metallic soap raw materials are significant raw materials for multiple stabilizers and are additives functioning as lubricants, such as softening and releasing properties of PVC.

Generation

DS Dansuk's metallic soap materials are also used as auxiliary materials for our own multiple stabilizers in order to improve quality and cost competitiveness. We are continuing our supply of metallic soap-based raw materials to not only the domestic market but also to the overseas plastic molding industry and polyolefin neutralizer and PVC multiple stabilizer markets.

Characteristic

- Ca-St (calcium, stearate): Non-toxic, excellent activation
- Zn-St (zinc stearate): Non-toxic, excellent economic value
- Ba-St (barium stearate): Excellent activation and gelling properties

Purpose

- Ca-St : Stabilizer, release agent, lubricant, neutralizer • Zn-St : Stabilizer, release agent, lubricant, pigment dispersant
- Ba-St : Extrusion processing, injection molding, calendaring processing

LDH(Layered Double Hydroxide) / Hydrotalcite

LDH is a functional non-toxic compound used as a key raw material in various fields due to its ability of capturing chloride ions. In addition, LDH is a nanoparticle capable of capturing chloride ions between stacks of nano-sized plate-shaped particles.

LDH High Pressure Reactor

Generation

Through continuous research and development of LDH, DS Dansuk developed its own hydrotalcite mass production process and possesses and operates the largest production capacity in Korea. DNT-09, our company's LDH, is recognized for its value in the overseas non-toxic stabilizer market and continues to be supplied to leading overseas PVC stabilizer companies such as Baerlocher, Chemson, and Adeka.
In particular, we are continuing expansion of our market through additional exports to countries such as Kazakhstan, where our business partners are suffering decrease in operating rates and demand due to the worsening global economy.

Characteristic

- Non-toxic and environmentally friendly compound consisting of magnesium, aluminum, hydroxide, and carbonic acid.
- Excellent anion exchange capability preventing PVC deterioration with excellent anti-chlorine properties in spandex fibers
- Small particles and high particle size distribution providing high dispersibility and transparency in PVC and polyolefin

Purpose

- Anti-inflammatory materials • Heat-resistant aids • Flame retardants • Antacids • Neutralizers

Base Materials & Additives

Characteristic

- Expected to improve quality and reduce costs through supply of EP raw materials and import of global raw materials/ auxiliary materials.

Purpose

- PVC Resin, ASA, R-TiO2 ,etc.

RUBY POLY, Dansuk Advanced Materials' own Brand

RUBYPOLY is an own brand of Dansuk Advanced Materials, capable of achieving various performances by tailoring general-purpose plastic and engineering plastics to the required characteristics.
Our products are used for PP, PE, ABS, HIPS, ASA, PC, mPPO, PBT, PET, and nylon. We produce the best products with our accumulated expertise.

RUBY ECO, Dansuk Advanced Materials' Eco-friendly PCR Brand

RUBYECO is Dansuk Advanced Materials' eco-friendly PCR brand. It is an eco-friendly product recycling used plastic. ISCC-Plus, GRS-certified products are being produced, and we are carrying out various material development as well. PP produced from DS Dansuk's battery recycling business, plastics from household goods, plastics used in home appliances, and PET bottles are applied to automobiles, electrical and electronics, textiles, and packaging products.

Generation

Currently, Dansuk Advanced Materials is supplying its products to GS Caltex, HDC Hyundai EP, BASF Korea, Korea Styrolution, etc. We are making efforts to develop and mass produce products tailored to the physical properties and characteristics required by each customer.
In addition, we aim to take the lead in resource circulation by producing PCR plastics comparable to virgin plastic by investing in specialized companies and technology development capable of high-purity separation and selection of plastic recyclables. We are reviewing various measures, including establishment of a base to strengthen the supply and demand of recycled raw materials in addition to internalizing product technology and promoting business.


Process inspection room

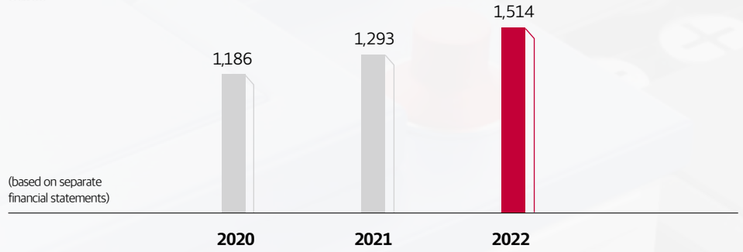
Battery Recycling Business

Recycled Lead

Recycled lead is produced by collection and recycling of used lead-acid batteries (waste batteries) and extraction of the lead inside the collected batteries. Recycled lead is used by lead acid battery manufacturers as a raw material for manufacturing automobile batteries.

Sales

(Unit: KRW 100 million)



Generation

DS Dansuk collects waste lead batteries generated around the world to manufacture recycled lead in order to establish a lead resource circulation economy system. We are partnered with automobile battery manufacturers Sebang Battery, Delco, Hankook & Company (formerly Atlas BX), and Hyundai Sungwoo Solite. We also aim to improve product reliability and expand sales opportunities through LME brand registration.

Characteristic

- The purity of recycled lead is over 99.97%, which is the same as that of primary lead.
- Low metal impurity content: Low dross generation in the lead oxide manufacturing process and lead-acid battery plate manufacturing process
- Easily operated manufacturing process due to excellent melt flowability

Purpose

- Main raw material for automobile batteries and various industrial batteries
- Wire covering, radiation shielding, solder • Solute oxide (litharge, red lead)

Lead alloy

Lead alloy is a material in which its hardness is improved through adding antimony and tin to complement the soft nature of pure lead. It is an essential material for forming bridges between the terminals of automobile batteries and internal cells.

Generation

High-content antimony-lead compound is extracted from waste batteries and manufactured through precise mixing and alloying of concentrated lead, antimony, and tin.
DS Dansuk's lead alloy is supplied not only the field of automobile battery but various industrial fields such as fields of solar panel ribbon and solder alloy.

Characteristic

- High antimony and tin content: Customers are able to adjust to various compositions
- Precise content control of lead, antimony and tin: Ensured reliability of customized antimony-lead compound

Purpose

- Electrodes and connection terminals of lead acid batteries

Copper Melt Casting Products

Copper melt casting products are functional (high strength and high conductivity) copper and copper alloys produced by melting and casting electrolytic copper and copper scrap. High-quality products are produced by controlling physical properties through a continuous casting process.

Generation

We are producing high-quality products with high electrical conductivity with the completion of the latest copper plant in 2023, using copper as a raw material and removing foreign substances and impurities through testing and stabilization.
We also utilize electric induction furnaces to supply alloys improved physical, mechanical, and processability both home and abroad.

Category	Characteristic	Purpose
C1100 Tough Pich Copper	• Cu 99.90% ↑ • Cathode with main raw material of electrolytic copper	• Transformers • Switchboard electrode • Electrical and electronics • Automobiles
C2680 Brass	• Zn 35% • Processability • Outstanding corrosion resistance	• Breaker wiring • Mechanical type • Household goods • Building interior and exterior materials
C7060 Nickel	• Ni 10% • Seawater resistance • Outstanding corrosion resistance	• Shipbuilding and marine plants • Seawater-resistant valves and pipes • Heat exchange • Welding

2022 ESG Highlights

DS Dansuk's Sustainable Management System

Sustainable Management Vision and Strategies

DS Dansuk continues to promote ESG management from a systematic and company-wide perspective to achieve sustainable growth. As ESG-related regulations are being strengthened globally, we are striving to establish and internalize strategies linking ESG regulations and businesses. Furthermore, we are improving the company-wide ESG level through proactive management of newly emerging opportunities and risks and establishment of an integrated reporting system in response to changes in the business environment. At the same time, we are striving to achieve 2025 Only One Innovation through creation of sustainable value based on digital corporate culture and smart thinking.

Sustainable Management Vision

D.S. 2025 Only One !
Digital Driven 2025, Smart Sustainability Only One !

Sustainable Management Goals (Management Principles)

Advancement Of Business Model	Eco-friendly/Smart Workplace	Win-Win Cooperation & Shared Growth	Opportunity & Risk Management

Four Strategies

Advancement Of Business Model	Eco-friendly/Smart Workplace	Win-Win Cooperation & Shared Growth	Opportunity & Risk Management
• Securing original technology – Eco-friendly energy, recycling, future materials • Securing recycled/ regenerated/waste raw materials – Stabilization of raw material market and discovery/expansion of new partnerships • Global localizations – Expansion of export markets including the US/EU/China – ISCC/LCFS certification, etc.	• Reduction and disclosure of GHG emissions – Management of company-wide GHG emissions trading system – Improvement of utility/ energy efficiency • Licensing and legal compliance – Environmental management improvement/legal and regulatory compliance • 4th industrial revolution technology – Process advancement and automation/ systemization • Advancement of environmental management – Advanced wastewater/ waste management	• Improvement of safety-first working environment – Advancement of safety and health management system – Pursuance of zero safety accident • Nurturing talent – Establishment of new HR evaluation system/ improvement of personnel system • Protection of human rights and respect for diversity • Supplier process evaluation/ win-win cooperation support • Enhancing social value – Dansuk scholarship, community donation activities • Customer satisfaction (ISO 9001, QC/TC, satisfaction)	• Advancement of governance system – Strengthening the independence, expertise and diversity of the board of directors – Expansion of (female) outside directors • Ethics/Jeong-do Management – Internalization of ethical management – Achieving zero anti-corruption risk • Risk Management – Establishment of Audit Committee – Operation/improvement of internal accounting management system

ESG Governance

The ESG Sustainability Committee consists of a total of 8 internal directors and advisors and is held once a quarter.

New Establishment of ESG Committee

Board of Directors	Highest decision-making body on ESG management
ESG Committee	Advisory body under the Board of Directors
External Cooperation Office	Internal ESG control tower

Safety and Environment | Social Responsibility | Ethical Management | Governance

Major Activities of the ESG Committee

- Consultation before deliberation/decision on ESG agenda
- Inspection and suggestion on detailed ESG tasks
- Leading management awareness in improvement training
- Suggestions on ESG risks and rating agency responses

ESG Performance System

DS Dansuk operates ESG Sustainability Committee in order to actively respond to social ESG management demands and strategically promote sustainable management. The committee performs roles such as ESG management-related strategies, policy decisions, and risk management. The committee is operated in the form of a reporting and advisory (conference body) body until the committee is established as a decision-making body.
As an organization dedicated to ESG, the External Cooperation Office (PR Strategy Team) is entrusted with seamless response to ESG evaluations and environmental information disclosures. At the same time, we inspect ESG activities across the company as well as providing to support to ensure seamless execution of improvement tasks.

ESG Improvement Process

- Establishment of short/mid/long term strategies and goals
- ESG policy review and improvement task establishment/implementation
- Advancement of ESG data management and disclosure levels
- Expansion of the scope of application of ESG management across the entire supply chain

Execution System

Board of Directors
Highest decision-making body related to ESG

ESG Sustainability Committee
Advisory Committee on ESG agendas under the Board of Directors

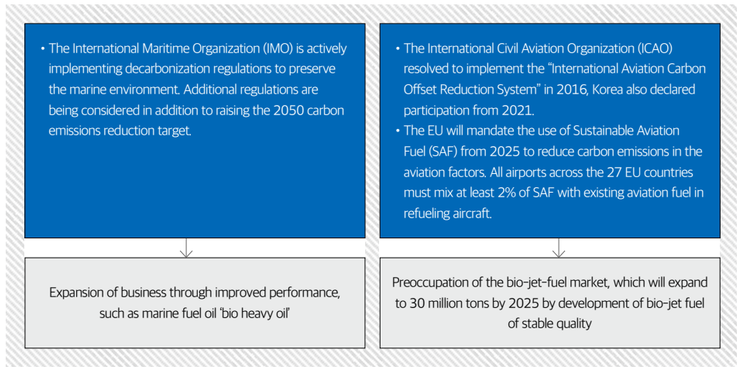
Organization dedicated to ESG (External Cooperation Office's PR Strategy Team)
In-house ESG control tower (ESG evaluation, environmental information disclosure response)

Response to ESG Regulations

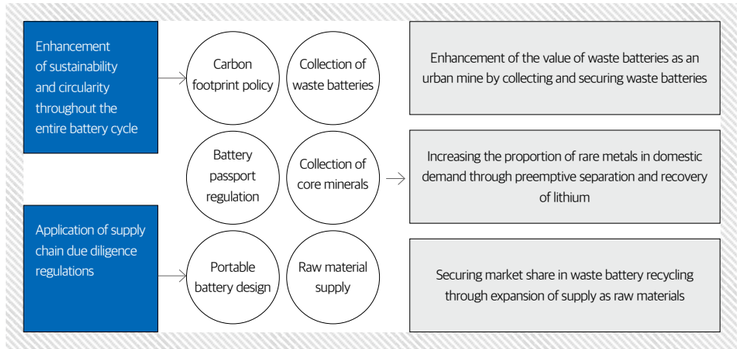
DS Dansuk's Response Strategy to ESG Reguations

With the strengthening international community's demands for the transition to a decarbonized society and corporate sustainable management, DS Dansuk is striving to establish strategies that apply to corporate management by identifying trends in domestic and international regulations/policies. The core ESG management keywords affecting our business activities can be categorized into strengthening environmental regulations, strengthening plastic regulations, and strengthening industrial safety and health activities. DS Dansuk will continue to strengthen the company's ESG management activities and risk management system according to major trends through establishment of preemptive and flexible response strategies.

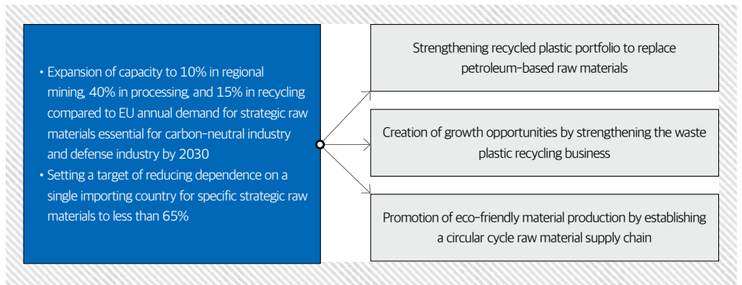
Strengthening Global Regulations On Marine/Aircraft Fuel



Diversification Of Waste Battery Recycling LIB Portfolio



Mandatory Recycling of Critical Raw Materials (CRMA)



Stakeholder Participation and Dual Materiality Assessment

Stakeholder Communication and Participation

Communication with various stakeholders is essential in fulfilling our responsibilities as a corporate citizen. We have categorized our major stakeholders into customers, employees, local communities, partner company shareholders and investors, and the media/government, and established communication channels according to the characteristics of different stakeholders to communicate through various communication channels, and to address major interests and demands.

Stakeholder	Stakeholder definition	Communication channels	Major interests
Customer	Stakeholders being supplied with DS Dansuk's products and services	• Website customer center • On-site consultation	• Quality • Price • Delivery
Executives and employees	Human resources that make up DS Dansuk, stakeholders who are future assets of the company	• Groupware • Labor-Management Council (Quarterly) • Safety and Health Council (Quarterly)	• Welfare benefits • Training • Work-life balance
Local community	Stakeholders who are affected by DS Dansuk's management activities in terms of local economy and environment	• Social contribution activities • Visits to related organizations	• Social responsibility • Investment in local communities
Suppliers	Stakeholders who build diverse and strategic part-nerships with DS Dansuk and exchange essential impacts on the company's business activities	• Supplier meeting (annual) • Safety training	• Fair trade • Work safety
Shareholders and investors	Stakeholders who invest in and benefit from DS Dan-suk and are affected by the company's management and profitability	• Shareholder meeting • Board of Directors • Website	• Dividend • Financial statement
Government/local government	Stakeholders who interact with DS Dansuk and have a role in monitoring and eval-uating the company's impact and responsibility	• System briefing session • Public-private cooperation programs	• Compliance with laws and regulations • Partnerships

Dual Materiality Assessment

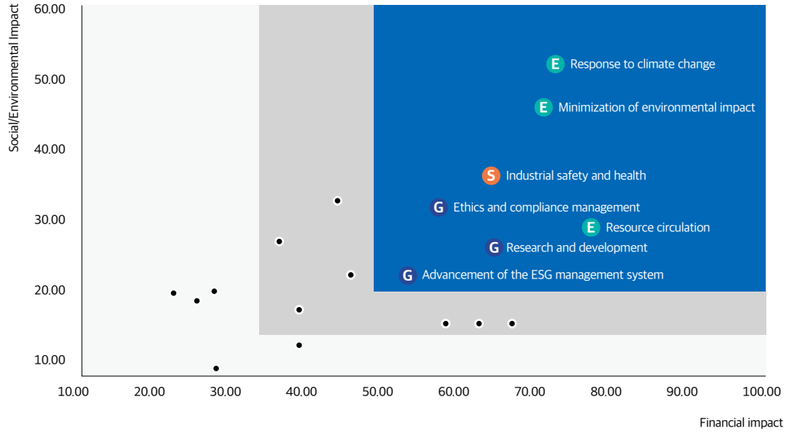
Dual Materiality Assessment Results [1)]

As a result of dual materiality assessment, the seven issues of response to climate change, minimization of environmental impact, resource circulation, industrial safety and health, ethics and compliance management, research and development, and advancement of the ESG management system were selected out of a total of 19 issues. In particular, fives issues of minimization of environmental impact, resource circulation, industrial safety and health, ethics and compliance management, and research and development were selected as core material issues for two consecutive years. Response to climate change and advancement of the ESG management system were selected as new major issues.

DS Dansuk faithfully included the major sustainability management activities and achievements of the company in 2022 with a focus on the major issues. We will continue to transparently disclose necessary information and performance of interest to all stakeholders, including financial and social/environmental information.

Step 1	Step 2	Step 3
Derivation of ESG issue pool	**Dual materiality assessment**	**Derivation of major ESG issues and review of their effectiveness**
• Analysis of ESG strategies and existing reports • Identification of material and disclosed issues of benchmarking companies[3)] • ESG-related evaluation and standard analysis (MSCI, SASB)	**[Financial perspective]** External environment analysis • ESG evaluation indicator analysis • ESG management strategy analysis • Finance-related stakeholder survey **[Social/Environmental perspective]** Internal environment analysis • Media analysis • Benchmarking • Internal and external stakeholder survey	• Identification of issues within the core response areas as material issues through materiality assessment by considering the size of the impact of the company's activities on external stakeholders and the possibility of affecting the company's financial performance • The material issues identified as a result of the materiality assessment in 2023 will be reported to management to strengthen the linkage of response goals, plans, and strategy establishment of ESG issues.

2022 Materiality Assessment Results



List of Major Issues

Ranking	2023 ESG material issues	Note[2)]
1	Response to climate change	NEW
2	Minimization of environmental impact	△8
3	Resource circulation	△7
4	Industrial safety and health	▽1
5	Ethics and compliance management	▽3
6	Research and development	▽1
7	Advancement of the ESG management system	NEW

1) As a result of the 2023 dual materiality assessment, environmental issues have been selected as top issues. This indicates that DS Dansuk is focusing on expansion of eco-friendly business, and that the topic is recognized as a top priority in ESG management.

2) Information on changes in ranking compared to the previous year's materiality assessment results and newly selected material issues are included.

3) Companies that compose the same eco-friendly business portfolio as DS Dansuk, such as bio fuel/energy were selected and analyzed as benchmarking companies.

Response Strategies Linking Material Issues with UN SDGs

DS Dansuk established risk/opportunity factors and response strategies for the identified seven major issues and implements systematic management based on the values of UN SDGs.

Ranking	Material Issue Name	Implementation of UN SDGs Targets	Risk Factors	DS Dansuk's Response Strategies	Report page
1	Response to climate change	7, 13	• Increased losses in response to natural disasters due to climate change, and increased energy cost burden due to response • Increased interest from external stakeholders in climate change-related response strategies	• Promotion of GHG reduction at each business sites • Operation of solar power generation facility • Energy management through FEMS (process energy management system) • Biodiversity protection activities • Establishment of 2050 Carbon Neutrality Roadmap	40-45p
2	Minimization of environmental impact	6, 7, 13, 15	• Minimization of environmental pollutants at business sites through achievement of carbon neutrality • Need to secure workplace competitiveness and enhance customer satisfaction	• Water resources management and wastewater recycling • Strengthening of online system monitoring • Response to chemical-related laws and regulations by country	66-73p
3	Resource circulation	12	• Need to strengthen resource reuse and recycling	• Waste cooking oil recycling • Recycled PP/waste PVC recycling • Waste battery/rare metal resource recycling	46-51p
4	Industrial safety and health	13, 8	• Strengthened legal regulations following enforcement of the Severe Accident Punishment Act • Increased demand for social responsibility by achievement of ZERO workplace accidents	• Establishment of serious disaster reduction roadmap policy • Promotion of installation of automated external defibrillator (AED) at all business sites • Promotion of autonomous safety and health diagnosis through external professional organizations	52-61p
5	Ethics and compliance management	6	• Need to meet expectations for corporate compliance with legal regulations and fraud prevention	• Operation of online ethics reporting line • Ethics training for executives and employees	90-92p
6	Research and development	7, 13	• Increased demand for eco-friendly new technologies in energy consumption, greenhouse gas emissions, and resource circulation	• Biodiesel and bio heavy oil development and sales business • Promotion of bio marine fuel business	20-29p
7	Advancement of the ESG management system	8, 9, 10, 13	• Need to inspect and strengthen ESG management system • Strengthening of risk management in accordance with strengthening regulations for each ESG sector	• Establishment and quarterly hosting of ESG Sustainability Committee • Operation of an integrated risk management system • Establishment of 2050 Carbon Neutrality Roadmap	32-37p, 94-96p

Driven Sustainability Story

DS Story 1. Response to Climate Change

DS Management Approach

The purpose of corporate activities is not limited to corporate development due to the intensifying climate change, and the global social demand for expanding the sustainability of human society through environmental protection is also increasing. DS Dansuk will prepare preemptive and practical strategy to respond to climate change in order to reduce greenhouse gas emissions and carbon emissions based on eco-friendly business and realize carbon neutrality (Net-Zero).

Aligns with these UN Sustainability Goals

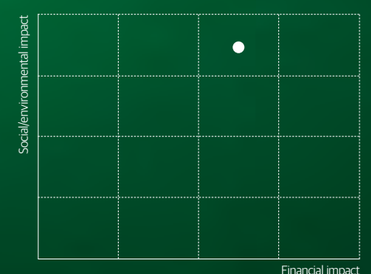
Target 7.2
By 2030, increase the share of renewable energy in the global energy mix (diversification of energy sources)

Target 13.3
Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

The impact of climate change response on DS Dansuk

Financial impact
Social/environmental impact

Material issue matrix



Governance

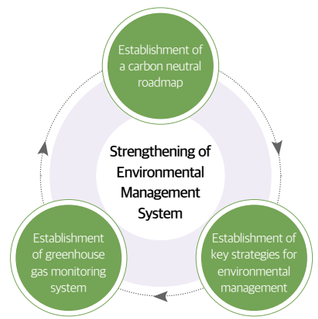
DS Dansuk has established a company-wide environmental management organization system to establish major strategies of responding to climate change and achieving zero environmental pollution, and selected tasks to achieve customized strategies for each business site centered on the head office. In addition, we are expanding activities to raise environmental awareness by carrying out tasks, training, diagnosis, and inspection centered on the environmental management and environmental safety teams at each business site. In particular, major strategies to reduce GHG emissions in the environmental sector and expanding the use of renewable energy are established to the board of directors. We will continue our efforts to strengthen the environmental management system at all business sites, to discover/manage environmental risks, and achieve targets.

Strategy

DS Dansuk places eco-friendly management as its top priority, with all members recognizing its importance and value and abiding by the environmental policy in all tasks to fulfill the corporate responsibility and mission. We produce eco-friendly clean fuel reducing GHG emissions, and contribute to global climate crisis response through circular economy projects creating new added value by utilizing waste and waste resources. We are implementing and improving strategy establishment and execution according to the PDCA cycle.

Metrics and targets

DS Dansuk plans to establish a systematic environmental system to minimize the environmental impact of its business activities and spare no environmental costs in managing the emission of environmental pollutants at each business site. All employees will spare no efforts in contributing to the society and preserve the environment by systematically establishing, implementing, maintaining, and continuously improving the environmental management system.



Risk management

In the global trend of promoting a transition to a green era and strengthening GHG reduction regulations due to the global climate crisis, DS Dansuk is managing risks based on an eco-friendly business portfolio. The company has entered the ultra-low sulfur Bio Marine Fuel market in its earnest in addition to the HVO business gaining traction as the next-generation biofuel, securing new growth engines and further contributing to reducing global carbon emissions. In addition, we have recruited related experts to expand our expertise in environmental management. Our goal is to increase employees' concentration of work through detailed division of duties for each person in charge, and create work guidelines that can be applied equally across the company.

