

HD HYUNDAI ENERGY SOLUTIONS

PROMISING FUTURE
WITH GREEN ENERGY

2024 HD Hyundai Energy Solutions Sustainability Report

About This Report

Overview

This report outlines the activities and performance of HD Hyundai Energy Solutions in embedding sustainability into its operations. Starting in 2025, the report has been rebranded from an "Integrated Report" to a "Sustainability Report," and it will be published annually to provide transparent updates on progress and plans for addressing both financial and non-financial risks with stakeholders.

Reporting Standards and Frameworks

This report has been prepared in accordance with the Global Reporting Initiative (GRI) Standards 2021, the international guidelines for sustainability reporting. In order to incorporate key issues relevant to the solar energy industry, it also adheres to the disclosure framework of the Task Force on Climate-related Financial Disclosures (TCFD) and the industry-specific standards from the Sustainability Accounting Standards Board (SASB). Environmental and social topics are reported using the following thematic structure: Governance – Strategy – Risk Management – Metrics and Targets.

Reporting Period

The report covers the activities of HD Hyundai Energy Solutions from January 1 to December 31, 2024. To support stakeholders' right to information and ensure transparency, selected activities and achievements outside this period are also included. For quantitative performance and indicators, including financial metrics, the data from 2022 to 2024 are presented to help identify three-year trends.

Independent Assurance

To enhance the credibility and quality of this report, an independent external agency has conducted an assurance review.

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Date of Publication: June, 2025

Reporting Scope

This report covers HD Hyundai Energy Solutions and its subsidiaries. Financial performance has been prepared in accordance with the Korean International Financial Reporting Standards (K-IFRS). Unless mentioned otherwise, disclosures of non-financial activities and progress are limited to the HD Hyundai Energy Solution's headquarters and the Eumseong plant.

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Interactive Guide

HD Hyundai Energy Solutions' 2024 Sustainability Report is available for download on the company's official website (https://www.hd-hyundaies.co.kr). For user convenience, the report has been published in an interactive PDF format.

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CEO Message

Paving the way toward a total energy solutions provider based on eco-friendly solar energy.



CEO & President of
HD Hyundai Energy Solutions
Jong Hwan Park

Dear Valued Stakeholders,
Thank you for your continued interest in and support for HD Hyundai Energy Solutions.

Despite challenging circumstances stemming from a stagnant domestic solar market and underperformance in overseas operations, HD Hyundai Energy Solutions has remained steadfast in its efforts to diversify its business portfolio through the expansion of the EPC and O&M operations.

Looking ahead, we anticipate even greater internal and external challenges compared to the previous year. Nevertheless, we are committed to navigating these difficulties with resilience and determination. By embedding ESG principles into our core management practices, we aim to lay a solid foundation for sustainable growth with a focus on the following priorities:

First, we will establish a foundation for sustainable and inclusive growth.

The global energy transition toward carbon neutrality remains in full motion. The shift from fossil fuels to renewable energy has become a central pillar of climate action and national competitiveness.

Leveraging the long-term benefits of renewable energy in terms of environment, society, and economy, HD Hyundai Energy Solutions will take the lead in this transition. To this end, we will launch products customized for each region and explore new market opportunities and diversified sales channels. At the same time, we will create a more stable revenue structure by expanding our EPC and O&M services and advancing into new electric utility businesses, and promptly internalize TOPCon cell manufacturing process and Heterojunction Technology (HJT), which are currently under development.

Second, we will enhance our ESG information management capabilities.

As ESG disclosure becomes mandatory in regions such as the United States and Europe, external expectations and regulatory requirements for ESG management continue to grow.

In response, we will strengthen our management systems across environmental, social, and governance areas, with the ESG Committee playing a central role. We will also expand the scope of ESG data management and establish an integrated digital platform that enables database accumulation to analyze, evaluate, and report both quantitative and qualitative performance for each indicator.

Third, we will implement low-carbon efforts in response to climate change.

As corporate accountability in regard to addressing the climate crisis is rising, we are introducing equipment to reduce carbon emissions during our high-power and high-efficiency solar production lines, installed rooftop solar power systems for self-consumption to promote the use of renewable energy, and participated in campaigns to recycle waste materials.

Moving forward, we will continue to plan and implement carbon-reduction efforts across all stages of our value chain, including product development, manufacturing processes, supply chain operations, and the entire product lifecycle.

HD Hyundai Energy Solutions remains committed to engaging with our stakeholders and driving meaningful change for a better future. We ask for your continued support and engagement as we move forward on this journey together.

Thank you.

Company Overview

About HD Hyundai Energy Solutions

Company Overview

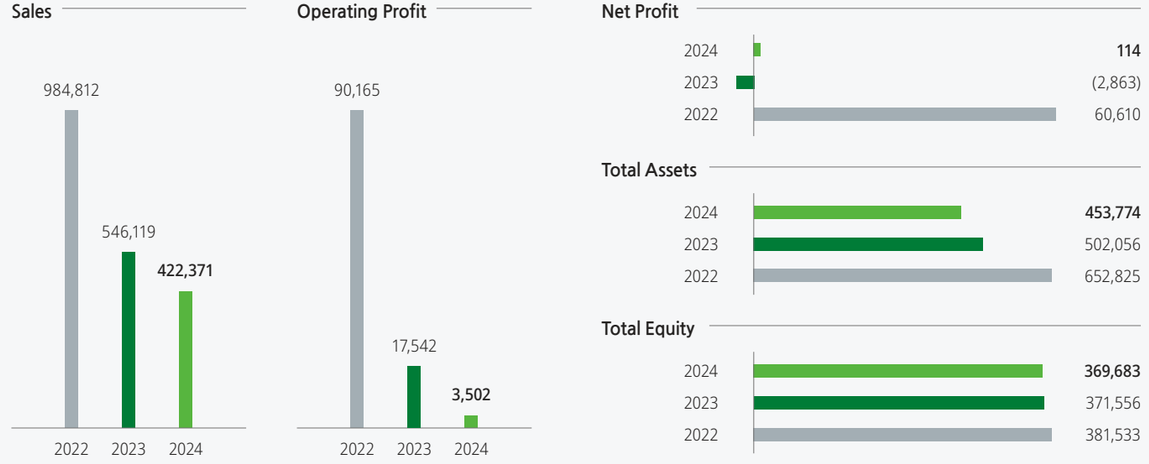
HD Hyundai Energy Solutions is a leading solar energy company in South Korea, established to drive the sustainable growth of the solar industry. We began our solar energy operations in 2004 as part of Hyundai Heavy Industries' Green Energy Division. To develop its expertise and enhance global competitiveness in the solar sector, the division was spun off as an independent corporation on December 21, 2016. Since becoming an independent entity, HD Hyundai Energy Solutions has expanded its investments in R&D and reinforced global partnerships, leading to the development of high-efficiency products and a more stable supply chain. Based on these efforts, it is reinforcing its competitive position in both domestic and international markets.

Business Overview

As a total solution provider in the solar energy sector, HD Hyundai Energy Solutions has diversified its business portfolio, based on its expertise in high-efficiency solar module manufacturing. Our main business areas include solar module production, power plant EPC, inverter supply, and O&M services. We also develop and manufacture high-power, high-efficiency solar modules using proprietary technology, supplying them to solar power plants around the world. In the EPC sector, we deliver customized energy solutions that cover the entire project life cycle, from plant design and construction to commissioning and maintenance. In addition, by supplying power conversion systems (PCS), including inverters, along with technical support, we are building the foundation for smart energy management systems.

Key Financial Indicators

(Unit: KRW million)



*As of December 31, 2024 (consolidated basis)

Corporate Profile

Company Name	HD Hyundai Energy Solutions	**CEO**	Jong Hwan Park
Date of Establishment	December 21, 2016 *Began solar energy operations in 2004 as a business division of Hyundai Heavy Industries	**Primary Business**	Manufacturing and sales of PV modules
Head Office Address	9F, 477 Bundangsuseo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do (HD Hyundai Group Global R&D Center)	**Stock Exchange**	Korea Exchange (KRX), KOSPI Market

2024 R&D Project Highlights (In-House)

· Developed technology to improve the SE-PERC efficiency.	· Developed large-area crystalline/thin-film silicon heterojunction (HJT) solar module technology.
· Developed automotive solar roof modules using curved glass.	· Developed specialized materials and prototypes for mobility and curved-surface applications.
· Developed passivated electrode-type cells and modules using high-efficiency tunnel oxide.	· Developed solar module products for noise-reduction facilities and conducted power generation validation tests.
· Conducted research and technical exchange on ultra-high efficiency tandem cell technology based on silicon.	· Advanced mass-production technology for HJT cells and modules larger than M10.
· Verified and evaluated feasibility study of large-area n-TOPCon solar cell materials and equipment mass production.	· Developed large-scale synthesis technology for core materials of tandem top cells using dry vacuum processes.

Business Overview

Market Conditions and Operational Status

Industry Landscape

The solar energy industry is part of a process industry that requires substantial facility investment for manufacturing, a technology-intensive field that demands continuous R&D and innovation to enhance product efficiency and reduce costs, and a knowledge-intensive field requiring expertise across diverse areas. As part of the renewable industry, it is also subject to fluctuations driven by changes in national energy policies.

The solar value chain includes upstream processes such as the production of polysilicon and its transformation into ingots and wafers, followed by midstream and downstream stages involving solar cells that convert sunlight into electricity, modules made by assembling multiple cells, and integrated solar power systems. Upstream segments like polysilicon and ingot/wafer manufacturing involve high initial capital investment and technical barriers, resulting in an oligopolistic market dominated by a few leading companies. On the other hand, downstream segments, which are more labor-intensive and have lower entry barriers, are characterized by fierce competition.

Industry Growth Outlook

Amid accelerating global efforts on carbon neutrality and enhancement of energy efficiency, the demand for solar energy is expected to continue its upward trend in 2025. Increased government support and policy incentives for energy security and the expansion of solar infrastructure have further elevated the importance of solar power in the global energy transition. In 2025, China alone is projected to install over 330 GW of solar capacity, accounting for over 50% of global installations, leading the market growth. At the same time, advanced economies such as the E.U. and the U.S. are expediting their decarbonization policies, while emerging markets like India and Brazil are expected to drive market expansion through improved economic competitiveness.

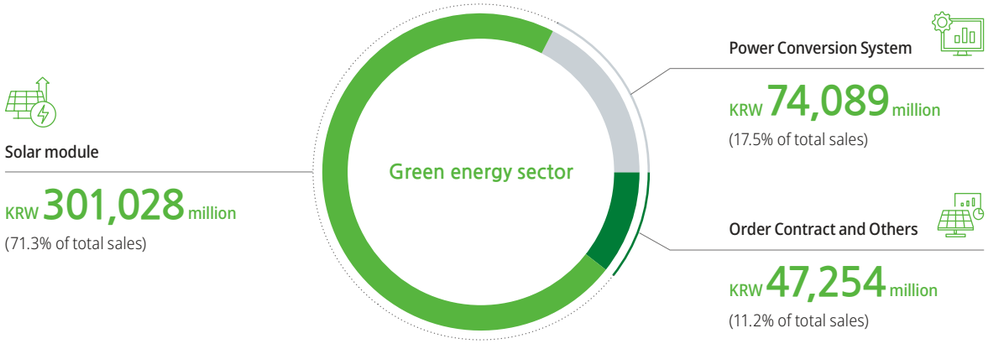
Operational Status

The domestic solar market is shifting toward a bidding-based structure, supported by government initiatives to expand renewable energy adoption while institutional foundations for power purchase agreements (PPAs) between energy consumers and renewable energy producers are also being established. At HD Hyundai Energy Solutions, we are developing our competitive edges in the domestic market by launching low-carbon solar modules with reduced emissions during manufacturing. We also offer optimal solutions tailored to various installation environments, ranging from solar applications to project design, construction, and maintenance.

Globally, the solar market continues to face challenges, including the reduction of energy subsidies for residential buildings in Europe and intensified price competition caused by inventory oversupply. In response, we are expanding our market presence in 2025 by focusing on premium, high-power solar modules such as HJT and n-type TOPCon modules. At the same time, we are enhancing our customer engagement strategy with different marketing efforts including local exhibitions and webinars.

In the U.S. market, demand for n-type solar products is growing, accompanied by competitive launches of high-power, high-efficiency modules. To capitalize on the fast-growing commercial and utility-scale segments, we will promote new product lines (TOPCon, n-Type) through local exhibitions and expand our customer networks.

Sales Performance in 2024



Market Shares

Category				2022	2023	2024
Domestic	Module	Amount		4,252.4 KRW million	3,475.3 KRW million	1,869.8 KRW million
		Market Share		30.3%	29.1%	26.4%
	Inverter	Amount		453.4 KRW million	555.4 KRW million	740.9 KRW million
		Market Share		26.0%	40.0%	55.4%
Overseas	Module	U.S.	Amount	665.1 KRW million	334.6 KRW million	455.8 KRW million
			Market Share	0.4%	0.2%	0.3%
		Non-U.S.	Amount	4,352.5 KRW million	1,031.2 KRW million	684.7 KRW million
			Market Share	0.4%	0.1%	0.1%
	Overseas Market Share			0.4%	0.1%	0.1%

Global Network

HD Hyundai Energy Solutions Global Network

Domestic Business Site

Category	Address
Headquarters	9F, 477, Bundangsuseo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Eumseong Plant	313, Soi-ro, Soi-myeon, Eumseong-gun, Chungcheongbuk-do, Republic of Korea

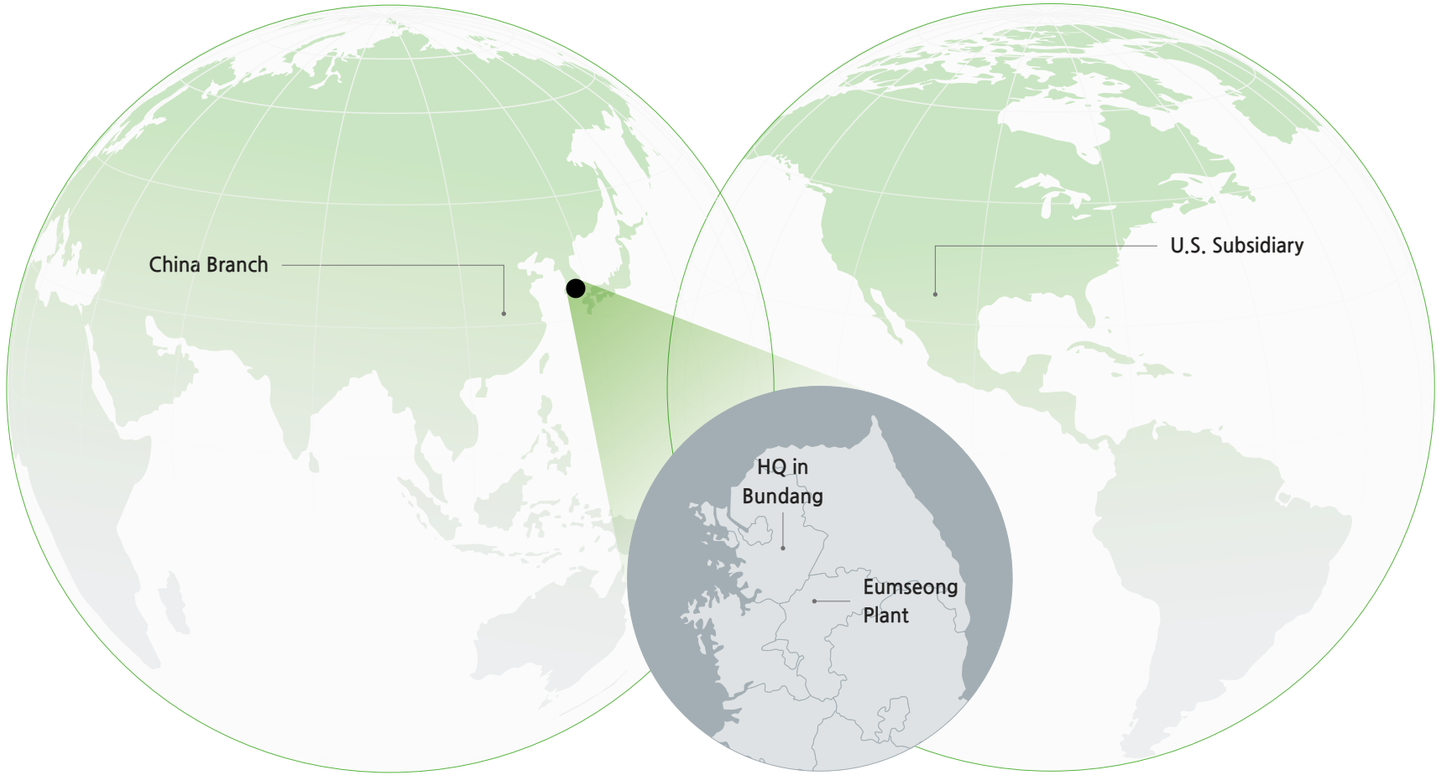
Consolidated Subsidiaries

Name	HD Hyundai Energy Solutions America Inc.
Date of Establishment	April 19, 2019
Location	California, U.S.A.
Main Business	Sales of PV modules
Total Assets	KRW 32,403 million

Overseas Branches and Subsidiaries

Name	HD Hyundai Energy Solutions America Inc.
Date of Establishment	April 19, 2019
Location	California, U.S.A.
Main Business	Sales of PV modules

Name	HD Hyundai Energy Solutions Co., Ltd. Shanghai Representative Office
Date of Establishment	November 13, 2019
Location	Shanghai, China
Main Business	Global sales of PV modules and raw material procurement



ESG Management

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Group ESG Management System

HD Hyundai Group ESG Management

HD Hyundai ESG Vision

HD Hyundai Group has set its ESG vision as "Future from the Ocean" and adopted the slogan "Beyond Blue, Forward to Green" to drive company-wide ESG initiatives. This slogan expresses the Group's ambition to become a leading eco-friendly company through technological innovation. Based on this vision, ESG strategies have been formulated across three key areas: environment, social responsibility, and governance. In the aspect of environment, under the theme "Blue Ocean with Green Tech," HD Hyundai Group is focused on developing eco-friendly technologies and expanding its investments. In the social areas, it promotes "Green Together with People & Society" by enhancing the safety and health framework and promoting shared growth with suppliers. In regard to governance, the Group is advancing transparent and ethical management under the principle of "Green Leadership with Responsibility" and is committed to establishing a responsible and accountable corporate governance structure.

HD Hyundai ESG Management

To strengthen ESG governance across the group, HD Hyundai Group operates a Group ESG Council, composed of Chief Sustainability Officers (CSOs) from each affiliate. This council facilitates communication on key ESG policies and issues, supporting the advancement of ESG management at the affiliate level. The group has also established an ESG Advisory Group comprising outside experts in such fields as environment, shared growth, and compliance. This group enhances the professionalism and objectivity of the ESG policy development process. Each affiliate's dedicated ESG departments work closely with the Group ESG Strategy Team to share policies and guidelines while group-level ESG agendas are reviewed through the CEO Council and reflected in affiliate operations. The group has enhanced execution capabilities based on this governance system, and it introduced ESG KPIs and linked them to employee performance evaluations and compensation systems.

HD Hyundai ESG Council

In support of group-wide ESG management, HD Hyundai Group promotes collaboration among its affiliates. The Group ESG Working Council, consisting of ESG personnel from 13 affiliates, identifies and proposes common ESG issues with high priority across the group. Based on their findings, the Group ESG Council, composed of the CSOs, determines key tasks, action plans, and strategic priorities. The ESG governance framework is centered on establishing ESG policies and integrating them into the group's overall business strategy. As chair of the ESG Council, the Chief ESG Officer of the group coordinates all related topics and provides systematic guidelines for the selected ESG tasks, enabling each affiliate to effectively achieve them.

HD Hyundai Energy Solutions ESG Strategy

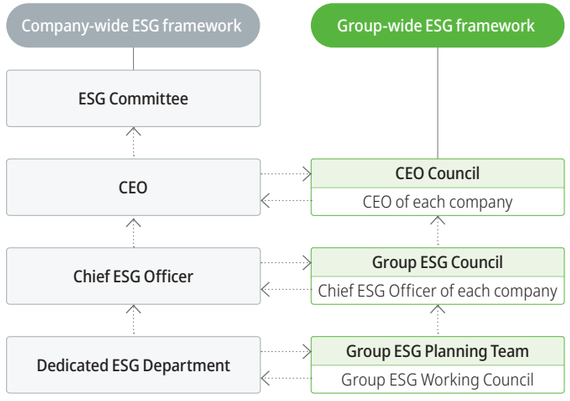
HD Hyundai Energy Solutions has developed its own mid- to long-term ESG roadmap to expand ESG practices through enhancing internal capabilities and embedding ESG principles into its operations. Each year, ESG key tasks and the annual timeframe are reported to the ESG Committee. Evaluation results from domestic and international ESG initiatives are analyzed to identify areas of improvement in the environmental, social, and governance aspects and are used to determine key tasks.