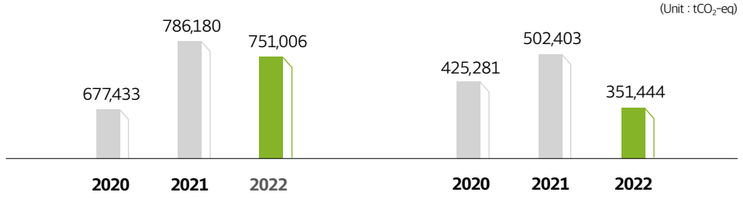
Contribution to GHG reduction through eco-friendly business

In order to preemptively respond to domestic and international demands for carbon neutrality, DS Dansuk started the biodiesel business in 2007. Since then, the company's sales volume has continuously increased, reducing GHG emissions by replacing fossil fuel-based biodiesel fuel. In 2022, the company sold 361,225 tons of biofuel (biodiesel, bio-heavy oil), estimated to have reduced 1,102,450 tCO_2-eq of GHG emissions when converted to GHG reduction. In addition, the quality of UCOME (Used Cooking Oil Methyl Ester), known to have superior GHG reduction effect than FAME biodiesel, has been improved to meet the growing demand overseas markets. We plan to increase production and sales according to the growing demand of the global market to participate in global GHG reduction efforts.

GHG reduction plan to strengthen climate change response

GHG reduction (based on biodiesel)[1)] **GHG reduction (based on bio heavy oil)** [2)]

(Unit : tCO_2-eq)



1) Jae-kon Kim(2019). "The Status of Sustainable Biofuels Policy and Development (90p).", Presentation materials released by Korea Carbon Forum 2019.Petroleum Technology R&D Center, Korea Petroleum Quality & Distribution Authority(K-Petro)
2) Hyeong-joo Seo (2018), "Analysis of Environmental, Socio-Economic Effects of the Bio-Heavy Oil Industry (118p)" Sejong University Graduate School Doctoral Dissertation

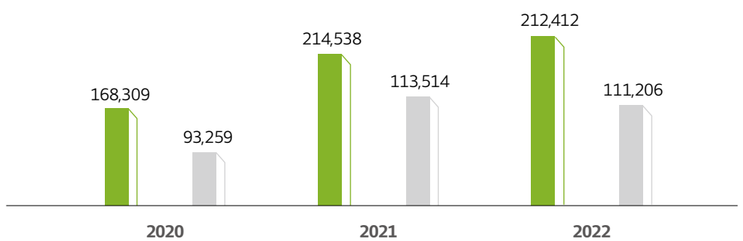
Circular economy system for bioenergy business

DS Dansuk's bioenergy business is building a circular economy system producing renewable energy by utilizing various waste and byproducts from the process of refining and using waste cooking oil and various edible oils and oil refining. In the future, we will continue to expand and produce eco-friendly products such as HVO and bio jet fuel based on our accumulated technological capabilities, reducing GHG emissions and realizing a circular economy ecosystem.

Waste[1)], Waste&Residue[2)] raw material consumption

Waste
Waste&Residue

(Unit : tCO_2 -eq)



1)Waste : Waste or materials discarded after fulfilling their purpose in life or business activities
2)Residue : Low-grade oil or by-products from the process

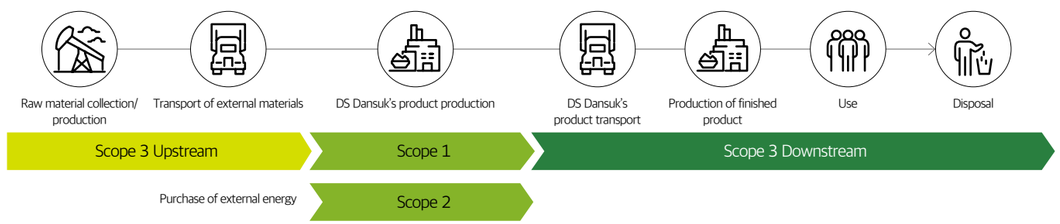
Environmental management roadmap for carbon neutrality

DS Dansuk deeply sympathizes with corporate environmental and social responsibilities in responding to global climate crisis. To this end, we established an environmental management roadmap in order to actively participate in the government's 2030 NDC and global carbon neutrality policy. We plan to realize our roadmap through maximization of the effect of reducing external GHG emissions through recycling of waste resources in major businesses and minimizing environmental impact through detailed strategies for each area under mid-to long-term basic goals.

Building the foundation for environmental management (2021~2025)	Internalization of environmental management system (2026~2030)	Advancement of environmental management (2031~2050)
• Establishment of foundation for ESG governance and refinement of management policies (strengthening committee activities, etc.) • Establishment of carbon neutrality roadmap • Development of eco-friendly technologies and business - Pre-treatment of HVO raw materials, LIB recycling, Re-NCM precursor, PCR plastic • Expansion of eco-friendly certification and products (ISCC, GRS, etc.) • Diversification of utilization of waste resources and establishment of supply chain • Strengthening of environmental impact/waste monitoring and management processes • Reinforcement of the GHG monitoring system • Improvement of energy efficiency by improving process operation and introducing high-efficiency facilities • Laying the foundation for Life Cycle Assessment (LCA)	• Support and joining climate change initiatives (TCFD, etc.) / Establishment of an environmental management disclosure system • Establishment of climate change response strategy and revision of carbon neutralization roadmap (quantitative target) • Development of eco-friendly technology and business - Expansion of recycling scale and establishment of HVO and SAF production system (entering Saemangeum RE100 industrial complex, etc.) • Increase of the use of eco-friendly raw materials and establishment of a supply chain climate change response system • Establishment of energy consumption (intensity) reduction targets • Conversion of business vehicles to eco-friendly vehicles • Analyze and reduce emissions across the value chain including Scope3	• Joining of a global eco-friendly initiative and establishment of a certification system (RE100, SBTi, etc.) • Expansion of procurement of new and renewable energy by business site and reviewing of 2050 Net-Zero Plan • Development of eco-friendly technologies and business - Expansion of new businesses such as fuel cell production and green hydrogen production through water electrolysis • Strengthening of support for climate change response activities of suppliers within the supply chain • Offsetting carbon emissions through external reduction projects • Application of carbon reduction technology process (CCUS, e-fuel) • Establishment of company-wide goals and development of activities for biodiversity activities

Product environmental impact management - Life Cycle Assessment (LCA)

DS Dansuk promotes Life Cycle Assessment (LCA) to comprehensively manage the impact of products on the environment throughout the entire lifecycle from collection of raw materials to disposal. DS Dansuk aims to disclose objective environmental information expansion and external certification in transparent manner through quantitative analysis of resources and energy input and pollutants emitted during the entire process of the product system and identification of potential impact on the environment.



Activities/Performance

DS Dansuk is carrying out facility investment and low-carbon process investment projects for GHG reduction and energy use improvement. From 2021, we are expanding air pollutant management to all business sites and monitoring GHG emissions throughout the entire production process in order to reduce GHG emissions. We are also implementing a GHG emissions trading system, and allocation of 94,634tCO_2-eq is expected for 2022, with a total allowance of 10,679tCO_2-eq. In addition, Gunsan Recycling Plant will save energy and reduce GHG emissions through activities to improve energy use efficiency, such as deciding on a carbon-neutral facility support project and lighting replacement at workplaces to reduce energy use and carbon emissions.

GHG emissions verification statement

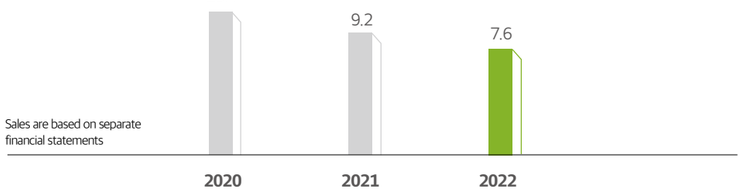
GHG reduction after replacement of two filter dust collectors

(Unit : tCO_2-eq)

Category	Electricity Consumption	GHG Emissions
Unit	kWh	tCO_2-eq
Before improvement	602,318	276.712
After improvement	105,210	48.334
Reduction	**497,108**	**228.378**

GHG emissions intensity

(Unit: tCO_2-eq/KRW 100 million (sales))



GHG and energy consumption reduction activities by Plant

Pyeongtaek Plant EnMS System

Category	Used fuel
Sihwa Plant	The capacity of the boiler is made to suit the process by replacement of old boilers, reducing LNG usage by increasing efficiency
Gunsan Recycling Plant	Selected for carbon neutral facility support project hosted by the Ministry of Environment Replacement of two new filter dust collectors and reducing the amount of compressed air generated from the dust collection facility by approximately 70% Target to reduce electricity consumption and reduce GHG by 229 tons annually
Gunsan Fine Chemical Plant	Operation by lowering the temperature of the boiler by innovating the value of waste heat recovery Reduction of LPG usage by increasing efficiency
Pyeongtaek Bio Plant	Real-time management of energy consumption in Plants by establishing EnMS System(Energy Management System) Sharing of energy consumption with all employees through in-office EnMS monitoring Energy saving by identification of energy loss areas through annual thermal energy diagnosis

ESG Bond/Green Guarantee

DS Dansuk issued ESG bonds (KRW 20 billion) and raised green guarantees (KRW 5.415 billion) for GHG reduction to respond to climate change and to promote bioenergy business to reduce environmental pollution.

Businesses subject to ESG bond/green guarantee

DS Dansuk has raised KRW 20 billion through green bonds, and plans to export and sell eco-friendly fuel through production of biodiesel and heavy oils through purchase of raw materials. These bioenergy projects are included in the eligible project category under the Korean government guidelines. Also, by review of the relationship with the UN SDGs and the SDGs mapping of the International Capital Market Association (ICMA), DS Dansuk's ESG bond and green guarantee fall under SDG 7 "ensure access to affordable, reliable, sustainable and modern energy for all".

Project	KIS Taxonomy	Government guideline	UN SDGs
Bioenergy	New and renewable energy	1. Business related to new and renewable energy	7.2. By 2030, increase substantially the share of renewable energy in the global energy mix 7.a. By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology

Individual target project selection process

1st Stage

Planning and discussion of ESG investment projects by working-level departments and planning teams

2nd Stage

ESG environmental impact and financial viability analysis

3rd Stage

Decision on final investment made through a management meeting, investment based on final approval

4th Stage

General management of project, progress/ improvement reporting to management by financial headquarters

Outline of ESG bond/green guarantee

DS Dansuk aims to meet the trend of global GHG reduction through projects of purchasing raw materials for bioenergy (biodiesel, bio heavy oil). We plan to expand the use of eco-friendly fuels in the aviation and shipping sectors and realize the commercialization of eco-friendly energy. To this end, we will increase stakeholder satisfaction through issuing ESG bonds and strengthening seamless purchase of raw materials through stable sourcing of corporate capital.

DS Dansuk's projects and businesses have very low negative effects and the likelihood of serious impacts in the future in terms of environmental impact. In particular, as the capital invested through ESG bond issuance is invested in purchasing raw materials for biodiesel and heavy oils, the effect of replacing fossil fuels and GHG reduction through our bioenergy business is clearly anticipated.

Performance of ESG bond/green guarantee

According to the research results and standards of the UNFCC(United Nations Framework Convention on Climate Change), replacement of 10,000 liters of fossil fuel-based diesel by biodiesel will lead to the reduction of GHG by 26.2 tCO_2-eq. DS Dansuk's sales of biodiesel and bio heavy oils was 254,186tons and 107,039tons as of 2022. As the amount of GHG reduction has been increased to 1,102,450tCO_2-eq, bioenergy projects receiving capital from green bond issuance is expected to contribute to improving the environment by reducing greenhouse gases and mitigating climate change. Also, since use of biodiesel and heavy oils may lead to reduction of air pollutants, DS Dansuk aims to continue issuance of ESG bonds and procurement of green guarantees to lead eco-friendly management while fulfilling corporate social responsibilities.

DS Story 2.

Reinforcement of Circular Recycling Solution

DS Management Approach

DS Dansuk operates a corporate research center with expertise in resource circulation and recycling and promotes eco-friendly business in order to overcome the limitations of being a resource importing country. In particular, we are carrying out research, development, and commercialization in each major sector to maximize the company's business capacities and potential. DS Dansuk considers discovery of growth engines for the company and securing competitiveness in the market to be important and does not shy away from its roles and responsibilities as a company prioritizing the environment. We will continue our efforts to become a total solution provider creating sustainable values.

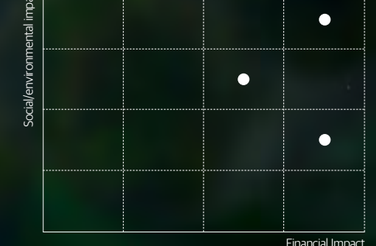
Aligns with these UN Sustainability Goals

Target 7.a
By 2030, enhance international cooperation to facilitate access to clean energy research and technologies, including renewable energy, energy efficiency, and advanced and cleaner fossil fuel technologies, and promote investment in energy infrastructure and clean energy technologies

Target 14.1
By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

Target 15.1
By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements

Impact of circular recycle solution on DS Dansuk



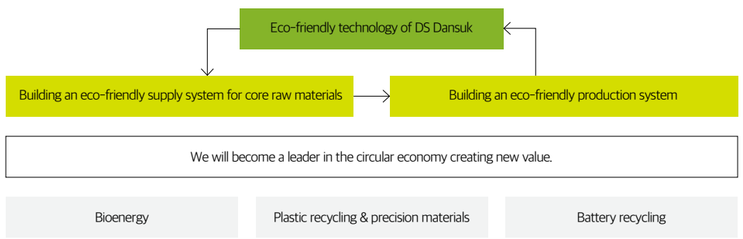
Technology development activities by business

- Bioenergy
  - Advancement of 2nd generation biodiesel (HVO) raw material treatment and production technology
  - Diversification of applied raw materials such as waste resources and by-products
- Battery recycling
  - Development of waste LIB recycling technology
  - Development of Re-NCM precursor and lithium iron phosphate (LFP) battery cathode material
- Plastic recycling
  - Advancement of PCR plastic separation and selection technology
  - Development of PCR plastic high-efficiency production process technology

Governance

DS Dansuk is diversifying its portfolio into eco-friendly businesses and eco-friendly circulation businesses as well as strengthening the competitiveness of its existing business in order to realize a decarbonized society. Furthermore, we are seeking business opportunities to secure new growth engines to provide differentiated competitiveness.

Building a circular economy system



Strategy

DS Dansuk prioritizes proactive response to environmental regulations and market changes among global ESG regulations and trends related to corporate business activities. In order to maximize our strengths, we are pursuing the commercialization of second-generation biodiesel (HVO), the development of battery recycling technology, and the development of plastic recycling technology as key business strategies.

Metrics and targets

DS Dansuk aspires to become a global leader in the eco-friendly circular economy and to strengthen its business that considers the development of the national ecosystem as well as the local community. We plan to do so through expansion of recycled product production plants and facilities, expansion of B2B business, and collaboration with local governments.

Strengthening circular recycling solutions

Risk management

DS Dansuk has elevated risk management responsibility centered on the board of directors, classifying risks that may impact the company's business activities by type, and preparing response strategies to discover business opportunities from risks. In particular, we are identifying major risk factors arising during project execution in each business area and strengthening company-wide communication in order to prevent recurrence of issues, striving to lower the overall risk rate.

Circular Recycle Solution Vision

DS Dansuk is making systematic preparations to cement its position as a company specializing in resource circulation in response to environmental regulations in major countries such as the US and EU countries and the increasing demand for global recycling energy and materials. We are promoting an HVO project to strengthen our green business. Furthermore, we will start construction of a plant dedicated to HVO pretreatment raw material production in 2024, and a plant dedicated to HVO and bio-jet fuel in 2026. In addition, we will continue our growth as a resource recycling and eco-friendly energy company by developing eco-friendly process technology as well as recycling technology tailored to the characteristics of waste batteries and plastics.

	Bioenergy	Battery Recycle	Plastic Recycle
Business Sector			
Business Status	Scope expansion from 1st generation biodiesel to 2nd generation biodiesel (HVO)	Expanding demand for recycling and mining for rapidly growing lithium-ion batteries (LIB)	Carbon-neutral and sustainable PCR business gaining attention
Business Direction	Preoccupy the second-generation bioenergy market such as biojet fuel through HVO processing raw materials and main production	Growth into a secondary battery material company based on LIB recycling technology development and recycled raw materials	Establishment of a foundation for high-performance recycled plastics, with a focus on PCR plastics and engineering plastics
Future Developments	• HVO oil refinement technology (PE removal, metal removal such as phospholipid, chlorine removal, sulfur removal technologies)	• Secondary lithium battery recycling technology • Development of Re-NCM precursor and lithium iron phosphate (LFP) cathode material	• Development of high-purity waste plastic classification technology utilizing specific gravity/electrostatic/color difference.

Taking a leap to become a global leader in the resource circulation industry for future sustainable growth

HVO pre-treatment Process

DS Dansuk is currently introducing a pre-treatment facility for Hydro-treated Process input raw materials as an effort to enter the second-generation biodiesel (HVO) and bio-jet fuel markets. Second-generation biodiesel requires more stringent management standards in terms of quality compared to the first generation. Accordingly, we are striving to take an early lead in the HVO raw material refining market by securing a process satisfying relevant standards.

Feed Stock → PE removal → Degumming → Bleaching → Pre-treated Oil

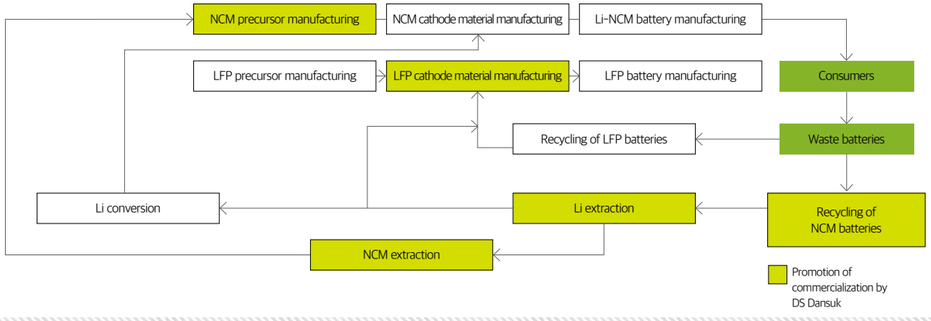
HVO Process

DS Dansuk plans to enter the second-generation biodiesel market in earnest based on securing HVO pretreatment raw materials. Sites such as the Gunsan Industrial Complex are being reviewed for the HVO plant, and we plan to expand the production of recycled diesel based on waste resources and enter the bio-jet fuel markets home and abroad based on the HVO plant.

Pre-treated Oil → Guard/Treating Reaction → Isomer Reaction → Fractionation → HVO / SAF / Naphtha

LIB Project Plan

With the rapid growth of the electric vehicle market, it is expected that the amount of waste batteries generated will increase with the increasing demand of related NCM and LFP batteries. We aim to expand our business scope in the secondary battery market based on our experience in the waste lead acid battery recycling business, battery supply and demand network, land ownership for comprehensive waste recycling processing business, and experience in material manufacturing business.



Business Development Map

DS Dansuk will not be satisfied with the performance of existing businesses and aims to cement its position as a leading company specializing in resource circulation through continuous technology development and business model innovation.

Bioenergy

DS Dansuk's bioenergy business is increasing its value as a core business through diversifying raw materials, applying automated process technology, traceability management, and certification system.

Process Innovation

Waste oil refining technology/process

Refining and conversion of residual by-products such as waste cooking oil and food waste into raw materials (140,000 tons/year)

Ester with glycerol process

Utilization of oil with high acid/low quality/ waste (50,000tons/year)

Neutralization and cleaning process

Reactor

Smart UCO refinement process

- Manufacturing of high-quality raw materials through automation of used cooking oil can input/processing (86,400tons/year)
- Designed to sort and recycle foreign substances such as steel scrap and PP

Business Innovation

Diversification of material supply/utilization

Waste cooking oil, animal and vegetable oil, food waste, POME, etc.

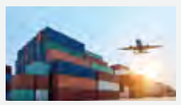
Strengthening of raw material supply chain transparency

Utilization of Blockchain technology/platform to strengthen PO (Point of Origin) traceability of raw materials

Biodiesel manufacturing → European/American certification → Domestic sales and export of biodiesel

HVO raw material preprocessing (starting construction in July 2023)

HVO plant construction (planned to start construction in 2026)



Battery Recycling

Based on its capabilities in the waste lead acid battery recycling business, DS Dansuk is promoting the recycling rate of valuable metals through a highly efficient physical sorting process as well as extracting secondary battery materials. Furthermore, we plan to manufacture lithium compounds of high purity by developing a preemptive separation and recovery process for lithium within black mass, manufacture Re-NCM precursors using recycled raw materials, and even pursue the LFP cathode material business.

Production of recycled lead from recycling waste lead batteries (up to 100,000 tons/year)

Copper melt casting process

- Production of pure copper and copper alloy products (14,400 tons/year)

Start of LIB recycling plant construction (May 2023)

Waste LIB processing (8,000 tons/year), black mass extraction (5,000 tons/year)

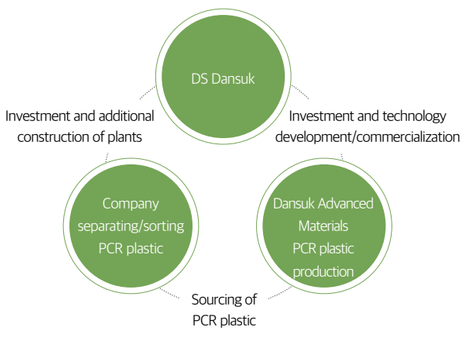
- Additional construction of LIB recycling plants (from 2024) in Malaysia, Indonesia, Vietnam, Thailand, etc.
- Construction of Re-NCM precursor plant (from 2025) for manufacturing utilizing recycled raw materials (Saemangeum, etc.)
- Construction of LFP cathode material (from 2025) at Gunsan Fine Chemical Plant, Saemangeum, etc.

Plastic Recycling

With globally increasing plastic regulations and recycling obligations, DS Dansuk is pursuing the PCR plastic business to produce high-quality recycled plastic and establish a virtuous cycle system. We plan to expand our business by building a recycling center (RC) network to expand the supply and demand of recycled raw materials, upgrading PCR plastic separation/sorting technology, and building additional production plants.

PCR Plastic Manufacturing Process

Recovery of abandoned home appliances → Grinding the recovered product into pellets → Washing of granules converted to pellet form → Sorting and separation of pellets by type → Mixing with existing raw materials in appropriate ratio



Construction of additional PCR plastic separation/ sorting plants (in Korea and in Vietnam, etc.)

Construction of small-to-mid sized recycle center to supply waste plastic (Utilize small and medium-sized home appliances recovered before grinding)

DS Story 3. Strengthened Occupational Safety and Health

DS Management Approach

With the Serious Accidents Punishment Act coming into effect in January 2022, it is required for companies to establish a safety and health management system and strengthen industrial safety and health activities. In the past, the focus of safety and health management was on the obligation to take action, but it is more important nowadays to secure safety and health to minimize casualties and maximize accident prevention.

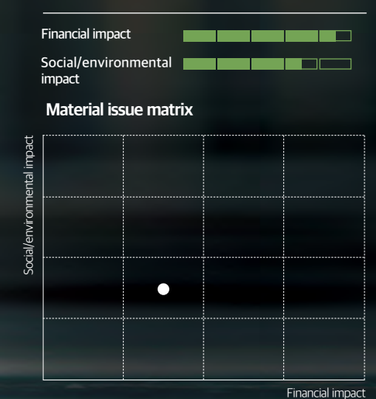
Accordingly, DS Dansuk aims to strengthen the level of safety and health management by focusing on the creation of a ZERO workplace for serious accidents. In particular, we would like to strengthen the response system in the event of an accident to minimize the occurrence of damage and ensure the safety and health of executives and employees of partner companies.

Aligns with these UN Sustainability Goals

Target 3.4
By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being

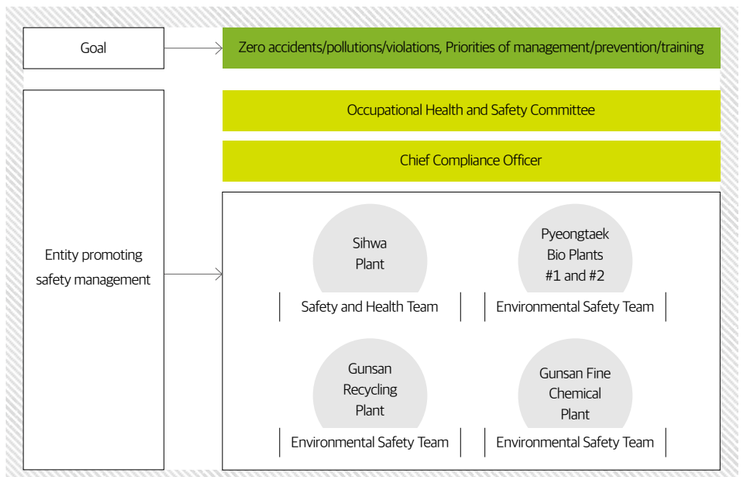
Target 8.4
Improve progressively through 2030 global resource efficiency in consumption and production, and endeavor to decouple economic growth from environmental degradation in accordance with the 10-year framework of programs on sustainable consumption and production with developed countries taking the lead

Impact of industrial safety and health on DS Dansuk



Governance

DS Dansuk has appointed a Chief Safety Officer (CSO) to establish and implement a safety and health management system stipulated in the Act on the Punishment of Serious Accidents for all business sites, systematically overseeing and managing safety and health-related efforts at each business site. Safety and health managers at each business site work closely with Sihwa Plant safety and health team to build a safety and health management system, expanding and strengthening the safety and health governance system.