In 2025, priority tasks for enhancing ESG management capabilities include the establishment of a governance framework, such as introducing human rights policies, and the implementation of a digital platform to enhance the accuracy and efficiency of ESG data management. At the same time, we are taking short-term actions in response to weaknesses identified in the evaluation results.

HD Hyundai ESG Vision Framework



HD Hyundai ESG Management Structure



Group ESG Council Meetings in 2024

Date	Agenda
Feb. 27 (1st)	· Each affiliate's achievements in 2023 and plans for 2024 · Discussion on the group-wide ESG directions
Aug. 28 (2nd)	· Progress on carbon neutrality roadmaps by affiliate · Guideline of human rights management concepts and directions · Necessity and directions for developing the group ESG platform
Dec. 20 (3rd)	· (Special lecture) ESG outlook following the U.S. presidential election · 2024 GHG emissions and reasons for change

ESG Action Plan for 2025

Category	Task
Enhancement of ESG Management Capabilities	· Establishing a human rights governance framework - Develop standardized human rights policies and define work processes
	· Building an ESG data platform - Implement a system-based approach for structured management of ESG indicators and data
	· Implementing short-term ESG actions - Set mid- to long-term targets in the environmental areas

ESG KPIs

Overview of ESG KPI Implementation

Background

At HD Hyundai Energy Solutions, we have introduced ESG Key Performance Indicators (KPIs) to enhance the effectiveness of our sustainability management and to track non-financial performance. We established quantitative and qualitative indicators for key issues across environmental, social, and governance areas to regularly monitor the progress of sustainable strategies and identify corresponding actions. ESG KPIs has been implemented to align with the growing tendency in the establishment of a management system and non-financial, measurable targets. Linking the KPIs to performance evaluation and compensation system for executive management and employees provides a tangible incentive to promote internalization of these ESG values.

Application Strategy

We have introduced ESG KPIs to manage the execution of our sustainability strategies and to lay a foundation for identifying and responding to risks and opportunities. ESG KPIs serve as a basis for setting both short- and long-term sustainability strategies and goals, enabling each organizational unit to define and implement specific actions. Performance managed through these KPIs is also transparently disclosed to external stakeholders. In this way, ESG KPIs go beyond simple performance metrics, functioning as a key component of a results-driven management system that supports company-wide sustainable management.

ESG KPI Areas

Environment (2 areas)	· Reduction of GHG emission intensity · Establishment of carbon neutrality roadmap

ESG KPI Process

ESG KPI Areas and Indicators

In establishing ESG KPIs, we considered our industry characteristics, benchmarking of ESG leaders, and internal sustainability strategies. Quantitative indicators were selected for each material issue area, with defined baseline years and performance targets to facilitate continuous performance management. Both domestic and international disclosure standards and evaluation frameworks, as outlined by major ESG rating organizations, were referenced to enhance the reliability and comparability of the ESG KPIs, thus assuring global integrity.

Development of ESG KPI Pool and Guidelines

A comprehensive analysis was conducted encompassing global ESG trends, disclosure standards, evaluation criteria, industry-specific issues, and stakeholder expectations to create a pool of ESG KPIs. Guidelines were then developed to ensure that selected KPIs are strategically aligned, measurable, and actionable across the group. A detailed definition manual was also created to systematically implement each KPI. The manual specifies definitions, assessment metrics, target directions, and reference material management practices, maintaining consistency and efficiency in the implementation of these KPIs.

ESG KPIs Setting Process

01 Creating a group KPIs setting policy	02 Setting ESG KPIs by company	03 Review and adjust ESG KPIs	04 Reporting corporate ESG KPIs	05 Reporting group ESG KPIs
Set directions for group-wide KPIs	Set corporate KPIs based on group policy	Review KPIs relevance and feasibility	Report to each company's Chief ESG Officer and ESG Committee	Report to the group's Chief ESG Officer and ESG Committee

ESG KPI-Based Performance Evaluation and Compensation

We monitor progress toward ESG KPI targets to evaluate the performance of the CEO, executives, and departments and provide incentives based on the results. Evaluations consider both individual contributions and organizational performance relative to each KPI, with differentiated rewards. This comprehensive performance-aligned approach increases accountability and encourages active participation in ESG initiatives across all organizational levels.

Current Status of ESG KPI Implementation

In 2024, we incorporated ESG indicators into the KPIs for the CEO and executives to effectively evaluate organizational sustainability performance. ESG goals were also integrated into the KPIs for all managers, including team leaders and staff, establishing a top-down MBO system from office heads and department heads to team leaders and staff.

ESG Goal Setting Guideline

Category	KPI	Details
HR	Human rights management	Receiving human rights impact assessments, family-friendly workplace certification, etc.
Procurement	Reinforcement of supply chain management	Implementing evaluation programs and participating in Korea Commission for Corporate Partnership's projects, etc.
GA	Improving green transportation and employee benefits	Purchasing eco-friendly equipment and workwear, etc.
Environment	Legal risk management and mid-/long-term goal setting	Identifying and managing risks and improving recycling rate of industrial waste, etc.
Security	Information security and leakage	Increasing investment in security and completion rate of information security training
Assets	Renewable energy usage rates and efficiency	Improving renewable energy usage rate and water recycling rate
Safety	Safety-related technology and risk management	Implementing near-miss metrics and smart technologies such as DT
Finance	Protection of shareholders' rights and communication	Establishing approaches for protection of management rights and collection of shareholder input
	BOD independence and fiduciary duty	Monitoring outside directors' rate and board activities
	Auditor independence	Monitoring long-tenured auditors or audit committee members
R&D	Eco-friendly protection technology	Improving carbon emissions coefficients and developing low-emission paint and fuel technologies
	Pollution reduction technology	Enhancing VOC (Volatile Organic Compound) reduction systems and developing eco-friendly paints
	Supply chain management	Promoting and supporting sustainable supply chains

ESG Disclosure

Advancing ESG Data Framework

Disclosure of ESG Performance Data

At HD Hyundai Energy Solutions, we are upgrading our integrated ESG data management system and build trust with our stakeholders through transparent and consistent disclosure of ESG performance data. Our group-wide integrated ESG framework specifies key ESG indicators, assessment metrics, and data collection cycles. This allows us to quantitatively manage our key indicators across environmental, social, and governance areas. The standardized data collection criteria encompass key ESG indicators and are refined to align with global ESG disclosure standards and external requirements. ESG data is reviewed and updated on a regular basis to ensure an effective response to external assessments and disclosure demands, and it is provided to the Board of Directors and key decision-making bodies for strategic decision-making.

ESG Disclosure

ESG Disclosure Channels

To promote communication with stakeholders, we maintain multiple ESG disclosure channels and transparently publish key information on the HD Hyundai ESG website. This includes core performance data such as GHG emissions, energy consumption, and industrial accident rates, as well as details on our policies and activities regarding human rights, safety and health, and ethical practice. Through these efforts, we are able to gain insights into our key ESG indicators and management activities, while reinforcing a foundation of trust with external stakeholders.

Publication of the Sustainability Report

In order to communicate our ESG performance and support stakeholder engagement, we publish an annual sustainability report outlining our strategies, actions, and outcomes across the environmental, social, and governance areas, focusing on material issues. It is prepared in accordance with both domestic and international ESG reporting standards. By disclosing our sustainability performance with transparency and integrity, we remain committed to enhancing the credibility of our ESG data and supporting long-term corporate value creation.

Double Materiality Assessment

Double Materiality Assessment Process

Review of Global Indicators

To establish a foundation for our materiality assessment, we have analyzed key indicators from major ESG rating organizations such as DJSI, MSCI, and KCGS, as well as international disclosure standards including ESRS and GRI. Based on this review, ESG-related data points were extracted, and then overlapping and similar items were consolidated to come up with a set of 239 keywords. In line with industry characteristics, main product lines, and the value chain, we have created a pool of ESG issues.

Internal and External Environment Analysis

As a basis for the double materiality assessment, we have conducted a comprehensive analysis of both internal and external environments. Internally, we reviewed our corporate vision and strategy, business structure, key product offerings, and supply chain status. Externally, we examined ESG policy trends, industry-specific issues, and evolving domestic and international regulatory landscapes. This analysis provided a clear understanding of the environmental and social issues that we face and provided an informational basis for the materiality assessment.

IRO Analysis

To assess the financial and non-financial impact of identified ESG issues, we have performed an IRO (Impact, Risk, Opportunity) analysis. This process enabled a structured evaluation of each issue's potential impact, associated risks, and opportunities. The results served as a key reference for determining materiality.

Impact Materiality Assessment

To evaluate the impact materiality of each issue, we set scale, scope, and irremediability as our primary metrics. The scale was determined with reference to global disclosure and assessment requirements, while scope was defined through an analysis of stakeholders across the value chain. Irremediability was measured based on the potential severity of regulatory penalties associated with legal violations.

Financial Materiality Assessment

To assess financial materiality, we analyzed results from stakeholder surveys as well as global disclosure and rating requirements. We also assess the degree of issue-specific engagement by global institutional investors, based on stewardship activity reports.

Pool of Material Issues

Rank	Issue	Impact on external stakeholders							Impact Materiality	Financial Materiality	YOY change	GRI	Page
		Raw materials	Suppliers	Employees	Customer	Local community	Investors	Government					
1	Climate action				●			●	11	12	▲ 1	GRI 302, GRI 305	p.15 - 18
2	Sustainable product and technology development	●	●	●	●		●		12	10	▼ 1	Non-GRI	p.19 - 22
3	Occupational safety and health	●	●	●	●			●	10	9	NEW	GRI 403	p.31 - 34
4	Resource circulation	●	●		●			●	10	9	▲ 7	GRI 306	p.24 - 25
5	Supply chain ESG management	●	●		●			●	9	9	▲ 3	GRI 308, GRI 414	p.44 - 45
6	Product quality and stewardship	●	●		●		●		8	8	▲ 2	GRI 416	p.46 - 47
7	Business ethics		●	●	●			●	8	7	NEW	GRI 205, GRI 206, GRI 2-23, GRI 2-24	p.60 - 61
8	Corporate-wide risk management	●	●				●	●	7	7	▼ 2	GRI 2-12, 2-13, 2-14	p.62 - 63
9	Hazardous materials and pollutants control	●			●	●		●	7	7	NEW	Non-GRI	p.27
10	Information security		●	●	●			●	7	7	NEW	GRI 418	p.48 - 49

Stakeholder Engagement

Stakeholder	Issues of Interest (Survey Results)	Other Areas of Interest	Communication Channels	Action	2024 Highlight
Customers	· Climate action · R&D and product development for environmental impact reduction · Product quality and stewardshipBusiness ethics	· Strengthening product and technology competitiveness · Development of eco-friendly and high value-added products · Enhancement of product quality and stability · Improvement of communication satisfaction	· Trade fairs, exhibitions, and forums · Customer satisfaction surveys · Customer service center	· Participated in trade fairs, exhibitions, and technology forums · Enhanced customer satisfaction management through quality training · Acquired eco-friendly product certifications	· Held the HD Hyundai AI Forum · Participated in the International Green Expo and Conference, and Gastech
Shareholders/Investors	· Climate action · Product quality and stewardship · Sound corporate governance · Corporate-wide risk management	· Creating shareholder values · Stable business performance · Opportunity and risk management · Transparent corporate governance	· General shareholders' meeting · Corporate briefing · Public disclosures and website postings	· Disclosed board resolutions and other information · Announced quarterly earnings and provided IR materials · Introduced shareholder protection systems (e.g., e-voting) · Conducted IR activities for analysts and institutional investors	· Conducted IR presentations and NDR (4 times) · Provided guidance on minority shareholder rights (1 time)
Suppliers	· Resource circulation · Product quality and stewardship · Supply chain ESG management	· Promoting shared growth · Fair practices · Capability development of suppliers · Safety, health, and human rights in suppliers	· Supplier seminars · Consultation channel for suppliers on unfair practices · Supplier council · On-site meetings with suppliers	· Operated the HiPRO (integrated purchase system) · Provided financial, educational, and technical support to suppliers · Invited top-performing dealers to solar exhibitions and held stakeholder meetings · Evaluated safety management activities of suppliers	· (External Suppliers) Held the HD Hyundai Integrated Council Meeting annually · (Internal Suppliers) Conducted meetings on process improvement and quality collaboration
Local Community	· Hazardous materials and pollutant control · Human rights and diversity · Supply chain ESG management · Business ethics	· Attracting industry and creating jobs in local communities · Protecting and improving the local environment · Social contribution with focus on local communities · Communication with local communities	· Local government council · Meetings with local community organizations · Meetings with local volunteer groups · Community events	· Organized social contribution programs (e.g., volunteer activities) · Operated local talent development programs · Supported investments for local community development · Introduced support programs for vulnerable groups	· Operated consultation channels for social contribution in cooperation with local administrative offices · Formed a chemical safety community with local businesses · Maintained communication channels with local residents and issued chemical safety notices
Employees	· Occupational safety and health · Human resource management · Business ethics	· Fair evaluation and compensation · Employee benefits and talent development · Labor-management relations and communication · Workplace safety	· Labor-management council · Whistleblowing system (ethics and human rights) · Intranet and newsletters · Business briefings and dialogue with executive management	· Held quarterly labor-management council meetings · Promoted communication activities including CEO town hall meetings · Introduced benefits (e.g., family-friendly programs) · Personalized training programs based on roles and interests	· Held labor-management council meetings (3 times) · Implemented an executive meeting observation program (monthly) · Operated a TF for corporate culture
Government/National Assembly	· Climate action · Hazardous materials and pollutant control · Occupational safety and health · Human rights and diversity	· Participation in and support for government policies · Support for local economy · Labor and safety-related issues · Sharing industry and corporate information	· Visits to the National Assembly and government ministries · Policy advisory bodies · Policy seminars	· Implemented compliance guidelines for economic sanctions · Diversified the business portfolio in response to government regulations · Participated in major economic association seminars and forums · Engaged with local government councils and civic organizations	· Participated in projects organized by the Ministry of Trade, Industry and Energy · Attended industry seminars on solar energy policy issues
Media	· Climate action · Hazardous materials and pollutants control · Occupational safety and health · Sound corporate governance	· Business performance and industry issues · Corporate-wide issues · Strategic direction of core business areas	· Press releases · Website media center · Media meetings	· Provided timely press releases · Posted news on the website · Supported media coverage for journalists	· Published press releases on the website http://www.hd.com https://www.hd.com/en/newsroom

Environmental

15 Climate Action
19 Environmental Impact and Green Products
23 Environmental Management
29 Biodiversity



Climate Action

Governance

Climate Action Governance

Oversight by the BOD and Executive Management

Role of the BOD

To advance sustainable management alongside environmental protection, HD Hyundai Energy Solutions engages in climate-related discussions and agenda reviews through the ESG Committee. Organized as a subcommittee under the Board of Directors, the ESG Committee is responsible for identifying environmental risks and opportunities, setting strategies and goals, and reviewing mid- to long-term roadmaps. The committee also oversees ESG strategies, action plans, progress, and CSR initiatives. In addition, it reviews capacity-building measures and internalization approaches to embed ESG practices across the organization as part of our commitment to sustainable management.

Role of the CEO

The CEO of HD Hyundai Energy Solutions is responsible for setting the strategic direction of climate action and monitoring the GHG reduction strategies and environmental impact mitigation plans. The CEO also integrates climate-related opportunities into business planning and establishes management strategies to address risks and minimize potential impacts. Climate action strategies and performance results are presented as agenda items and deliberated with the Board for Directors to facilitate coordinated decision-making.

Role of the Dedicated Departments

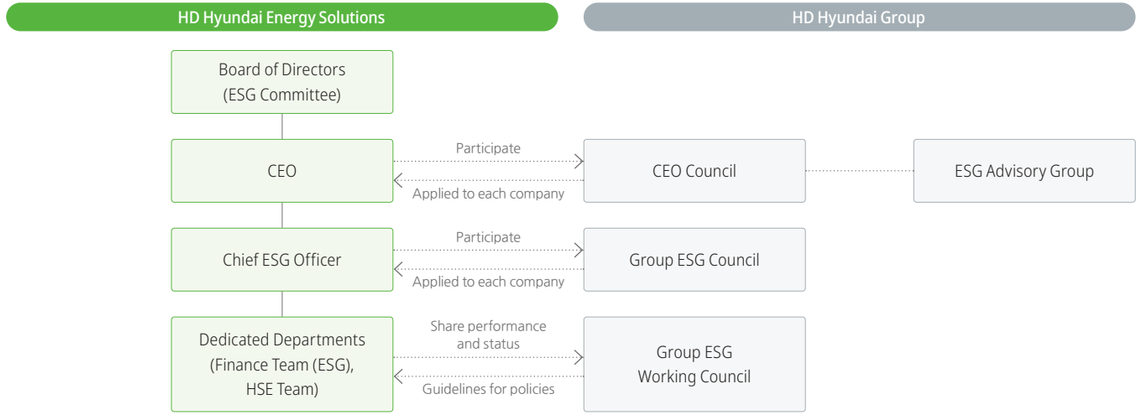
The dedicated climate action department at HD Hyundai Energy Solutions is responsible for identifying and executing the tasks for implementing climate strategies. It also monitors and responds to changes in applicable domestic and international regulations, policy trends, and industry developments related to climate change.

Climate Action KPIs

To reinforce our approach and framework for climate action, we establish company-wide KPIs on an annual basis and continuously monitors their progress. The CEO, relevant executives, and dedicated departments are evaluated based on these KPIs, which are also reflected in performance assessments and compensation frameworks.

GHG emissions reduction targets are incorporated into the KPIs for both the CEO and relevant executives. Based on these executive KPIs, team leaders in the dedicated departments define detailed objectives aligned with the roles and responsibilities of their respective teams and are evaluated accordingly.

HD Hyundai Energy Solutions Subsidiaries' Climate Action Governance



HD Hyundai Energy Solutions Climate Action KPIs

Year	KPI	Details
2025	Achieved GHG emissions reduction targets	Reduced emissions by 7%
2024		Reduced emissions by 1%
2023	Achieved energy consumption reduction target	Reduced energy consumption by 1%

Climate Action

Strategy

Climate Action Strategy

Carbon Neutrality Strategy

GHG Emissions Management Strategy (Scope 1 and 2)

In order to reduce our annual GHG emissions, we quantify our emissions and energy consumption in alignment with regulatory requirements, prepare emissions quantification plans and detailed reports, and then undergo third-party assurance review before disclosing them. We also fulfill our legal obligations by submitting the verified data to the Ministry of Environment through the National GHG Management System (NGMS). GHG emissions from not only production facilities but also from the headquarters and research centers are monitored on a monthly basis.

In 2024, we recorded total carbon emissions of 19,982 tCO_2, representing a 52.2% reduction compared to 2023. The emission intensity was also reduced, recording a value of 47.3, a 38.2% year-over-year decrease.

We have implemented various initiatives aimed at reducing GHG emissions. To increase the share of renewable energy, we have installed solar power facilities for our own use. At the same time, we are executing emission reduction projects outside of our organizational boundaries and exploring carbon offset strategies to be recognized as part of our carbon offset credits.

Adoption of Renewable Energy

As part of our efforts to reduce GHG emissions during operational phases and to promote renewable energy utilization, we installed a rooftop solar power system at our Eumseong Module Plant 3 in 2024. By utilizing unused roof space on the plant, we were able to generate electricity cost-effectively without requiring additional land. The electricity produced is consumed on-site, minimizing energy losses from transmission and distribution for high energy efficiency. The newly installed facility, covering approximately 4,700□ with a total capacity of 426.24kW, commenced full-scale operation in November 2024. We expect to reduce annual electricity costs by KRW 93 million while contributing to GHG reduction and improving our energy self-sufficiency.



Solar power system of Eumseong Module Plant 3

ACTIVITIES

Expansion of Renewable Energy Use

As part of our GHG emissions management strategy, we have installed a 426.24 kW solar power system for our own use on the rooftop of Eumseong Module Plant 3 in November 2024. In light of the decreasing trend of free allocation of emission allowances and anticipated long-term increases in carbon credit prices, we will further expand our use of renewable energy to reduce GHG emissions. To this end, we are preparing to convert six existing solar power plants, currently operating under RPS and FIT programs, to those for self-consumption after the expiration of their current power purchase agreements and are installing more power plants.



Solar Power Testbed at the Eumseong Plant

Climate Action

Risk Management

Climate Risk Management

Climate Risk Management Procedures

Risk Identification and Assessment

At HD Hyundai Energy Solutions, we identify climate risks based on their time frames and develop effective mitigation approaches. Risks are categorized as short-term (likely to occur within 5 years), medium-term (within 5 to 10 years), and long-term (beyond 10 years). Each category is analyzed for its potential financial and operational impacts. In the short term, key risks include the tightening of government regulations on GHG emissions and expanded corporate disclosure requirements on climate issues. In the long term, risks include increased capital expenditures due to the transition toward eco-friendly products and green technologies, potential challenges in attracting investment with insufficient climate action, and potential damage to corporate reputation and stakeholder trust. On the other hand, we recognize business opportunities arising from growing demands for solar power solutions under the global shift toward renewable energy and advancements in ultra-high efficiency cell and module technologies.

Risk Management

In order to effectively manage identified risks, we develop response strategies that consider both the likelihood of risks and the financial impact on the business. The dedicated climate risk department and the risk management department have enacted joint efforts for climate risk management. They work together to address high-impact, high-probability risks by identifying areas to be improved and implementing actions accordingly. In addition, we monitor our production sites and manage data such as waste discharge levels on a daily basis.

Transition Risk Management

Overview of Transition Risks

To minimize the financial impact of transition risks, we monitor domestic and international trends in environmental policies, regulations, market dynamics, and consumer responses. As the risk of climate change grows, it is anticipated that regulations related to carbon emissions will become even stricter, along with challenges in cost management arising from intensified price and technology competition and innovative technology development.

Risk Identification Process

01 Analysis of Climate Issues	02 Risk Identification	03 Priority Setting	04 Action Planning
· Create climate issues based on scenario analysis.	· Identify risks associated with each climate issue.	· Assess probability and impact. · Prioritize based on materiality.	· Develop response strategies and action plans. · Identify areas of improvement through monitoring.

Physical and Transition Risks

Category			Description
Physical	Acute	Natural disasters (e.g., typhoons, floods)	· Damage to facilities and power outages from natural disasters such as typhoons or heavy rain may reduce productivity.
	Chronic	Rising average temperatures	· Higher average temperatures may affect worker safety and lower productivity.
Transition	Policy	Enhanced regulations on GHG emissions	· Costs may increase due to lower free allocation for emission allowances and more paid ones. · More proof of eco-friendliness, such as certificates of carbon and origin, may be required.
	Technology	Competition for commercialization of next-generation technologies	· Urgency in commercialization of new technology may lead to falling behind global competitors and weaken position in overseas market.
	Market	Market oversupply	· Lower demand from reduced government subsidies may lead to price drops. · Despite expected market growth due to RE100 and carbon reduction target, large capital input in equipment and oversupply from global competitors may cause inventory risks.
	Reputation	Investment risks due to failure to achieve carbon neutrality	· Shareholder activism and divestment, such as investment limits and shareholder letters, may occur.

Climate Action

Metrics & Targets

GHG and Energy Management

Scope 1 & 2 GHG Emissions Management

Current Status of Scope 1 & 2 Emissions

At HD Hyundai Energy Solutions, we measure our GHG emissions in accordance with the IPCC Guidelines and domestic GHG emissions standards. Emissions are monitored on a monthly basis, and any significant variations are reported to the CEO. To ensure inventory integrity and data reliability, the collected data is verified annually by an independent third-party agency. Then, we disclose the verified data through the sustainability report, business reports, and the ENV-INFO System.

Actions and Plans for Scope 1 and 2 Emissions Reduction

To reduce GHG emissions and achieve zero environmental incidents, we conduct regular inspections and implement various initiatives. These include phasing out CO_2 welding equipment, adjusting gas supply pressure, installing LED lighting, and minimizing the operation of air compressors to improve energy efficiency and reduce unnecessary emissions. We are also introducing advanced technologies in our production process, such as replacing traditional scrubbers with plasma-type equipment to significantly reduce emissions of nitrous oxide (N_2O) emissions, which fall under the main GHG emissions. Furthermore, Scope 2 emissions are being reduced through equipment replacement and maintenance to enhance energy efficiency.

Energy Management

Investment in High Output Equipment

We are transitioning our existing 500W module production lines to high-power lines capable of producing 625-700W modules. These upgraded lines with high-productivity use less electricity per unit during production. The modules produced through these lines incorporate TOPCon technology and large-area cells, increasing power output by 5% per module compared to previous models. As the enhanced module output supports higher power output, it is expected to promote the expansion of renewable energy in Korea and contribute to GHG reduction. The new modules are also designed to be eco-friendly and free from lead (Pb), offering high durability and serving as green solutions for floating, offshore, and agricultural installations.

Progress Toward Scope 1 & 2 Emissions Reduction Targets[1)]

(Unit: tCO_2eq, tCO_2eq/KRW billion)

Category	2022	2023	2024	2024 Target	Rate (%)	2025 Target	2026 Target	2027 Target
Emissions	38,240	41,779	19,982	22,000	110.1%	35,000	40,500	40,500
Intensity	38.8	76.5	47.3	-	-	Reduction by 7%[2)]	-	-

1) Intensity: based on revenue from the consolidated financial statements in the business report
2) The 7% reduction target for 2025 is part of the company's KPIs.

Progress Toward Energy Consumption Reduction Targets[1)]

(Unit: TJ, TJ/KRW billion)

Category	2022	2023	2024	2024 Target	Rate (%)	2025 Target	2026 Target	2027 Target
Absolute value	753	780	401	450	112.2%	680	800	800
Intensity	0.8	1.43	0.95	-	-	-	-	-

1) Intensity: based on revenue from the consolidated financial statements in the business report

Environmental Impact and Green Products

Governance

Green Technology R&D

Green Technology R&D Governance

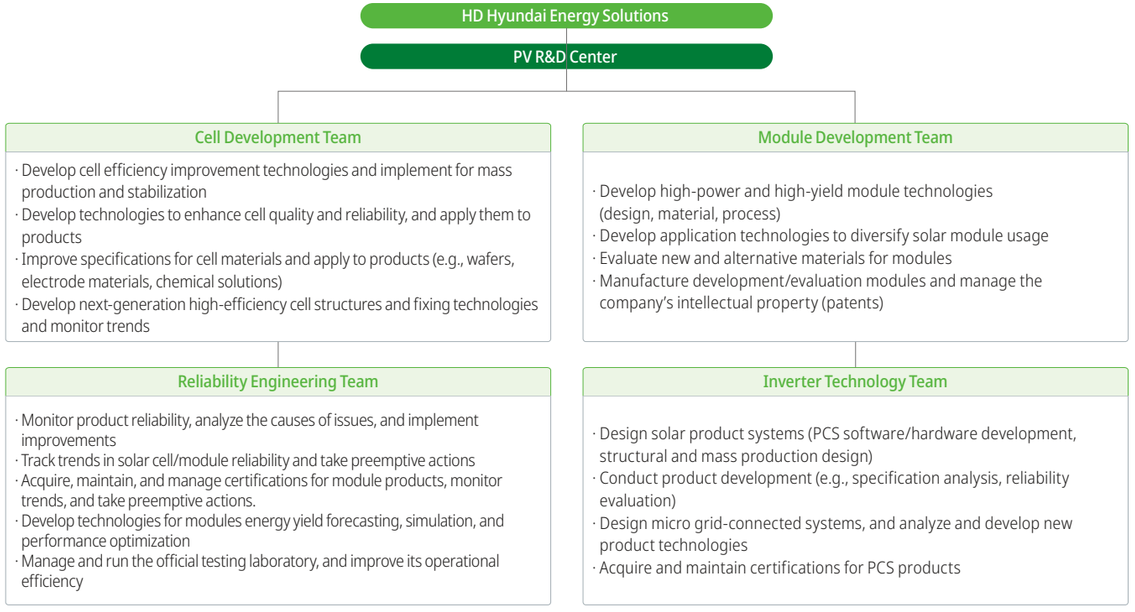
R&D Organizations

At HD Hyundai Energy Solutions, we conduct our R&D initiatives under the leadership of the PV R&D Center. The center consists of four teams: Cell Development, Module Development, Reliability Engineering, and Inverter Technology. Together, they focus on market-driven innovation in solar cells and modules, including enhancement of the efficiency and output, improvement of the reliability and power output, expansion of module applications, and development of an advanced inverter.

Research and Development of PV R&D Center

The PV R&D Center is dedicated to improving the efficiency, output, and reliability of solar cells, modules, and systems. Since 2024, the center has launched research into perovskite top cell materials using a dry vacuum-deposition process and pursues tandem cell technology development based on silicon solar cells in technical collaboration with the Korea Research Institute of Chemical Technology (KRICT) and Korea Electric Power Corporation (KEPCO).

HD Hyundai Energy Solutions R&D Governance



Risk Management

Green Product Development

PERC Solar Cells

Since becoming the first domestic producer of high-efficiency PERC solar cells in 2014, we have enhanced our P-type cells by adding a rear PERC layer that reflects long-wavelength light to improve output. In 2019, we introduced a bifacial cell structure that enables rear-side power generation, making the solar module bifacial and improving actual power output. Since late 2022, we have commercialized large-area M6 and M10 solar cells to deliver even higher-efficiency products.

Solar Modules

To minimize environmental impacts during the manufacturing process, we have introduced high-output equipment for module production and are working on enhancing module power output. In addition, we have reduced emissions from module production using thinner silicon wafers. Furthermore, we have developed lead-free floating solar modules recognized with KS certification for its high durability and eco-friendliness. As of the end of 2024, we hold 289 certified carbon Emissions verifications for our solar modules from the Ministry of Trade, Industry and Energy.

BIPV Modules

We provide Building Integrated Photovoltaic (BIPV) solutions that combine building materials with PV modules, enabling both on-site power generation and consumption. BIPV systems integrate PV modules into exterior walls, rooftops, and windows, offering high-efficient power generation without additional installation space. Unlike traditional installations in forests or open land, BIPV systems are suitable for urban environments, making them more eco-friendly. They use low-iron glass to minimize transmission loss while achieving performance comparable to standard modules. We also offer colored BIPV systems that blend various aesthetic designs and functionality.

In 2021, the modules were installed on the research building and retaining walls at the Eumseong plant to complete demonstration projects. They will move toward full commercialization afterward.



BIPV System at Eumseong Plant

Environmental Impact and Green Products

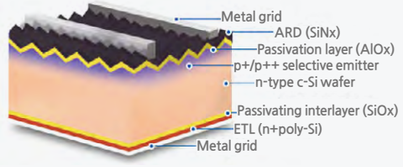
Risk Management

Green Technology Research

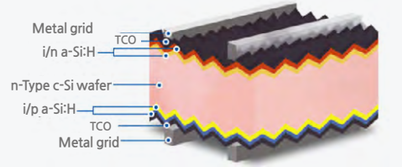
Green Product Development

N-Type Solar Cells

At HD Hyundai Energy Solutions, we are developing N-type solar cells, which offer higher efficiency and longer lifespan than conventional P-type cells. The N-type wafer-based cells using thin film technologies include TOPCon solar cells, in which an oxide layer is inserted between the metal and silicon to reduce electrode losses, and HJT solar cells, in which amorphous thin films are coated on crystalline silicon to minimize recombination losses. Both cells provide over 1%p higher power efficiency than existing P-type cells. Notably, HJT cells are highly compatible with tandem cell structures aimed at achieving over 30% efficiency, making them a core technology in the solar industry.



TopCon(Tunnel Oxide Passivated Contact)



HJT(HeteroJunction Technology)

ACTIVITIES

Participation in Green Energy Expo

In April 2025, we showcased our latest solar technologies and solutions at the 22nd International Green Energy Expo & Conference held at EXCO in Daegu. At this event, we unveiled our ultra-low-carbon N-type module for the first time. Processed entire cell and module production in Korea, the product reduces carbon emissions to below 630 kg CO_2/kW, leading to our commitments to the Nationally Determined Contributions (NDCs).

We also presented tandem solar cells combining HJT silicon and perovskite cells, as well as 750W high-power modules using G12 large-area wafers, setting the direction of next-generation solar technologies. The tandem solar cell, which layers perovskite on top of HJT silicon, is an ultra-high-efficiency technology. Moving forward, we plan to accelerate the development of these silicon-based tandem solar cells in collaboration with leading domestic and international organizations specializing in perovskite technologies.



2025 Daegu EXCO Exhibition Booth

Expansion of Solar Projects on Idle Sites

In April 2024, we successfully built rooftop solar power plants at CJ CheilJedang's Incheon and Jincheon plants. Solar installations on unused areas like rooftops or parking lots eliminate the need for additional land usage and allow the direct use of generated electricity on-site. This reduces energy losses from transmission and saves on electricity costs.

With companies accelerating their RE100 commitments and aiming to boost global competitiveness, renewable energy systems for self-consumption are gaining traction. Rooftop solar power is emerging as a solution in this trend. In response to the growing demand for these self-consumption systems, we plan to expand solar installations on idle areas such as rooftops.



Rooftop Solar Power Plant at CJ CheilJedang Incheon Plant

Partnership for Perovskite Solar Cell Development

In November 2024, we signed an MOU with Korea Electric Power Corporation (KEPCO) and LX Glas to jointly develop perovskite solar cell technology. Perovskite solar cells are transparent and suitable for window applications, and they can also be stacked on existing solar cells as tandem structures. For window applications, they do not need additional space, offering low-cost production compared to traditional solar cells. This feature is why these cells are attracting attention as next-generation solar cells.

When commercialized, tandem and window-integrated perovskite systems will enable decentralized renewable energy generation and allow cities to simultaneously produce and consume electricity, thereby enhancing energy efficiency and alleviating power supply imbalances.



Perovskite Partnership MOU Signing Ceremony

Environmental Impact and Green Products

Risk Management

Green Products

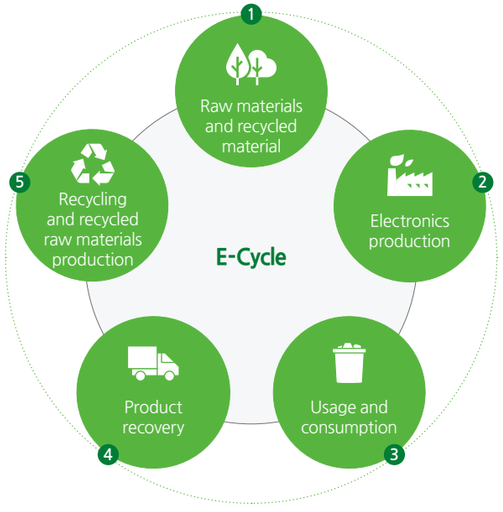
Green Production

Green Procurement Policy

In order to minimize environmental impact across our operations, we established our own Green Procurement Policy in 2022. This policy applies not only to raw materials used in manufacturing, but also to office supplies, consumables, and household goods, all of which can be replaced with eco-friendly alternatives.

Recycling of Waste Solar Modules

Following the enforcement of the Eco-Assurance System (EcoAS) in January 2023, manufacturers, importers, and sellers of solar modules are obligated to recycle or collect waste modules. At HD Hyundai Energy Solutions, we joined the E-Cycle Governance to ensure responsible recycling of retired modules.



Environmental Efficiency in Manufacturing Processes

We are investing in the transition of our third solar module plant from a 500W production line to high-power lines producing 625–700W modules. The new high-output facilities are expected to reduce more electricity consumption, cutting 2,700 tons of carbon emissions annually. Additional process improvements such as maintenance efforts for the pure water make-up system at the plant, upgrades to PCW piping, and LED lighting replacements in the logistics warehouse, have helped reduce operating costs by KRW 216 million per year.

We remain committed to reducing environmental impacts from our manufacturing processes and enhancing energy efficiency through continued R&D and investment. Through these efforts, we will be able to secure competitive advantages in the domestic solar industry and contribute to the expansion of renewable energy in line with the government policy and national carbon neutrality.

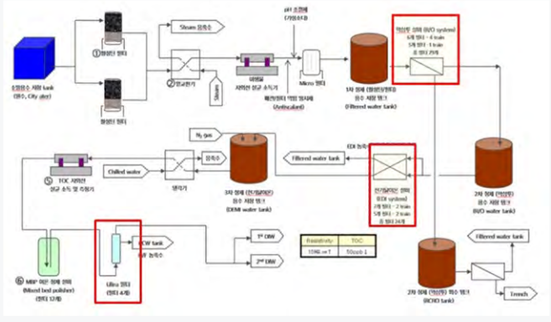


Improving Environmental Efficiency

ACTIVITIES

Pure Water Make-up Systems at Eumseong Cell Plant

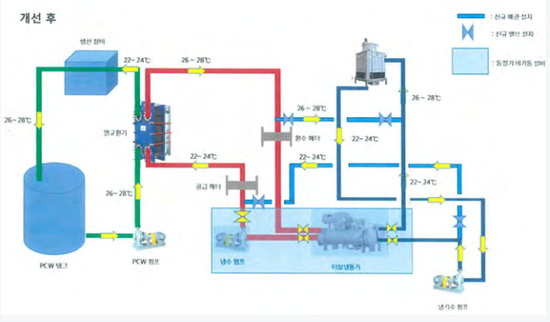
As we transition from PERC to TOPCon cell production, the former production lines have been decommissioned. Maintenance and piping modifications of Reverse Osmosi (RO) and Electrodeionization (EDI) equipment in pure water make-up systems have resulted in an annual savings of KRW 93 million in electricity and water costs.



Flowchart of Pure Water Make-up System

PCW System Upgrade

Previously, a turbo chiller was used to cool module production facilities. By upgrading the PCW piping to utilize wintertime ambient air as a natural cooling source, we saved 76 million in electricity cost per year.



Flowchart of Process Cooling Water (PCW) System

Environmental Impact and Green Products

Risk Management

ACTIVITIES

High-Durability and Eco-Friendly Floating Solar Modules

As a major supplier of floating solar modules in Korea, we plan to launch high-durability and eco-friendly N-type TOPCon modules. To obtain KS certification for high-durability and eco-friendly modules, the lead content must be below 0.005% by weight and the product must pass leaching tests per hygiene and safety standards prescribed in the Enforcement Decree of the Water Supply and Waterworks Installation Act. As of 2024, our P-type modules have met these requirements and received 46 KS certifications. Our N-type modules are currently undergoing the same certification process.

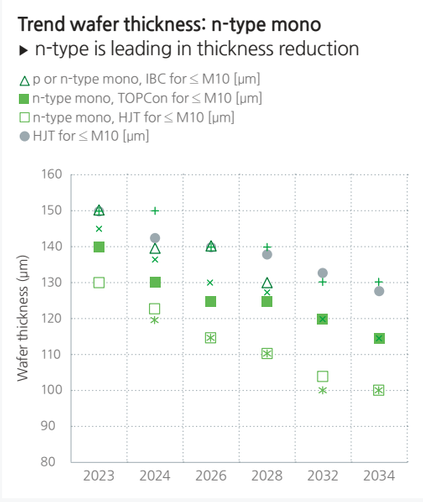
In August 2023, we also obtained a Restriction of Hazardous Substances (RoHS) certification for materials used in our N-type TOPCon and HJT modules under development in line with EU RoHS Directive. RoHS certification is an international standard that outlines 10 hazardous substances, including lead, cadmium, and mercury, which are present at less than 0.1% in all components of a product.



Floating Solar Power System

Solar Modules with Reduced Silicon

Advancements in N-type solar technology have enabled the production of high-power modules using thinner silicon wafers compared to the existing P-type. While P-type cells typically use wafers that are 150-140㎛ thick, N-type TOPCon cells use wafers under 130㎛, and N-type HJT under 120㎛. For M10 modules designed with 156 cells, this change means carbon emission reduction of more than 20kgCO_2-eq/kW, 40kgCO_2-eq/kW compared to P-type. For future N-type HJT solar cells, we are promoting R&D efforts toward thinner silicone wafer with thicknesses as low as 100㎛.



R&D DEMO PRODUCTS

High-durability and Eco-Friendly Floating TOPCon Solar Module

This floating solar module uses high-efficiency N-type TOPCon solar cells, delivering over 6% more output than conventional P-type modules. This improved product reduces the number of modules, floats, and structures needed for a floating power plant with the same capacity, thereby lowering carbon emissions. With enhanced resistance to high temperature, humidity, and wind and snow loads, this floating solar module extended the product lifespan from 25 to 30 years, minimizing waste modules. It also obtained a RoHS certification that recognize its high efficiency, high durability, and eco-friendliness, assuring water pollution prevention.

TOPCon Solar Module using Grade 1 Carbon Emissions

This eco-friendly, high-power module achieves carbon emissions below 630 kgCO2/kW using low-carbon, high-efficiency N-type TOPCon cells manufactured in Korea. As of the end of May 2025, this product is the only domestic N-type TOPCon module with Grade 1 Certification for Carbon Emissions from the Ministry of Trade, Industry and Energy.