Strengthened risk identification/removal activities to prevent major disasters

- Establishment of a serious disaster prevention system
- Strengthening of safety management activities within workplaces
- Securing the soundness of facilities/equipment

Strengthened activities to 'increase safety awareness' for employees and partner workers

- Strengthening training/campaigns to improve safety capabilities of employees
- Incorporating safety as part of daily routine/habits
- Development of on-site safety activities

Strengthening employee health promotion activities

- Strengthened activities to improve employee health
- Activation of risk prediction
- Establishment of a data-based HSE activity system

Strategy

DS Dansuk plans to implement strategies and activities with a focus on prevention in order to strengthen occupational safety and health and achieve ZERO serious accidents. The internal safety and health management system is periodically inspected to ensure the soundness of equipment/facilities to strengthen worker safety protection. In particular, we provide professional training in addition to legally required training to workers in high-risk processes to strengthen their safety-related capabilities.

Metrics and targets

DS Dansuk is strengthening its safety and health management system to achieve its operational goal of zero serious industrial accident. We are making efforts to ensure a safe and pleasant working environment by establishing and appropriately executing safety and heath management budget led by management.

Risk management

DS Dansuk is preparing for the establishment and revision of safety and health-related laws by operating a safety and health team, utilizing the 'Legal Revision Service', and providing technical guidance and consignment management to professional companies. In accordance with the policy direction of the 2023 Serious Disaster Reduction Roadmap, our risk assessment regulations have been revised to establish a self-discipline prevention system. Furthermore, efforts have been made to build a culture of safety and health participated by all workers through introducing proposal boxes and planning contests.

Safety and Health Management

DS Dansuk has established and announced a safety and health management policy for 2022. We plan to implement a management policy geared toward strengthening the level of the safety and health management system based on this policy. In 2023, we will strengthen our set of activities to achieve strategic tasks such as 'ensuring ZERO serious industrial accidents' and 'strengthening activities to prevent serious industrial accidents'.

Goal	Zero accidents/pollutions/violations, Priorities of management/prevention/training
Strategic Tasks	Environmental Safety Facility Management / Environmental Safety Operation Management / Nurturing Human Resources Specializing in Safety
Major Tasks	• Maintenance of environmental facilities tailored to new and expanded production processes • Improvement of work environment and methods • Promoting the habit of risk assessment at work • Securing soundness through regular inspection and maintenance of equipment • Reporting changes in license according to new/expanded production process • Establishment of an on-site safety management system in line with the chemical accident prevention and management plan • Improvement of process safety management (PSM) • Establishment of an environmental and safety management system through ISO 45001 and ISO 14001 certification • Exchange of chemical plant information through participation in the Process Safety Management Council • Enhancement of practical capabilities through specialized training and seminar attendance • Guidance and support for the legal qualification acquisition process

Safety and Accident Rate

Serious disaster (last 6 years)
0.0%

ISO 45001 Safety and Health Management System

Safety and Health Management System

DS Dansuk holds Safety and Health Management System (ISO 45001) certification for all business sites, and continues to improve the system and maintain certification through regular audits. A department dedicated to environmental safety and safety and health is assigned to each business site to operate specialized safety and health activities for each business site. At the same time, we are inspecting safety and health management status through promoting quarterly self-inspections for each business site in order to establish a safety and health management system.

DS Dansuk is maintaining zero serious industrial accidents by strengthening process safety management (PSM), and prepares and operates process safety reports for facilities handling hazardous substances in accordance with legal standards. We are continuously making efforts to improve the level of process safety management (PSM) by promoting autonomous safety and health inspections in 2022 through an external professional agency. Pyeongtaek Bio Plants #1 and #2 have received an S grade as a result of the regular evaluation of the 2023 process safety report implementation status.

Occupational Health and Safety Committee Activities

DS Dansuk holds an Occupational Health and Safety Committee composed of employers and workers in order to collect opinions on safety and health between labor and management every quarter. A cooperative labor-management relationship is maintained through the process of enacting and revising safety and health regulations, improving on-site risk factors, and deliberating and deciding on major safety and health issues. In addition, the implementation and results of items resolved in the previous quarter are inspected to ensure practical operation of the committee.


Occupational Health and Safety Committee

Date	Agenda and resolution (Pyeongtaek plant #1)	
2022.03.25	• Additional installation of exhaust fans, etc. within the process building • Additional monthly healthcare for workers • Firefighting facility operation training	• Risk of falling in adjustment of methanol 1st line valve • Securing illumination to check water meters near the unloading area • Placement of additional safety protection equipment in each area within the plant building
2022.06.16	• Sharing of risk assessment schedule for the first half of the year • Reinforcement of wearing protective gear related to musculoskeletal diseases • Installation of a blood pressure meter in the reception room	• Installation of equipment to improve working posture at catalyst warehousing line • Reinstallation of trench footing at the EWG process entrance • Additional on-site MSDS attachment
2022.09.16	• Sharing of flu vaccination schedule • Business cooperation agreement for medical benefits at nearby hospitals • Sharing of the results of Working Environment Measurement in the 2nd half of the year • Sharing of safety inspection results of harmful or dangerous machinery	• Collection of management supervisor training schedule • Emergency response training schedule for the 4th quarter • Strict compliance with follow-up management recommendations during health consultations
2022.12.23	• Installation of local exhaust system for facility management department • Installation of entrance reflectors in the plant • Information on December occupational health doctor	• Information/request for additional provision of personal cold protection equipment for winter season • Request for measures to prevent falls on icy roads during winter • Sharing of self-audit and improvement on process safety report
2023.03.17	• Sharing of 2023 health checkup schedule and precautions • Information on criticisms/improvements made during firefighting facility operation function inspection • Evaluation of process safety report implementation status and sharing of findings	• Change in regular safety and health training time • Information on investigation of harmful factors for musculoskeletal diseases • Discussion on safety measures for power equipment
2023.06.23	• Matters on wearing personal safety equipment • Review on installing a safety and health suggestion box • Review of changes in risk assessment method	• Changes in worker break times during summer heat waves • Review on provision of refrigerated equipment in preparation for hot weather • Review of providing separate meal plans for with special dietary needs

Safety and Health Strengthening Activities

Investment in Safety and Health

Based on management's interest in safety and health DS Dansuk has established and is executing an annual safety and health management budget, striving to create a safe and pleasant working environment. In 2022, Gunsan Plant #1 invested KRW 200 million in risk assessment improvement to create a safer and more comfortable working environment, carrying out improvement activities in 88 cases. In 2023, DS Dansuk plans to conduct risk assessments to ensure the safety and health of workers in the field in order to identify harmful risk factors and making improvements through continued interest and investment in safety and health.

Communication on Safety and Health

DS Dansuk is building trust between labor and management as well as creating a safer workplace by operating a safety and health council between labor and management by resolving on-site safety and health complaints in a timely manner. In addition, executives and employees are communicating and striving to promote safety and health through communication through various channels, such as regular inspections and evaluations and training to raise safety awareness.

Regular technical guidance on safety and health

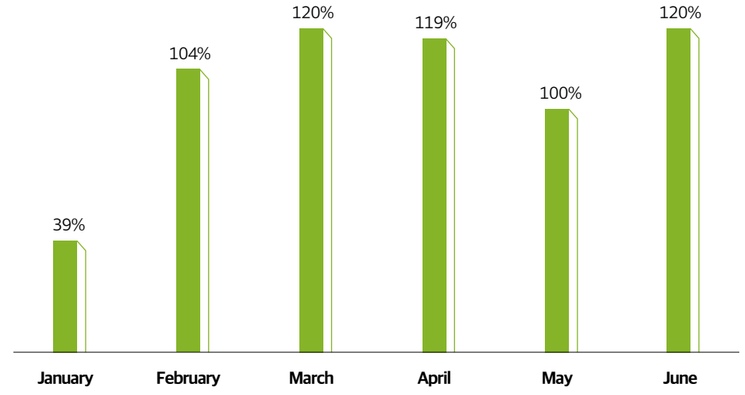
Safety and Health Communication Channel

Sort	Frequency	Response
Regular safety and health meetings with cooperative company	Once a month	A consultative body on safety and health consisting of contractors and cooperative company
Safety and health inspection with cooperative company	Once every quarter	Joint discovery of on-site risk factors and implementation of improvement activities
Workplace risk assessment	Twice a year	Identification of risk factors for each detailed process and carrying out of improvement activities • First half of the year: Identification of harmful risk factors and establishment of improvement plans • Second half of the year: Implementation of supplements according to improvement plan
Process risk assessment	Once every 4 years	Process risk assessment for PSM and improvements to reduce risk
Gyeonggi Western Region Chemical Plant Safety Management Council	Once a month	Meeting of chemical plant safety management personnel in western Gyeonggi Province to improve process safety management
Relevant organizations (Serious Industrial Accident Prevention center, fire department, Korea Occupational Safety and Health Agency, etc.)	Frequently	Inspection of safety and health management implementation and information delivery
Korea Industrial Safety Association	Once a month	Technical guidance for industrial safety management
Occupational and Environmental Medicine Center at Korea University Ansan Hospital	Once a month	Technical guidance for occupational health management (occupational health doctors, industrial hygienists, industrial nurses)
WeENG and others	Once a week	Dangerous material safety management agency and technical guidance
Urban disaster prevention and others	Once a month	Fire safety management technical guidance

Establishment of Safety and Health Culture

DS Dansuk is establishing a culture of safety by improving the level of safety awareness of all executives and employees and training personnel specializing in safety. To establish a safety management culture focusing on worksites, we are expanding specialized training to enable independent discovery and improvement of risk factors in the field. In addition, we are building a safety and health culture participated by all workers, such as introduction of suggestion boxes and contests. Sihwa Plant is actively promoting activities geared toward identifying and improving hazardous risk factors on a daily basis. In particular, we will manage safety and health activity rate as a key performance indicator (KPI) from 2023, and we will develop a practical safety and health system by setting more challenging goals.

Safety and Health Activity Rate at Sihwa Factory [1)]



1) Safety and Health Activity Rate : (Number of safety and health activities/total working hours)*1 million hours

Risk Assessment

DS Dansuk is laying the foundation for implementation for serious disaster reduction through revision of risk assessment regulations to establish a self-regulating prevention system by establishing a culture of safety and health and activating risk assessment involving labor and management in accordance with the policy direction of the 2023 serious disaster reduction roadmap. More qualified personnel such as industrial safety engineers are being employed than the legally required number of personnel in order to reduce and manage the complex risks of chemical process operation, and risks and the field and process are being managed through technical guidance and regular risk assessments, leading to discoveries and improvements in safety and health management.

Safety and Health Activities (Sihwa Plant)

Safety and Health Suggestion Box

- DS Dansuk operates a Safety and Health Suggestion Box to encourage workers to participate in risk assessments and implement daily risk assessment. We aim to establish a self-regulated prevention system through implementing worker suggestions on safety and health, such as discovering near misses, and awarding excellent suggestions at risk assessment meetings every month.

2023 Safety and Health Slogan Contest

- DS Dansuk held 2023 Safety and Health Slogan Contest to raise worker awareness in safety and health and spread a culture of participation. As a contest promoted through resolutions by the Occupational Health and Safety Committee, we are implementing a roadmap to reduce serious accidents through operating a workplace safety and health culture program. Awards are given to winners decided through voting by all executives and employees at Sihwa Plant, and the winning works will be used in increasing worker awareness in safety and health through banners and DANTalk (company newsletter)/groupware.

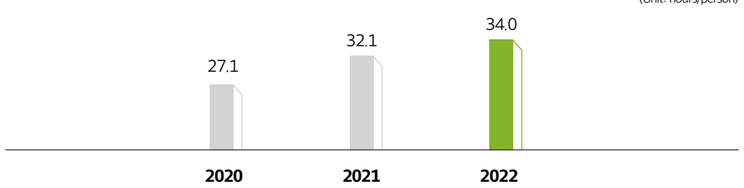
Safety and Health Training

Safety and Health Training through Case Studies

DS Dansuk has established a systematic process to improve the safety-related capabilities of executives and employees and to establish a culture of safety, regularly conducting safety and health training for workers. We are appointing and assigning safety and health managers exceeding the number specified in safety and health-related laws such as the Occupational Safety and Health Act. Their job qualifications and capabilities are maintained through new and additional training at registered safety and health training institutions. We have also established an annual training plan in order to increase workers' safety and health knowledge and awareness, encouraging compliance with laws and regulations through sharing and collaborations with managers at each business site. In addition to the statutory safety training required by the Occupational Safety and Health Act, knowledge about safety management is disseminated through a variety of trainings, including special training for supervisors and those in charge of handling hazardous substances. New training topics are reflected in the safety and health training plan in accordance with the revised Occupational Safety and Health Act, and improvements for blind spots are made by improving the processes subject to special training. Relevant health training topics are reflected monthly in the annual training plan, and the head office's safety and health training educational materials is shared on the bulletin board for Plants to utilize. In addition, review time for MSDS training is provided during regular safety and health training in accordance with relevant laws and regulations.

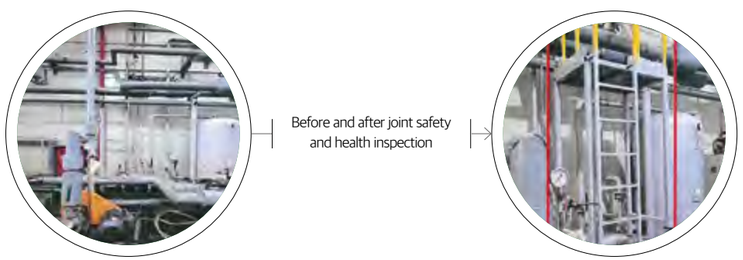
Safety and health training hours per person

(Unit: hours/person)



Cooperative company Safety and Health Management

DS Dansuk supports cooperative company by establishing safety management procedures for cooperative company to prevent cooperative company accidents. In selecting cooperative company, a preliminary evaluation of the level of safety and health management is conducted to select qualified cooperative company. Harmful risk factors within the workplace are identified through regular inspections, and safety and health activities are supported. We are establishing an autonomous safety and health management system through regular safety and health meetings with our partners, and continuously identifying and improving on-site risk management factors through joint safety and health inspections.



Safety Accident Improvement Activities

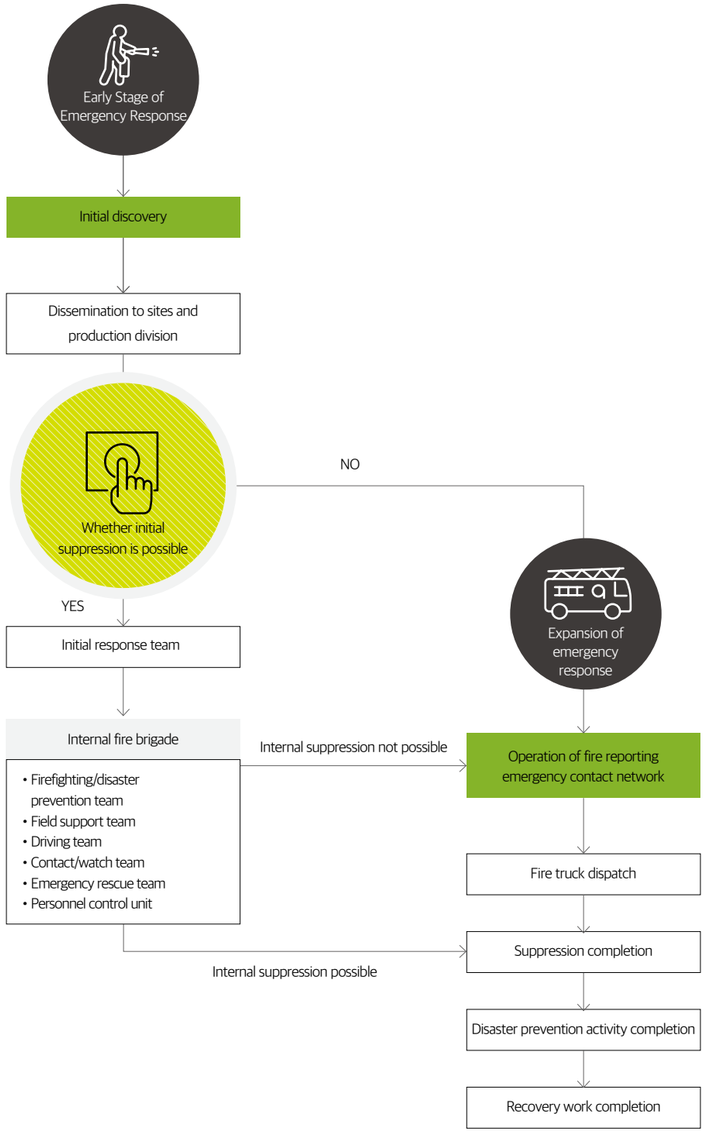
DS Dansuk is sparing no effort to establish an emergency response system through emergency evacuation drills and self-defense fire brigade drills. An emergency response system is being operated to prepare for emergencies and prevent the spread of damage through prompt and effective initial response. The crisis response capabilities of our members are strengthened by planning and promoting firefighting and emergency evacuation training according to various accident scenarios. We are also participating in the joint response council to rapidly disseminate information and actively working with the local community to prevent accidents by providing safety and disaster prevention supplies.

We are also conducting group training programs on topics in which experience is important, such as properly wearing respiratory protection, CPR, and using AED, to improve worker awareness and acquire professional knowledge. Gunsan Plant #1 is managing dust within the site by renting a dry cleaner and providing relevant training to manage dust in areas that cannot be cleaned with existing sweepers in order to improve the working environment.

Emergency evacuation drill

Firefighting facility operation training

Emergency Response Flowchart



Employee Health Management

DS Dansuk implements occupational health management for employee disease prevention and health maintenance and promotion. Each business site provides occupational nursing, including disease prevention and health maintenance and promotion for workers through a health management agency. A health manager at the headquarters from a health management agency visits quarterly to provide safe first aid, providing guidance and advice on first aid. Furthermore, we are making great efforts in preventing occupational diseases caused by chemicals in workers, carrying out health promotion activities in accordance with relevant laws and regulations, such as risk assessment of cerebrovascular diseases, job stress assessment, and investigation of factors burdening the musculoskeletal system. We are also sparing no efforts to manage and improve the health of our workers by conducting annual employee health checkups and follow-up management such as follow-up tests and health counseling based on the results of various evaluations.

Industrial nursing through organizations specializing in health management

Follow-up care for workers with a diagnosis and workers at risk of developing an outbreak (follow-up tests, health counseling, etc.)
'Reassessment of suitability for work' for Night worker diagnosed with cerebrovascular disease
Explanation of health-related questionnaire results, including risk assessment of cerebrovascular disease, job stress assessment, and musculoskeletal symptom survey.

Industrial hygiene management through external organizations

Regular work environment measures (semi-annual or annual visits to work environment measurement institutionst depending on the size of the workplace)
Regular on-site health checks (bi-monthly or quarterly visits to institutions specializing in health management depending on the size of the workplace)
Regular inspection of work hazard burdening musculoskeletal system (visit to contracted organizations once every three years in accordance with relevant laws)

Employee Health Checkup

Agreement for on-site examinations by institutions specializing in health examinations (general and special health examinations)
Agreement with in-hospital health examination agency for pre-deployment health examination and follow-up examination for follow-up management
Support for cholesterol testing costs for workplaces to assess the risk of cerebrovascular disease development
Job stress assessment

Safe first aid

MSDS training for new hires and employees changing departments
Preparation of automatic external defibrillator (AED) and CPR Mannequin for CPR training
First aid experiential training during regular safety and health training (CPR, air respirator, air supply mask, amputated stump management, burn treatment, etc.)
Review of installation of first aid tools such as automatic external defibrillator (AED) at all workplaces
Operation of first aid kits in accordance with relevant laws (replenishment through regular inspection, management of expiration, etc.)

Prevention of occupational diseases related to chemicals

Regular discovery and securing of MSDS target substances
Review by Safety and Health Team or Environmental Safety team before using new substances
Discovery and new measurement of substances subject to work environment measurement
Discovery of materials subject to special health examinations and conducting health examinations before deployment
Familiarization with first aid methods appropriate for the characteristics of chemical substances by re-educating MSDS during regular safety and health training

ESG Performance

64
ENVIRONMENTAL

74
SOCIAL

86
GOVERNANCE

Environmental

Aligns with these UN Sustainability Goals

Environmental Issues

- Minimization of impact on the environment
- Resource circulation

DS Dansuk recognizes intensifying climate change is the biggest problem facing global society. We are implementing risk management at the company level to respond to climate change and reduce environmental impact by diversifying our eco-friendly business portfolio to transition to an era of decarbonization.
In the future, we will focus on implementing environmental management to ensure the effectiveness of environmental policies, ultimately realizing an eco-friendly society by setting DS Dansuk's core tasks and KPIs.

Background

- GHGs generated during the processes of mining and combustion of fossil fuels are a major cause of climate change and global warming. DS Dansuk aims to reduce GHG, fine dust, and carcinogen emissions through development of high-quality biofuel, a next-generation energy source, with fuel performance similar to diesel fuel, perfect compatibility with existing diesel fuel, and excellent lubricating properties.
  - To secure the effectiveness of environmental management policies, we will focus on implementation of environmental management to realize an eco-friendly society by seeing our core tasks and KPIs.

Our Strategy

- Expansion of production and use of eco-friendly clean fuel-> Contribution to GHG reduction
- Expansion of circular economy projects using waste and waste resources
- Establishment/implementation of environmental management goals and strategies through PDCA cycle
- Expansion of environmental training for executives and employees
- Implementation of systematic management of water/air/waste/hazardous chemicals to minimize environmental impact at business sites

Performance

Reduction of bio heavy oil air pollutants in 2022: 586 tons

**Environmental Investment Costs in 2022
KRW 7.379 billion**

Waste recycling rate at all business sites: 54.56%

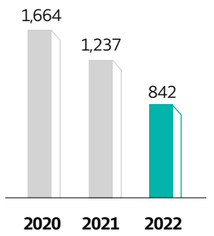
Environmental Management System

ISO 14001 Environmental Management System

Quality Environment Management Policy

Cost of Facility Investment

(Unit: KRW 1 million)



Environmental Policy

DS Dansuk has established eco-friendly management as its top priority for the company's sustainable growth, and all executives and employees are sparing no efforts in complying with the environmental policy. We are improving service satisfaction and establishing production technology and operating an environmental management system (ISO 14001) through green management to prevent environmental pollution. We have systematically established an environmental management system and are continuing our efforts to improve the system, sparing no effort in managing local environmental pollution and preserving biodiversity through minimization of pollutants.

Environmental Management System

DS Dansuk has acquired ISO 14001 environmental management system certification, an international standard, in order to minimize environmental pollution.

Business sites subject to certification	Sihwa Plant, Gunsan Recycling Plant, Gunsan Fine Chemical Plant, Pyeongtaek Bio Plant #1, Pyeongtaek Bio Plant #2
Scope of certification	Design, development and production of biodiesel, bio heavy oil, pure lead, hydrotalcite, hydromagnesite, ferromolybdenum, bismuth oxide, ritharge red lead, PVC stabilizer (single, composite), and glycerin

Investment in Environmental Facilities

During the process of deliberating investment in business, DS Dansuk reviews environmental risks such as GHG emissions and environmental pollutant emissions and reflects the review results in decision-making. We are also making environmental investments to minimize pollutant emissions. We have continued our investment in machinery and structures to prevent environmental pollution, including scrubber improvements and additional construction.

Environmental Training

DS Dansuk establishes and implements a plan for environmental training every year to raise employees' awareness of the environment and strengthen their capabilities in environmental pollutant management. Employees' environmental management capabilities and expertise are ensured by providing training for hazardous chemical users and training on new and revised environmental laws for employees at worksites. Sihwa Plant conducted environmental training for 194 persons in 2022 to internalize environmental laws and environmental management strategies and systems.

Environmental Compliance

DS Dansuk complies with safety, health, and environmental laws and regulations home and abroad and promotes autonomous practice by executives and employees through a legal management system and self-inspection checklist. In addition, regular company-wide environmental inspections are conducted to identify environmental risks in advance and prevent environmental accidents through sharing and cross-checking risks found at different business sites across the company. Furthermore, we receive assistance from external experts to inspect/diagnose environmental permits and whether on-site environmental facilities meet legal standards.

Minimization of Impact on the Environment

Air Pollutants

DS Dansuk has introduced and has been operating the total air pollutant management system implemented by the government in 2020 to improve the air environment. We have installed reduction facilities such as the highly efficient low-NOx burners and replaced absorbents within the facility every three months to reduce air pollutant emissions. All worksites are complying with environmental laws and stakeholder requirements through self-inspection in order to reduce air pollutants. Various pollutant reduction facilities are making efforts to reduce air pollutants.

Gunsan Recycling Plant complies with strict air pollutant emission standards as an integrated environmental management licensed business. The Gunsan Recycling Plant made an expenditure of approximately KRW 800 million the replacement of two old filter dust collection facilities in order to control the high concentration of air pollutants and NOx.

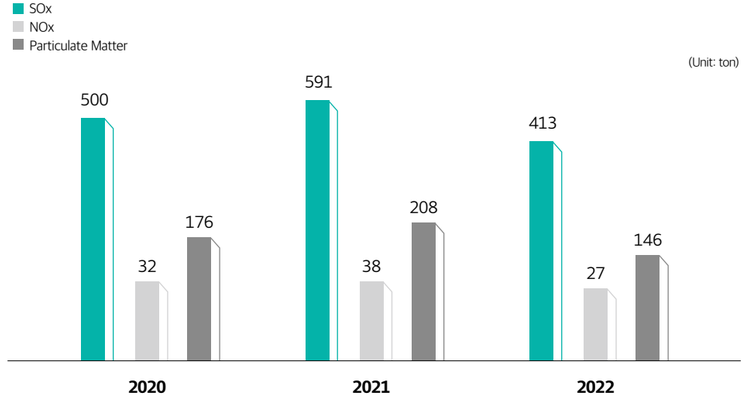
Air Pollutant Management Status

Sihwa Plant establishes a facility overhaul period in order to manage air pollutants, and also manages substances that may be additionally generated exceeding permits through self-measurement of all items at air pollution prevention facilities. In addition, we are building an environmental management ICT capable of minimizing human error and effectively compiling environmental databases. We plan to apply the system at Sihwa Plant in advance in 2023 and expand the system to all Plants from 2024. Additionally, the Gunsan Fine Chemicals Plant invested approximately KRW 20 million in scrubber repair work to reduce odor generated during the process.

Business Site Name	Site Scale	Status of Air Pollutant Prevention Facilities
Sihwa Plant	Type 2	A total of 26 units (6 Scrubber units, 14 filter type units, 2 absorption type units, 4 controlled combustion units)
Gunsan Recycling Plant	Type 1 (special)	A total of 12 units (8 Scrubber units, 4 filter type units)
Gunsan Fine Chemical Plant	Type 1	A total of 51 units (2 Scrubber units, 49 filter type units)
Pyeogtaek Bio Plant #1	Type 3	A total of 4 units (4 Scrubber units)
Pyeogtaek Bio Plant #2	Type 3	A total of 2 units (2 Scrubber units)
Jecheon Bio Plant	Type 3	A total of 4 units (2 absorption type units, 2 centrifugal force dust collection units)

Effect of Air Pollutant Reduction from Bio Heavy Oil Salles

DS Dansuk recognizes the importance of biofuel emitting significantly less air pollutants than fossil fuels. Accordingly, we are contributing to reducing air pollutant emissions resulting from the combustion of fuel for power generation by selling and supplying 107,039 tons of bio heavy oil as an energy source for power plants in 2022.



Highlight1

Scrubber Replacement and Expansion

DS Dansuk is striving to improve odor management by investing KRW 60 million in new scrubber expansion to reduce odors in the workplace. In order to comply with the odor emission standards under Article 7 of Malodor Prevention Act, pollutant treatment efficiency has been improved through scrubber replacement. We are even removing odor generated by the scrubber itself by increasing the treatment capacity compared to the existing scrubber and changing the methanol scrubber material and adding a chemical injection system.

Expansion of new scrubbers

Highlight2

Expansion of Pollution Preventive Facilities

In expansion of Sihwa Plant's smart UCO facilities, an investment of KRW 130 million was made to install new prevention facilities to reduce air pollutants and odor. Efforts were made to minimize the emission of pollutants through a two-stage design. A new washing facility was introduced to improve the spraying power of the washing water and reduce the amount of wastewater generated.

Expansion of prevention facilities

Water Resource

DS Dansuk recognizes its responsibility for the use and management of water used in the company's business activities as a company aiming to build a circular economy through eco-friendly business and resource reuse. In particular, we support 'Goal 6. Ensuring water and sanitation and sustainable management' among the UN SDGs 17 Goals(Sustainable Development Goals). Accordingly, we operate internal standards that are strengthened compared to legally permitted standards. The water quality is recorded and managed for water pollutants at each Plant.

Water Resource Management Activities at each Plant

Sort	Details
Sihwa Plant	An early management system for pollutants is installed in the final rainwater pipe within the Plant. If pH abnormality is detected, real-time notifications are sent out to check dangerous situations 24 hours a day.
Gunsan Recycling Plant	Expansion of water collection capacity from 160 tons to 400 tons by investing approximately KRW 440 million in the water collection tank improvement project. Reduction of water pollutant emissions by preventing environmental accidents and controlling high concentrations of heavy metals
Gunsan Fine Chemical Plant	pH sensors are regularly cleaned and pH levels are detected in real time 24/7 in the control room. Regularly weekly effluent test analysis is requested to monitor water pollutants.
Pyeongtaek Bio Plant	Water usage reduction through water reuse (Reduction of 7tons/day at Pyeongtaek Bio Plant #1, reduction of 36 tons/day at Pyeongtaek Bio Plant #2) Condensate is recovered from steam boilers, and approximately 45 tons/day of water is reused as a steam resource.

Management of Water Usage at Workplace

DS Dansuk is continuing efforts to minimize the increase in water usage at its business sites. We are reducing water usage by identifying and improving the causes of increases and decreases in water usage compared to before through water monitoring, and are pursuing optimized methods to reuse wastewater generated in the production process. In addition, we are making various efforts to protect water resources within our business sites, and we are leading water conservation by sharing the status of water stress[1)] in each region with executives and employees to form a consensus on water resource protection.

1) Water Stress : The amount of water used from the water in the region, excluding the water needed to maintain the environment

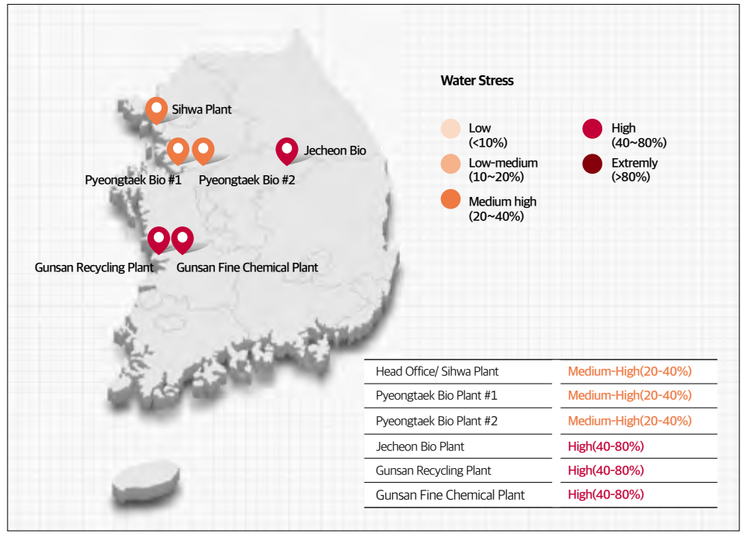
Water Pollutant Management Status

Business Site Name	Site Scale	Wastewater Prevention Facility Status
Sihwa Plant	Type 4	Joint processing of the entire amount Sump tank capacity: 1,400ton
Gunsan Recycling Plant	Type 3 (special)	Wastewater treatment method: physical and chemical treatment Wastewater treatment capacity: 800 tons/day
Gunsan Fine Chemical Plant	Type 1 (special)	Wastewater treatment method: Physical and chemical treatment Wastewater treatment capacity: 3,100 tons/day
Pyeogtaek Bio Plant #1	Type 5	Consignment processing of total quantity(sump tank capacity: 317 tons)
Pyeogtaek Bio Plant #2	Type 5	Consignment processing of total quantity(sump tank capacity: 284 tons)
Jecheon Bio Plant	Type 5	Consignment processing of total quantity(sump tank capacity: 156 tons)

Water Stress

DS Dansuk utilizes the Aqueduct Water Risk Atlas announced by the World Resources Institute (WRI) for collection and management of water usage for domestic business sites located in areas with a high water stress index.

This too divides water stress into five levels. DS Dansuk's Jecheon Bio Plant, Gunsan Recycling Plant, and Gunsan Fine Chemicals Plant are categorized as high-risk areas. For Plants located in high water stress areas, we are seeking to introduce measures to use and recycle water through development of risk management plans and management measures. DS Dansuk will consider environmental factors at all domestic business sites and will expand recycling measures to reduce water resource usage.



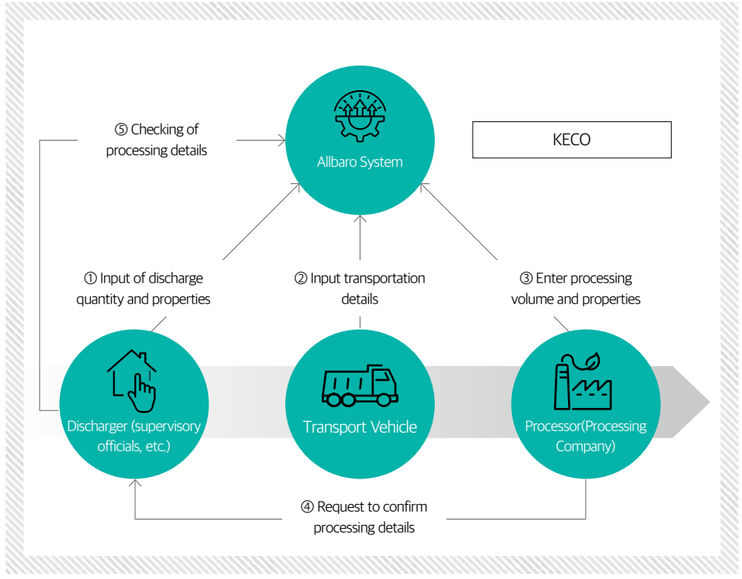
Head Office/ Sihwa Plant	Medium-High(20-40%)
Pyeongtaek Bio Plant #1	Medium-High(20-40%)
Pyeongtaek Bio Plant #2	Medium-High(20-40%)
Jecheon Bio Plant	High(40-80%)
Gunsan Recycling Plant	High(40-80%)
Gunsan Fine Chemical Plant	High(40-80%)

Waste

DS Dansuk is minimizing waste generated at its business sites for eco-friendly resource circulation and disposes of generated waste in compliance with the Waste Management Act. Furthermore, we are making various efforts to achieve resource conversion into eco-friendly products, such as operation of waste resource recovery and reuse system for waste recycling. Furthermore, we are reducing the amount of landfill waste by registering in legal waste disposal system and new contracts with waste treatment companies, hoping to contribute to resource circulation through reduction of waste.

Waste Management Activity at Each Plant

Category	Details
Sihwa Plant	Installation of security cameras in all waste storage facilities to respond to waste leaks and other accidents Implementation of a system capable of checking the entry/exit details and measurement information of all waste by 2024
Gunsan Recycling Plant	Management of the entire waste treatment through an online system Introduction of a raw material recovery system through a resource performance management implementation project hosted by the Ministry of Environment in 2022 Waste resources are reused through recovery of solids (lead sludge) in raw wastewater
Pyeongtaek Bio Plants #1 and #2	Minimization of waste generated through a system to recover and reuse byproducts generated through recycling and reuse Installation of CCTVs and establishment of a management system for waste storage facilities Registration of waste in the legal waste disposal system from generation to disposal of waste



MSDS Training

Harmful Chemical Substances

DS Dansuk complies with not only the standards for handling hazardous chemicals in accordance with the Chemical Substances Control Act, but also responds to chemical-related laws in major countries such as China, the United States, and Taiwan, thoroughly managing relevant laws to ensure that there are no violations. All chemical substances are managed in warehousing and shipping, and warehousing and shipping are carried out under the inspection by a manager and confirmation of safety matters. The safety of workers is protected in facilities handling hazardous chemicals by installing automatic valves to minimize access to workers. As a result of accident prevention activities and regular inspection and training on hazardous chemicals for all employees, we have recorded zero serious industrial accidents (fires, explosions, leaks) due to chemical substances for 6 consecutive years.
In addition, our material safety data sheets are updated in work areas in accordance with other related laws such as the Occupational Safety and Health Act and the Hazardous Substances Control Act to enable immediate response in the event of an emergency. In particular, we are storing adequate amounts of laboratory reagents in addition to materials used in the field, and we ensure that they are judged to be suitable through regular laboratory detailed safety inspections every year. We will continue management and strengthening of chemical accident prevention capabilities and response capabilities to create safer workplaces.

Preparation and Management of MSDS [1)]

DS Dansuk establishes and operates internal hazardous substance management regulations to systematically manage hazardous chemicals. We analyze and manage potential hazards during the entire process of manufacturing, using, importing, and selling chemical substances handled at all business sites according to hazardous substances management regulations.
Environmental, safety, and health-related risk factors are systematically analyzed for hazardous chemicals by our in-house hazardous substances manager, and chemicals are registered with relevant organizations for appropriate management. In addition, the department managing import, production, and sales of chemical substances is aware of the hazards of chemical substances, and communicates any changes to relevant departments and customers.

1) DS Dansuk complies with the labeling requirements of the Korean Chemical Substances Control Act in delivery of products, and meets all of the standards specified in the law.

MSDS Preparation Management System

Raw Material

Procurement
- Obtain relevant documents as MSDS of new companies
- Management of the latest MSDS for raw materials
- Registration and management of directly imported raw materials at the Korea Occupational Safety and Health Agency

Safety and health/Environment/Quality
- Check the latest revision of the obtained MSDS
- Confirmation of hazards according to relevant laws (Occupational Safety and Health Act, Dangerous Substances Management Act, etc.)
- Update of the contents of the on-site MSDS storage box
- Training of workers handling chemical substances

Production
- Maintenance and management of on-site MSDS storage box
- Familiarization of workers with MSDS

Finished Goods

R&D Quality
- Obtain relevant documents as MSDS in new registration
- Management of the latest MSDS for products
- Registration and management of products produced by DS Dansuk at the Korea Occupational Safety and Health Agency

Safety and health/Environment/Quality
- Latest revision
- Confirmation of hazards according to relevant laws (Occupational Safety and Health Act, Dangerous Substances Management Act, etc.)
- Update of the contents of the on-site MSDS storage box
- Training of workers
- Provision of chemical substance (hazard) information when requested by customers

Customers
- Provision of the latest copy of MSDS
- Provision of chemical substance (hazard) information when requested by customers

Accident Prevention

DS Dansuk is continuously providing chemical leakage response training to executives and employees to prepare for hazardous chemical leakage accidents. In addition, we are participating in local consultative bodies to prevent the spread of pollution damage within the community. Additional CCTVs are installed and safety management personnel are hired to fully manage warehousing and shipping and thoroughly respond to leakage accidents. In addition, all business sites have subscribed to environmental liability insurance to be able to take prompt action and compensate victims in the event of an environmental pollution accident. In the future, we will continue to periodically establish and revise response manuals meeting the standards for handling hazardous chemicals and facilities in accordance with the Chemical Substances Control Act, improving response capabilities in the event of chemical accidents by deploying additional supplies to prepare against accidents and regular emergency response training.

Hazardous Chemical Substance Management Status

Sihwa Plant installed CCTVs in addition to hazardous chemical leakage alarm in order to prevent external leakage of hazardous chemicals. In addition, a guidebook explaining accident evacuation routes to external personnel has been provided for them to be aware of accidents. Furthermore, we plan to digitalize the entry personnel and improve in-house broadcasting for immediate notification in accidents to ensure the safety of all personnel entering workplaces handling hazardous chemicals.

Highlight3

Conversion to integrated environmental management business site

DS Dansuk converted a total of three business sites - Sihwa Plant, Gunsan Recycling Plant, and Gunsan Fine Chemical Plant - into integrated environmental management business sites as of 2023 in order to achieve carbon neutrality. Integrated environmental management business sites are applied stronger pollutant discharge standards rather than the existing generalized standards, and manage not only the discharge of pollutants but also all substances used within the Plant from start to finish. We are carrying out and planning improvements for carbon-emitting raw materials and processes. Furthermore, we are also reviewing diversification of waste disposal methods to increase the circulation rate of discharged waste.

Information on the Hazards of Chemical Substances[1)]

In response to K-REACH, the hazards of chemical substances are being reviewed to register substances manufactured/imported in the range of 100 to 1,000 tons by 2024. We are making efforts to minimize hazards to the human body by changing raw materials to less hazardous substances and confirming the exact path of downstream users of the substances.

Local Environmental Pollution Management (Biodiversity)

DS Dansuk empathizes with the value of biodiversity in the midst of the climate change and actively participates in various biodiversity preservation activities. We are working to understand the status and habitats of endangered animals and plants around our business sites and protect them. Furthermore, we plan to carry out continuous activities to preserve precious nature and biodiversity. Our efforts include environmental cleanup activities around our business sites and local environmental improvement.

Highlight4

Standardization of Environmental Management

DS Dansuk is preparing environmental management ICT starting with Sihwa Plant in 2023. We plan to expand its application to all Plants in 2024. The environmental management ICT is a system computerizing and automating environmental data to build a database and manage company-wide environmental indicators using a web-based program. We are making continuous efforts to become a sustainable company by using the reduction of environmental pollutants as an indicator to align the environmental direction of all business sites in the future and assign indicators tailored specifically to the characteristics of each business site.

1) DS Dansuk complies with the labeling requirements stipulated in the Domestic Chemical Substances Control Act when delivering products and meets all standards specified in the law.

Social

Aligns with these UN Sustainability Goals

Social Issues

- Talent Management • Sustainable supply chain
- Human rights management • Customer satisfaction and quality management
- Social contribution

DS Dansuk believes that considering the happiness and satisfaction of all stakeholders is essential in realizing a sustainable society. Accordingly, we will operate systems and programs to strengthen the capabilities of executives and employees, who are the main players in corporate growth, and realize a satisfying organizational culture. In addition, we will satisfy customers, supply chain, and local communities by strengthening our efforts to create social value by establishing various systems and support measures.

Background

- The internal and external environment surrounding our company's business is rapidly changing, and the industrial paradigm is also rapidly changing as well. It is essential to secure excellent human resources and strengthen executive and employee capabilities in order to respond quickly to such external environment. In particular, we must establish corporate activities and strategies based on respect for the human rights of executives and employees, partners, customers, and community members, and provide training and capacity building to improve the awareness of partners in order to align the direction of sustainable management of the company.

Our Strategy

- Diversification of training programs by job/level to strengthen employee capabilities
- Establishment of an ethics reporting channel to prevent misconduct and enhance transparency
- Realization of human diversity by expanding employment of the disabled and female employees
- Strengthening of sustainability management evaluations and support measure for partners

Performance

Establishment of training system for each employee position
Scheduled to be implemented in 2023

Number of labor union and labor-management council meetings held: 16

Social contribution donation: KRW 259.71 million

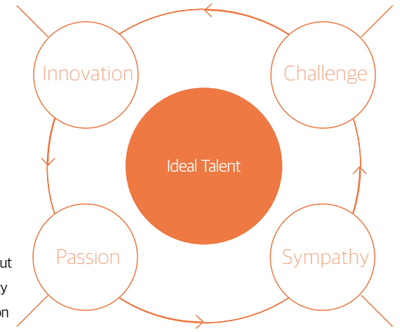
Talent Management

Recruitment

DS Dansuk provides equal opportunities to applicants based on fair procedures in conducting competency-based recruitment. We pursue human talent that matches our core values of innovation, challenge, passion, and empathy. We also contribute to job creation by recruiting local talent. As of the end of 2022, the ratio of full-time employees is 97.3%, and the ratio of female employees is 11.0%.
Meanwhile, the recruitment of new employees will be changed to a recruitment-type internship system from the second half of 2022, so the ratio of full-time employees may appear to have decreased slightly compared to the previous year. However, as a result of a recruitment-type internship system providing more opportunities to new employees with difficulties entering the job market due to lack of experience in the industry, the recruitment rate of interns is 32.1% compared to the total number of employees.

Innovative Dansuk members
Pursuing new things, being proactive in change, and inspiring others

Dansuk members with the Spirit of Challenge
Pursuing the best performance with an active challenging spirit without fearing failure



Passionate Dansuk members
Passionately carrying out work with responsibility and passion for creation of better value

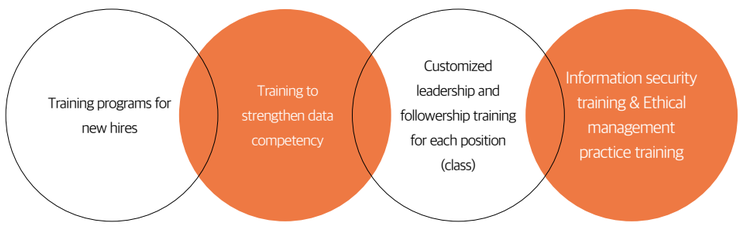
Sympathizing Dansuk members
Caring and listening based on mutual trust and striving for a common goal

Nurturing Talent


Special global economic lecture

In connection with the human talent nurturing system in 2023, DS Dansuk is developing a 'new hire training program' to aid new employees adapt to work and promote their understanding of DS Dansuk's culture and system. The values of Dansuk are established through training to be implemented from the second half of 2023, preparing the basis for both individuals and organizations to grow together. We plan to provide data competency strengthening training, including Power BI to contribute to productivity enhancement as well as digital work innovation. Furthermore, we plan to develop and implement a leadership and follow-up training program tailored to each position (class) by 2024.
As the need for information security in addition to the statutory training is emerging, we plan to conduct information protection training for all employees during the second half of 2023. Meanwhile, we are conducting ethical management practice as part of ethical management strengthening for all employees .

New Training Programs (Planned)



Labor-Management Communication[1)]

DS Dansuk pursues a labor-management culture of trust and cooperation based on communication. Opinions on working condition improvement and employee grievance handling are collected and reflected in the system, and quarterly labor-management council meetings are being held. Meanwhile, worker committee members have been elected through a vote of all employees in accordance with the amendment of the Act on Promotion of Worker Participation and Cooperation Act, and worker committee members were also appointed as members of the in-house grievance committee.. All of these efforts contribute to an environment for mutual cooperation between labor and management.

1) DS Dansuk's labor-management council is held at each workplace, and resolutions are disclosed within the workplace.

Agenda for 2022 Labor-Management Council

Category	Date	Agenda
1st quarter	2022.03.17	• Change of user representative member • Implementation of ethical management • Non-face-to-face temperature measurement • Sharing of treatment of employees who have been transferred to DS FINE
2nd quarter	2022.06.28	• Remodeling of in-house welfare facilities • Construction of waiting room for in-house logistics drivers • Increase of the unit price of meal
3rd quarter	2022.09.29	• Operation and use of in-house labor welfare fund • Use of in-house public welfare facilities • Recommendation of strengthened personal hygiene and flu vaccination
4th quarter	2022.12.22	• Increase of production worker wage • Change of worker representative members

Labor-Management Council

Digital Work Innovation

DS Dansuk is introducing digital innovation technologies to improve employee satisfaction and elevate human capabilities through improvement of digital expertise.

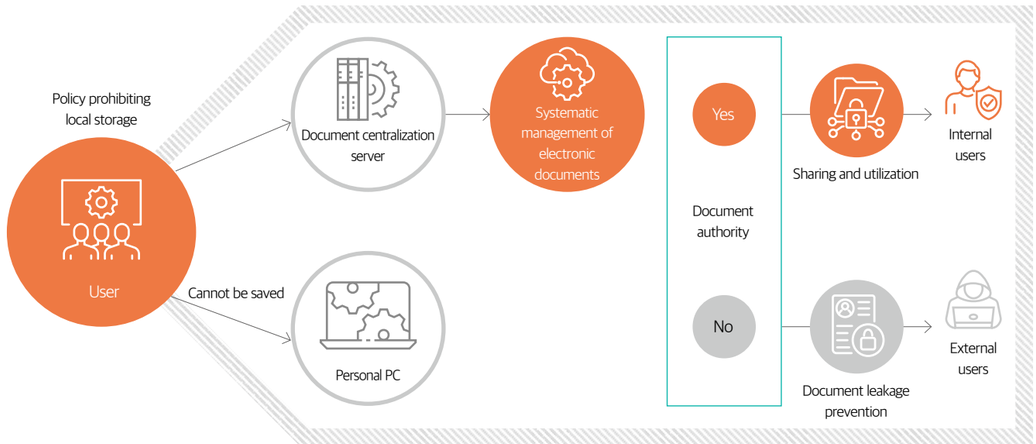
RPA System Operation Management

DS Dansuk improved employees' work efficiency and digital expertise through introducing the RPA (Robotic Process Automation) system to replace simple repetitive tasks with digital labor. In addition, we are improving work satisfaction by promoting a work environment that allows employees to focus on creation of individual value rather than simple, repetitive office tasks. We have been utilizing 6 RPA bots since May 2021 and applying them to 12 office tasks, including sales/purchase, warehousing, and expenditure resolutions. The 4,600 hours expected to be saved annually through the introduction of the RPA system is equivalent to the workload of approximately 2.4 persons based on 1,920 hours of average annual FTE (Full Time Equivalent) for corporate workers. We plan to continue to improve work efficiency by pursuing additional development and application of RPA modules to increase work efficiency.

Introduction of ECM System

DS Dansuk introduced the ECM (Enterprise Content Management) system to strengthen the company's ownership of documents and prevent security accidents such as deletion, information leakage, and ransomware by centralizing documents to the central server. Starting with Sihwa headquarters, we plan to expand the system to all plants, including the Pyeongtaek and Gunsan plants.