Solar Module at EXCO (Daegu Exhibition & Convention Center) in 2025

Environmental Management

Governance

Environmental Management Governance

Roles and Responsibilities in Governance

Roles of the Board of Directors

Guided by the ESG Committee, we actively engage in discussions and reviews of relevant issues to achieve environmental protection and sustainable management. Under the Board of Directors, the committee plays a central role in identifying environmental risks and opportunities, developing response strategies and objectives, and reviewing the key elements of medium- to long-term roadmaps.

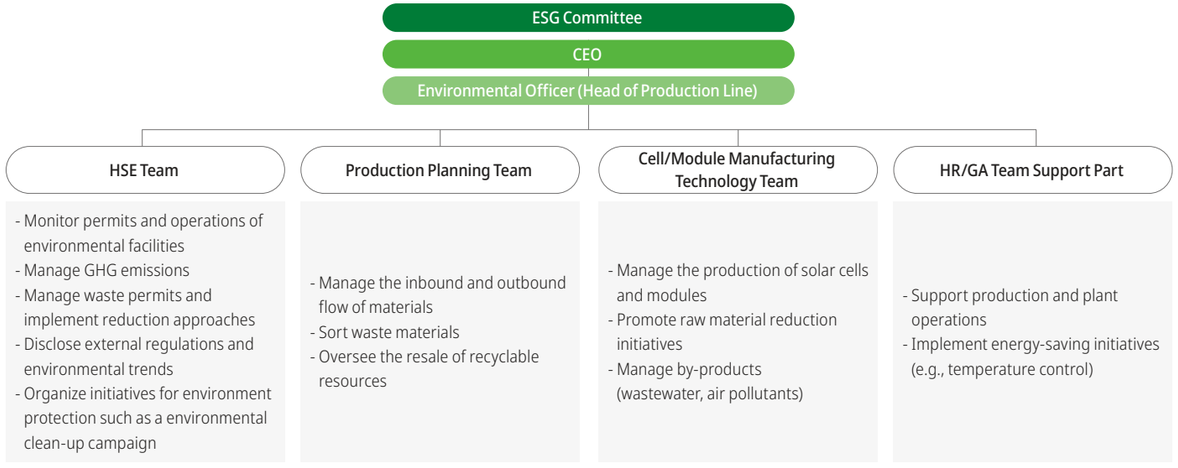
Roles of Executive Management

The CEO and the Environmental Officer at HD Hyundai Energy Solutions receive reports on environmental management initiatives and monitor progress on a regular basis. They regularly review action plans, implementation steps, post-assessment for environmental management and make decisions based on their reviews.

Roles of Dedicated Environmental Management Departments

To minimize environmental impacts across the product life cycle, from production to disposal, we have designated environmental impact officers in each department, in addition to the HSE Team. These departments monitor environmental indicators to efficiently manage environmental impacts arising from our operations, and actively engage in impact mitigation efforts. The dedicated environmental management departments also implement activities such as GHG emissions monitoring, waste material management, and reduction of energy consumption in alignment with the ESG Committee's guidelines.

HD Hyundai Energy Solutions Environmental Management Organization



Strategy

Environmental Management Strategy

Foundation for Environmental Management

Declaration of Environmental Management

In order to minimize the environmental impacts of our business operations and implement environmental management practices, we have established clear policies and objectives related to safety, health, and the environment. To further strengthen our commitment, we are exploring participation in global environmental initiatives and are diversifying our efforts to enhance environmental protection and sustainability.

Efforts Toward Environmental Management Goals

In line with our safety, health, and environment policies, we have set environmental objectives to ensure a safe and healthy environment for all employees and stakeholders and take actions based on these objectives.

Safety, Health, and Environment Policy

Committed to establishing a framework for safety, health, and environmental management and creating a safe and pleasant working environment for all employees, we affirm to our stakeholders our continued dedication to the following principles:

• Protecting Workers' Lives	- Comply with applicable laws and safety standards. - Promote safety management led by supervisors.
• Fostering Safe Working Environment	- Continuously improve the working environment. - Operate an occupational health management system with focus on preventive approaches.
• Promoting Green Organizational Culture	- Reduce carbon footprints through GHG emission control. - Prevent environmental pollution and take more active approaches for improvement.

2024 Environmental Objectives

Zero Environmental Incidents	- Conduct rigorous inspections on environmental facilities (monthly) - Maintain compliance with environmental and safety standards (zero violations) - Promote waste sorting and disposal (monthly)

2025 Environmental Objectives

Green Organizational Culture	- Prevent chemical accidents (zero accidents) - Manage emissions of pollutants (zero violations)

Environmental Management

Strategy

Environmental Management Strategy

Foundation for Environmental Management

Securing Environmental Investment Capital

In 2024, we were selected for the Loan Program of the Leading Transition toward Carbon Neutrality Project by the Korea Industrial Complex Corporation and secured investment capital to advance our environmental management efforts and implemented eco-friendly, high-output production facilities.

As part of this initiative, we upgraded our existing 480-500W low-power solar module production lines to high-power N-type TOPCon module lines capable of producing 625-700W modules while investing in new production lines utilizing large-area solar cells. These facility improvements have reduced energy consumption and GHG emissions during the manufacturing process. The high-efficiency modules produced through the upgraded lines also contribute to reaching national GHG reduction targets by delivering higher power output with the same number of installations.

Environmental Management Training

To promote our environmental management practices, we organize environmental training programs for all employees. The program includes mandatory training for hazardous material safety and that for environmental managers and hazardous material managers. They are designed to raise awareness among employees and support the implementation of sustainable management practices across the organization.

Environmental Training Programs

Category	Completion rate
Mandatory Training for Hazardous Material Safety	100%
Mandatory Training for Environmental Managers and Hazardous Material Managers	100%

Risk Management

Environmental Risk Management

Environmental Risk Management System

Certification and Internal Review of Environmental Management System

We have obtained ISO 14001 certification for our environmental management system. Our head office and production sites certified under this international standard regularly monitor environmental performance and analyze the results to assess the effectiveness of the system.

Response to Environmental Laws

We maintain a comprehensive list of environmental laws relevant to our operations and ensure strict adherence to their requirements. Our internal compliance managers regularly monitor enactments and amendments of applicable laws and share the requirements to respond to them with the relevant departments. In coordination with these departments, we take proactive measures to maintain compliance, thereby minimizing legal risks. As a result, there have not been any violations or penalties in the past three years, including 2024.

Response to Environmental Laws

Environmental Laws & Regulations	Response from HD Hyundai Energy Solutions
Clean Air Conservation Act Enacted to manage and protect air quality, the Act defines responsibilities for managing air pollutant-emitting facilities.	We manage air pollutant emissions using internal standards that surpass the legal requirements. Regular maintenance and upgrades of pollution control equipment help improve efficiency to handle sources of air pollution, while emissions are closely monitored through in-house inspections on a regular basis.
Act on Promotion of Transition to Circular Economy and Society Enacted to promote efficient use of resources and reduce wastes, the Act regulates violations related to waste disposal charges.	In alignment with the Act that promotes to establish and operate the national circular economy information system, we set annual goals for circular use ratio through circular economy performance management. To this end, we have expanded the use of circular raw materials and strived to achieve circular use by recycling all generated wastes.
Water Environment Conservation Act Enacted to prevent contamination and degradation of water environment, the Act sets standards for discharging wastewater and water pollutants.	We operate under wastewater management standards that exceed legal requirements. Performance testing has been conducted to identify the optimal wastewater treatment chemicals that help comply with the defined discharge levels and improve treatment efficiency. We also carry out regular inspections on wastewater discharge facilities and implement improvements to water pollution control facilities.
Waste Control Act Enacted to minimize wastes and properly treat the generated wastes, the Act defines guidelines for waste management and treatment.	We have established waste management guidelines to ensure lawful and responsible framework throughout the generation and disposal of waste. In addition, we monitor and manage relevant data using the Ministry of Environment's "Allbaro System."
Act on the Integrated Control of Pollutant-discharging Facilities The Act is enacted to establish a framework for the integrated management of pollutants at business sites and the application of site-specific environmental management techniques, leading to the development of environmental technologies and the protection of public health and environment.	As a designated business subject to the integrated environmental permit (IEP) system, we obtained our first IEP for semiconductor manufacturing in 2024. To ensure integrated management of pollutant-discharging facilities, we prepare monthly inspection logs and submit the saved data to the Ministry of Environment as part of our post management process.
Act on the Allocation and Trading of Greenhouse Gas Emissions Permits The Act is enacted to introduce the Emissions Trading System that helps reduce GHG emissions nationwide.	As a designated business subject to the Ministry of Environment's Emissions Trading System, we quantify our GHG emissions annually and receive independent assurance reviews for the collected data to be disclosed in public. In addition, we set emissions reduction targets and implement various initiatives to lower our carbon footprint.

Environmental Management

Risk Management

Environmental Risk Management

Environmental Risk Management System

Implementation of Environmental Management

Through various community activities, we identify potential safety risks associated with our operations, assess their scope and severity, and work with stakeholders to minimize negative outcomes. We organized a Chemical Safety Community in collaboration with local small and medium-sized enterprises to prevent chemical accidents and improve the management of hazardous chemical facilities.

Our various activities conducted in 2024 include chemical safety campaigns, training on the use of personal protective equipment, emergency drills for hydrofluoric acid leaks, and site tours of hazardous chemical facilities. We also worked with the Eumseong Fire Station and local companies for joint drills to build a coordinated response system that supports fire equipment and information sharing. In addition, we installed pollution control facilities to preemptively manage legal risks following amendments to the Clean Air Conservation Act and launched a used paper towel recycling campaign as part of our waste resource recycling system.

ACTIVITIES

Chemical Safety Community Initiatives

We organized Chemical Safety Community activities with local small and medium-sized enterprises to prevent chemical accidents and improve the management of hazardous chemical facilities. In 2024, we were designated as a leading company of Chungbuk Community 4 by the Wonju Regional Environmental Office and worked with local SMEs to build a coordinated response system. Joint drills were conducted to minimize the impact of chemical accidents, and the coordinated response system was inspected by the environmental teams from Chungju Branch and Seosan Branch of the Joint Inter-agency Chemical Emergency Preparedness Center. These drills introduced analysis tools (mobile labs and detection equipment) and demonstrated their use and response strategies in emergency scenarios. We also monitor chemicals mainly used at our site and share information in real time with response agencies of the community via analytical equipment, establishing a sound basis for well-organized, initial response. As a leading company of Chemical Safety Community, we regularly hold information exchange sessions and organize chemical safety campaigns such as "VFS (Valve, Flange, Switch) Safety Check."



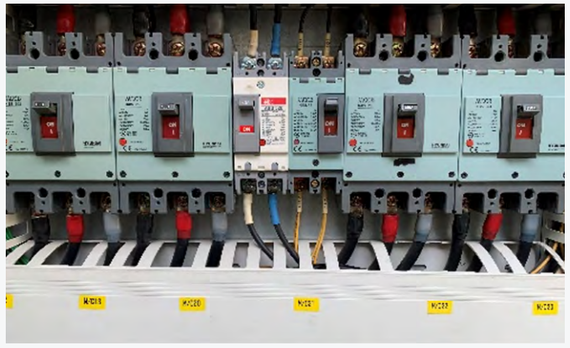
"VFS Safety Check" Campaign of Chungbuk Community 4 promoted by Wonju Regional Environmental Office



Joint Emergency Drill for Chemical Accident with Relevant Organizations

IoT Monitoring Devices for Air Pollution Control Facilities

In response to amendments to the Enforcement Decree of the Clean Air Conservation Act, we installed IoT monitoring devices to verify proper operations of our air pollution control facilities. The size of our business site falls under a small-scale level with less than 10 tons of annual air emissions, which requires the installation of an IoT monitoring device. The installed devices collect and transmit real-time data on key metrics such as electric current, pH levels, pressure, and temperature of the pollution control facilities, enabling verification of their proper operations. They will enhance transparent operations of the pollution control facilities and contribute to improved air quality. We have installed IoT monitoring devices that operate 24 hours a day for four control facilities at our Eumseong plant. The collected data is automatically transmitted to the Korea Environment Corporation's Green Link system for real-time monitoring.



Installation of IoT Monitoring Devices

Used Paper Towel Recycling Campaign

In collaboration with Yuhan-Kimberly, we launched a used hand towel recycling campaign to promote resource cycling and environmental protection. Previously, used hand towels were disposed of in a wet state and treated as general waste due to their low weight to volume ratio and relatively low pulp content. In addition, recycling challenges arise when foreign objects such as PET bottles and vinyl get blended in the collection process or become decomposed during prolonged storage. To address these issues and encourage employee participation, we implemented a hand towel collection and sorting process in cooperation with our business partners, promoting sustainability not only during product manufacturing but also post-consumption. In 2024, we collected a total of 353.1 kg of used hand towels through this campaign, resulting in a reduction of 365.4 kgCO_2eq in GHG emissions.



Paper Towel Recycling Campaign Poster

Environmental Management

Risk Management

Environmental Risk Management

Reducing Water Consumption

Water Consumption Management

The HSE (Facility Part) Team is responsible for monitoring daily water consumption throughout the production process. Water resources used in operations are categorized into incoming municipal water (withdrawal), generated wastewater (consumption in plant), and water discharge (effluent) and managed accordingly. In line with internal guidelines, all data is recorded in operation logs. To prevent pollution of the Hanbeolcheon stream, the final discharge point within the Han River basin, we utilize a TMS to monitor pollutant concentrations in real time. Water consumption is also tracked by category, such as DI and PCW, and shared with the Utility Management and Production Departments. Based on the collected data, we implement ongoing efforts to reduce overall water use and minimize wastewater.

Water Recycling and Reuse

To support water recycling, we are committed to improving our processes using advanced technologies. For example, concentrate water from EDI process, a by-product from the ultrapure water production in cell manufacturing, is redirected to Process Cooling Water (PCW) storage tanks and reused as cooling water or utilized as liquid absorbent in POU scrubbers (devices for removing hazardous gases during processes).

Water Resource Risk Management

In line with the World Resources Institute (WRI) guidelines, we are establishing a water risk management strategy based on water stress levels in the regions where our sites are located. According to the risk assessment, our sites in Eumseong, Chungbuk are exposed to a medium-high level of quantitative physical risk, while qualitative physical and transition risks are assessed as Low. Based on these results, we are developing targeted strategies to manage water risks.

Link. WRI Water Risk Atlas

Water Risk Exposure Level

Category	Level of Exposure
Physical Risk (Quantitative)	Medium-high (2-3)
Physical Risk (Qualitative)	Low-medium (1-2)
Transition Risk (Regulatory and Reputational)	Low (0-1)

Water Withdrawal and Wastewater Discharge

Category	Unit	2022	2023	2024
Total water withdrawal	ton	417,887	516,561	206,866
Surface water	ton	-	-	-
Groundwater	ton	-	-	-
Seawater	ton	-	-	-
Third-party water supply (e.g., municipal water, industrial water)	ton	417,887	516,561	206,866
Water withdrawal intensity	ton/KRW 1B	424	946	490
Total wastewater discharge	ton	356,076	360,562	69,349
Reused water	ton	-	-	-

WRI Water Risk Atlas



Physical Risks Quantity



Physical Risks Quality



Regulatory and Reputation Risks

Environmental Management

Risk Management

Environmental Risk Management

Reducing Pollutant Discharge

Water Pollutant Management

At HD Hyundai Energy Solutions, we monitor pollutant discharge concentrations in real time through TMS to ensure that harmful substances or micropollutants are not discharged above regulatory limits. We also operate a wastewater treatment facility with a daily capacity of 1,800 tons to effectively treat wastewater and sewage generated from production processes and the work site. To further improve water quality, we have engaged in various efforts including optimization of biological treatment processes using hydrogen peroxide removers and nitrifying microbial agents to reduce nitrogen concentrations in discharged water.

Air Pollutant Management

We implement enhanced internal standards, stricter than legal requirements, to minimize air pollutant emissions and reduce environmental impact. During new investment in our cell production line, we eliminated NOx generation from production by excluding any processes using HNO3, a major source of NOx emissions. To promote proper operations of pollution control facilities, we also install IoT monitoring devices for each facility to send real-time data directly to the authorities.

Waste and Chemical Management

Waste Management

We rigorously manage various types of waste generated during production such as waste synthetic resin, paint, sludge, wood, and glass. The waste is then sorted and disposed in designated areas where registered outsourcing agencies collect them for proper waste treatment. Since 2021, we have transitioned from incinerating ordinary industrial waste to recycling it through a recycling service provider, thereby increasing our recycling rate and reducing waste disposal costs. As a result, we achieved a 99.9% waste recycling rate in 2024.

Chemical Management

Our work site in Eumseong, Chungbuk handles various types of chemicals. To manage environmental and safety-related risks, we pre-screen all chemicals during their procurement and delivery to determine whether they can be admitted on site. Our integrated control center monitors chemical sensors and safety valves in real time to prevent environmental accidents at the source. To ensure safety of our local community, we share our accident control plans with local residents and have established an emergency contact system to respond effectively to emergency situations.

Water Pollutant Discharge

		Unit	2022	2023	2024
TOC	Discharge	kg	717	505	116
	Intensity	kg/KRW 1B	0.7	0.9	0.3
BOD	Discharge	kg	338	82	40
	Intensity	kg/KRW 1B	0.3	0.1	0.1
SS	Discharge	kg	506	367	83
	Intensity	kg/KRW 1B	0.5	0.7	0.2
T-N	Discharge	kg	2,845	1,895	239
	Intensity	kg/KRW 1B	2.9	3.5	0.6

This data pertains only to the Eumseong plant.

Air Pollutant Emission

		Unit	2022	2023	2024
NOx	Emissions	kg	4,237	1,146	682
	Intensity	kg/KRW 1B	4.3	2.1	1.6
SOx	Emissions	kg	27	60	46
	Intensity	kg/KRW 1B	0.0	0.1	0.1
PM	Emissions	kg	734	2,075	280
	Intensity	kg/KRW 1B	0.7	3.8	0.7

This data pertains only to the Eumseong plant.

Waste Discharge

		Unit	2022	2023	2024
General Waste	Landfilled	ton	-	-	-
	Incinerated	ton	-	-	-
	Recycled	ton	5,169	4,979	2,724
	Total	ton	5,169	4,979	2,724
Designated Waste	Landfilled	ton	-	-	-
	Incinerated	ton	17	21	5
	Recycled	ton	2,415	2,282	619
	Total	ton	2,432	2,303	624
Total Waste	Landfilled	ton	-	-	-
	Incinerated	ton	17	21	5
	Recycled	ton	7,584	7,261	3,343
	Total	ton	7,601	7,281	3,348
	Intensity	ton/KRW 1B	7.7	13.3	7.9

This data pertains only to the Eumseong plant.

Environmental Management

Metrics & Targets

Environmental Management Indicators and Objectives

Environmental Management Progress and Objectives

Water

In order to minimize the environmental impact of our business operations and improve performance, we are committed to monitoring water consumption, setting reduction targets, and conducting annual assessment. Based on these assessment results, we implement initiatives aimed for reducing water usage.

Waste

We have established a framework for measuring treated waste by category to reduce waste discharge. Throughout the entire process, from generation to disposal, we strictly manage waste in compliance with applicable regulations. We also set annual targets for both waste discharge and recycling, and assess our achievements. These assessment results are then used as a basis for promoting waste reduction efforts.

Water Consumption Reduction Targets and Performance

Category	2024 Target	2024 Performance	2025 Target	2026 Target	2027 Target
Consumption	250,000t	206,866t	450,000t	600,000t	600,000t

Waste Discharge Targets and Performance

Category	2024 Target	2024 Performance	2025 Target	2026 Target	2027 Target
Waste Amount	5,000t	3,348t	7,000t	8,000t	8,000t
Recycling Rate	95.0%	99.9%	95.2%	95.5%	95.5%

Key Initiatives to Reduce Water Consumption

Promoting Water Reuse

- Improved processes and invested in technology and equipment to facilitate water reuse.
- Implemented continuous improvements to processes.
  (e.g., recycling concentrate water using EDI as cooling water in production processes and utilizing as liquid absorbent in POU scrubbers)

Investment in High-Efficiency Production Lines

- Introduced high-efficiency equipment with lower water consumption per unit of production in case of installation of new equipment in production lines, such as TOPCon cell line.

Key Initiatives to Achieve Waste Discharge and Recycling Rate Targets

Used Hand Towel Recycling Campaign

- Promoted the recycling of used hand towels that were previously treated as general waste.
- Achieved an annual reduction of approximately 365kgCO2eq in carbon emissions and improved the recycling rate.

Investment in Waste Collection Facilities

- Demolished the outdoor waste storage area and built a new waste collection facility in compliance with storage standards under the Waste Control Act, thereby improving waste management efficiency and recycling rate.

Biodiversity

Governance

Biodiversity Conservation Governance

Roles and Responsibilities in Governance

Roles of the Board of Directors

Our Board of Directors is responsible for establishing biodiversity policies, approving response strategies and objectives, and then determining the company-wide direction for implementation. The board regularly reviews the risks and opportunities associated with biodiversity conservation, overseeing reports about achievements and relevant initiative highlights to ensure effective governance.

Roles of Executive Management

Following the board's directives, the executive management formulates biodiversity protection objectives and integrates them within business operations. It also assesses environmental impacts in local areas and establishes action plans for environment protection and restoration to reduce such impacts.

Roles of Dedicated Departments

Our dedicated departments are tasked with on-site implementation that requires monitoring and reviewing legal requirements and global guidelines for biodiversity. They set and coordinate specific action plans such as assessing environmental impact and monitoring protected species. The findings are regularly reported to executive management.

Strategy

Biodiversity Conservation Strategy

Approach to Biodiversity Conservation

Biodiversity Conservation Policy

In line with the global biodiversity agreements and guidelines, including Convention on Biological Diversity (CBD), we are committed to minimizing the impact of our operations on ecosystems and fulfilling our responsibilities toward ecosystem restoration. In local areas, we also strictly comply with all legal requirements defining biodiversity enhancement, habitat conservation, and natural resource use.

Nationally Protected Species Near Work Sites

Within the regions of Eumseong-gun, Chungcheongbuk-do where our manufacturing facilities are located and Seongnam-si, Gyeonggi-do where our headquarters is based, a total of 21 nationally protected species, including otters, leopard cats, and Siberian flying squirrels, have been identified. To minimize negative impacts on the environment near our work sites, we implement biodiversity initiatives in coordination with local communities, and we have monitoring systems in place to take immediate action for any emerging environmental issues.

Nationally Protected Species

Category	Class 1	Class 2
Nationally Protected Species in Seongnam-si		
Mammals	-	Leopard cat, Siberian flying squirrel
Birds	Scaly-sided Merganser	Crested honey buzzard, Eurasian sparrowhawk, Eurasian hobby, owl, long-billed plover
Amphibians and reptiles	-	Narrow-mouthed frog
Terrestrial plants	-	Prickly waterlily
Nationally Protected Species in Eumseong-kun		
Mammals	Otter	Leopard cat
Birds	Scaly-sided merganser, white-tailed sea eagle	Cinereous vulture, Chinese sparrow hawk, Eurasian sparrow hawk, Eurasian hobby, northern goshawk, long-billed plover
Amphibians, reptiles, and birds	Suwon treefrog	Argynnis nerippe

Risk Management

Biodiversity Risk Management

ACTIVITIES

Environmental Cleanup Campaign in Seongnam-si

As part of our biodiversity conservation efforts, we are working with the Seongnam Volunteer Center to promote regular environmental clean-up campaigns. Seongnam-si, where our headquarters is based, is an ecologically significant region, hosting a variety of legally protected species such as scaly-sided mergansers (Class 1: endangered) and the long-billed plover and prickly waterlily (Class 2: vulnerable). With voluntary employee participation, we organize plogging campaigns in the Tancheon Freshwater Marsh Ecological Park. Participants collected litter while walking from the public parking lot to the park entrance. In the ecological park, they also focused on removing invasive alien species, including wild hops, which hinders the growth of prickly waterlily, contributing to local ecosystem conservation and biodiversity protection.



Tancheon Biodiversity Conservation Campaign 2023

Social

31 Safety and Health
35 Human Resource
39 Human Rights
42 Supply Chain
46 Quality Management
48 Information Security
50 Social Contribution



Safety and Health

Governance

Safety and Health Governance

Roles and Responsibilities in Governance

Roles of the Board of Directors

To foster a corporate culture of safety and health and prevent industrial accidents, we establish objectives and strategies for safety and health and review their progress. Where investments are required to ensure a safe working environment for our employees, such decisions are made through board resolutions in accordance with the regulations. In addition, OSH Committee meetings are held with representatives from both Labor and Management to manage relevant risks.

Roles of Chief Safety Officer

The Chief Safety Officer (CSO) is responsible for overseeing all aspects of the safety and health management, including establishing the company-wide safety and health policies and frameworks, reviewing proper operation of the safety and health management system, and planning and implementing workplace safety programs. The CSO also monitors hazards identified through risk assessments and conducts on-site safety inspections, providing instructions for remedial actions for those with a high likelihood of occurrence.

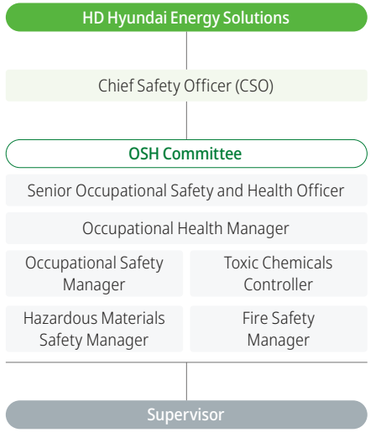
Role of Dedicated Departments

The HSE Team, the dedicated safety and health department, is responsible for formulating and implementing safety, health, and environmental policies and objectives at work sites. Each work site develops annual safety and health plans based on risk assessments while incorporating relevant domestic and international legal requirements and accident trends into work manuals on a regular basis. Through on-site routine inspections and real-time monitoring, the team tracks compliance with safety standards, and will halt work to take preemptive action in response to any evolving anomalies.

OSH Committee

OSH Committee, composed of representatives from both labor and management, convene quarterly meetings where they jointly inspect workplace hazards and discuss improvement measures. Resolutions or decisions made during the meetings are shared with all employees through communication channels such as internal posts to ensure full awareness across the organization. In addition to the prescribed measures, we have monitored our safety and health management system through regular and occasional risk assessments and internal audits, which are carried out at least once a year in accordance with the audit guidelines for safety and health management.

OSH Committee Structure



Key Agenda of OSH Committee Meetings in 2024

No.	Agenda
1	Risks in use of handcarriage with increased material weight
2	Needs to secure paths due to increased shipments at module plants
3	Reinforcement of the HJT pilot line trenches at the cell plant
4	Request for repairing potholes inside the plants
5	Request for installing shutter air shower
6	Speed limit for forklifts in the module plants

Safety and Health

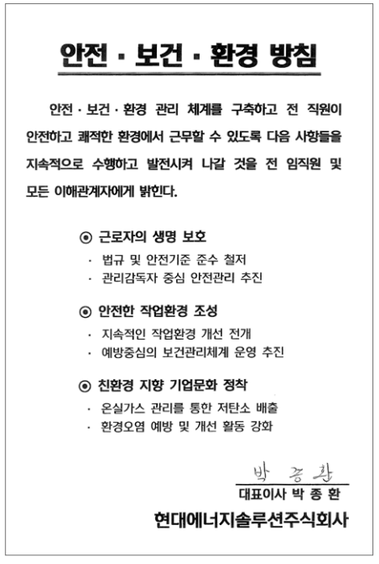
Strategy

Safety and Health Strategy

Safety and Health Policy

Establishment of Safety and Health Policy

We have established a health, safety, and environmental policy to foster a safe working environment, and implement various workplace improvement initiatives based on this policy. It not only applies to all employees of HD Hyundai Energy Solutions, but also extends to those of our suppliers. We encourage our business partners whose operations are closely associated with ours to adopt this policy.



안전 · 보건 · 환경 방침

안전 · 보건 · 환경 관리 체계를 구축하고 전 직원이 안전하고 쾌적한 환경에서 근무할 수 있도록 다음 사항들을 지속적으로 수행하고 발전시켜 나갈 것을 전 임직원 및 모든 이해관계자에게 밝힌다.

◉ 근로자의 생명 보호
- 법규 및 안전기준 준수 철저
- 관리감독자 중심 안전관리 추진

◉ 안전한 작업환경 조성
- 지속적인 작업환경 개선 전개
- 예방중심의 보건관리체계 운영 추진

◉ 친환경 지향 기업문화 정착
- 온실가스 관리를 통한 저탄소 배출
- 환경오염 예방 및 개선 활동 강화

박 종 환
대표이사 박 종 환
현대에너지솔루션주식회사

Safety, Health, and Environment Policy

Safety and Health Training

To raise safety awareness among our employees, we organize ongoing safety training including regular mandatory training for supervisors, new employees, and those taking on new roles. In 2024, a total of 173 employees completed safety and health training, averaging 24 hours of training per person. To ensure safe handling of hazardous chemicals in each process, Material Safety Data Sheets (MSDS) are made readily available at work sites for employees to consult at any time. These MSDS cover key information such as substance properties, risks, and emergency response procedures.

Safety and Health Training in 2024

Category	Unit	2022	2023	2024
No. of participants	person	147	203	173
Training hours	hour	3,528	4,872	4,152
Hours per person	hour	24	24	24
Participation rate	%	59	95	86

Risk Management

Safety and Health Risk Management

Safety and Health Risk Management Framework

Third-party Safety and Health Management System Certification

We have established a safety and health management system, which help set action plans, identify potential hazards, and develop improvement measures, and this system is aimed at preventing industrial accidents and enhancing performance of our operations. We obtained third-party certification for our system based on the ISO 45001, the international standard for occupational safety and health management system. This certification has enabled us to identify workplace hazards and establish a risk management process with a focus on prevention.

Third-party Safety and Health Management System Certification

Standard	Agency	Validity
ISO 45001:2018	Kiwa	Mar. 20, 2023 - Mar. 22, 2026

Safety and Health Management Guidelines

To ensure safety across all our work sites, we maintain safety and health guidelines that serve as overarching standards, along with detailed guidelines tailored to each production line. These guidelines are developed in accordance with legal requirements, workplace-specific safety standards, and specific workplace attributes. They cover procedures for hazardous work, protective equipment requirements, and emergency response protocols. We promote regular updates to the guidelines and relevant training for working personnel to enhance proactive implementation on site. In case of a new process or incident, the guidelines are reviewed and are promptly updated as needed.

Compliance with Safety and Health Laws

In addition to the establishment of a safety and health management system, we ensure full compliance with all relevant regulations, thereby minimizing legal risks within work sites and ensuring safety at workplaces. We have set internal rules and procedures in accordance with safety and health laws such as the Serious Accidents Punishment Act and the Occupational Safety and Health Act. We regularly monitor to review any amendments to the laws and promptly incorporate them into our system. In addition, employee training and internal audits are conducted to prevent potential legal violations, and we also fully cooperate with regard to inspections and guidance from authorities.

"Permit to Work" System

Our permit to work system is designed to enforce preventive measures for high-risk work. Before initiating hazardous work such as hot work, confined space work, and working at heights, safety inspections and approvals from the relevant departments are required to identify and thoroughly manage workplace hazards thoroughly. A permit to work can be granted once all required checklists—risk assessment, personal protective equipment, and safety devices—are confirmed, and adherence to safety rules is also monitored during the work.

Safety and Health

Strategy

Safety and Health Risk Management

Safety and Health Risk Management Initiatives

Risk Assessment

In accordance with content related to the process-safety report as outlined in Article 44 of the Occupational Safety and Health Act, and as a workplace with hazardous and dangerous facilities, we prepare a process-safety report following the OHS Committee's review. To prevent serious industrial accidents, we have implemented a Process Safety Management (PSM) system. As part of this system, all departments annually develop and implement standardized work procedures and hazard assessments. Through these measures, we remain committed to ensuring a safe working environment where employees can perform their job safely.

Internal Audits and Facility Inspections for Safety and Health Management

Based on internal audit regulations, we conduct at least one internal audit a year along with monthly on-site inspections to identify potential hazards. Fire equipment and sensors are managed as key safety priorities at the company level. We also conduct regular safety checks for hazard prevention plans, as well as check various facilities such as pressure vessels, gas facilities, elevators, and chemical supply tanks.

In the cell production areas, inspections focus on equipment handling hazardous materials and substances, as well as the use of protective equipment. In the module production areas, the safety conditions of powered equipment such as conveyors and forklifts are assessed. To enhance this preventive framework, CCSS, CGSS, and TMA areas are regularly checked in utility operations, and potential safety hazards in the office are also inspected.

Emergency Response and Disaster Preparedness

In response to various types of emergencies and disasters, we have developed emergency response manuals and conduct regular training based on them. We focus on minimizing damage and ensuring employee safety during natural disasters such as typhoons and earthquakes. In the event of an emergency or safety incident at the company level, we work closely with local fire stations to carry out regular fire drills and promptly respond to actual fire events, protecting people and their properties.

Healthcare Programs

To promote the well-being and prevent illness among our employees, we operate various healthcare programs. All employees and their family members receive general and specialized health check-ups every year along with comprehensive health check-ups for long-serving employees and their families. As part of our efforts for preventing infectious diseases, we also provide influenza vaccinations to all employees, fostering a healthy workplace.

Safety and Health Risk Control for Suppliers

Safety and Health Policies for Suppliers

While respecting the autonomous management of our suppliers, we encourage them to adapt to our safety and health policies and consider their safety and health management as an important assessment metric in the supplier screening. We also conduct regular assessments of our suppliers' safety and health management to identify hazards that may cause safety and health risks and promote improvements to those factors.

Risk Assessment for Suppliers

To enhance suppliers' safety management capabilities, we support them in conducting risk assessments. We encourage them to identify hazards for their main work and assess the identified risks based on likelihood and severity. If necessary, technical and on-site consultations are offered by safety professionals. In addition to setting action plans for improvements based on assessment results, we monitor compliance with safety rules, including protective equipment and work procedures, to promote on-site implementation.

Communication and Training for Supplier Safety and Health

We promote open communication and support for our suppliers to enhance their safety and health management capabilities. We are committed to communicating with our suppliers to improve their awareness of safety and health management through various approaches, including sharing our direction on relevant policies and strategies, reviewing key issues, and discussing ways to resolve grievances. Special lectures are organized to raise safety awareness among their representatives, while training programs are offered to strengthen the competency of safety managers.

Safety and Health

Metrics & Targets

Safety and Health Indicators and Objectives

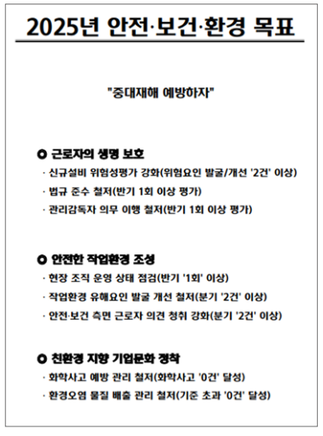
Current Status of Safety and Health Management

Safety and Health Objectives

As part of our efforts to prevent workplace accidents, we have established internal safety and health objectives and systematically manage their progress. We set these objectives based on various factors, including safety and health policies, external indicators such as industry trends in safety and health management, and internal indicators—risk assessments, safety level analyses, and accident records.

Short-term Objectives and Achievements of Safety and Health Management

Category	2024	2025
Objective	· Zero cases of fire/explosion and industrial incidents · Zero cases of occupational disease	· Protecting workers' lives · Fostering safe working environment
Action Plan	· Fully implement 12 rules in Process Safety Management (PSM) · Comply with applicable laws and safety standards. · Ensure that supervisors fulfill their safety responsibilities · Enhance near-miss prevention campaigns · Improve working environments and mandate the wearing of protective equipment	· Strengthen risk assessments for new equipment · Comply with applicable laws · Ensure that supervisors fulfill their safety responsibilities · Conduct regular on-site inspects on quenching-tempering process · Identify and address hazards in working environments · Collect employee feedback on safety and health management


2025년 안전·보건·환경 목표

"중대재해 예방하자"

○ 근로자의 생명 보호
· 신규설비 위험성평가 강화(위험요인 발굴/개선 '2건' 이상)
· 법규 준수 철저(반기 1회 이상 평가)
· 관리감독자 의무 이행 철저(반기 1회 이상 평가)

○ 안전한 작업환경 조성
· 현장 조직 운영 상태 점검(반기 '1회' 이상)
· 작업환경 유해요인 발굴 개선 철저(분기 '2건' 이상)
· 안전·보건 측면 근로자 의견 청취 강화(분기 '2건' 이상)

○ 친환경 지향 기업문화 정착
· 화학사고 예방 관리 철저(화학사고 '0건' 달성)
· 환경오염 물질 배출 관리 철저(기준 초과 '0건' 달성)

Safety, Health, and Environmental Objectives in 2025

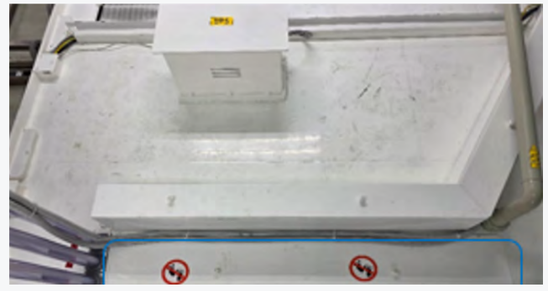
ACTIVITIES

Near-miss Prevention Campaigns

As part of our commitments to strengthening near-miss prevention campaigns, we conduct a "Find Hidden Risk Factors" campaign on a monthly basis to identify potential hazards and raise safety awareness across our plants. Through these campaigns, we identify and address more than 10 hazards each month and recognize good practices through a reward system, encouraging employees' active participation.

For example, in the Texturing process area on the first floor of the cell plant, we identified and addressed a potential fall hazard involving unused equipment. The cover of the equipment had loose bolts, which posed a safety risk if closed without proper awareness. To address this, we secured the bolts on the VV Box, applied warning stickers for fall hazard, and provided safety training to workers in the area.

In 2025, we have set key objectives for safety and health management, such as protecting employees' lives, fostering a safe working environment, and promoting green organizational culture. To this end, we remain committed to implementing action plans for better safety.


After implementing remedies

Human Resource

Governance

HR Management Governance

Roles and Responsibilities in Governance

HR Management Organization

We have established a systematic talent management system that covers all aspects of human resource management, including recruitment, capability building, performance assessment and compensation, benefits, organizational culture enhancement, and retirement support. In line with our vision of our company “Steering innovation and defying our limits,” we are committed to attracting, developing, and retaining top talent. By doing so, we are strengthening our organizational competitiveness and drive sustainable growth.

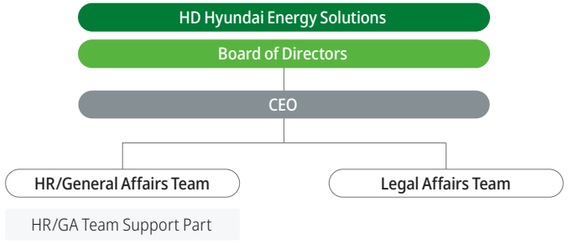
Labor Union

We respect our employees' rights to collective bargaining and fully support union activities in accordance with applicable laws.

Labor-Management Council

Under the Act on the Promotion of Employees' Participation and Cooperation, we hold quarterly Labor-Management Council meetings to discuss working conditions and employee welfare. The council consists of three representatives each from Labor and Management, fostering collaborative dialogue in an open and interactive setting. Through these discussions, we seek practical solutions to improve the working environment and uphold labor rights, ensuring employee voices are reflected in our operations.

HR Management Organization



2024 Labor-Management Council Meetings

Category	Description
No. of Meetings	3 times
Agenda	· Executive meeting observation program - Helping non-managerial employees better understand business operations and encouraging communication - Attending a monthly breakfast meeting (2 employees from each region) · Updating rules for using bereavement leave when a family death occurs · Reviewing and finalizing of Production Calendar 2025

Strategy

Approach to HR Management

Capability Building and Self-Development

Core Value Integration and Practice

To ensure all employees actively contribute to the realization of our corporate values, we provide training programs designed to embed core values into their work. For new employees, we offer onboarding sessions for our corporate value system that is built on the HD Hyundai Group’s mission, vision, and core values. For existing members, we provide in-depth training courses on core values. These efforts foster a shared sense of our corporate direction and help them gain insight into our organizational culture.

Online Learning Platform "Hi-Class"

To make training more accessible for our employees, we developed Hi-Class, an online training platform that allows them to take various courses (job-related training, language learning, etc.) at their convenience.

Leadership Development

We cultivate next-generation leaders who can drive innovation and respond strategically to a rapidly changing business environment with our leadership development programs at the group level, including the HLC (HD Hyundai Leader Course) and HTLC (HD Hyundai Technical Leader Course). These programs are designed for those selected as next-generation leaders and offer a variety of work-related training with action learning sets, covering the core challenges in each business area. Participants can develop both problem-solving skills and leadership competencies.