Document Centralization Process



Welfare System

DS Dansuk is continuing its efforts for improved employee welfare. Various welfare programs, including health checkups, hobby support, and congratulations and condolences, are operated to encourage employees' awareness in work and improvement of quality of life to boost concentration in work.

Employee Benefits

Category	Unit	2020	2021	2022
Employee benefits	KRW 1 million	4,012	4,051	5,724

Rest, Leisure, and Transport Support System

DS Dansuk reopened its in-house recreational facility after remodeling, allowing executives and employees to enjoy leisure activities on days off. Also, we are striving to revitalize in-house clubs that were suspended due to the COVID-19 pandemic. We aim to help employees pursue similar hobbies and leisure activities with other department members through in-house clubs, bringing them together and boosting work motivation. A new commuter bus routes were established in the first half of 2023 to alleviate the inconvenience of employees commuting through public transportation.

Leisure facility for executives and employees

Parental Leave System

DS Dansuk has prepared a parental leave system to promote a culture in which members can enjoy the balance between work and family. In addition, we are striving to prevent social problems including gender inequality and career interruptions of female employees caused by the use of childcare leave. We are creating a family-friendly environment through various systems.

Category	Unit	2020	2021	2022
Numbers of employees on parental leave	Persons	2	2	0

Welfare Systems

Anniversary gift
- An employee benefit in which employees receive flowers and cakes on anniversaries designated by executives and employees
- The quality of gifts is being upgraded from 2022

Recreational facilities and resorts for employees (membership)
- Remodeling of recreational facilities exclusively for executives and employees (2022)
- Condominium for executives and employees to rest comfortably during their vacations
- Employees are able to enjoy recreational facilities across the country with a condominium membership

Congratulations and condolences support
- Congratulations and condolences support to congratulate them on happy events and comfort them in mourning
- Provision of funeral materials and condolence leave in case of funerals

Operation of an in-house café
- An in-house café is operated to provide comfortable space and rest area for employees and visitors
- Free beverage coupons are provided every month

Congratulations on children starting school and scholarship support
- Congratulatory payment when a child enters school
- Provision of scholarship to employees' children entering college

Self-development expense support
- Achievement of balance between work and life by enabling more efficient work and competency development
- Support for various online and offline education and book purchase expenses related to job, vocabulary, and certification

Healthcare support
- Implementation of a regular checkup system to maintain the health of executives and employees
- Health counseling and winter flu vaccination support by in-house nurses

Commuting bus
- Stablishment of commuter bus routes from the first half of 2022 to relieve the inconvenience of employees using public transportation

In-house loan system for executives and employees
- An in-house loan system to ensure housing stability for executives and employees

In-house hobby clubs
- Hobby and leisure activity support to promote intimacy and work motivation by bringing together employees from different departments

Human Rights Protection

DS Dansuk is continuously making efforts to protect the human rights of its executives and employees and spread a culture of respect for human rights. We are promoting activities related to human rights protection with the principle of protecting the human rights of executives and employees. We also refrain from discrimination based on gender, rate, religion, etc.
An Ethics Reporting Center was established on the company website, to receive and monitor reports from all stakeholders, including executives and employees, customers, and cooperative company.

Ethics Reporting Center on DS Dansuk website

Performance Evaluation and Compensation

DS Dansuk is striving to establish a reasonable personnel system and evaluation system focusing on competency and performance. As a result of consulting in 2022 to implement a new personnel evaluation system,, we decided to implement a solution provided by a professional personnel evaluation solution company enabling management of both performance and competency for more objective and fair evaluation. Basic work on solutions and employee training have been carried out to implement personnel evaluations, and we plan to carry out input and inspection of goals and performance for performance management by November 2023. We plan to implement a comprehensive personnel evaluation environment by evaluating individuals and utilize the evaluation in compensation systems such as promotions and bonuses. The establishment of the new personnel evaluation system will enable fair evaluation for the majority of employees and contribute to work satisfaction of executives and employees.

Respect for Diversity

Compliance rate with legal obligations for employment of persons with disabilitiese
Maintaining **100%**

DS Dansuk has been contributing to the creation of jobs for the disabled since 2019 by directly hiring workers with severe disabilities who face difficulty finding employment. Even after recruitment, we have maintained 100% legal obligations for employment of persons with disabilities as a private company by assigning jobs appropriate to each individual's abilities and circumstances, continuously improving the working environment, and communicating with members. We review and assign jobs to the disabled in cooperation with the Gyeonggi West Branch of the Korea Employment Agency for the Disabled for the disabled workers to be able to work in a wider range of fields. We are also reviewing and making efforts to utilize the in-house cafes as a vocational training site for employment of other disabled persons who are not our employees.

Sustainable Supply Chain

Supply Chain Risk Management

DS Dansuk is strengthening supply chain risk management from environmental, social, and governance perspectives. With the changing global business environment caused by the COVID-19 pandemic and the Russo-Ukrainian War, supply chain management considering social responsibility and environmental sustainability is gaining more attention. We are pursuing regional diversification through diversification of our purchases of raw materials and cooperation with socially and environmentally responsible partners. Furthermore, we are minimizing financial risks and enhancing the competitiveness of our partners through multi-faceted evaluations of our partners. We are strengthening the company's survival and competitiveness and maintaining a sustainable supply chain through mutual growth with cooperative company home and abroad through such supply chain risk management.

Support for Win-Win Cooperation

DS Dansuk is carrying out support activities through various programs for long-term win-win partnerships with its cooperative company. We are preventing poor management by changing payment method from bills to cash or changing the maturity date of electronic bills from 90 days to 30 days to shorten payment period in order to support the fund management of cooperative company. DS Dansuk encourages bioenergy raw material cooperative company to obtain certifications such as ISCC through educational support. In addition, as the importance of storage tanks is increasing with the promotion of new HVO projects, we are also pursuing projects to discover new cooperative company and expand our storage tanks. Our Pyeongtaek Plant #1 is promoting expansion of business based on win-win cooperation, such as connecting transfer pipes with external tank terminal cooperative company storing bioenergy raw materials and products and promoting a project to expand new tanks in spare land. These efforts contribute to promoting the stability of logistics operations, environmental improvement by reducing the amount of transport vehicles, and sustainable shred growth.

Cooperative company Selection and Evaluation

DS Dansuk operates a transparent and fair cooperative company selection and evaluation process. In selecting new cooperative company, the final selection reflects the company's current status and major financial information through corporate credit evaluation reports. We also conduct yearly regular evaluations of our partners based on ISO certification system standards, and thoroughly manage and inspect them based on comprehensive evaluation factors such as management status, delivery performance, and trustworthiness. We transparently manage the process from cooperative company registration to bidding process through an online purchase management system, ultimately selecting a cooperative company through reflection of comprehensive evaluation factors such as overall management, quality, and process management.

Cooperative company Selection and Evaluation Process

Step 1	Step 2	Step 3	Step 4
New registration request	Quality and management evaluation	Ethical pledge	Conclusion and registration of standard contracts

Customer Satisfaction and Quality Management

ISO 9001 Quality Management System

Quality Management Policy

DS Dansuk pursues customer satisfaction as its top priority, striving to provide excellent products and services. We are committed to producing high-quality products to achieve sustainable growth, providing the highest level of customer satisfaction, and striving to become a leading company in creating environmentally-friendly future value. DS Dansuk is advancing toward continuous quality development with the vision of constantly creating customer value through provision of the best quality and service.

Quality management policy

Realization of customer satisfaction through prioritizing customers	Provision of excellent quality products and services	Compliance and continuous improvement of the quality, environmental, safety and health management system

Quality Management System

DS Dansuk's six domestic business sites and one overseas business site have acquired and maintained quality management system (ISO9001) certification. We plan to continuously expand the scope of our business sites and systematically establish, implement, maintain, and continuously improve the quality management system. All executives and employees are engaging in quality activities to produce the best products by internalizing the quality system throughout the company and managing it efficiently and systematically. Every year, detailed directions for each quality management goal are set, carrying out continuous management and improvement activities through internal review, data analysis, corrective action, and preventive action. Furthermore, we are establishing a quality management system satisfying the latest standards of European EN14214 (European biodiesel quality standard) and American ASTM D6751 (American biodiesel quality standard) for overseas export) to ensure reliable products. In Korea, we also provide products meeting the latest standards based on KSM2965 (Korean biodiesel quality standard) and petroleum and petroleum alternative fuel business laws and regulations.

Vision

DS Quality Only One!
DS Dansuk aims for the brand value of the best quality.

Management goals

ZERO external nonconformities	Strengthening of process quality	Strengthening of customer satisfaction

Promotion directions

• Strengthened raw material management • Strengthened key indicator management • Strengthened cooperative company evaluation/management	• Strengthened quality monitoring • Sharing with related departments • Strengthened instrument calibration	• Customer satisfaction analysis • Enhancement activities according to satisfaction analysis


KCC Quality Agreement

Customer Contact Activities

DS Dansuk is continuously striving towards a greater future through mutual growth with customers based on the best quality. We are building trust and bond through understanding customers' needs and ensuring seamless business processing by regularly communicating with customers. We pursue mutual growth with our customers by actively collecting customer opinions through various communication channels and collecting customer opinions using various communication channels and providing new value according to industry trends. We are actively participating in business-related exhibitions home and abroad to showcase our business competitiveness and technological capabilities, accepting and reflecting customer opinions and demands from a diverse perspective according to changing market trends and technological advancements. As part of this, we continue to engage in customer contact activities at home and abroad, including participating in Chinaplas and various international biofuel conferences, as well as attending environmental energy industry exhibitions every year. In addition, DS Dansuk recently established quality goals for both companies through a quality agreement ceremony with KCC and was selected for the 2023 Shared Growth Support Program for excellent partners by Hyundai L&C for excellent partners. We actively participate in on-off business and quality enhancement activities to strengthen communication with customers and expand the market by realizing quality satisfaction that meets the needs of the market.


Participation in Chinaplas

Customer Satisfaction Survey

DS Dansuk collects opinions through customer satisfaction surveys to maximize customer satisfaction. We conduct regular annual surveys for our top-grossing customers in each business division in order to accurately identify and manage satisfaction. The customer satisfaction survey evaluates satisfaction in four items of delivery date, quality level, emergency response, and customer complaint response. The survey results are analyzed and possible improvements are identified to meet customer demands. Furthermore, we are striving to build trust by providing products of competitive quality and delivery times requested by customers, and grow together with customers by increasing customer satisfaction through active service activities.

Customer Satisfaction Survey

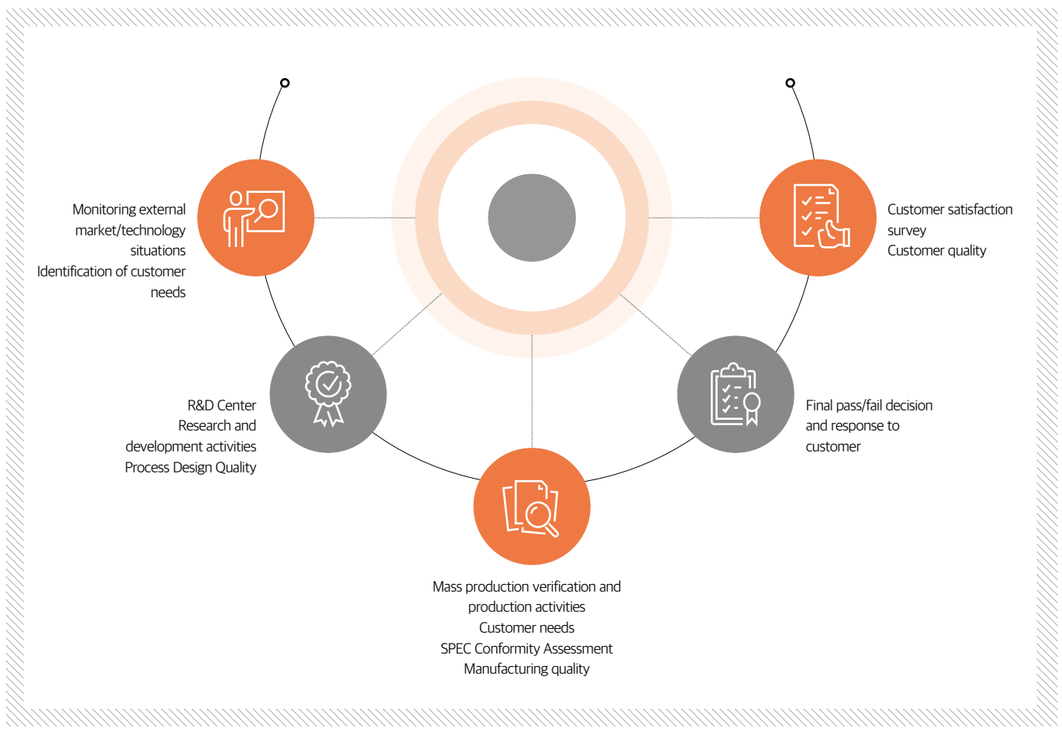
(Unit: score, standard: score out of 100)

Category	2020	2021	2022
Bioenergy business	95.0	92.9	97.0
Plastic recycling & precision materials business	94.4	95.0	95.8

* Survey target group and criteria: 7 companies in the bioenergy industry (domestic), 15 companies in the plastic recycling & precision materials industry (top sales customers)

Customer and Quality Response System

DS Dansuk strives to provide the best quality to ensure customer satisfaction. When a customer complaint is received, relevant departments respond in prompt manner to resolve the complaint and quality issues from the customer's perspective to secure customer trust. When the sales department receives customer opinion, an internal investigation is carried out in 24 hours to identify the cause as a top priority, and detailed goals are established within 3 days to promote technical quality improvement activities. We are striving to maximize efficiency to achieve customer satisfaction by utilizing an integrated system performing quality management in conjunction with similar business sites. We are continuously improving and reviewing processes reduce customer complaints, further improving customer satisfaction through production and sales of customized products. We are managing product quality through the entire process from research and development to post-sales customer feedback by accurately identifying and analyzing customer needs. We are continuously improving and developing products through technological innovation in order to provide better value, further accelerating mutual growth through creation of value.



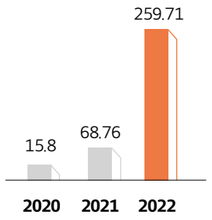
Social Contribution

Scholarship sponsorship

2020	2021	2022
32 persons	40 persons	18 persons
KRW 57.10million	KRW 71.30 million	KRW 48.50 million

Total amount of social contribution donations

(Unit: KRW 1 million)



Dansuk Scholarship Foundation

DS Dansuk is participating in various social contribution activities to fulfill its corporate social responsibility. We are continuously carrying out donation activities to develop the local community and help underprivileged neighbors. We also provide scholarship to students in need to support their dreams of growing as excellent members of the community. The Dansuk Scholarship Foundation was established in 2000 as a non-profit organization, and has selected a total of 803 scholarship students by 2022, providing them with scholarship of a total of KRW 1.42 billion to nurture future talent. Also, we are striving to promote academic research, such as participating in the 2022 Korea Environment and Energy Awards as a special sponsor.

Donation Activities

DS Dansuk carries out various social contribution activities such as supporting the underprivileged in the community and community development through eco-friendly businesses and investment in local bases. We are continuing to realize the value of coexistence between the company and our society through donating to local welfare foundations, social welfare communities, multicultural families and orphanages. In addition, we raised funds to help damage from forest fires that occurred in Gangwon Province in March through the Fruit of Love of the Community Welfare Association. Donations were delivered to local welfare foundations, St. Mary's Dream Hill, and the Seoul Symphony Orchestra. Our social contribution reached KRW 250 million won.

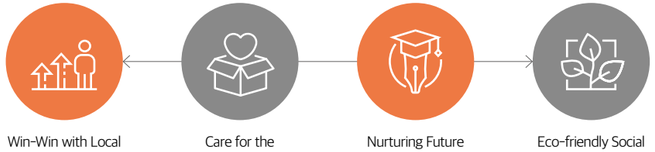
Donation to Siheung-si's 1% Welfare Foundation


Donation to Community Welfare Foundation

Expansion of Social Contribution Activities

As the demand of social responsibility increases due to corporate social influence, we aim to create social value through social contribution activities and pursue expansion to a wider range of social contribution activities. We are planning to introduce a program where all executives and employees are able to voluntarily participate in donations and volunteer activities while continuing our scholarships and academic support through our Dansuk Scholarship Foundation.

Social Contribution Promotion Directions



Governance

Aligns with these UN Sustainability Goals

Governance Issues

- Ethics/Compliance management
- Risk management and internal control
- Advancement of ESG management system

DS Dansuk practices sustainable management activities based on its sound and transparent governance structure.
We have stipulated ethics/compliance management and are practicing it company-wide in all business areas in order to achieve healthy growth by building a solid relationship of trust with all stakeholders.

Background

- With intensifying legal/regulatory risks and increasing social expectations for corporate social responsibility, the importance of transparent governance and ethics/compliance management is increasing. It is important to secure the trust of various stakeholders through fair and transparent corporate activities and to strengthen corporate competitiveness by strengthening the ESG integrated risk management system.

Our Strategy

- Strengthened ESG management decision-making system
- Establishment of ethics/compliance management system (establishment of code of ethics)
- Introduction/operation of ethics education and reporting system
- Conduct information security training and security audits
- Strengthened internal accounting control system

Performance

Number of BOD meetings held
13 times

BOD meeting attendance rate
86%

Number of reports to the Ethics Reporting Center
1 case

Board of Directors

Board Composition and Operation

In order to strengthen its independence and expertise as the highest corporate decision-making body, DS Dansuk's board of directors has appointed three outside directors at the 2023 regular general shareholders' meeting to establish a board system at the level of a listed company in accordance with Article 542-8 of the Commercial Act. DS Dansuk's board of directors consists of 6 internal directors and 3 outside directors, and operates regular quarterly board meetings and temporary board meetings held when necessary. The term of office of a director is three years in principle, and reappointment is decided based on the director's activities and performance. The dependence of the board of directors on the CEO is reduced through the participation of outside directors with specialized knowledge and abundant practical experience, and independent and objective decision-making and transparency in management are ensured. A total of 13 board meetings were held in 2022 to deliberate and decide on a total of 43 agenda items, with an attendance rate of 86%.

Composition of Board of Directors[1)]

Sort	Name	Gender	Position	Appointment Date	Field of Expertise	Professional Experience
Internal Directors	Han Seung-uk	Male	CEO in charge of management strategy, Chairman of the Board of Directors, Chairman of the Management Committee	2021.12.01	Overall management, including planning, budgeting, accounting and finance, and sales	Current Chairperson, DS Dansuk Co., Ltd. Former president, Korean Energy Society
	Kim Jong-wan	Male	CEO managing compliance	2021.03.31	Production, safety and environmental management, R&D, quality	Current Vice President of DS Dansuk Co., Ltd.
	Yoo Jae-dong	Male	Management Committee Member, Internal Transaction Committee Member, Compensation Committee Member	2021.03.31	Financial accounting	Current Managing Director, Financial Division, DS Dansuk Co., Ltd.
	Jang Se-hoon	Male	Management Committee Member	2021.09.10	Strategic planning	Current Director, Future Management Division, DS Dansuk Co., Ltd.
	Kim Ji-hun	Male	Internal director	2022.03.31	Investment and strategic planning	Current Representative Partner, Stonebridge Capital Co., Ltd.
	Koh Sang-hyuk	Male	Outside Director Candidate Recommendation Committee Member	2022.03.31	Legal and ESG	Current Director, External Cooperation Office, DS Dansuk Co., Ltd.
Outside Directors	Shim Chung-jin	Male	Audit Committee Chairman, Internal Transaction Committee Member, Compensation Committee Member	2022.03.31	Accounting and management (certified public accountant)	Currently Professor, Department of Business Administration and Accounting, Konkuk University Former President, Korea Taxation Association Former President, Korea Taxation Research Forum
	Kim Hak-ja	Female	Compensation Committee Chairman, Outside Director Candidate Recommendation Committee Chairman, Audit Committee Member	2022.03.31	Legal and compliance (lawyer)	Current Vice President, Korean Bar Association Current 12th President, Korean Women Lawyers Association Former prosecutor, Suwon District Prosecutors' Office
	Yeo Hwan-seop	Male	Internal Transaction Committee Chairman, Audit Committee Member, Outside Director Candidate Recommendation Committee Member	2022.04.05	Legal and compliance (lawyer)	Currently lawyer (Seoul Association) Former 47th Director, Legal Research and Training Institute Former 27th Chief Prosecutor, Daejeon High Prosecutors' Office

1) At DS Dansuk, the CEO also serves as the chairperson of the board of directors to strengthen the decision-making process and promote efficient communication.

Operation of Board of Directors

Sort	Unit	2020	2021	2022
Number of BOD meetings held	Times	14	14	13
Number of Resolution Items	Cases	30	47	43
BOD attendance rate	%	96	94	86

Committees within the Board of Directors

DS Dansuk has established and operates a total of five committees in accordance with relevant laws to improve the efficiency of operations and promote professionalism of the board of directors. The Audit Committee, Management Committee, Internal Transaction Committee, Compensation Committee, and Outside Director Candidate Recommendation Committee are established and operated under the Board of Directors.

Status of Committees within the Board of Directors

Sort	Composition	Main Roles
Audit Committee	3 outside directors	Check/supervision of management activities to improve corporate value and shareholder value through legal procedures and rational decision-making
Management Committee	3 internal directors	Deliberation/decision on major management matters delegated by the Board of Directors for timely decision-making on everyday management matters
Internal Transaction Committee	1 internal director and 2 outside directors	Deliberation/decision on important internal transactions for fair transactions with specially related persons
Compensation Committee	1 internal director and 2 outside directors	Deliberation/decision on compensation limit and compensation system for registered directors to ensure transparency of executive compensation and decide on reasonable compensation
Outside Director Candidate Recommendation Committee	1 internal director and 2 outside directors	Recommendation of outside director candidates to the general shareholders' meeting through a resolution of the committee in order to secure the independence of the board of directors

Audit System

DS Dansuk is operating an Audit Committee by appointing three outside directors as members of the Audit Committee at the 2023 regular general shareholders' meeting in order to introduce an audit system similar to that of a listed company. The Audit Committee consists entirely of outside directors in order to maintain the committee's independence, and the chairperson of the Audit Committee is elected among the outside directors. The Audit Committee promote activities such as establishing an audit plan in accordance with operating regulations, and a separate taskforce (TF) is established and operated as an in-house support organization for efficient and seamless performance.

Evaluation and Compensation

DS Dansuk supports the board of directors properly to carry out its role of keeping management in check through regular review of whether the board is carrying out its roles and responsibilities required by the law and internal regulations. We plan to continue improvement activities for the board of directors based on the evaluation results, including supplementing board-related regulations. Directors' remuneration is paid within the remuneration limit approved at the board of directors and general shareholders' meeting based on a comprehensive evaluation of their position and management performance. In the future, directors' remuneration will be paid according to the results of deliberation and resolution by the Compensation Committee to strengthen objectivity and transparency.

ESG Sustainability Management Committee

DS Dansuk established a new Sustainability Management Committee in the form of an advisory body in March 2022 in order to strategically promote sustainable management. The ESG Sustainability Management Committee is held quarterly. We plan to develop the committee into an organization deliberating and deciding on ESG-related management decisions in the future. We are carrying out ESG-related management activities in a practical and proactive manner, presenting the company's ESG policy and direction, and actively discussing related matters through the committee. Furthermore, we provide training and seminar support for the committee, such as lectures by invited experts and reports on global trends, to strengthen the committee's capabilities.

ESG Sustainability Management Committee meeting

2022 ESG Sustainability Management Committee Activity Details

Sort	Date	Agenda
1st	2022.03.24	• Internal and external ESG trend report • DS Dansuk's 2022 ESG management plan report • DS Dansuk's ESG management report for each division • Lecture inviting experts
2nd	2022.06.29	• Report on the preparation status of the 2022 sustainability report • Global trend report: "EU Fit for 55 package" • Report on ESG progress of each business division
3rd	2022.09.28	• 2022 DS Dansuk's ESG management plan report • Domestic & Global ESG trend report • Report on the publication of the 2022 Sustainability Management • Report on the status of ESG progress for each business division
4th	2022.12.28	• 2022 review of ESG Sustainability Management Committee • 2023 ESG self-inspection review • Establishment and systematization of the committee organization in 2023 • Mid-to-long-term strategy report (draft) of DS Dansuk's ESG management strategies • ESG trend report - "EU WEEE & RoHS" • Report on ESG progress status for each division
5th	2023.03.29	• Overview of committee operations • Report on DS Dansuk's governance reorganization (draft) • DS Dansuk's 2023 management plan report • Internal and external ESG trend report • Report on RE100 & Smart Green Industrial Complex • Report on ESG promotion status in non-business sectors

Ethics and Compliance Management

Ethical Management System

DS Dansuk established a Code of Ethics in December 2021 as a standard for correct behavior and value judgment for all executives and employees to adhere to. Based on the Code of Ethics, ethical rules to be observed and followed in all aspects of corporate activities in all aspects of corporate activities and practice guidelines applicable to various situations are provided. From 2022, we are strengthening our ethical management promotion system by requiring all executives and members to sign an ethics pledge. We also had an ethics pledge in 2023 in line with the New Year's ceremony. Furthermore, we are creating an organizational culture that allows all newly hired executives and employees to sign an employment contract and an ethics pledge simultaneously to promise that they will voluntarily participate in ethical management.

Regulations Related to Ethical Management

DS Dansuk announced 2021 as the first year of strengthening ethical management, promoting all executives and employees to sign the ethics pledge to establish the correct ethics within the company. In particular, strategies to implement ethical management are being implemented in 2023 by establishing a new ethics reporting center and operating a dedicated ethics management organization. We aim to protect the rights and interests of stakeholders and realize sustainable social development through creation of an ethical corporate culture. Our Code of Ethics, practical guidelines, and ethics pledge related to ethical management can be referred to on the company website.

DS Dansuk's Ethical Management Policy

http://dsdansuk.com/sustainability/ethical_management/

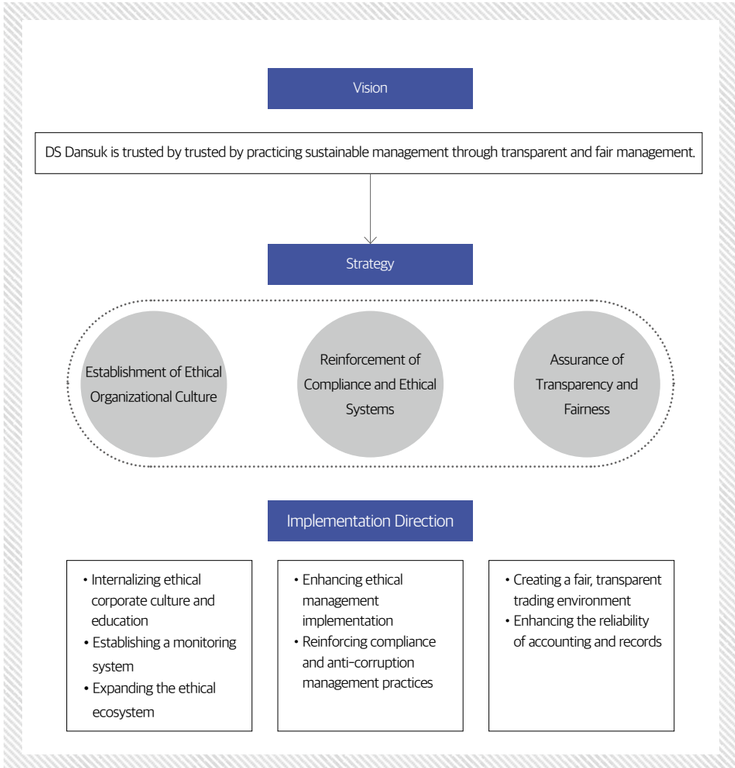
Code of Ethics

Practice Guidelines

Ethics Pledge

Vision and Strategy

DS Dansuk is striving to establish an ethical organizational culture and strengthen compliance and ethics system to create a company trusted through transparent and fair management. We have established detailed strategies and plans to voluntarily practice and internalize ethical management.



Ethical Management Roadmap

Ethical management in daily life (~2022)	Internalizing ethical management (2023~)
• Implementing and establishing the foundation for ethical management • Inspecting guidelines for implementing the Code of Ethics • Promoting social responsibility fulfillment education • Reviewing the implementation of internal and external evaluations	• Spreading the organizational culture and voluntary practice • Auditing promotion of ethical management • Promoting the online reporting system • Spreading the fulfillment of social responsibility

Ethical Management Education

Ethical Management Education Completion Rate in 2023
100%

DS Dansuk conducts ethics training to foster ethical awareness among executives and employees. We are helping practice of ethical management and ethical standards by inviting professional instructors to educate people on the concept of ethical management and various cases. Also, we will establish a sustainable management system by raising awareness and internalizing ethical management among all executives and employees through education on ethical rols awareness, understanding of the ethical reporting system and anti-corruption laws.

Ethics Education

Ethics Reporting System

DS Dansuk operates an online reporting channel called Ethics Reporting Center on its website regarding violations of ethics regulations and various laws. The Management Support Division has been designated as the dedicated department to investigate reports, and we ensure thorough anonymity to prevent exposure of the identity of the informant.

After establishment of the Ethics Reporting Center in February 2023, one report has been received, which was a compliant that arose during the communication process between employees of a cooperative company and our employees. After an internal meeting, DS Dansuk conducted re-training for the employee in charge, and replied with an apology for the incident and promised to prevent recurrence. We are enabling reporting on all ethical issues, including ethics regulations, at all times through the Ethics Reporting Center to create a company that can be trusted by all stakeholders of the company.

Ethics Reporting Center

DS Dansuk's Ethics Reporting Channel: : http://dsdansuk.com/ethics/report/

Information Protection and Security

Information Security Policy and Management System

DS Dansuk has established an information security system in accordance with the company's information security regulations, complying with personal information protection regulations throughout the entire process of collecting, using, and destroying personal information of third parties as well as preparing countermeasures to prevent and respond to accidents. In addition, we are promoting the introduction of a document centralization (Enterprise Contents Management) system, strengthening our security policy in addition to the advancement of our information protection management system. We are minimizing risks through security audits and continuously improving the level of internal technology leakage prevention and personal information protection. Furthermore, we are maintaining a high level of security awareness through continuous education, campaigns, and regular inspections.

Information Security Certification

DS Dansuk has established a high-level information protection management system and is making efforts to obtain and maintain external information security-related certification in order to prevent damage to the company and all stakeholders caused by personal information leakage. We hold domestic information protection and personal information protection management system certification in accordance with the Information and Communications Network Act, and we are striving to thoroughly comply with related laws and regulations.

Furthermore, we are enhancing internal information security through document centralization, which enforces the mandatory storage of data on the company's central server instead of individual user PCs, thus preventing data leakage.

Personal Information Protection Training Screen

IT Security

Strengthened Information Security Response

DS Dansuk plans to expand information security training to raise employees' information security awareness and strengthen their capabilities. In addition, we provide online personal information protection training to all employees every year, disseminating major security rules and issues. In particular, we are providing support to prevent information security issues by sharing incidents such as phishing and impersonations of public institutions and police stations. Furthermore, we are continuously working to safely manage personal information and improve the level of personal information protection. Vulnerabilities are identified through security audits once a year, reducing the risk of leakage of personal and sensitive information.

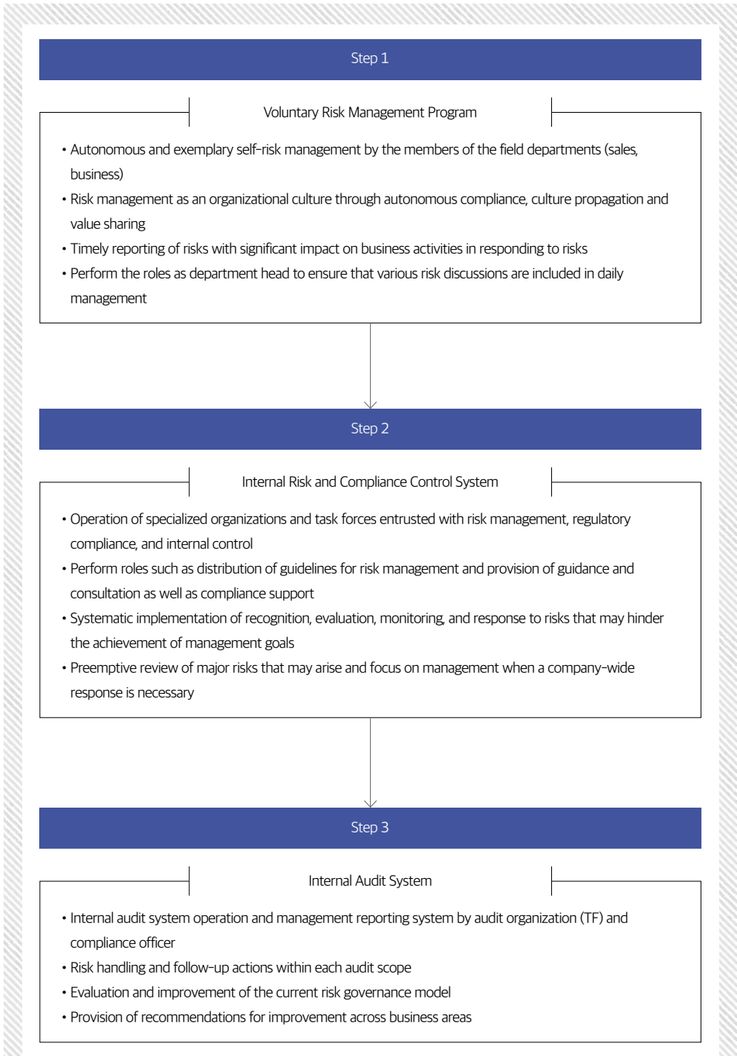
Risk Management

Risk Management Scheme

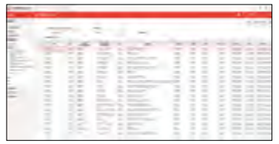
DS Dansuk operates a risk management system for mutual growth with all stakeholders to preemptively review and respond to various risk factors that may impact business activities and to prepare for potential risks in advance. From the stage of autonomous operation by members of the field departments, through the stage of risk management compliance support organization operation, to risk supervision and policy approval by the board of directors and Audit Committee, we are building a risk management system.

Risk Management System

DS Dansuk operates a risk management system to effectively identify and respond to various potential risks in corporate business activities in a rapidly changing business environment. We are operating a company-wide risk management system through an autonomous risk management program. Our top management decides company-wide risk management directions and periodically checks management status. Major risks are reviewed and response plans are established through reporting to the board of directors. We operate an advanced risk management system assigning risk management roles to all members ranging from top management to field staff, in order to ensure risk management across the company.



Internal Accounting Control System

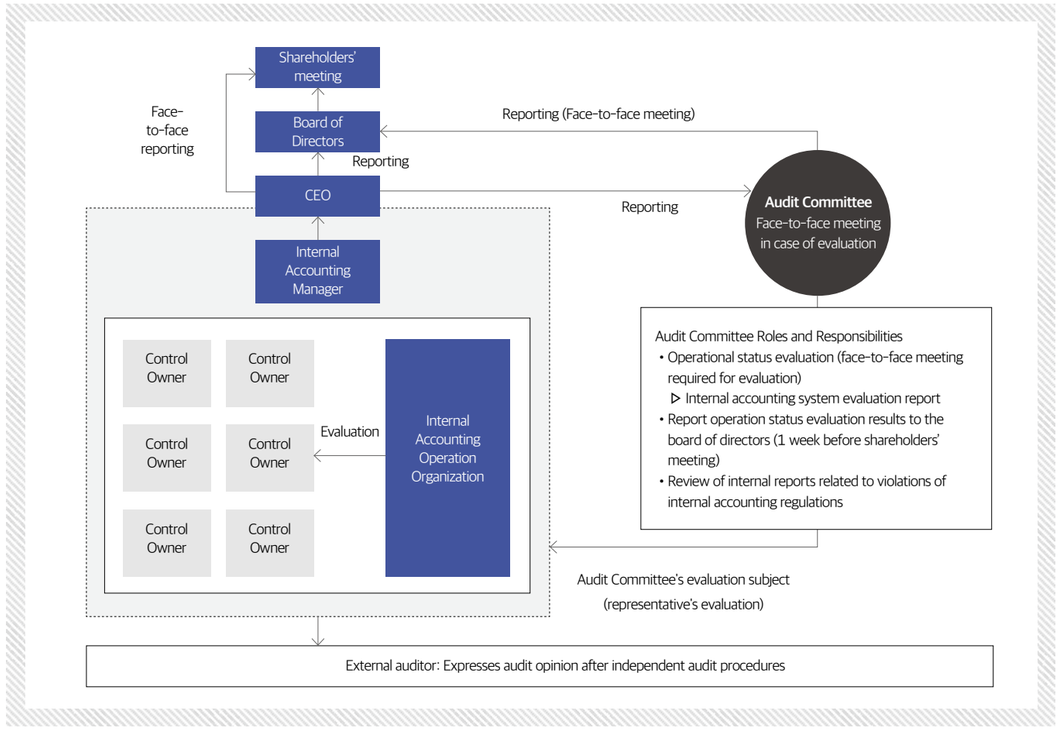


Internal accounting management system operation evaluation

DS Dansuk operates an internal accounting management system to ensure the reliability of the internal accounting system. We regularly evaluate accounting processing and operation status, control activities, and adequacy of evidence, and organize a company-level task force to prevent errors or fraud through inspection of design and operation status through the internal accounting system. Furthermore, the internal accounting management system operation status report is included in the audit report after sufficient review and confirmation by the internal accounting manager and CEO.

In 2023, stabilization and advancement of our internal accounting management system is promoted by assistance of Samil Accounting Corporation, in order to be listed in the stock market and strengthen internal control. Through this process, we are providing employee training to break down misconceptions about existing internal accounting and promote the importance of internal accounting. In addition, we are advancing our internal accounting management system to prepare and disclose reliable accounting information during audits by designated auditors through interviews with each working level staff. Furthermore, we plan to conduct internal accounting on a semi-annual basis upon completion of internal accounting advancement.

Internal Accounting Management System Evaluation And Reporting System



Appendix

Financial Performance

Summarized Consolidated Financial Statement

(Unit: KRW 1 million)

Sort	End of Dec. 2020	End of Dec. 2021	End of Dec. 2022
Current assets	139,535	249,421	303,352
Non-current assets	226,827	252,418	262,235
Total assets	366,362	501,839	565,587
Current liabilities	206,978	245,906	317,923
Non-current liabilities	32,970	82,572	107,921
Total liabilities	239,948	328,478	425,844
Equity attributable to owners of the parent	122,021	168,205	139,467
Non-controlling interests	4,393	5,156	277
Total equity	126,415	173,360	139,743

Summarized Consolidated Comprehensive Income Statement

(Unit: KRW 1 million)

Sort	End of Dec. 2020	End of Dec. 2021	End of Dec. 2022
Revenue	599,354	900,507	1,133,720
Cost of sales	540,300	787,392	1,017,311
Gross profit	59,053	113,115	116,409
Selling and administrative expenses	34,245	40,583	42,423
Operating income	24,808	72,532	73,985
Non-operating income	10,954	5,727	10,437
Non-operating expenses	26,107	26,462	46,664
Net income before income tax expenses	9,654	51,797	37,759
Income tax expense	2,023	11,976	10,577
Net income	7,631	39,821	27,182
Total comprehensive income	7,631	47,159	27,172

Parent Shareholder

Sort	Shares owned	Stake (%)
Han Seung-uk and 3 others	2,477,552	100

ESG Data | Environment_All Business Sites

Sort				Unit	2020	2021	2022
Response to climate change	GHG management	GHG emission	Total GHG emissions	tCO_2eq	78,931.8	81,528.3	83,886.9
			- Direct emissions (Scope 1)	tCO_2eq	50,433.3	53,419.3	54,433.1
			- Indirect emissions (Scope 2)	tCO_2eq	28,498.6	28,109.0	29,453.8
			Base unit emissions[1]	tCO_2eq/KRW 100 million	13.4	9.2	7.6
			GHG reduction performance (reduction)	tCO_2eq	10,678.3	-2,596.5	-2,358.6
	Energy management	Total energy use		TJ	1,406.1	1,660.6	1,692.0
		Direct energy use	Total unit(energy intensity)	TJ/KRW 100 million(KRW)	0.24	0.19	0.15
				TJ	691.4	819.7	819.9
			Total unit(energy intensity)	TJ/KRW 100 million(KRW)	0.12	0.09	0.07
			- LNG (fuel)	TJ	587.0	586.9	607.6
			- LPG (fuel)	TJ	104.4	232.8	212.3
		Indirect energy use		TJ	714.9	841.0	872.1
			Total unit(energy intensity)	TJ/KRW 100 million(KRW)	0.12	0.10	0.06
			- Electricity consumption	TJ	477.5	533.8	567.6
			- Heat/steam consumption	TJ	237.4	307.2	304.5
			Energy reduction performance (reduction) (change compared to previous year)	TJ	-1.2	-128.3	-31.4
		Carbon intensity	Total energy	tCO_2eq/TJ	56.1	49.1	49.6
			Direct energy	tCO_2eq/TJ	72.9	65.2	66.4
			Indirect energy	tCO_2eq/TJ	39.9	33.4	48.5
Environmental performance management	Water management performance[2]	Water intake	Total	Ton	1,148,231.1	1,375,308.4	1,338,241.5
			Water service	Ton	159,089.0	192,512.4	269,222.5
			Industrial water	Ton	989,142.1	1,182,796.0	1,069,019.0
		Classification of total water intake	Freshwater	Ton	0	0	0
			Other than freshwater	Ton	0	0	0
			Total amount of water intake in the water stress area	Ton	0	0	0
		Total amount of water discharged		Ton	751,838.0	953,611.0	813,687.5
		Water usage		Ton	396,393.1	421,697.4	524,554.0
		Wastewater generation		Ton	751,838.0	953,611.0	813,687.5
	Air pollution emission management and performance	Particulate matter (PM) emissions		Ton	4.5	6.0	3.8
		NOx emissions		Ton	46.0	28.1	30.3
		SOx emissions		Ton	8.3	4.0	1.2
	Water contaminants	BOD		Ton	2.2	7.4	1.2
		COD		Ton	14.8	7.5	3.0
		T-N		Ton	5.4	6.5	4.1
		T-P		Ton	0	0.1	0
		TOC		Ton	0	3.2	7.2
		SS		Ton	3.9	7.8	10.1
	Waste management (Allbaro system data)	Total waste generation	Total	Ton	22,011.7	25,109.5	25,070.3
			Waste recycling rate	%	42.0	62.6	64.4
			Base unit (percentage compared to sales)	Ton/KRW 100 million	3.74	2.84	2.28
			- Recycling	Ton	10,726.8	13,451.5	13,677.9
			- Incineration	Ton	2,395.7	1,833.5	1,564.0
			- Incineration	Ton	8,693.8	9,214.2	9,806.9
			- Neutralization	Ton	79.2	167.8	0
		In-house	Recycling	Ton	0	0	0
			Incineration	Ton	0	0	0
			Landfill	Ton	0	0	0
		Consignment	Recycling	Ton	4,859.3	3,680.3	6,618.2
			Incineration	Ton	1,649.1	1,161.9	818.3
			Landfill	Ton	287.1	35.4	70.8
	Hazardous chemical management	Consumption		Ton	91,552.6	99,233.7	108,336.2
		No. leakage accidents		cases	0	0	0
Environmental management	Violation of environmental regulations			cases	1	0	0
	Eco-friendly investment[3]	Facility management cost		KRW 1 million	945.9	6,715.2	6,537.3
		Facility investment cost		KRW 1 million	1,664.2	1,237.0	841.7
		Total		KRW 1 million	2,610.2	7,952.2	7,379.0

1) GHG emissions and energy base unit emissions are calculated based on DS Dansuk's sales in the reporting year.
2) DS Dansuk's data on water intake has been prepared based on bills, and data on water discharge has been prepared based on water.
3) Data errors have been corrected for the data from 2020.

ESG Data | Environment_Sihwa Plant

Sort				Unit	2020	2021	2022
Response to climate change	GHG management	GHG emission	Total GHG emissions	tCO_2eq	18,699.80	18,239.50	17,607.76
			- Direct emissions (Scope 1)	tCO_2eq	7,966.50	7,968.60	8,076.23
			- Indirect emissions (Scope 2)	tCO_2eq	10,733.30	10,270.90	9,531.53
			Base unit emissions[1]	tCO_2eq/KRW 100 million	7.67	4.94	4.03
			GHG reduction performance (reduction)	tCO_2eq	-886.80	460.30	631.74
	Energy management	Total energy use	Total	TJ	434.80	402.70	388.26
			Base unit (energy intensity)	TJ/KRW 100 million	0.18	0.11	0.09
		Direct energy use	Total	TJ	149.90	146.60	157.50
			Base unit (energy intensity)	TJ/KRW 100 million	0.06	0.04	0.04
			- LNG (fuel)	TJ	149.90	146.60	157.50
		Indirect energy use	Total	TJ	284.90	256.10	230.76
			Base unit (energy intensity)	TJ/KRW 100 million	0.12	0.07	0.05
			- Electricity consumption	TJ	162.50	161.00	151.32
			- Heat/steam consumption	TJ	122.40	95.10	79.44
			Energy reduction performance (reduction)(change compared to previous year)	TJ	-15.20	32.10	14.44
		Carbon intensity	Total energy	tCO_2eq/TJ	43.01	45.29	45.35
			Direct energy	tCO_2eq/TJ	53.15	54.36	51.28
			Indirect energy	tCO_2eq/TJ	37.67	40.11	41.31
Environmental performance management	Water management[2]	Water intake	Total	Ton	278,955	189,773	213,194
			Water service	Ton	18,250	18,339	18,392
			Industrial water	Ton	260,705	171,434	194,802
		Classification of total water intake Category	Freshwater	Ton	-	-	-
			Other than freshwater	Ton	-	-	-
			Total amount of water intake in the water stress area	Ton	-	-	-
		Total amount of water discharged		Ton	65,367	55,818	61,295
		Water usage		Ton	213,588	133,955	151,899
		Wastewater generation		Ton	65,367	55,818	61,295
	Air pollution Discharge management	Particulate matter (PM) emissions		Ton	0.80	0.40	0.50
		NOx emissions		Ton	9.00	4.20	3.66
		SOx emissions		Ton	0	0	0.17
	Water contaminants	BOD		Ton	0	0.40	0.40
		COD		Ton	0	2.20	2.60
		T-N		Ton	0.10	0.30	0.30
		T-P		Ton	0	0	0
		TOC		Ton	-	1.30	1.70
		SS		Ton	0.20	0.80	0.80
	Waste management (Allbaro system data)	Total waste generation	Total	Ton	6,795.47	4,877.60	5,528.98
			Waste recycling rate	%	71.51	75.45	88.53
			Base unit (percentage compared to sales)	Ton/KRW 100 million	2.79	1.32	1.27
			- Recycling	Ton	4,859.30	3,680.28	4,894.57
			- Incineration	Ton	1,649.11	1,161.90	577.69
			- Landfill	Ton	287.05	35.42	56.72
		Consignment	Recycling	Ton	4,859.30	3,680.28	4,894.57
			Incineration	Ton	1,649.11	1,161.90	577.69
			Landfill	Ton	287.05	35.42	56.72
	Hazardous chemical substance management	Consumption		Ton	14,662.30	14,388.70	12,369.63
		No. of leakage accidents		cases	0	0	0
	Violation of environmental regulations[3]			cases	1	0	0
Environmental management	Eco-friendly investment	Facility management cost		KRW 1 million	376.5	2,797.1	2,474
		Facility investment cost		KRW 1 million	68.0	33.4	158
		Total		KRW 1 million	444.5	2,830.5	2,632.1

1) GHG emissions and energy base unit emissions are calculated based on DS Dansuk's sales in the reporting year.
2) DS Dansuk's data on water intake has been prepared based on bills, and data on water discharge has been prepared based on water.
3) DS Dansuk does not include cases of violation of environmental regulations with a fine of USD 10,000 or less.

ESG Data | Environment_Pyeongtaek Bio Plant #1

Sort				Unit	2020	2021	2022
Response to climate change	GHG management	GHG emission	Total GHG emissions	tCO_2eq	13,327.60	9,365.50	11,760.68
			- Direct emissions (Scope 1)	tCO_2eq	6,777.40	5,014.30	6,026.63
			- Indirect emissions (Scope 2)	tCO_2eq	6,550.20	4,351.20	5,734.05
			Base unit emissions[1]	tCO_2eq/KRW 100 million	11.16	5.11	4.73
			GHG reduction performance (reduction)	tCO_2eq	-2,592.20	3,962.10	-2,395.18
	Energy management	Total energy use	Total	TJ	328.20	401.80	463.66
			Base unit (energy intensity)	TJ/KRW 100 million	0.27	0.22	0.19
		Direct energy use	Total	TJ	133.30	98.80	118.79
			Base unit (energy intensity)	TJ/KRW 100 million	0.11	0.05	0.05
			- LNG (fuel)	TJ	133.30	98.80	118.79
		Indirect energy use	Total	TJ	194.90	303.00	344.87
			Base unit (energy intensity)	TJ/KRW 100 million	0.16	0.17	0.14
			- Electricity consumption	TJ	79.90	90.90	119.82
			- Heat/steam consumption	TJ	115.00	212.10	225.05
			Energy reduction performance (reduction)(change compared to previous year)	TJ	-94.40	-73.60	-61.86
		Carbon intensity	Total energy	tCO_2eq/TJ	40.61	23.31	25.36
			Direct energy	tCO_2eq/TJ	50.84	50.75	50.74
			Indirect energy	tCO_2eq/TJ	33.61	14.36	16.63
Environmental performance management	Water management[2]	Water intake	Total	Ton	81,271	85,405	132,169
			Water service	Ton	81,271	85,405	132,169
		Total amount of water discharged		Ton	5,282	9,170	11,258
		Water usage		Ton	75,989	76,235	120,911
		Wastewater generation		Ton	5,282	9,170	11,258
	Air pollution Discharge management	Particulate matter (PM) emissions		Ton	0.40	0.30	0.06
		NOx emissions		Ton	9.00	1.60	2.71
		SOx emissions		Ton	0.40	0	0.15
	Water contaminants	BOD		Ton	0	0	0
		COD		Ton	0	0	0
		T-N		Ton	0	0	0
		T-P		Ton	0	0	0
		TOC		Ton	0	0	0
		SS		Ton	0	0	0
	Waste management (Allbaro system data)	Total waste generation	Total	Ton	161.80	1,239.50	1,958.45
			Waste recycling rate	%	36.80	76.60	88.01
			Base unit (percentage compared to sales)	Ton/KRW 100 million	0.14	0.68	0.79
			- Recycling	Ton	59.60	949.20	1,723.58
			- Incineration	Ton	0	0	240.56
			- Landfill	Ton	0	0	14.11
		In-house	Recycling	Ton	-	-	0
			Incineration	Ton	-	-	0
			Landfill	Ton	-	-	0
		Consignment	Recycling	Ton	-	-	1,723.58
			Incineration	Ton	-	-	240.56
			Landfill	Ton	-	-	14.11
	Hazardous chemical substance management	Consumption		Ton	10,911.10	13,017.00	14,696.58
		No. of leakage accidents		cases	0	0	0
	Violation of environmental regulations			cases	0	0	0
Environmental management	Eco-friendly investment	Facility management cost		KRW 1 million	62.50	510.20	712.34
		Facility investment cost		KRW 1 million	16.00	717.10	0
		Total		KRW 1 million	78.50	1,227.30	712.34

1) GHG emissions and energy base unit emissions are calculated based on DS Dansuk's sales in the reporting year.
2) DS Dansuk's data on water intake has been prepared based on bills, and data on water discharge has been prepared based on water.