Main Training Programs

Programs	Eligible participants	Description
Core Value Competency	New employees, managers, etc.	· Understand the background and importance of corporate missions, visions, and core values · Share the significance, practical examples, and direction of each core value
HLC[1] Training	Senior- to executive-level talent	· Deliver a five-level training program tailored by position and role, from senior talent to manager- and executive levels · Provide foundational knowledge in business management, technology management, and leadership to nurture future leaders
Leadership Multifaceted Debriefing	Executive-levels	· Enhance self-awareness through interpretation of multifaceted nature of leadership · Explore strategies to strengthen individual leadership capabilities
Training for Newly Appointed Managers	New department heads, manager-levels, etc.	· Develop leadership skills such as goal setting, performance management, coaching, and feedback · Foster understanding of company-wide systems
Technical Skill Building	All production and technical staff	· Provide foundational competency training
Expertise Transfer	All production and technical staff	· Offer training in core production technologies

1) HD Hyundai Leader Course

Human Resource

Strategy

Approach to HR Management

Capability Building and Self-Development

Job Competency Development Programs

We have established a systematic training system and learning infrastructure to develop talent that will drive the company's future growth. From the time of onboarding, everyone at HD Hyundai Energy Solutions is provided with personalized training programs based on their job title, role, and position. The programs cover a wide range of areas, including next-generation leadership development, interdisciplinary talent, job expertise, and global talent. To support the digital transformation (DT) of our workplace, we also offer company-wide DT awareness training in two key areas, "Culture Building" and "Talent Development," promoting our employees' adaptation to digital changes.

Support for Pursuing Academic Degrees

As part of our commitments to enhancing employees' expertise in their field, we offer support for pursuing master's and doctoral degrees. The program focuses on work-related majors and provides support for scholarships, training costs, and other necessary expenses. We also provide flexible work arrangements, ensuring the balance between their academic and professional responsibilities.

Support for Language Proficiency Test and Expatriate Training

At HD Hyundai Energy Solution, we offer English training programs to promote employees' effective performance. With a focus on communication skills, specifically speaking and listening, we have adopted TOEIC Speaking and OPIc as the primary testing options and cover application fees to encourage continued self-development.

Performance Evaluation and Compensation

Performance Evaluation System

In support for a fair and transparent evaluation system, we use HR evaluation as the foundation for compensation, promotion, talent development, and underperformance management. Individual goals are set by using the "management by objectives (MBO)" technique and key performance indicators (KPIs). The evaluation grades are determined based on the achievement of these goals. Afterward, the evaluation results support employee capability development and help embed a performance-driven culture throughout the organization.

MBO-based Team Performance Evaluation

Based on the company's management strategies, visions, and mid- to long-term goals, we design sub-goals for employees to evaluate their performance. Executives define their individual KPIs based on the company KPIs, while team leaders establish their MBO targets in alignment with the KPIs of their direct senior managers. Semi-annual reviews are conducted for these KPIs. To ensure acceptance of the evaluation results, we promote regular communication and feedback between evaluators and evaluatees throughout the process.

Performance Evaluation Based on Job Priorities

Job priorities are designed in line with our mid- to long-term goals and used as the foundation for performance assessments. Individual objectives are set through communication between managers and employees, taking into account each employee's role and performance. Evaluations are conducted on a regular basis following the submission of performance outcomes. To ensure fairness, we have coordination sessions and an appeal process, and provide comprehensive feedback after each evaluation cycle, promoting both individual and organizational growth.

Evaluation Review and Feedback

To ensure fair and valid outcome of the evaluation process, we have implemented a feedback process by which employees and managers can openly discuss goal alignment, objectivity of performance indicators, and progress updates. Our biannual evaluation includes first and second sessions followed by a coordination session. Employees are also given the opportunity to raise objections to their evaluations and can request additional feedback at any time.

Ensuring Fairness and Acceptance

To increase transparency and trust in our HR evaluation system, we disclose the results of first, second, and coordinated sessions and gather employee feedback. Employees are encouraged to provide input not only on the outcomes but also on the procedures and metrics. We also set performance goals and indicators for individual titles and roles, and then transparently share the outcomes of evaluation, thus improving acceptance of the results.

Performance Evaluation Types by Position Level

Position	Evaluation type	Cycle
Executives	Evaluation with MBO technique and multifaceted nature of leadership	Once per year
Department Heads and Team Leaders	Evaluation with MBO technique and multifaceted nature of leadership	Twice per year
Non-managerial Staff including Managers	Work-based performance evaluation	Twice per year
Certified Professionals (e.g., lawyers, patent attorneys, accountants)	Self-evaluation, multifaceted evaluation (by relevant personnel), evaluation by department head	Twice per year
Research and Administrative Staff	Performance and competency evaluation	Twice per year
Production Staff	Comprehensive evaluation covering performance, capability, and attitude	Twice per year

Performance-based Pay System

At HD Hyundai Energy Solutions, we differentiate pay based on the principle that "rewards follow performance." We apply performance-based variation to both base and merit pay within the annual salary structure, and incentive bonuses are determined based on individual performance and contribution levels.

Reward Program

Each year, we recognize outstanding individuals and teams through our performance reward program. Among the recipients, the highest honor is awarded to the top performer selected through a fair evaluation process. In addition, employees at the Eumseong plant receive incentives for achieving 100 days without any accidents on both the cell and module production lines, encouraging proactive safety initiatives.

Retirement Pension Plan

To support employees in preparing for a stable post-retirement life, we have a company-wide retirement pension plan in place. All retirement assets are managed through external reserves using principal and interest-guaranteed financial products. We also provide regular training sessions on the pension system to help our employees better understand it and take advantage of the full benefits.

2024 Defined-benefit Pension Plan (Unit: KRW 1,000)

Category	Present value of defined benefit obligations
End of current year	7,399,178
End of previous year	6,513,171

Human Resource

Strategy

Approach to HR Management

Employee Benefit Programs

Flexible Work System

We respect our employees' work-life balance and provide a flexible work system to create an efficient working environment. Our employees can freely plan their monthly working schedules through the Hi-HR system and adjust their plans as needed. Except during main working hours, our employees may arrange their work hours on a monthly basis within time slots. Meanwhile, the PC-OFF system automatically shuts down computers at the end of working hours, and a half-day leave policy allows our employees to take leave in four-hour increments for improved focus on their jobs and quality of life.

Retirement Planning Training

To help our employees prepare for a healthy and stable life after retirement, we provide the HD Hyundai Group retirement planning programs. These programs are available to those within two years of retirement, offering education on asset and health management, career exploration including re-employment and business start-up, and future planning. The program can be personalized to meet individual needs, covering self-assessment, life planning, start-up know-how, reemployment preparation, and information on farm and rural life.

Family-friendly Programs

To support maternal protection and childcare, we have introduced various programs. In addition to statutory maternity leave, employees are eligible for an additional one-month special maternity leave. Telecommuting is encouraged for pregnant employees. We provide childbirth bonuses of KRW 5 million for childbirth and pregnancy. Family-friendly facilities within the HD Hyundai Group, such as daycare centers, are also available to support working parents.

Job Stress Management

To address workplace stress and mental health, we have a group counseling center where our employees receive counseling services related to their work stress as well as family and childcare issues.

Fitness Center

Hi-GYM is our group fitness center, designed to promote employees' health and create a healthy working environment. Personalized workout programs are provided through equipment with advanced smart monitors. Professional trainers are available for personal training (PT) and group exercise (GX) sessions, helping employees maintain their physical fitness and contribute to a healthy organizational culture.

Policies on Childbirth, Childcare, and Family Care

Category	Description
Work hours before and after childbirth	· Work at night and on holidays: Not for employees who are pregnant or gave birth less than a year ago. · Work overtime: Not allowed for pregnant workers, only allowed within the limits defined in the Labor Standards Act for employees who gave birth less than a year ago. · Possible reduction of working hours during the early and late stages of pregnancy.
Medical check-up time for pregnant women	· Provide time for weekly pregnancy medical check-ups (up to once a week, four hours per check-up).
Maternity leave before and after childbirth	· Grant 90-day leave before and after childbirth (Extended to 100 days for premature births and 120 days for multiple births).
Miscarriage/stillbirth leave	· Provide leave according to the number of pregnancy weeks (max. 90 days).
Parental leave and reduced working hours during childcare	· Apply to all employees with children under the age of 8 or in 2nd grade or below in elementary school. · Available upon request as per the Equal Employment Opportunity and Work-Family Balance Assistance Act, with a guarantee for reduced working hours during childcare even if parental leave was used. · Unused parental leave can be counted as double the unused duration and applied toward additional reduced working hours.
Parental leave	· Applicable to all employees with children under the age of 8 or in 2nd grade or below in elementary school.
Infertility treatment leave	· Grant up to 3 days per year (paid for the first day) for infertility treatment such as artificial insemination or in vitro fertilization.
Breastfeeding time guaranteed	· Provide 30 minutes of paid breast-feeding time twice a day for female employees with infants under one year old.


가족친화인증서

기 업 명 : 본[illegible]
소 재 지 : [illegible]
유효기간 : 2022.12.01~2025.11.30

위 기업은 「가족친화 사회환경의 조성 촉진에 관한 법률」 제15조 제1항에 따라 우수한 가족친화경영 운영체계를 구축하고 가족친화제도를 운영함으로써 근로자의 일·생활 균형을 지원하고 국가경쟁력 향상에 기여하였기에 가족친화기업으로 인증합니다.

2022년 12월 01일

여성가족부

Certification for Family-Friendly Management

Human Resource

Risk Management

HR Planning and Organizational Assessment

Structured HR Management

HR Supply and Operational Planning

To attract top talent in our key business areas, we develop and implement mid- to long-term human resource plans. These plans include internal job transitions to strengthen workforce capabilities and active recruitment of experienced professionals from the solar energy sector. We also conduct in-depth analyses of workforce demand and supply by job category, taking into account economic conditions and market volatility. Through a balanced approach to internal job transition and new talent outsourcing, we maintain an optimal HR management system.

Employee Value Survey

To identify the strengths and weaknesses of our organizational culture, we regularly conduct employee surveys. These surveys focus on three key areas: employee engagement, alignment with corporate values, and change management (CM) initiatives. The results help us monitor satisfaction with the working environment, levels of job-related stress, and other productivity-related indicators.

Labor-Management Communication

Internal Communication

We hold regular CEO town hall meetings with employees to foster an open and interactive organizational culture that encourages active communication. During these meetings, the CEO shares insights into our business operations with non-managerial employees at various work sites, including Bundang and Eumseong, and listens to their opinions to promote transparent and direct communication. Our approach to communication has helped build trust across the organization and promoted a more flexible and innovative working environment.

Task Force for Improving Corporate Culture

We have organized a task force of change agents and hold monthly meetings to drive continuous improvement in our corporate culture. These efforts enable us to gather input from work sites, develop remedial measures in response, and share feedback on the outcomes—ultimately leading to tangible change.

ACTIVITIES

The CEO's Treat!

Twice a year, we host food truck events to strengthen employees' sense of belonging and boost morale. Held in celebration of our company anniversary and Jungbok (the second of the three Dog Days in Korea), these events offer an opportunity to relax and connect over seasonal beverages and easy-to-eat snacks.



Food Truck Event

Vacation Accommodation Benefits

As part of our efforts to support employee well-being, we offer access to affiliated hotels such as SEAMARQ Hotel, as well as additional lodging options through platforms like Yeogi Eottae. Employees are free to choose from a wide range of vacation accommodations, both domestically and internationally.


SEAMARQ Hotel

Employee Statistics in 2024

Category	2022	2023	2024
Total (person)	248	235	220
Regular (person)	190	201	197
Percentage of regular employees (%)	76.6	85.5	89.5
Non-regular (person)	58	34	23
Percentage of non-regular employees (%)	23.4	14.5	10.5

Metrics & Targets

HR Management Indicators and Goals

Progress in HR Management

HR Management KPIs

We have set KPIs for each area to strengthen our company-wide HR management system and track progress consistently.

Employee Diversity in 2024

Total no. of employees	Percentage of female employees	No. of female employees at manager level
220	18.1%	1

Employee Training in 2024

Total training hours	Hours per person	Total training cost	Cost per person
740	3.3	KRW 50 million	KRW 0.222 million

Human Rights

Governance

Human Rights Governance

Roles and Responsibilities in Governance

Governance Body of Human Rights

We are committed to respecting the human rights of all stakeholders throughout our business operations and to preventing potential violations through a structured human rights management system. The ESG Committee, operating under the oversight of the Board of Directors, plays a key role in human rights governance. Key human rights issues and risks are identified through cross-functional collaboration among relevant departments, including Finance (ESG), Human Resources and General Affairs, HSE, Procurement, Business Planning, and Legal Affairs. Issues that are identified to have potential or high risks are reported to both the Human Rights Management Committee and the ESG Committee. Based on these reports, the ESG Committee reviews and approves decisions related to human rights

Human Rights Management Committee

Established in 2022, the Human Rights Management Committee is chaired by the Chief ESG Officer and includes representatives from main departments such as Safety and Environment, Human Resources and General Affairs, Shared Growth, Procurement, PR, and Legal Affairs. The committee oversees all aspects of human rights management, including the execution of human rights impact assessments, and discusses regulatory compliance strategies and action plans. Regular meetings are held to review key human rights issues and drive ongoing efforts to prevent and mitigate potential violations.

Dedicated Departments

Human rights management is embedded into our daily operations in collaboration with relevant departments, such as Finance (ESG), Human Resources and General Affairs, HSE, and Procurement. The dedicated ESG departments lead the development and implementation of action plans to strengthen human rights management practices. They also organize human rights training for employees. monitor relevant issues, and conduct human rights impact assessments. These assessment results help identify human rights risks and are used to develop remedial measures.

Human Rights Governance



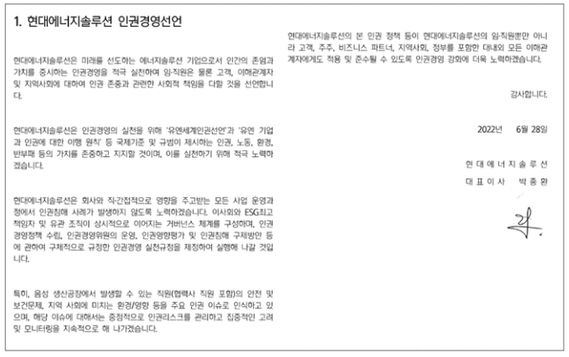
Strategy

Approach to Human Rights Management

Foundation for Human Rights Management

Human Rights Management Declaration

In 2022, we formally declared our commitment to human rights through the publication of our first Human Rights Management Report. As part of this initiative, we adopted and publicly issued a Human Rights Management Declaration that aligns with international standards, including the UN Universal Declaration of Human Rights and the UN Guiding Principles on Business and Human Rights (UNGPs).


1. 현대에너지솔루션 인권경영선언

현대에너지솔루션은 미래를 선도하는 에너지솔루션 기업으로서 인간의 존엄과 가치를 중시하는 인권경영을 적극 실천하여 임직원은 물론 고객, 이해관계자 및 지역사회에 대하여 인권 존중과 관련한 사회적 책임을 다할 것을 선언합니다.

현대에너지솔루션은 인권경영의 실천을 위해 '유엔세계인권선언'과 '유엔 기업과 인권에 대한 이행 원칙' 등 국제기준 및 규범이 제시하는 인권, 노동, 환경, 반부패 등의 가치를 존중하고 지지할 것이며, 이를 실천하기 위해 적극 노력하겠습니다.

현대에너지솔루션은 회사와 작·간접적으로 영향을 주고받는 모든 사업 운영과정에서 인권침해 사례가 발생하지 않도록 노력하겠습니다. 이사회와 ESG최고책임자 및 유관 조직이 상시적으로 이어지는 거버넌스 체계를 구성하며, 인권경영협의체 수립, 인권경영위원회 운영, 인권영향평가 및 인권침해 구제방안 등에 관하여 구체적으로 규정한 인권경영 실천규정을 제정하여 실행해 나갈 것입니다.

특히, 음성 생산공장에서 발생할 수 있는 직원(협력사 직원 포함)의 안전 및 보건문제, 지역 사회에 미치는 환경/영향 등을 주요 인권 이슈로 인식하고 있으며, 해당 이슈에 대해서는 중점적으로 인권리스크를 관리하고 집중적인 고려 및 모니터링을 지속적으로 해 나가겠습니다.

현대에너지솔루션의 본 인권 정책 등이 현대에너지솔루션의 임직원뿐만 아니라 고객, 주주, 비즈니스 파트너, 지역사회, 정부를 포함한 대내외 모든 이해관계자에게도 적용 및 준수될 수 있도록 인권경영 강화에 더욱 노력하겠습니다.

감사합니다.

2022년 6월 28일

현대에너지솔루션
대표이사 박중원

HDHyundai Energy Solutions Human Rights Commitment

Human Rights Management Roadmap

In response to the growing global demand for human rights management—particularly following the enactment of the EU's Corporate Sustainability Due Diligence Directive and disclosure regulations such as the IFRS standards on human capital and human rights—we developed a Human Rights Management Roadmap to create a systematic management framework at the group level.

The initial phase of this roadmap, launched in 2024, included the establishment of our Human Rights Policy, Human Rights Management Declaration, and the Human Rights Management Committee Operating Manual. We also created internal standards, metrics, forms, and practical guidelines to support the implementation of human rights initiatives across the organization. In addition, a standard program was developed to embed human rights awareness throughout the HD Hyundai Group.

Human Rights Regulations

Following the adoption of our Human Rights Management Declaration, we enacted the Human Rights Regulations to ensure a systematic and consistent approach to the human rights management and the protection of the rights of employees and other stakeholders. These regulations outline the guiding principles, execution framework, operations of the Human Rights Management Committee, and grievance mechanism for addressing violations. The regulations were developed through a legal review by the Compliance Office and deliberation by the Human Rights Management Committee. They consist of six chapters and 33 articles, including supplementary provisions.

Human Rights Management Roadmap

Phase 1 (2024)	Phase 2 (2025)	Phase 3 (2026 onward)
Human Rights Management Framework at the Group Level · Development and revision of group-wide human rights policies · Operation and oversight of the HD Hyundai Group's Human Rights Management Committee	Human Rights Management at the Affiliate Level · Implementation of a human rights management framework aligned with the group-level system · Execution of impact assessments and publication of related reports	Expansion of Human Rights Management Outcomes · Extension of human rights management initiatives to overseas subsidiaries · Human Rights risk management across the supply chain

Human Rights

Risk Management

Human Rights Risk Management

Identification of Human Rights Risks

Materiality Assessment

We conduct materiality assessments on the general principles outlined in our Human Rights Regulations. To evaluate the significance of each principle to our operations, we conducted a survey with members of the Human Rights Management Committee and staff in charge. The assessment results will inform the strategic direction of our human rights management in response to changing business environments and serve as reference material for enhancing our human rights impact assessment checklist.

Results of Materiality Assessment

To ensure effective implementation of our human rights management framework, we assessed the materiality of various issues based on the likelihood of occurrence and severity of impact. The stakeholder survey was designed with reference to a reporting framework under the UN Guiding Principles on Business and Human Rights (UNGP). Based on these results, we identified the right to a healthy environment, health and safety, and working conditions as the top priorities.

Materiality Assessment Metrics

Level	Likelihood	Severity	
		Scope of Impact	Recovery Time
Very Low	Potential risk exists, but no incidents have occurred	No impact	Very short recovery time
Low	No incidents from us, but similar cases have occurred in the industry	Very few stakeholders	Less than 1 year
Moderate	Has occurred in the past and may recur depending on the business sector	Some stakeholders	1 to 3 years
High	Occurred in the past and continues to occur	Most stakeholders	3 to 5 years
Very High	Has been occurring consistently	All stakeholders	Over 5 years or irrecoverable

Human Rights Impact Assessment

Scope of Assessment

We defined the scope of our human rights impact assessment to include all work sites where our business operations are based, such as the headquarters, R&D center, and production facilities. The scope was also expanded to encompass various stakeholders, including our employees, those of our suppliers, local communities, and customers, to identify potential human rights risks.

Development of Assessment Indicators

Based on the results of our human rights materiality assessment, we developed a set of indicators to evaluate key human rights issues for each stakeholder group. In 2022, the indicators were further refined through insights from internal and external environmental analyses, with a focus on high-priority issues such as the rights to a healthy environment, working conditions, and health and safety.

Human Rights Impact Assessment Indicators

Right to a Healthy Environment	Health & Safety	Workplace Bullying and Sexual Harassment
Working Conditions	Responsible Supply Chain	Forced Labor, Child Labor, Exploitation
Discrimination	Human Rights Protection in Local Community	Freedom of Association and Collective Bargaining

Human Rights Impact Assessment Process

Building on our materiality assessment, we conducted the human rights impact assessment using indicators aligned with the guidelines from the National Human Rights Commission. The assessment framework comprised 9 areas, 28 categories, and 124 indicators. Led by the Human Resources Department, the assessment was carried out through a self-evaluation based on evidence from each working unit. The results were analyzed to identify key risk factors and areas for improvement, forming the basis for the development of our action plans.