ESG Data | Environment_Pyeongtaek Bio Plant #2

Sort				Unit	2020	2021	2022
Response to climate change	GHG management	GHG emission	Total GHG emissions	tCO_2eq	11,065.30	10,900.00	10,885.80
			- Direct emissions (Scope 1)	tCO_2eq	9,073.10	8,876.20	8,854.22
			- Indirect emissions (Scope 2)	tCO_2eq	1,992.20	2,023.80	2,031.58
			Base unit emissions[1]	tCO_2eq/KRW 100 million	12.74	8.52	6.06
			GHG reduction performance (reduction)	tCO_2eq	-1,322.70	165.30	14.20
	Energy management	Total energy use	Total	TJ	219.80	217.40	217.15
			Base unit (energy intensity)	Ton/KRW 100 million	0.25	0.17	0.12
		Direct energy use	Total	TJ	178.80	175.10	174.69
			Base unit (energy intensity)	Ton/KRW 100 million	0.21	0.14	0.10
			- LNG (fuel)	TJ	178.80	175.10	174.69
		Indirect energy use	Total	TJ	41.00	42.30	42.45
			Base unit (energy intensity)	Ton/KRW 100 million	0.05	0.03	0.02
			- Electricity consumption	TJ	41.00	42.30	42.45
			- Heat/steam consumption	TJ	0	0	0
			Energy reduction performance (reduction) (change compared to previous year)	TJ	-26.10	2.40	0.25
		Carbon intensity	Total energy	tCO_2eq/TJ	50.34	50.14	50.13
			Direct energy	tCO_2eq/TJ	50.74	50.69	50.68
			Indirect energy	tCO_2eq/TJ	48.59	47.84	47.85
Environmental performance management	Water management[2]	Water intake	Total	Ton	53,291.00	56,135.00	84,867.52
			Water service	Ton	53,291.00	56,135.00	84,867.52
		Total amount of water discharged		Ton	2,243.00	1,379.00	1,242.52
		Water usage		Ton	51,048	54,756	83,625
		Wastewater generation		Ton	2,243.00	1,379.00	1,242.52
	Air pollution emission management and performance	Particulate matter (PM) emissions		Ton	0.20	0.30	0.06
		NOx emissions		Ton	2.80	3.90	4.99
		SOx emissions		Ton	0.10	0	0
	Water contaminants	BOD		Ton	0	0	0
		COD		Ton	0	0	0
		T-N		Ton	0	0	0
		T-P		Ton	0	0	0
		TOC		Ton	0	0	0
		SS		Ton	0	0	0
	Waste management (Allbaro system data)	Total waste generation	Total	Ton	13.90	152.10	41.27
			Waste recycling rate	%	0	0	0
			Base unit (percentage compared to sales)	Ton/KRW 100 million	0.02	0.12	0.02
			- Recycling	Ton	0	0	0
			- Incineration	Ton	0	0	0
			- Landfill	Ton	0	0	0
		In-house	Recycling	Ton	-	-	0
			Incineration	Ton	-	-	0
			Landfill	Ton	-	-	0
		Consignment	Recycling	Ton	-	-	0
			Incineration	Ton	-	-	0
			Landfill	Ton	-	-	0
	Hazardous chemical substance management	Consumption		Ton	7,522.20	7,596.00	9,131.89
		No. of leakage accidents		cases	0	0	0
	Violation of environmental regulations			cases	0	0	0
Environmental management	Eco-friendly investment	Facility management cost		KRW 1 million	3.00	5.20	42.97
		Facility investment cost		KRW 1 million	4.00	0.70	0
		Total		KRW 1 million	7.00	5.90	42.97

1) GHG emissions and energy base unit emissions are calculated based on DS Dansuk's sales in the reporting year.
2) DS Dansuk's data on water intake has been prepared based on bills, and data on water discharge has been prepared based on water.

ESG Data | Environment_Gunsan Recycling Plant

Sort				Unit	2020	2021	2022
Response to climate change	GHG management	GHG emission	Total GHG emissions	tCO_2eq	20,074.00	18,734.90	21,298.91
			- Direct emissions (Scope 1)	tCO_2eq	15,491.00	14,448.70	16,617.24
			- Indirect emissions (Scope 2)	tCO_2eq	4,583.00	4,286.30	4,681.67
			Base unit emissions[1]	tCO_2eq/KRW 100 million	16.95	14.49	14.07
			GHG reduction performance (reduction)	tCO_2eq	13,219.00	1,339.10	-2,564.01
	Energy management	Total energy use	Total	TJ	219.30	202.50	217.08
			Base unit (energy intensity)	TJ/KRW 100 million	0.19	0.16	0.14
		Direct energy use	Total	TJ	125.00	113.00	119.25
			Base unit (energy intensity)	TJ/KRW 100 million	0.11	0.09	0.08
			- LNG(fuel)	TJ	125.00	113.00	119.25
		Indirect energy use	Total	TJ	94.40	89.60	97.83
			Base unit (energy intensity)	TJ/KRW 100 million	0.08	0.07	0.06
			- Electricity consumption	TJ	94.40	89.60	97.83
			- Heat/steam consumption	TJ	0	0	0
			Energy reduction performance (reduction) (change compared to previous year)	TJ	133.30	16.80	-14.58
		Carbon intensity	Total energy	tCO_2eq/TJ	91.54	92.52	98.11
			Direct energy	tCO_2eq/TJ	123.93	127.86	139.35
			Indirect energy	tCO_2eq/TJ	48.55	47.84	47.86
Environmental performance management	Water management [2]	Water intake	Total	Ton	102,274	101,945	126,137
			Water service	Ton	5,242	5,159	5,457
			Industrial water	Ton	97,032	96,786	120,680
		Total amount of water discharged		Ton	81,848.70	79,645	96,564.30
		Water usage		Ton	20,425.30	22,300	29,572.70
		Wastewater generation		Ton	81,848.70	79,645	96,564.30
	Air pollution emission management and performance	Particulate matter (PM) emissions		Ton	2.20	3.40	2.70
		NOx emissions		Ton	23.30	14.50	13.10
		SOx emissions		Ton	7.70	3.60	0.70
	Water contaminants	BOD		Ton	0.10	5.20	0.09
		COD		Ton	0.90	0.80	0.40
		T-N		Ton	4.80	4.50	0.50
		T-P		Ton	0	0.10	0
		TOC		Ton	-	1.90	0.30
		SS		Ton	1.50	5.60	0.50
	Violation of environmental regulations	Total waste generation	Total	Ton	14,351.53	15,726.94	14,737.40
			Waste recycling rate	%	37.37	37.45	30.83
			Base unit (percentage compared to sales)	Ton/KRW 100 million	12.12	12.16	9.73
			- Recycling	Ton	5,363.82	5,890.50	4,543.80
			- incineration	Ton	578.60	501.90	457.50
			- Landfill	Ton	8,329.89	9,166.70	9,736.10
			- Neutralization	Ton	79.22	167.84	0
	Hazardous chemical substance management	Consumption		Ton	53,225.00	52,644.00	53,915.01
		No. of leakage accidents		cases	0	0	0
	Violation of environmental regulations			cases	0	0	0
Environmental management	Eco-friendly investment	Facility management cost		KRW 1 million	236.60	2,808.80	2,775.80
		Facility investment cost		KRW 1 million	1,019.30	25.80	270.30
		Total		KRW 1 million	1,255.90	2,834.60	3,046.10

1) GHG emissions and energy base unit emissions are calculated based on DS Dansuk's sales in the reporting year.
2) DS Dansuk's data on water intake has been prepared based on bills, and data on water discharge has been prepared based on water.

ESG Data | Environment_Gunsan Fine Chemical Plant

Sort				Unit	2020	2021	2022
Response to climate change	GHG management	GHG emission	Total GHG emissions	tCO_2eq	15,765.10	19,589.60	18,969.11
			- Direct emissions (Scope 1)	tCO_2eq	11,125.30	13,517.50	12,333.32
			- Indirect emissions (Scope 2)	tCO_2eq	4,639.90	6,072.00	6,635.78
			Base unit emissions[1]	tCO_2eq/KRW 100 million	80.67	60.19	58.86
			GHG reduction performance (reduction)	tCO_2eq	2,261.00	-3,824.50	620.49
	Energy management	Total energy use	Total	TJ	204.00	359.70	350.99
			Base unit (energy intensity)	TJ/KRW 100 million	1.04	1.11	1.09
		Direct energy use	Total	TJ	104.40	232.80	212.33
			Base unit (energy intensity)	TJ/KRW 100 million	0.53	0.72	0.66
			- LPG(fuel)	TJ	104.40	232.80	212.33
		Indirect energy use	Total	TJ	99.70	126.90	138.66
			Base unit (energy intensity)	TJ/KRW 100 million	0.51	0.39	0.43
			- Electricity consumption	TJ	99.70	126.90	138.66
			- Heat/steam consumption	TJ	0	0	0
			Energy reduction performance (reduction) (change compared to previous year)	TJ	1.16	-155.70	8.71
		Carbon intensity	Total energy	tCO_2eq/TJ	77.28	54.46	54.04
			Direct energy	tCO_2eq/TJ	106.56	58.06	58.09
			Indirect energy	tCO_2eq/TJ	46.54	47.85	47.86
Environmental performance management	Water management[2]	Water intake	Total	Ton	619,492	884,497	810,390
			Water service	Ton	2,106	2,776	5,021
			Industrial water	Ton	617,386	881,721	805,369
		Total amount of water discharged		Ton	605,026	815,304	652,441
		Water usage		Ton	14,466	69,193	157,949
		Wastewater generation		Ton	605,026	815,304	652,441
	Air pollution Discharge management	Particulate matter (PM) emissions		Ton	0.90	1.40	0.28
		NOx emissions		Ton	1.90	3.00	3.71
		SOx emissions		Ton	0.10	0.10	0.08
	Water contaminants	BOD		Ton	2.10	1.80	0.70
		COD		Ton	13.90	4.50	-
		T-N		Ton	0.50	1.70	3.34
		T-P		Ton	0	0	0.03
		TOC		Ton	-	-	5.20
		SS		Ton	2.20	1.40	8.80
	Waste management (Allbaro system data)	Total waste generation	Total	Ton	689.00	1,325.52	1,375.43
			Waste recycling rate	%	64.46	86.62	80.01
			Base unit (percentage compared to sales)	Ton/KRW 100 million	3.53	4.07	4.27
			- Recycling	Ton	444.10	1,148.20	1,100.50
			- Incineration	Ton	168.00	165.20	274.90
			- Landfill	Ton	76.90	12.10	0
	Hazardous chemical substance management	Consumption		Ton	5,232	8,596	16,064
		No. of leakage accidents		cases	0	0	0
Environmental management	Violation of environmental regulations			cases	0	0	0
	Eco-friendly investment	Facility management cost		KRW 1 million	267.33	384.00	241.60
		Facility investment cost		KRW 1 million	556.92	460.00	413.40
		Total		KRW 1 million	824.25	844.00	655.00

1) GHG emissions and energy base unit emissions are calculated based on DS Dansuk's sales in the reporting year.
2) DS Dansuk's data on water intake has been prepared based on bills, and data on water discharge has been prepared based on water.

ESG Data | Environment_Jecheon Bio Plant

Sort				Unit	2020	2021	2022
Response to climate change	GHG management	GHG emission	Total GHG emissions	tCO_2eq		4,698.80	3,364.62
			- Direct emissions (Scope 1)	tCO_2eq		3,594.00	2,525.40
			- Indirect emissions (Scope 2)	tCO_2eq		1,104.80	839.22
			Base unit emissions[1]	tCO_2eq/KRW 100 million		11.49	9.93
			GHG reduction performance (reduction)	tCO_2eq		-	1,334.18
	Energy management	Total energy use	Total	TJ		76.50	54.89
			Base unit (energy intensity)	TJ/KRW 100 million		0.19	0.11
		Direct energy use	Total	TJ		53.40	37.35
			Base unit (energy intensity)	TJ/KRW 100 million		0.13	0.07
			- LNG(fuel)	TJ		53.40	37.35
		Indirect energy use	Total	TJ		23.10	17.54
			Base unit (energy intensity)	TJ/KRW 100 million		0.06	0.03
			- Electricity consumption	TJ		23.10	17.54
			- Heat/steam consumption	TJ		0	0
			Energy reduction performance (reduction) (change compared to previous year)	TJ		-	21.61
		Carbon intensity	Total energy	tCO_2eq/TJ		61.42	61.30
			Direct energy	tCO_2eq/TJ		67.30	67.61
			Indirect energy	tCO_2eq/TJ		47.83	47.85
Environmental performance management	Water management[2]	Water intake	Total	Ton		24,575	22,974
			Water service	Ton		24,575	22,974
			Industrial water	Ton		-	-
		Total amount of water discharged		Ton		0	0
		Water usage		Ton		24,575	22,974
		Wastewater generation		Ton		0	0
	Air pollution Discharge management	Particulate matter (PM) emissions		Ton		0.20	0.18
		NOx emissions		Ton		0.90	2.12
		SOx emissions		Ton		0.30	0.14
	Water contaminants	BOD		Ton		-	-
		COD		Ton		-	-
		T-N		Ton		-	-
		T-P		Ton		-	-
		TOC		Ton		-	-
		SS		Ton		-	-
	Waste management (Allbaro system data)	Total waste generation	Total	Ton		1,787.80	1,428.78
			Waste recycling rate	%		99.75	99.06
			Base unit (percentage compared to sales)	Ton/KRW 100 million		4.37	2.81
			- Recycling	Ton		1,783.30	1,415.40
			- Incineration	Ton		4.50	13.38
			- Landfill	Ton		0	0
	Hazardous chemical substance management	Consumption		Ton		2,992.00	2,159.11
		No. of leakage accidents		cases		0	0
Environmental management	Violation of environmental regulations			cases		0	0
	Eco-friendly investment	Facility management cost		KRW 1 million		209.90	290.53
		Facility investment cost		KRW 1 million		0	0
		Total		KRW 1 million		209.90	290.53

1) GHG emissions and energy base unit emissions are calculated based on DS Dansuk's sales in the reporting year.
2) DS Dansuk's data on water intake has been prepared based on bills, and data on water discharge has been prepared based on water.

ESG Data

Employee Status

Sort				Unit	2020	2021	2022
Employees	Number of employees	Total		Persons	364	385	373
		Male		Persons	329	344	332
		Female		Persons	35	41	41
		Proportion of regular employees		%	99.7	99.2	97.3
	By employment type	Management executive	Male	Persons	11	16	15
			Female	Persons	0	1	1
		Workers with an indefinite period	Male	Persons	317	325	312
			Female	Persons	35	40	35
		Fixed-term workers	Male	Persons	1	3	5
			Female	Persons	0	0	5
	Employees by position	Executive		Persons	11	16	16
		Director		Persons	8	6	6
		Section chief		Persons	17	21	23
		Deputy section chief		Persons	21	18	19
		Assistant manager		Persons	39	45	40
		Employee[1]		Persons	268	279	269
	By age	Younger than 30 years		Persons	88	89	66
		30 ~ 50 years old		Persons	232	244	252
		50 years or older		Persons	44	52	55

1) The 'deputy assistant manager' position was abolished in 2023, and the data for the previous three years have been reflected as an employee.

Remuneration

Sort			Unit	2020	2021	2022
Remuneration[1]	Annual total remuneration	Total	KRW	17,339,143,382	21,532,999,139	23,330,873,189
		Male	KRW	16,132,351,261	19,880,538,410	21,480,920,373
		Female	KRW	1,206,792,121	1,652,460,729	1,849,952,816
	Average remuneration per person	Total	KRW	33,408,754	39,655,615	44,953,513
		Male	KRW	33,679,230	39,920,760	45,997,688
		Female	KRW	30,169,803	36,721,350	35,576,016
	Percentage of base salary and compensation of female workers compared to male workers		%	89.6	92.0	77.3
	Average employee remuneration		KRW 1 million	33.41	39.66	44.95

1) DS Dansuk does not differentiate compensation based on gender, and the difference in compensation is affected by the characteristics of the company as a manufacturer and changes in the number of new and retired employees by position.

Recruitment And Employment Turnover Status

Sort			Unit	2020	2021	2022
Recruitment and turnover status	By gender	Total	Persons	125	184	139
		Male	Persons	119	174	127
		Female	Persons	6	10	12
	By age	Younger than 30 years	Persons	34	56	47
		30~50 years old	Persons	83	121	89
		50 years or older	Persons	8	7	3
	No. of employee turnover (voluntary)	Total	Persons	132	157	155
	Average years of service		Years	4.5	4.5	4.5

Training/Education Status

Sort			Unit	2020	2021	2022
Employee training	Number of trainees[1]	Total	Persons	366	404	547
	Training hours	Total training hours	Hours	2,197	3,465	5,592
		Training hours per person	Hours/Person	6	8.6	10.2
	Training/educational cost	Total amount of training cost	KRW 1 million	9	21	24
		Training cost per person	KRW 1,000/Person	26	52	43.5

1) DS Dansuk's no. of hours of employee training was calculated as the cumulative number of employees as the training includes the total number of employees in legally required training, senior qualification training, group training, social job training, safety training on dangerous substances for manufacturing facilities, and additional training.

Maternity And Parental Leave Status

Sort				Unit	2020	2021	2022
Maternity/parental leave	Maternity leave	Persons taking maternity leave		Persons	3	1	0
	Parental leave	Persons taking parental leave		Persons	2	2	0
		Return to work from parental leave	No. of employees with min. 1 year of service	Persons	0	1	0

ESG Data

Diversity and inclusion

Sort				Unit	2020	2021	2022
Diversity and inclusion	Gender diversity	Total number of female employees	Number of persons	Persons	35	41	41
			Percentage	%	9.6	10.6	11.0
		Number of female managers (section chief or higher)	Number of persons	Persons	1	3	3
			Percentage	%	2.9	7.3	7.3
	Diversity of minority groups	Employees from, minority groups	Number of persons	Persons	41	43	44
		Total number of foreigner employees	Number of persons	Persons	29	31	33
		No. of disabled employees	Number of persons	Persons	12	12	11
	Organizational culture	Cyber reporting center	No. of registrations	Cases	0	0	0
		Joint labor-management conference	Total Number of persons	Persons	24	24	24
			Number of hosts	Times	16	16	16
			Number of agenda items	Cases	-	-	-

cooperative company Transaction Status

Sort			Unit	2020	2021	2022
cooperative company	No. of cooperative company		No. of companies	303	299	288
	Major cooperative company	Transaction amount over KRW 10 billion	No. of companies	8	23	30
	Total purchase cost		KRW 1 million	448,600	744,900	908,979

Social Contribution

Sort			Unit	2020	2021	2022
Social Contribution	Social contribution activities	Donations	KRW 1 million	15.8	68.76	259.71
	Dansuk Scholarship Foundation	No. of scholarship students	Persons	32	40	18
		Scholarship	KRW 1 million	57.1	71.3	48.5

ESG Data | Occupational Safety and Health

Sort			Unit	2020	2021	2022
Sihwa Plant	Safety and health disaster	No. of workers subject to the occupational safety and health management system	Persons	182	180	163
		Percentage of workers subject to the occupational safety and health management system	%	100%	100%	100%
		No. of fatalities	Persons	0	0	0
		Industrial accident rate	%	0	0	0
		Safety and health investment costs	KRW 1 million	269	369	362
		Number of violations of safety and health regulations	Cases	0	0	0
	Safety and health training	Training time	Hours	4,793	4,920	4,384
		No. of persons completing training	Persons	186	189	161
		Training time per person	Hours/ Persons	26	26	27
	Safety inspections and evaluations	Safety and health system operation status inspection	Times	2	6	8
		No. of Industrial Safety and Health Committee held	Times	4	4	4
		Joint safety and health inspection of cooperative company	Times	4	4	4
		Workplace risk assessment	Times	1	1	3
	Safety and health activities	Health checkup				
		- General checkup	Times	4	3	4
		- Comprehensive checkup	Times	0	0	0
		- Cholesterol test cost support (additional)	Times	0	0	75
		Health support activities				
		- No. of users of in-house clinic (medical room)	Persons	0	0	0
		- No. of regular in-house health counseling sessions (additional)	Times	77	18	132
		- No. of vaccination users	Persons	0	0	0
		- No. of vaccination participants (additional)	Persons	118	80	78
		- Vaccination rate	%	67.78	41.45	45.6
		- No. of smoking cessation clinic users	Persons	0	0	0
		- No. of regular in-house contract workers receiving health counseling (additional)	Times	80	43	113
Pyeongtaek Bio Plant #1	Safety and health disaster	No. of workers subject to the Occupational Safety and Health Management System	Persons	36	41	35
		Percentage of workers subject to the occupational safety and health management system	%	100	100	100
		No. of fatalities	Persons	0	0	0
		Industrial accident	%	0	0	0
		Safety and health investment costs	KRW 1 million	64	125	106
		Number of violations of safety and health regulations	Cases	0	0	0
	Safety and health training	Training time	Times	1,563	2,136	1,729
		No. of persons completing training	Persons	38	42	42
		Training time per person	Hours/ Persons	41	51	41
	Safety inspections and evaluations	Safety and health system operation status inspection	Times	0	4	4
		No. of Industrial Safety and Health Committee held	Times	0	0	4
		Health support activities	Times	0	0	4
		Workplace risk assessment	Times	1	1	1
	Safety and health activities	Health checkup				
		- General checkup	Times	1	1	1
		- Comprehensive checkup	Times	0	0	0
		Health support activities				
		- No. of users of in-house clinic (medical room)	Persons	0	0	0
		- No. of vaccination users	Persons	0	0	0
		- No. of vaccination participants (additional)	Persons	30	15	21
		- Vaccination rate	%	75	35	46
		- No. of smoking cessation clinic users	Persons	0	0	0

ESG Data | Occupational Safety and Health

Sort			Unit	2020	2021	2022
Pyeongtaek Bio Plant #2	Safety and health disaster	No. of workers subject to the Occupational Safety and Health Management System	Persons	19	17	15
		Percentage of workers subject to the occupational safety and health management system	%	100	100	100
		No. of fatalities	Persons	0	0	0
		Industrial accident	%	5.88	5.56	0
		Safety and health investment costs	KRW 1 million	42	39	22
		Number of violations of safety and health regulations	Cases	0	0	0
	Safety and health training	Training time	Hours	792	856	874
		No. of persons completing training	Persons	17	17	18
		Training time per person	Times/ Persons	47	50	54
	Safety inspections and evaluations	Safety and health system operation status inspection	Times	0	4	4
		No. of Industrial Safety and Health Committee held	Times	0	0	4
		Health support activities	Times	0	0	0
		Workplace risk assessment	Times	1	1	1
	Safety and health activities	Health checkup				
		- General checkup	Times	1	1	1
		- Comprehensive checkup	Times	0	0	0
		Health support activities				
		- No. of users of in-house clinic (medical room)	Persons	0	0	0
		- No. of vaccination users	Persons	0	0	0
		- No. of vaccination participants (additional)	Persons	15	11	3
		- Vaccination rate	%	93	78	21
		- No. of smoking cessation clinic users	Persons	0	0	0
Gunsan Recycling Plant	Safety and health disaster	No. of workers subject to the Occupational Safety and Health Management System	Persons	58	66	85
		Percentage of workers subject to the occupational safety and health management system	%	100	100	100
		No. of fatalities	Persons	0	0	0
		Industrial accident	%	0.91	1.35	0
		Safety and health investment costs	KRW 1 million	140	166	380
		Number of violations of safety and health regulations	Cases	0	0	0
	Safety and health training	Training time	Hours	1,685	1,852	2,517
		No. of persons completing training	Persons	106	62	76
		Training time per person	Times/ Persons	16	30	33
	Safety inspections and evaluations	Safety and health system operation status inspection	Times	2	6	7
		No. of Industrial Safety and Health Committee held	Times	4	4	4
		Health support activities	Times	0	0	0
		Workplace risk assessment	Times	1	1	1
	Safety and health activities	Health checkup				
		- General checkup	Times	1	1	1
		- Comprehensive checkup	Times	0	0	0
		Health support activities				
		- No. of users of in-house clinic (medical room)	Persons	0	0	0
		- No. of vaccination users	Persons	0	0	0
		- No. of vaccination participants (additional)	Persons	46	34	59
		- Vaccination rate	%	73	53	72
		- No. of smoking cessation clinic users	Persons	0	0	0