Human Rights Impact Assessment Process



Remedial Measures for Human Rights Risks

The human rights impact assessment enabled us to pinpoint areas for improvement to mitigate, address, or eliminate the risks associated with identified issues. We worked closely with the relevant departments to develop and implement detailed action plans for each issue.

Human Rights

Risk Management

Human Rights Risk Management

Grievance Reporting and Resolution

Grievance Mechanism

To ensure prompt and fair resolution of human rights violations and other grievances, we have established a mandatory grievance mechanism. The mechanism is managed by committee members composed of at least two representatives from both labor and management. It is designed to handle grievances arising in all areas of our operations. Upon receiving a report, the committee conducts a fact-check. Based on the investigation findings, they may impose disciplinary actions and provide necessary support and information to affected individuals.

Whistleblower Protection

We keep the identity of the whistleblowers and the content of their reports confidential through our Whistleblower Protection and Reward Program. The identities of whistleblowers are only disclosed with their explicit consent. The program ensures that no individual is subject to disadvantage or discrimination for making a legitimate report. To recognize contributions, such as preventing financial losses, recovering company assets, or achieving cost savings, whistleblowers may receive rewards of up to KRW 1 billion.

Grievance Mechanism

Report	**Receive a report from internal or external stakeholders related to the company.** · Reporting channel: employee representative body, hotline systems, etc. · Hold a quarterly town hall meeting by organizational level.
Fact Check and Review	**Acknowledge and review the report by the Grievance Review Committee.** · Investigate the issue and conduct a fact-check. · Listen to requests and review resolutions.
Notification of Results	**Notify the results and listen to feedback.** · If dissatisfied with the outcome, develop and review alternative solutions.
Closing	· Provide corrective actions, such as training, disciplinary and remedial measures, or infrastructure improvements. · Develop and implement action plans to prevent recurrence.

Grievance Statistics in 2024

Category	Number of Cases
Percentage of resolved cases	-
No. of cases reported	0
No. of cases resolved	0

Metrics & Targets

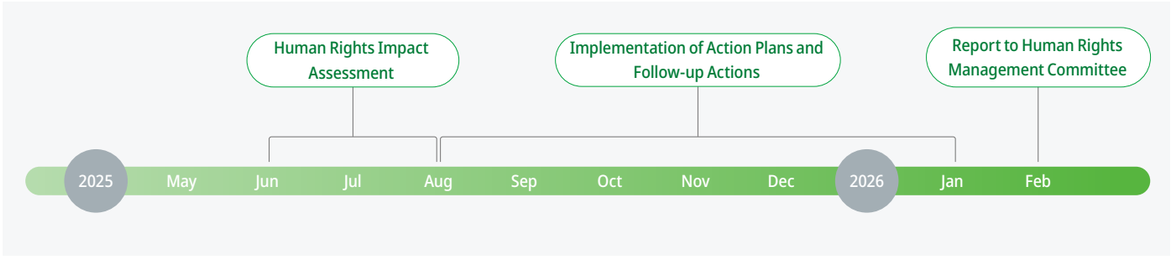
Human Rights Management Indicators and Goals

Setting Human Rights Management Goals

Human Rights Management Goals

To implement an effective human rights management system in line with the group-wide roadmap, we have set and are executing goals in three phases. In 2024, as the initial phase, we will revise our Human Rights Management Declaration and Regulations—established in 2022—to align with regulatory requirements such as the EU Corporate Sustainability Due Diligence Directive. We will also establish a standardized process to implement human rights initiatives. In 2025, we will conduct human rights due diligence on our domestic work sites under the human rights management system and initiate analysis of areas for improvement and follow-up actions. In 2026 and beyond, we will also expand the scope of due diligence to cover subsidiaries and value chains, in line with the EU Corporate Sustainability Due Diligence Directive. Through this phased approach to human rights management, we will mitigate legal risks and meet stakeholder expectations, fulfilling our social responsibilities.

Human Rights Management Roadmap



Supply Chain

Governance

Supply Chain Governance

Roles and Responsibilities in Governance

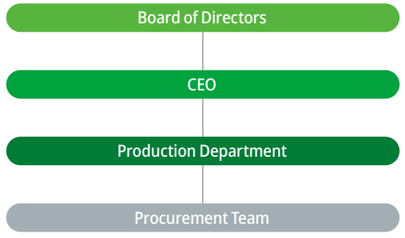
Roles of the Board of Directors

To mitigate risks across our supply chain, the Board of Directors sets strategic directions for supply chain management and identifies key risks. Based on reports on supply chain conditions from executive management, the Board assesses potential risks related to raw material procurement, supplier compliance with ESG standards, and global regulatory changes. It also reviews indicators directly linked to our sustainable management—including carbon emissions within the supply chain, human rights issues tied to traditional labor practices, and geopolitical risks—and develops appropriate action plans in response.

Roles of Dedicated Departments

The Procurement Team is responsible for managing the supply chain, implementing related strategies, and ensuring sustainability management. ESG indicators are incorporated into supplier evaluation and management criteria, reinforcing our commitment to human rights management and sustainable sourcing. As part of our efforts to build a resilient and sustainable supply chain, we are diversifying our supplier base to ensure stable access to raw materials and collecting and analyzing supply chain data to respond promptly to global regulatory changes.

Supply Chain Management Organization



Strategy

Approach to Supply Chain Management

Foundation for Shared Growth

Supply Chain Management Principles

We follow HD Hyundai Group's principles to promote transparent and rational business practices in supply chain management and contribute to the establishment of fair subcontracting standards. These principles are based on transparency, legality, and fairness, and reflect the Fair Trade Commission's four key practices. To build a sustainable supply chain in partnership with our suppliers, we maintain open communication to improve procurement policies, perform periodic supply chain inspections, and carry out other efforts.

HD Hyundai ESG Website

Integrated Procurement System

HiPRO, the HD Hyundai Group's integrated procurement system, manages all procurement-related processes—from supplier screening, contracting to delivery and payment. This end-to-end solution covers material management, purchase inquiries, quotation submissions, and order placements. Using HiPRO, we conduct supplier registration screenings that include ESG criteria and enter into agreements using standard contract forms. The system also provides suppliers with guidelines on requirements and procedures, subcontracting principles, and codes of conduct. It includes channels for reporting ethical violations or collusion, as well as for consultation on ethics and fair trade.

Fair Contracting and Reasonable Payments

To ensure fair transactions, we use standard subcontract forms and review them to eliminate any unfair terms, such as unilateral modifications or unreasonable return policies. We also support shared growth by factoring in changes in raw material and labor costs during price reviews, which are conducted regularly.

Prohibition of Unfair Interference in Suppliers' Operations and Forced Technology Disclosure

To support suppliers' autonomous management and fair trading practices, we strictly prohibit any form of unfair interference in their operations or forced disclosure of proprietary technology. Our Compliance Program (CP) is designed to educate employees on fair trade principles and prevent any infringement upon our suppliers' independence. In addition, our contact includes clauses to protect suppliers' proprietary technical information and prevent unauthorized use.

Supplier Grievance Handling

To address concerns and grievances from suppliers, we maintain open communication channels. Issues related to unfair trade practices—such as delayed payments, unfavorable contract terms, or technology protection—can be reported through the HD Hyundai Group's ethical management website. We guarantee the whistleblower anonymity and confidentiality, and do not tolerate any retaliatory actions. Upon receiving a report, we investigate to establish the facts and take appropriate corrective measures. Outcomes are communicated to the concerned parties and monitored to prevent recurrence.

HD Hyundai Consultation and Resolution for Unfair Trading

Supplier Grievance Handling Statistics in 2024

Reported case	Resolved case	Percentage of resolved case
0	0	-

Supply Chain

Strategy

Approach to Supply Chain Management

Initiatives for Shared Growth

Financial Support for Suppliers

To help our suppliers maintain stable cash flow, we provide financial support programs, including early payment options. As a general principle, transactions below a certain amount are paid in cash. For transactions involving electronic promissory notes, we provide payment support through accounts receivable financing, enabling suppliers to secure liquidity by cashing out their receivables through financial institutions before the due date.

Technical and Managerial Support Programs

We offer various support programs to enhance our suppliers' competitiveness in both technology and business management. Regular and ongoing meetings are held to exchange ideas for process improvements and operational efficiency, and to share our know-how in quality enhancement. In addition, when temporary reductions in operations or production interruptions occur due to our facility investments, we provide support to help stabilize suppliers' business operations during those periods.

Financial Support for Suppliers

(As of December 2024)

Accounts Receivable Financing
KRW 7 billion

2024 Technical and Managerial Support for Suppliers

Technical and Managerial Support	Cycle
Process & Work Improvement Meeting	Ongoing
Quality Council Meeting	Weekly
Managerial Support Initiatives	1 item
Health & Safety Meeting	12 meetings

ACTIVITIES

Process & Work Improvement Meetings and Quality Council Meetings

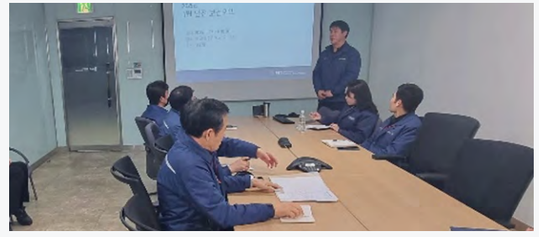
To support suppliers in improving manufacturing processes and product quality, we hold technical support meetings on a regular basis. These meetings focus on increasing material yield, reducing defect rates, and providing feedback on work environments to improve overall production line efficiency. Through these meetings, we are committed to strengthening our suppliers' capabilities and continuously addressing challenges at work sites.



Quality Council Meeting



Process & Work Improvement Meeting



Health & Safety Meeting

Supply Chain

Risk Management

Supply Chain ESG Risk Management

Foundation for Supply Chain ESG Risk Management

Sustainable Management Policy for Supply Chain

We follow the HD Hyundai Group's supply chain policies—covering human rights, safety and health, environmental responsibility, and ethics—to foster a healthy corporate ecosystem. Improving the ESG capabilities of our suppliers is key to establishing a sustainable supply chain. To this end, we have reinforced our group-wide management system with a focus on supplier ESG practices. Since 2023, the "establishment and disclosure of ESG management systems for supply chain" has been integrated into the Group's ESG KPIs, which reflect relevant issues in executive compensation. Over time, we will gradually expand the scope of these efforts.

HD Hyundai ESG Website

Conflict Minerals Policy

We recognize the sustainability challenges posed by minerals mined in conflict-affected areas and have implemented a conflict minerals policy to address these issues. Conflict minerals refer to tantalum, tin, tungsten, and gold sourced illegally in the Democratic Republic of the Congo and nine neighboring countries: Sudan, Rwanda, Burundi, Uganda, the Republic of the Congo, Zambia, Angola, Tanzania, and the Central African Republic. The mining of these minerals is often associated with severe social issues, including human rights violations, environmental degradation, and loss of life. In response, we support the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas and promote ethical sourcing across the Group and our supply chain.

Supplier Code of Conduct

To mitigate sustainability risks in the supply chain, we implement a Supplier Code of Conduct based on the core values of fairness, integrity, and legal compliance. The code outlines suppliers' responsibilities in the areas of human rights, safety and health, environment, ethics, and business management, promoting shared growth and development with them. Suppliers are expected to conduct assessments of their operations and decision-making processes to ensure continued compliance with the code.

HD Hyundai Supplier Code of Conduct

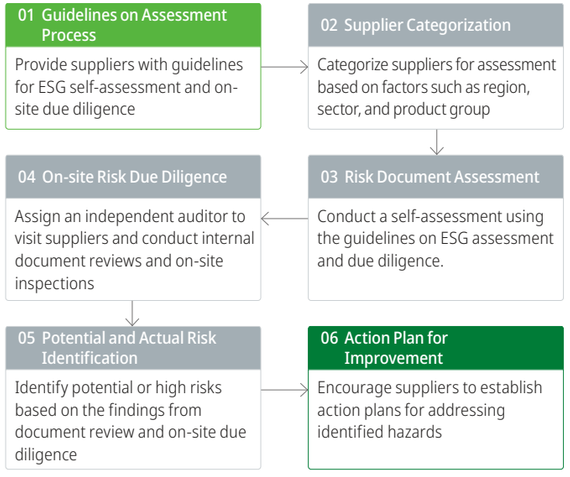
Actions Against Serious Violations

Suppliers are required to sign both the Pledge for Ethical Practice and the Code of Conduct for Logistics Partners when registering a supplier. We encourage compliance with standards and responsibilities in human rights, safety and health, environment, and ethics. When a violation does occur, we may issue warnings, requests for preventive measures, or restrict bidding for a certain period of time, depending on the severity of the violation. For serious violations, such as child labor, we may terminate the contract or suspend business dealings.

Supply Chain ESG Risk Assessment Process

We assess suppliers' ESG risks in line with the Pledge for Supplier Code of Conduct. In 2024, we conducted ESG risk assessments on supply chain in China, with five suppliers participating in both self-assessments and on-site due diligence. The results showed that four of the five suppliers demonstrated strong or satisfactory ESG performance. We communicated the results and areas for improvement to each supplier and plan to review their progress in the following year's assessment.

Supply Chain ESG Risk Assessment Process



Supply Chain ESG Assessment Metrics

Our supply chain ESG risk assessment metrics consist of 84 detailed indicators across five categories: labor and human rights, safety and health, environment, ethics, and management systems. These indicators reflect relevant laws and regulations—including the Environmental Technology and Industry Support Act, the Serious Accidents Punishment Act, and the Occupational Safety and Health Act—as well as ESG requirements, such as assessment initiatives and sustainability disclosure standards.

Supplier ESG Risk Assessment Metrics

Category	Summary
Labor & Human Rights (27)	· Voluntary labor, underage labor, working hours · Wages and benefits, freedom of association · Humane treatment, non-discrimination
Health & Safety (23)	· Occupational safety, emergency preparedness, industrial accidents · Industrial hygiene, physical labor, machinery safety · Food/hygiene/housing and safety and health communication
Environment (12)	· Environmental permits and reporting · Hazardous substances, waste, air pollutant · Material restrictions, water resource control, energy use and GHG emissions
Ethics (8)	· Anti-corruption, business integrity, unjust enrichment, unfair trade · Intellectual property protection, personal data protection · Responsible sourcing of materials
Management System (14)	· Engagement, duties, and responsibilities of executive management · Legal and customer requirements · Risk/assessment management, improvement objectives, training

Supply Chain

Risk Management

Supply Chain ESG Risk Management

Supply Chain ESG Risk Assessment

Risk Assessment through Document Review

We support our suppliers in conducting self-assessments of ESG risks using our guidelines and checklists. Based on the responses submitted by our suppliers, supporting documents, and any additional statements provided, we conduct a comprehensive review to evaluate their ESG risk levels. This evaluation helps us identify which suppliers require on-site due diligence. We also identify key areas of focus for the due diligence process to ensure a more structured and effective approach to ESG risk management.

On-Site Risk Due Diligence

Based on supporting documents and suppliers' responses regarding ESG risk assessments, we select suppliers for on-site due diligence, which is conducted by an independent third-party agency that has no affiliation to us. The due diligence includes reviewing suppliers' documentation, such as internal policies and guidelines, conducting interviews with both managers and workers, and inspecting work sites and working conditions. The identified hazards are then reviewed and confirmed through consultation with their designated personnel.

Risk Identification and Action Planning

Through our 2024 supply chain risk assessments, most suppliers demonstrated excellent ESG performance, exceeding the average standards for all areas in the manufacturing sector, including the solar industry. However, one supplier fell below the industry average in the areas of environment, ethics, and management systems. In response, we recommended implementing an action plan for improvement and worked with the supplier to establish a timeframe, measures, and objectives for improvement. Following the plan, we continue to monitor their progress and offer additional support where needed, including plan updates and resources to facilitate the process.

Improvement Planning and Monitoring

Indicators	Directions for Improvement
Labor & Human Rights	· Update internal regulations e.g., human rights management policy · Increase training to raise awareness
Health & Safety	· Update internal regulations e.g., safety policies · Increase safety inspections and preventive measures
Environment	· Set targets for environmental impact and energy efficiency · Provide training on GHG management and related regulations
Ethics	· Improve systems e.g., grievance handling procedures · Organize training on ethical management and compliance
Management System	· Introduce anti-corruption programs and related activities

Mitigation of Supply Chain ESG Risks

ESG Improvement Support for Suppliers

To strengthen ESG risk management among our suppliers, we provide support for improvement to those whose document assessment results show low compliance with key indicators, those who fail to meet the key requirements, or those for which significant or potential risks are identified. For such suppliers, we offer a roadmap outlining key areas for improvements, action plans, and detailed timeframes. This roadmap is designed to help mitigate identified ESG risks and guide them toward improvement.

ESG Training Support for Suppliers

To manage ESG risks across our supply chain, we provide ESG training programs for our suppliers. These training sessions are available online to ensure easy access and cover the importance of ESG management, domestic and international trends, our risk assessment indicators and procedures, and guidelines on follow-ups for assessment results. These programs were provided to 30 domestic suppliers who were subject to the ESG risk assessment.

Supply Chain Risk Assessment Results

Category	2023	2024	2024 Target (Overseas Suppliers)
No. of suppliers assessed through document review	30	5	5
No. of suppliers assessed through on-site due diligence	5	5	5
No. of suppliers with identified ESG risks	-	1	-

Quality Management

Governance

Quality Governance

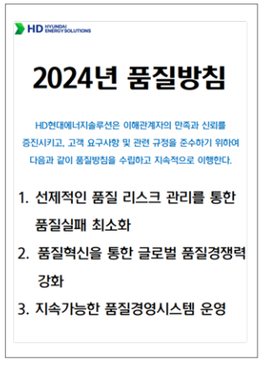
Roles and Responsibilities in Governance

Roles of Executive Management

We are committed to ensuring the stability and reliability of our products and services, which are directly related to the safety and convenience of our customers. Our executive management is responsible for embedding a quality-first culture across all stages of the product life cycle, from design and development to manufacturing and after-sales service.

Roles of Dedicated Departments

Our QM team plays a pivotal role in setting quality objectives for each sector in accordance with the company-wide quality management policies and developing action plans to achieve them. Based on internally established quality standards for products and services, the QM Team operates a thorough inspection and uses a monitoring framework. When quality issues arise, we promptly conduct root cause analyses and implement necessary measures to prevent recurrence. We also promote continuous improvement of our quality management system through various measures, such as quality training programs, enhanced internal communication, customer feedback, and external certification.


HD 현대에너지솔루션

2024년 품질방침

HD현대에너지솔루션은 이해관계자의 만족과 신뢰를 증진시키고, 고객 요구사항 및 관련 규정을 준수하기 위하여 다음과 같이 품질방침을 수립하고 지속적으로 이행한다.

1. 선제적인 품질 리스크 관리를 통한 품질실패 최소화
2. 품질혁신을 통한 글로벌 품질경쟁력 강화
3. 지속가능한 품질경영시스템 운영

Quality Policy 2024

Strategy

Approach to Quality Management

Implementation and Expansion of Quality Management

Quality Management Policy

To step up as a global leader in solar solutions through reliable, high-quality products, we have established and implemented a quality management policy. This policy focuses on strengthening global competitiveness and enhancing product performance through continuous improvement, while promoting customer-focused quality management initiatives.

Quality Management System



Customer Satisfaction Surveys

To evaluate our service levels and better understand customer needs, we conduct customer satisfaction surveys as a basis for improvement. These surveys are regularly administered through our distributors at customer touchpoints. The feedback from these surveys is collected to identify complaints and areas for improvement in our products and services. For those with low satisfaction ratings, we conduct an analysis to identify the cause and establish action plans for improvement, reinforcing our commitment to customer-focused quality management. In 2024, our customer satisfaction rating reached 4.6 out of 5. Moving forward, we will continue to strengthen our competitiveness by addressing customer feedback in the areas of product quality, distribution, and after-sales service.

Areas of Customer Satisfaction Evaluation

- Satisfaction with the information about products and contracts
- Satisfaction with efficiency and output (name plate)
- Satisfaction with energy generation
- Satisfaction with product pricing
- Satisfaction with product warranty period
- Satisfaction with after-sales service and support
- Evaluation of corporate image
- Overall impressions

Risk Management

Quality Risk Management

Quality Risk Management System

Quality Management System Certification

To ensure more consistent and structured quality control, we have established a comprehensive quality management system and maintain internationally recognized certifications, which are certified by the certification agency, Kiwa: ISO 9001 Quality Management Systems, ISO 45001 Occupational Safety and Health Management System, and ISO 14001 Environmental Management System. In the solar inverter sector, we offer KS-certified string inverters and independently developed central inverters, securing both technological competitiveness and quality assurance.