Sort			Unit	2020	2021	2022
Gunsan Fine Chemical Plant	Safety and health disaster	No. of workers subject to the Occupational Safety and Health Management System	Persons	55	62	74
		Percentage of workers subject to the occupational safety and health management system	%	100	100	100
		No. of fatalities	Persons	0	0	0
		Industrial accident	%	1.85	1.79	0
		Safety and health investment costs	KRW 1 million	45	53	122
		Number of violations of safety and health regulations	Cases	0	0	0
	Safety and health training	Training time	Hours	1,916	1,679	2,660
		No. of persons completing training	Persons	50	57	90
		Training time per person	Times/ Persons	38	29	30
	Safety inspections and evaluations	Safety and health system operation status inspection	Times	2	6	7
		No. of Industrial Safety and Health Committee held	Times	4	4	4
		Health support activities	Times	4	3	12
		Workplace risk assessment	Times	1	1	1
	Safety and health activities	Health checkup				
		- General checkup	Times	1	1	2
		- Comprehensive checkup	Times	0	0	0
		Health support activities				
		- No. of users of in-house clinic (medical room)	Persons	0	0	0
		- No. of vaccination users	Persons	0	0	0
		- No. of vaccination participants (additional)	Persons	40	25	61
		- Vaccination rate	%	73	40	81
		- No. of smoking cessation clinic users	Persons	0	0	0
Jecheon Bio Plant	Safety and health disaster	No. of workers subject to the Occupational Safety and Health Management System	Persons	-	19	19
		Percentage of workers subject to the occupational safety and health management system	%	-	100	100
		No. of fatalities	Persons	-	0	0
		Industrial accident	%	-	0	0
		Safety and health investment costs	KRW 1 million	-	83	56
		Number of violations of safety and health regulations	Cases	-	0	0
	Safety and health training	Training time	Hours	-	907	399
		No. of persons completing training	Persons	-	20	19
		Training time per person	Times/ Persons	-	45	21
	Safety inspections and evaluations	Safety and health system operation status inspection	Times	0	2	2
		No. of Industrial Safety and Health Committee held	Times	-	-	-
		Health support activities	Times	-	-	-
		Workplace risk assessment	Times	0	1	1
	Safety and health activities	Health checkup				
		- General checkup	Times	0	0	0
		- Comprehensive checkup	Times	0	0	0
		Health support activities				
		- No. of users of in-house clinic (medical room)	Persons	0	0	0
		- No. of vaccination users	Persons	0	0	0
		- No. of vaccination participants (additional)	Persons	0	3	0
		- Vaccination rate	%	0	16	0
		- No. of smoking cessation clinic users	Persons	0	0	0

ESG Data | Financial Performance

Board of Directors

Sort			Unit	2020	2021	2022
Board of Directors	Board of directors operation status	No. of board meetings held	Times	14	14	13
		Resolution agenda	Cases	30	47	43
		Internal director attendance	%	96	94	86
		Outside director attendance	%	-	-	-
	ESG Sustainable Management Committee	No. of meetings held	Times	0	0	4

Ethical Management

Sort				Unit	2020	2021	2022
Ethical Management	Ethics policy	No. of employees being notified ethics policy by position		Persons	-	-	373
		Percentage of employees being notified ethics policy by position		%	-	-	100
	Management system laws and regulations	No. of ethics violations and measures taken[1]	No. of incidents of code of ethics/ethics policy violations	Cases	-	-	0
			No. of corruption cases	Cases	-	-	0
			No. of cases in which workers have been fired or disciplined for corruption	Cases	-	-	0
		Legal violations	No. of cases of violations of laws and regulations	%	-	-	0
			- Number of cases of violations of laws and regulations (cases of fine)	Cases	-	-	0
			- Number of cases of violations of laws and regulations (cases of non-financial sanctions)	Cases	-	-	0
			Fines for violation of laws and regulations	KRW 1 million	-	-	0

1) DS Dansuk's ethics reporting channel was newly established in 2023, and data for 2020-2021 has been collectively marked as '-' as it has not been calculated.

R&D

Sort			Unit	2020	2021	2022
R&D	R&D costs	Operation costs	KRW 1 million	226	331	593
		Base unit compared to sales	KRW 1 million	0.0004	0.0004	0.0005
	No. of R&D personnel	Battery recycling technology	Persons	7	4	4
		Bio technology	Persons	2	4	3
		Multiple materials	Persons	7	9	9
	Intellectual property rights (number of registered cases)	Total	Cases	17	17	17
		Patent	Cases	12	12	12
		Utility model	Cases	0	0	0
		Design	Cases	0	0	0
		Copyright, trademark, etc.	Cases	5	5	5

GRI Index

Index	No	Disclosure Title (Disclosure)	Page
GRI 2: General Disclosure			
Organizational profile and reporting principles	2-1	Organizational details	8-15
	2-2	Entities included in the organization's sustainability reporting	2
	2-3	Reporting period, frequency and contact point	2
	2-4	Restatements of information (impact of revisions on information provided in previous reports and reasons for revisions)	99
	2-5	External assurance	119
Activities and Workers	2-6	Activities, value chain, and other business relationships (organizational supply chain)	20-29
	2-7	Employees (employees, workers)	106
	2-8	Workers who are not employees	This information is disclosed through employment type disclosure information.
Governance	2-9	Governance structure and composition	87-89
	2-10	Nomination and selection of the highest governance body	87-89
	2-11	Chair of the highest governance body	87
	2-12	Role of the highest governance body in overseeing the management of impacts	32-33, 87-89
	2-13	Delegation of responsibility for managing impacts	32-33, 87-89
	2-14	Role of the highest governance body in sustainability reporting	32-33, 87-89
	2-15	Conflicts of interest	87-89
	2-16	Communication of critical concerns	94-96
	2-17	Collective knowledge of the highest governance body	87
	2-18	Evaluation of the performance of the highest governance body	87
	2-19	Remuneration policies	112
	2-20	Process to determine remuneration	89
	2-21	Annual total compensation ratio	Insufficient information
Strategy, policies and practices	2-22	Statement on sustainable development strategy	6-7
	2-23	Policy commitments	90
	2-24	Embedding policy commitments	91-92
	2-25	Processes to remediate negative impacts	90-93
	2-26	Mechanisms for seeking advice and raising concerns	90-93
	2-27	Compliance with laws and regulations	99-105
	2-28	Membership associations	117
Stakeholder Engagement	2-29	Approach to stakeholder engagement	35
	2-30	Collective bargaining agreements	76
Material Topics			
GRI 3: Material Topics 2021	3-1	Process to determine material topics	36
	3-2	List of material topics	37
Response to climate change			
GRI 3: Material Topcis 2021	3-3	Management of material topics	40-41
GRI 305: Emissions (2016)	305-1	Direct GHG emission(Scope 1)	99-105
	305-2	Energy indirect GHG emission(Scope 2)	99-105
	305-4	GHG emissions intensity	99-105
	305-5	Reduction of GHG emissions	44, 99-105
GRI 302: Energy (2016)	302-1	Energy consumption within the organization	99-105
	302-3	Energy intensity	99-105
	302-4	Reduction of energy consumption	44
	302-5	Reductions in energy requirements of products and services	42

GRI Index

Index	No	Disclosure Title (Disclosure)	Page
[Environmental Material Issue] Minimization of impact on the environment/Resource circulation			
GRI 3: Material Topcis 2021	3-3	Management of material topics	64-65
GRI 303: Water and effluents (2016)	303-1	Interactions with water as a shared resource	68-69
	303-2	Water resources significantly affected by withdrawal of water	69
	303-3	Water withdrawal	99-105
	303-5	Water discharge	99-105
GRI 306: Waste (2020)	306-3	Waste generated	70, 99-105
	306-4	Waste diverted from disposal	70, 99-105
	306-5	Waste directed to disposal	70, 99-105
Occupational health and safety			
GRI 3: Material Topcis 2021	3-3	Management of material topics	52-53
GRI 403:Occupational health and safety (2018)	403-1	Occupational health and safety management system	52-53
	403-2	Hazard identification, risk assessment, and incident investigation	56
	403-3	Occupational health services	61
	403-4	Worker participation, consultation, and communication on occupational health and safety	55-59
	403-5	Worker training on occupational health and safety	58
	403-6	Promotion of worker health	61
	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	56-60
	403-8	Workers covered by an occupational health and safety management system	109-111
	403-9	Work-related injuries	54, 109-111
Ethics and compliance management			
GRI 3: Material Topcis 2021	3-3	Management of material topics	86
GRI 205: Anti-corruption (2016)	205-1	Operation assessed for risks related to corruption	96
	205-2	Communication and training about anti-corruption policies and procedures	90-92
	205-3	Confirmed incidents of corruption and actions taken	90-92, 112
GRI 206: Anti-competitive behavior (2016)	206-1	Legal actions taken for anti-competitive behavior, anti-trust, and monopoly practices	106
Research and debelopment			
GRI 3: Material Topcis 2021	3-3	Management of material topics	90
GRI 201:Economic performance (2016)	201-2	Financial implications and other risks and opportunities due to climate change	43
GRI 203: Indirect economic impacts	203-2	Significant indirect economic impacts	48-51
Social topics			
GRI 401: Employment (2016)	401-1	New employee hires and employee turnover	107
	401-3	Parental leave	107
GRI 404: Training and education (2016)	404-1	Average hours of training per year per employee	107
	404-2	Programs for upgrading employee skills and transition assistance programs	79-80
GRI 405: Diversity and equal opportunity (2016)	405-1	Diversity of governance bodies and employees	87, 108
GRI 406: Non-discrimination (2016)	406-1	Incidents of discrimination and corrective actions taken	92
GRI 413: Local communities	413-1	Operations with local community engagement, impact assessments, and development programs	85
GRI 417: Marketing and labeling	417-1	Operations with significant actual and potential negative impacts on local communities	71

SASB Contents

DS Dansuk belongs to the biofuels industry among the industry classifications according to SASB (Sustainability Accounting Standards Board)'s sustainability accounting standards. The disclosures have been made according to the disclosure items required by the accounting standards of the relevant industry, and information for each code is disclosed.

Topic	Code	Description of the metric	DS Dansuk's data
Air Quality	RR_BI_120a.1	Air emissions of the following pollutants: (1) NOx (excluding N_2O), (2) SOx, (3) volatile organic compounds (VOCs), and (4) particulate matter (4) and (5) hazardous air pollutants (HAPs)	99-105p
	RR_BI_120a.2	Number of incidents of non-compliance associated with air quality permits, standards, and regulations	99-105p
Water Management in Manufacturing	RR_BI_140a.1	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	68-69p, 99-105p
	RR_BI_140a.2	Description of water management risks and discussion of strategies and practices to mitigate those risks	68-69p
	RR_BI_140a.3	Number of incidents of non-compliance associated with water quality permits, standards and regulations	99-105p
Lifecycle Emissions Balance	RR_BI_410a.1	Lifecycle greenhouse gas (GHG) emissions, by biofuel type	42p
Sourcing & Environmental Impacts of Feedstock Production	RR_BI_430a.1	Discussion of strategy to manage risks associated with environmental impacts of feedstock production	65-73p
Management of the Legal & Regulatory Environment	RR_BI_530a.2	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	34-35p

Index	Code	DS Dansuk's Data
Biofuel production capacity	RR-BI-000.A	20-22, 42p
Amount of feedstock consumed in production	RR-BI-000.C	42p

TCFD Contents

Sort	TCFD Recommendation	Report Page	CDP Index
Governance	a) Describe the board's oversight of climate-related risks and opportunities	40-41p	C1.1, C1.1a, C1.1b
	b) Describe management's role in assessing and managing climate-related risks and opportunities		C1.2, C1.2a
Strategy	a) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	46-51p	C3.4
Risk management	a) Describe the organization's processes for identifying and assessing climate-related risks	64-65p	C2.1, C2.2
	b) Describe the organization's processes for managing climate-related risks	64-65p	
Metrics and targets	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	41p	C2.1b, C3.3
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	43-44p	C6.1, C6.3, C6.5
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	43-44p	C4.1, C4.1a, 4.2, 4.3, C4.1b

Awards and Memberships

Awards

Awards After 2000

Award name	Awarding body	Date
Citation for contributing to national industrial development through productivity improvement	Ministry of Trade, industry and Energy	2000. 05
Designation as a "new technology development venture company"	Gyeonggi Regional SMEs and Startups office	2001. 05
Selected as an "excellent technology company"	Korea Technology Finance Corporation	2001. 12
Confirmed as a specialized company for partsand materials	Ministry of Commerce, Industry and Energy	2002. 11
Citation for eradicating illegal petroleum products/establishing order in the supply chain for the oil market	Ministry of Commerce, Industry and Energy	2007. 10
Gold Award in the environmental safety sector at the Korea Green Energy Awards	KPETRO Korea Green Energy Awards organizing committee	2009. 10
Citation as a prestigious heritage company, and for improving the status of small and medium-sized companies	KBIZ Federation of SMEs	2011. 05
Citation for contributing to the conservation of the natural environment	Ministry of Environment	2011. 01
Awarded the 50 Million Dollar Export Tower	Ministry of Trade, Industry and Energy	2011. 11
Order of Industrial Service Merit (Silver Tower):Honest tax payment	Ministry of Economy and Finance	2012. 03
Awarded the 70 Million Dollar Export Tower	Ministry of Trade, industry and Energy	2012. 12
Awarded the Trader of the Year Award	Korea International Trade Association	2013. 10
Awarded the 100 Million Dollar Export Tower	Ministry of Trade, industry and Energy	2013. 12
Awarded the Academic Technology Award at the Korea Environmental Energy Awards	Korea Energy Society	2018. 11
Awarded the 200 Million Dollar Export Tower	Ministry of Trade, industry and Energy	2020. 12
Awarded the 300 Million Dollar Export Tower	Ministry of Trade, industry and Energy	2022. 12

Memberships in 2023

Association	
3D Printing Research Association	Korea Exchange
ISCC Association (ISCC e.V.)	Korea Copper Industrial Cooperative
Gyeonggi-do Trucking Association	Korea International Trade Association
Gyeonggi-do Environmental Conservation Association	Korea Bioenergy Association
Gyeonggi Western Region Chemical Plant Safety Management Council	Korea Nonferrous Metal Association
Gunsan Industrial Complex Development Council	Korea Fire Safety Institute
Gunsan Business Environment Council	Korea Energy Engineers Association
Gunsan Fire Industry Association	Korea Energy Society
Ministry of Justice Youth Crime Prevention Committee Gunsan/Iksan Regional Council	Korea Resource Recycling Society
Sihwa Fashion Color Business Cooperative	Korea Regeneration Association
Siheung Chamber of Commerce and Industry	Korea Electric Technology Association
Ansan Siheung Environmental Engineers Association	Korea Specialty Chemical Industry Association
Jeonbuk Environmental Engineers Association	Korea Waste Recycling Mutual Aid Association
Jeonbuk Environmental Preservation Association	Korea Packaging Recycling Business Mutual Aid Association
Poseung Management Council	Korea Chemical Management Association
	Representative Council of Chemical Handling Business Sites

Certification Status

Certification Details		Business Site	Organization	Acquisition Year
US EPA registration	Waste/Fat/Grease, Soybean oil	Sihwa	U.S. Environmental Protection Agency (EPA)	2012
	Waste/Fat/Grease	Pyeongtaek Bio #1, Pyeongtaek Bio #2		2018
	Soybean oil	Jecheon		
California LCFS registration	Domestic animal fats, UCO	Sihwa	California Air Resources Board (CARB)	2014
	Domestic UCO	Pyeongtaek Bio #2		2019
Oregon CFP registration	Domestic Animal fats, UCO	Sihwa	Oregon Department of Environmental Quality (DEQ)	2018
	Domestic UCO	Pyeongtaek Bio #2		2020
EU ISCC certification (BD manufacturer)	Bio Diesel,Bio Marine Fuel, Esterified fatty acids, Residue of FAME end distillation	Sihwa, Pyeongtaek Bio #1, Pyeongtaek Bio #2	European Commission EU ISCC Association	2012 2019 2017
EU ISCC certification (Trader with storage)	UCO, Food Waste, POME, SBEO	Sihwa, Pyeongtaek Bio #1,Pyeongtaek Bio #2		2017 2019 2017
EU ISCC certification (Collecting point)	UCO	Sihwa		2020
EU ISCC certification (Point of origin)	Residue of FAME end distillation, Crude Glycerine	Sihwa, Pyeongtaek Bio #1, Pyeongtaek Bio #2		2021
ISCC CORSIA PLUS certification (Collection point)	MSW, PFAD, Tallow, UCO, Refined oil, Fatty acid	Sihwa, Pyeongtaek Bio #1	ISCC Association ICAO Council	2023
ISCC CORSIA PLUS certification (Treatment plant for waste/residues)				
ISCC CORSIA PLUS certification (Biorefinery)				
ISCC CORSIA PLUS certification (SCOPE Trader withstorage)				

GHG Verification Statement

Korean Standards Association has conducted verification for GHG emissions based on GHG report provided by DS Dansuk Co., Ltd. which includes Scope1 and Scope2 emissions.

Verification Standards and Guidelines

To conduct verification activities, verification team applied verification standards and guidelines. The standards and guidelines are as follows.

· Guidance for reporting and verification of GHG emissions trading scheme
(No. 2022-279 provided by Ministry of Environment, Republic of Korea)
· ISO 14064-1, 3 : 2006
· 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Level of Assurance

DS Dansuk Co., Ltd.'s GHG emissions satisfies the under Reasonable Assurance(less than ±5.0% of total emissions).

Verification Conclusion

As a result of verification activities, verification team has found no significant errors, omissions, and misstatements. Therefore, Korean Standards Association confirms that following emissions data are adequately quantified.

2022 Emissions(Scope 1, Scope 2)

(Unit : tCO2eq)

Division	Scope1	Scope2	Total
Gunsan Factory no.1	16,617	4,682	21,298
Siheung Factory	8,076	9,532	17,607
Gunsan Factory no.2	12,333	6,636	18,969
Pyeongtaek factory no.1	6,027	5,734	11,760
Pyeongtaek factory no.2	8,854	2,032	10,885
Jecheon factory	2,525	839	3,364
Incheon plant	0	8	8
Daebudo plant	0	60	60
Total	54,433	29,522	83,950

※ Decimal place is not considered when calculating the emission of each workplace.

June 22, 2023

KOREAN STANDARDS ASSOCIATION

Independent Assurance Statement

To: The Stakeholders of DS Dansuk Co., Ltd.

Introduction and Objectives of Work

BSI Group Korea (hereinafter "the Assurer") was requested to verify DS Dansuk 2023 Sustainability Report (hereinafter "the Report"). This assurance statement applies only to the relevant information included in the scope of the assurance. DS Dansuk is solely responsible for all information and assertion contained in the Report. The responsibility of the Assurer is to provide DS Dansuk Management with independent assurance statement based on its expert opinions by applying the verification methodology for the specified assurance scope. It is also to provide the information to all stakeholders of DS Dansuk.

Standards and Levels

This assurance was based on the AA1000AS (Assurance Standard) v3 (2020) Assurance Standard and confirmed that the Report was prepared in accordance with the GRI Standards, the international standards guidelines of sustainability reports. In accordance with the AA1000 AS, the assurance level was Moderate Level, and conducted against Type 1 to confirm compliance with the four principles of the AA1000 AP (AccountAbility Principles) 2018 and the Type 2 assurance that verified the quality and reliability of the information disclosed in the report. Type 2 was limitedly verified against the topic standards below, based on the data and information provided by the reporting organization.

- GRI Topic Standards: 201-2, 203-2, 205-1~3, 206-1, 302-1, 302-3~5, 303-1~3, 303-5, 305-1~2, 305-4~5, 306-3~5, 403-1~9

Scope

The scope of assurance applied to the Report is as follows;

- Report contents during the period from January 1st to December 31st 2022 included in the report, some data included 2023.
- Major assesstion included in the report, such as sustainability management policies and strategies, goals, projects, and performance, and the report contents related to material issues determined as a result of materiality assessment.
- Appropriateness and consistency of processes and systems for data collection, analysis and review

The following contents were not included in the scope of assurance.

- Financial information in Appendix
- Index items related to other international standards and initiatives other than the GRI
- Other related additional information such as the website, business annual report.

Methodology

As a part of its independent assurance, the Assurer has used the methodology developed for relevant evidence collection in order to comply with the verification criteria and to reduce errors in reporting. The Assurer has performed the following activities;

- Review of the system for sustainability management strategy process and implementation
- Review of materiality issue analysis process and prioritization by reviewing materiality issue analysis process and verifying the results
- Review of the evidence to support the material issues through interviews with senior managers with responsibility for them
- Verification of data generation, collection and reporting for each performance index

Limitation

The Assurer performed limited verification for a limited period based on the data provided by the reporting organization. It implies that no significant errors were found during the verification process, and that there are limitations related to the inevitable risks that may exist. The Assurer does not provide assurance for possible future impacts that cannot be predicted or verified during the verification process and any additional aspects related thereto.

Assurance Opinion

On the basis of our methodology and the activities described above, it is our opinion that

- The information and data included in the Report are accurate and reliable and the Assurer cannot point out any substantial aspects of material with mistake or misstatement.
- The report is prepared in accordance with the GRI Standards. (Reporting in accordance with the GRI standards)
- The assurance opinions on the four principles presented in the AA1000 AP (2018) are as follows.

AA1000 AP (2018)

Inclusivity: Stakeholder Engagement and Opinion

DS Dansuk defined Customers, Executives and employees, Local community, Suppliers, Shareholders and Investors and Government/local government as key stakeholders groups, and operated communication channels for each stakeholder group for engagement. DS Dansuk reflected key issues drawn through stakeholder channels in sustainability management decisions and disclosed the process in the Report.

Materiality: Identification and reporting of material sustainability topics

DS Dansuk established the strategy related to sustainability management and established the process to derive reporting issues. DS Dansuk identified financial and social/environmental impacts and derived 7 material issues based on the analysis of media research, benchmarking global advanced companies in its field, and analysis of major global initiatives related to sustainability.

Responsiveness: Responding to material sustainability topics and related impacts

DS Dansuk established the management process for material issues determined by the materiality assessment, implemented a response plan for each issue to appropriately respond to the derived material issues that reflects the expectations of stakeholders. DS Dansuk disclosed the process including policy, indicator, activity and response performance on key reporting issues in the Report.

Impact: Impact of an organization's activities and material sustainability topics on the organization and stakeholders

DS Dansuk established the process to identify and evaluate the impact on organizations and stakeholders related to material issues. DS Dansuk used impacts, risk and opportunity factor analysis results for material issues to make decisions to develop response strategies for each issue, and disclosed the process in the Report.

Key areas for ongoing development

- It may be helpful to advance the sustainability management system by clarifying the scope and definition of the value-chain, and identifying and managing sustainability issues within the value-chain based on characteristics of the construction industry.
- It may be helpful to advance sustainability management system by developing and internalizing sustainability performance metrics that take into account the characteristics of major renewable energy business sectors such as bio-diesel and bio-oil, and specifying goals, achievements, and strategies according to them.

Statement of independence and competence

The Assurer is an independent professional institution that specializes in quality, health, safety, social and environmental management with almost 120 years history in providing independent assurance services. No member of the assurance team has a business relationship with DS Dansuk. The Assurer has conducted this verification independently, and there has been no conflict of interest. All assurers who participated in the assurance have qualifications as an AA1000AS assurer, have a lot of assurance experience, and have in-depth understanding of the BSI Group's assurance standard methodology.

Evaluation against GRI 'In Accordance' Criteria

The Assurer confirmed that the Report was prepared in accordance with the GRI Standards and the disclosures related to the following Universal Standards and Topic Standards Indicators based on the data provided by DS Dansuk, the sector standard was not applied.

[Universal Standards]

2-1 to 2-5 (The organization and its reporting practices), 2-6 to 2-8 (Activities and workers), 2-9 to 2-21 (Governance), 2-22 to 2-28 (Strategy, policies and practices), 2-29 to 2-30 (Stakeholder engagement), 3-1 to 3-3 (Material Topics Disclosures)

[Topic Standards]

201-2, 203-2, 205-1~3, 206-1, 302-1, 302-3~5, 303-1~3, 303-5, 305-1~2, 305-4~5, 306-3~5, 401-1, 401-3, 403-1~9, 404-1~2, 405-1, 406-1, 413-1, 417-1

AA1000
Licensed Report
000-4/V3-776PM

June 22, 2023

S. H. Lim / BSI Group Korea, Managing Director