Advancing Solar Product Quality

We have developed floating solar modules with a bifacial design, enabling light absorption from both the front and rear sides to maximize energy output. These modules are engineered for high durability, maintaining stable performance even in harsh conditions such as heavy snow, strong winds, and environments with high concentrations of ammonia or salt. To enhance output stability and long-term profitability, we incorporate technologies that prevent Light Induced Degradation (LID), which typically occurs in the first few hours of sun exposure, and Potential Induced Degradation (PID), caused by electric-field-induced degradation. To improve customer satisfaction and post-installation reliability, we provide a 12-year product warranty and have extended our performance warranty period from 25 to 30 years.

Quality Management

Risk Management

Quality Risk Management

Quality Risk Management System

Supply Chain Quality Management

To prevent quality risks in advance and ensure consistent product quality, we conduct quality assessments for our new suppliers and regular evaluations for existing partners. These assessments cover various indicators, including quality management systems and performance. To further strengthen product quality assurance, we implement a Quality Assurance Agreement (QAA) with our suppliers. We also promote ongoing quality improvement initiatives with both internal and external suppliers in terms of changes and nonconformities in our 4Ms (Man, Material, Machine, Method).

Metrics & Targets

Quality Management Indicators and Goals

Quality Management Progress

Performance Against 2024 Quality Goals

To drive continuous quality improvement, we established department-specific quality goals for our R&D, sales, production, and quality departments in 2024. We also developed structured action plans and risk management strategies to achieve these goals. Progress was reviewed semiannually and monitored through an annual internal audit. Key targets included the development of next-generation technologies, on-time delivery, increased production output, reduced defect rates, and enhanced customer satisfaction. Through these efforts to purse these goals, we achieved 90% of our plan for the year.

Strategies for 2025

In 2025, we will focus on stabilizing mass production at our newly equipped TOPCon cell manufacturing facility and enhancing the reliability and performance of our TOPCon modules, which have received Grade 1 Certification for Carbon Emissions. To support these efforts, we have already set department-specific quality goals and risk management indicators. Going forward, we remain committed to implementing customer-focused quality management as a leader in solar energy solutions through innovative technology and trusted, high-quality products.

Key Indicators for Supplier Quality Assessment

Category	Description
Quality Management System	· Maintenance of ISO certifications · Performance in human resources, responsible management, planning, operations, and performance evaluation · Capabilities in design, development, production, and service delivery
Quality Management Performance	· Quality performance in materials, processes, and products · Non-conformity management and improvement · On-site quality control performance in plants
General Management	· Executive management's commitment to quality · Financial status and delivery performance

Progress in 2024

Category	Description
Quality goal and risk management indicators by unit	· Achieved 89.5% of planned quality target · Achieved 88.2% of planned risk management target

Key Strategies for 2025

Category	Description
Quality goal and risk management indicators by unit	· Enhance reliability and performance in N-type TOPCon cells and modules · Minimize quality failure costs through improvement

Information Security

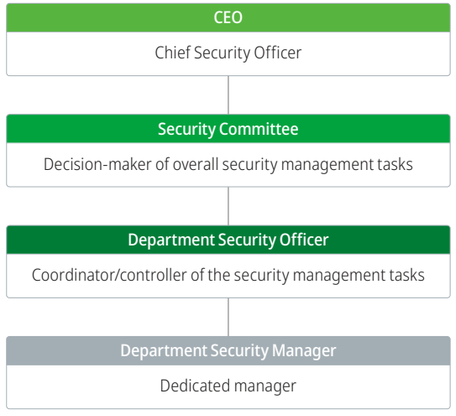
Information Security Governance

Roles and Responsibilities in Governance

Information Security Framework

We have appointed a Chief Information Security Officer (CISO) to lead our efforts in safeguarding internal data from external threats. Based on the HD Hyundai Group's security system, we maintain 24/7 security monitoring to manage and review our information security system. Under the leadership of the CISO, we manage the operation of the information security system and the protection of key internal data.

Security Management Structure



Information Security Strategy

Embedding Information Security Principles

Establishing and Updating Information Security Policy

To ensure compliance with domestic and international security laws and regulations, we continuously develop and revise our internal security policies. These include regulations on security management, protection of national core technologies, personal data protection, and GRC facility security. Policies are periodically updated in response to changes in laws and technologies, efficient business operations, security incident trends, and regulatory effectiveness assessments.

Information Security Training

We organize monthly security training programs for our employees through the HD Group's security portal system and hold regular information security sessions on the "Security Day." As we increase our investment in information security, we have allocated 2.2% of our IT investment to information protection in 2024. This initiative raises security awareness and ensures the safe management of our information assets.

Security Training Programs

Program	Description
Email Security	Training on caution against email security incidents
Personal Information Protection	Daily protocols for safeguarding personal data
Trade Secrets	Understanding of the protection of trade secrets
Daily Security Protocols	Daily security protocols for all employees
Access Badge	Guidelines for managing access badge
Workplace Security	Security guidelines in work environment
Ransomware	Preventive measures and response strategies for ransomware
Lost IT Systems	Procedures for responding to the loss of portable IT devices
Account Protection	Caution against credential theft on social media and social commerce platforms
Qshing Alerts	Warnings and guidelines on Qshing scams
Email Security	Warnings and guidelines on malware disguised as business emails

Information Security Risk Management

Information Security Risk Management Framework

Third-party Certification for Security Systems

Our security system is certified under ISO 27001 for Information Security Management System, a globally recognized standard for the framework to maintain and protect information. This certification affirms that our system meets the ISO standards through rigorous audits and verification. It also demonstrates the effectiveness of our security framework across 11 areas and 133 indicators, including information flow control as well as physical, administrative, and technical security measures.

Security Vulnerability Assessment

To respond to increasingly sophisticated cyber threats, we conduct vulnerability assessments on a regular basis and develop action plans for improvement. In 2024, we held quarterly simulation training against malicious emails to heighten information security awareness across the organization. These simulations use complicated administrator-style emails to assess employee responses in several categories: those who have not opened the email or opened it, those who clicked on a suspicious link with a potential risk of malware, and those who executed the attachments. Employees whose responses fell under potential risks received guidelines for responding to malicious emails and participated in Hi-Class training to improve their security response.

Response to Security Incidents

Our 24/7 monitoring system enables immediate detection and response to security incidents. Any abnormal activities are analyzed by the HD Group's security control center and forwarded to our internal security department for action. We have established protocols for preventive measures and response strategies that provide guidelines based on a predefined response manual to promptly respond to data breaches or hacking attempts, minimizing any potential damages. The Security Incident Response team, comprising department security officers and managers and IT system operators, then takes necessary measures for these issues. Our protocols also clearly define roles and responsibilities for preventive and follow-up activities.

Information Security

Information Security Risk Management

Personal Information Protection

Principles of Personal Information Protection

We strictly adhere to the regulations on personal information protection, including the Personal Information Protection Act, the Act on Promotion of Information and Communications Network Utilization and Information Protection, the Protection of Communications Secrets Act, and the Telecommunications Business Act. To ensure the proper collection, retention, and processing of personal information in line with these laws, we have established principles for handling such information. Personal information is not shared with third parties unless required by law. In cases where disclosure is necessary, we provide prior notice to the affected individuals through our website or other communication channels. In addition, our privacy policy outlines the rights of data subjects to maintain information security.

Collection and Processing of Personal Information

We collect and process personal information solely for the purpose of responding to customer inquiries and providing services. The information is used only for the specific purpose stated at the time of collection. If the purpose changes, we will obtain additional prior consent in compliance with applicable laws. Unless otherwise required by laws such as the Act on Consumer Protection in Electronic Commerce or the Protection of Communications Secrets Act, customer inquiry data is retained for three months and then deleted. For HI SMART members, only the minimum required data is retained and managed until membership is terminated.

Automatic Collection of Personal Data and Refusal

To respect the rights of data subjects, our services do not use automated data collection tools such as cookies. In cases where such tools should be installed and used in the future, we will program the settings for individuals to opt in or out of cookie storage. Detailed information on cookie installation and blocking is available on our website's privacy policy.

Technical and Administrative Security Measures

We implement strict controls to prevent the loss, theft, leakage, alteration, or destruction of personal information. To this end, we developed policies for the processing of personal information, internal control strategies, as well as established a comprehensive monitoring system to oversee ongoing processes. We also apply technical measures, such as data encryption, to prevent security incidents during transmission. Our security systems are regularly updated, and we monitor them to ensure a high level of data protection.

Physical Security Measures

To strengthen personal information protection, we implement physical security measures leveraging personnel and infrastructure from shared services provided by the HD Group's ICT organization. Physical security measures include restricting access to data centers and storage facilities. Documents and storage devices containing personal data are stored in locked, secure areas. When such media needs to be moved in or out of the designated areas, prior security control measures are established and followed.

Social Contribution

Governance

Social Contribution Governance

Roles and Responsibilities in Governance

Social Contribution Council

The HD Hyundai Social Contribution Council serves as the key decision-making body, overseeing the Group's social contribution initiatives and developing our primary direction and policies for those efforts. Our CEO at HD Hyundai Energy Solution participates in the council to review all group-wide projects and sets specific goals and plans for realizing the HD Hyundai Group's social value.

Governance Body of Social Contribution

Our social contribution efforts are led by the Human Resources and General Affairs Team. Dedicated personnel from the team are based both at the headquarters and the Eumseong plant to coordinate local engagement. Their responsibilities include planning community programs, managing donations and sponsorships, facilitating internal and external communications, and encouraging employee participation across all our initiatives.

HD Hyundai 1% Nanum Foundation

Through the HD Hyundai 1% Nanum Foundation, the HD Hyundai Group makes efforts to give back to the community, with each employee donating 1% of their salary. HD Hyundai Energy Solution also engages in this hope-fueled donation campaign. Donations collected from employees are used to support the Group's various social contribution programs.

HD Hyundai 1% Nanum Foundation Website

ACTIVITIES

HD Hyundai Honor Awards

The HD Hyundai 1% Nanum Foundation hosts the HD Hyundai Honor Awards to recognize individuals and organizations committed to supporting vulnerable groups, including the elderly, persons with disabilities, single-parent and multicultural families, and children in need of protection. The awards highlight stories of unsung heroes who embody the spirit of service and giving for the underprivileged, serving as a source of positive impact within our communities. In 2024, the top honor was awarded to the Purme Foundation. The Korea Unwed Mothers Support Network and Byeong-rok Kim were also given awards in the group and individual categories, respectively.



Winners of the 2nd HD Hyundai Honor Awards

Nanum Flea Market

To celebrate the year-end season and raise awareness of the value of giving, the Nanum Foundation hosted a flea market at the HD Hyundai Global R&D Center. The event supported participation from single parents, young adults transitioning from institutional care, and other vulnerable groups by helping them produce and sell goods, with all proceeds going directly to the sellers. This year's event was especially meaningful, featuring collaboration with the Goodwill Store. A charity bazaar was held using donated items from HD Hyundai employees, and all proceeds from the bazaar were donated to the Goodwill Store.



The 2nd GRC Nanum Flea Market

Butterfly's Dream

To create jobs for individuals with severe disabilities and raise public awareness, the Nanum Foundation hosted the "Butterfly's Dream" exhibition, showcasing specimen preparation as a form of professional work. With the increasing demand for entomological research due to the rise in pest outbreaks—and a significant shortage of researchers capable of focused taxonomic work—this project demonstrates a valuable employment model. Participants with disabilities classified over 10,000 insects per week and even discovered a previously unrecorded species, Selatosomus.


Butterfly's Dream, an exhibition showcasing specimen preparation by persons with severe disabilities

Social Contribution

Strategy

Approach to Social Contribution

Vision and Core Values for Social Contribution

Vision for Social Contribution

We are committed to building a more inclusive, healthier society in line with our vision of "A Better World, A Brighter Future." To achieve this vision, we have implemented social contribution initiatives through engagement-centered campaigns that highlight active participation from our employees, sustainability-centered campaigns across the HD Hyundai Group, and empathy-centered campaigns grounded in social responsibility and authentic leadership.

Our efforts are aligned with the Sustainable Development Goals (SDGs) and focus on supporting underprivileged communities, fostering coexistence with local communities, and empowering future generations. Through these efforts, we help our neighbors and create opportunities for children to pursue their dreams.

HD Hyundai Core Values for Social Contribution

Vision	"A Better World, A Brighter Future"		
Directions	Engagement-centered	Sustainability-centered	Empathy-centered
	Engagement-centered campaigns that highlight the value of giving by all employees	Sustainability-centered campaigns that promote future-oriented development in partnership with the group	Empathy-centered campaigns that share value through social responsibilities and authentic leadership
Areas of Focus	Fostering ecosystem with local communities	Supporting the underprivileged	Empowering future generations
	Upholding the founding spirit to foster mutual growth and build thriving communities	Improving living conditions and quality of life through inclusive giving and employee involvement	Creating a foundation for economic independence and a brighter future by improving access to education and living conditions, both domestically and internationally

HD Hyundai 1% Nanum Foundation Approach to Social Contribution

Making the world brighter and better, one percent at a time

Happy family

Heating Oil with Love

As part of HD Hyundai Group's energy-sector social initiatives, we donate heating oil to vulnerable groups and social welfare facilities, helping them stay warm throughout the winter.

A Meal of Happiness

We provide a daily lunch to the elderly with limited means and offer locally tailored programs to ensure nutritional balance in their meals.

Happy donor

Happy Supporters

We promote local campaigns that reflect donor feedback to support the sustainable development of local communities.

HD 119

In response to accidents and natural disasters, we provide aid to those in need through relief funds and the dispatch of HD Hyundai Group's construction equipment and personnel.

HD현대 나눔재단

Dream future

Dream Place

We create Dream Place, where vulnerable groups can pursue their dreams, supporting their growth in a safe and secure environment.

Dream Academy

We established and hold the Dream Academy where vulnerable groups can pursue their dreams, offering equal access to learning and helping them fulfilling their potential.

Dream Harmony

We create Dream Harmony where vulnerable groups can establish a foundation for their dreams, providing opportunities for various cultural experiences that enrich their lives.

Dream partner

HD Hyundai Honor Awards

We recognize individuals and organizations that are committed to supporting the underprivileged, promoting the value of giving.

I'm Donor Campaign

This campaign reflects donors' feedback and combines one-time donations from individuals or organizations with matching funds from the HD Hyundai 1% Nanum Foundation.

HD Hyundai MZ Volunteer Group

This volunteer group, composed of Generation MZ employees who are committed to addressing social issues and realizing social values, leads initiatives to support vulnerable and underprivileged communities.

Nanum Flea Market

We help vulnerable groups gain self-sufficiency by providing training in production of goods, with all proceeds returned to those groups.

Social Contribution

Strategy

Social Contribution Initiatives

HD Hyundai Energy Solutions' Social Contribution Initiatives

Energy Assistance Project - Donation of Solar Power Facilities

We donated solar power facilities to the Haetbit Haengbok Nanum Solar Power Plant (100kW), which uses the proceeds from solar power to support the Low-income Home Energy Assistance Project. Located at the Goseong Waste Management Facility, the plant is equipped with solar inverters that we provided and is expected to generate KRW 15 million in annual revenue. This revenue will be used to assist vulnerable groups by funding coal briquette purchases and promoting the expansion of solar energy projects.

In-kind Donations for the Community

We are committed to supporting senior centers and low-income households in Eumseong-gun, Chungcheongbuk-do, where our production facilities are located. In collaboration with HD Hyundai Construction Equipment every year, we donate a range of goods during traditional holidays such as Seollal and Chuseok. In 2024, we donated KRW 4.3 million worth of goods—including 23 sacks of rice and 13 sets of dried seafood—to senior centers located in Soi-myeon, Eumseong-gun, and to underprivileged households designated by the Soi-myeon Community Service Center. These ongoing efforts reflect our dedication to helping vulnerable members of the community and fostering a culture of sharing.

Summer Santa, Sharing Warmth

To share warmth with our neighbors in need during a heat wave, we participated in a donation program led by the Seongnam Volunteer Center, located near our headquarters. Alongside HD Hyundai Electric, HD Hyundai Marine Solution, and HD Hyundai Robotics, we donated 1,200 boxes of 5 kg kimchi, worth a total of KRW 38 million, to local social welfare centers and vulnerable households.

Donation for Solar Power Facilities

On April 12, 2024, we donated to the Solar Power Facility Financial Support Project for social welfare centers in Chungcheongnam-do through the Shinhan-Dongseo Haetbit Dream Fund, a joint initiative with Korea East-West Power and other partners. This project will install a total of 39 kW of solar power facilities at five local welfare centers, resulting in an estimated annual electricity savings of KRW 6.51 million. In addition to strengthening energy support for social welfare centers, this initiative contributes to expanding renewable energy use and reducing carbon emissions.



Completion Ceremony for the Solar Power Plant in Goseong-gun



In-kind Donation Ceremony in Soi-myeon



Kimchi Sharing Volunteer Activity



Shinhan-Dongseo Haetbit Dream Fund Donation Ceremony

Social Contribution

Risk Management

Social Contribution Risk Management

Social Contribution Monitoring

Sponsorship Fund Execution Process

As part of our commitment to preventing corruption and mitigating bribery risks, we have established a transparent and structured process for executing our sponsorship fund. The Human Resources and General Affairs Team receives sponsorship requests from various organizations, including local governments, schools, and charitable groups. Most sponsorship programs are conducted through Happy Supporters, a donor-initiated project that is solely managed by the HD Hyundai 1% Nanum Foundation. Other sponsorships are reviewed and approved either through an agenda proposed by the Head of the Human Resources and General Affairs Team or by the CEO's decision.

Standards for Execution of Donation

To ensure the integrity of our sponsorships and donations, we conduct thorough reviews of each case for eligibility. Beneficiary groups are assessed to confirm that they are not involved in illegal, unethical, or controversial activities and remain politically and religiously neutral. In addition, we evaluate whether the group aligns with our vision of social contribution. For the Happy Supporters project, we follow the internal standards defined by the HD Hyundai 1% Nanum Foundation.

Stakeholder Engagement Process

To promote our stakeholders' engagement and integrate their perspectives into our initiatives, we facilitate ongoing communication through the Human Resources and General Affairs Team. The received feedback is reviewed internally and reflected in the planning of social contribution initiatives, as well as in the administration and execution of donations and sponsorships. We work closely with local authorities—including county offices and community service centers—to determine the types of donation projects, timing and amount of donations or sponsorships, and the types of donated goods.

Metrics & Targets

Social Contribution Indicators and Goals

Progress of Social Contribution Initiatives

Performance Management and Short-term Goal Setting

We have established short-term goals based on a structured governance framework for social contribution and are monitoring their progress using quantitative criteria, such as volunteer hours and social contribution project expenditures. In 2024, we achieved 90% of our defined targets. For 2025, new short-term goals have been established and shared across the organization to foster a shared sense of purpose and enhance the performance of the social contribution programs in which our employees participate.

Social Contribution Target and Performance

Category	2024 Target	2024 Performance	2025 Target
Volunteer hours	320 hours	46 hours	320 hours
Social contribution project expenditures	KRW 29 million	KRW 48 million	KRW 20 million

Governance

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Board of Directors

Board Composition

Status of Board Composition

We have established a professional and independent board of directors to uphold our business philosophy and protect stakeholder interests in a balanced and transparent manner. As of the first half of 2025, our board comprises two inside directors and three outside directors. each possessing essential expertise and industry experience in business management, economics, finance, accounting, and law.

Director Appointment Process

In accordance with the Commercial Act, directors are appointed at the general meeting of shareholders. Candidates are nominated by the Board of Directors and the Outside Director Recommendation Committee. To ensure transparency, information about each candidate—such as personal background, nominator, and any relationships with major shareholders—is disclosed in the notice convening the general meeting of shareholders.

Term Limits for Directors

Director terms are determined at the time of appointment, with a maximum term of three years. If a director's term expires after the end of the fiscal year, but before the annual general meeting for that year, it is extended until the conclusion of that meeting. As of the first half of 2025, the average tenure of board members is two years.

Board Diversity

We are committed to strengthening board diversity to support comprehensive decision-making and operational effectiveness. When selecting board candidates, we consider a range of factors including gender, race, religion, ethnicity, nationality, and cultural background. Our Corporate Governance Charter explicitly outlines the principle of board diversity in Article 5, and we adhere to this principle in practice.

Board Independence

To ensure sound and transparent decision-making, more than half of our board members are outside directors. In line with this, all board committees are chaired by outside directors. As stipulated in our Corporate Governance Charter, outside directors must not have any special relationships with major shareholders, executive management, or affiliates. Upon appointment, each outside director is required to submit a written declaration confirming the absence of any significant conflicts of interest with our company.

Status of Board Composition

(As of March 31, 2025)

Category	Name	Position	Gender	Career Highlights	Date of Appointment
Inside Directors	PARK JONG HWAN	CEO	Male	Former Head of Asset Planning Office, HD Korea Shipbuilding & Offshore Engineering Current Chairman, Korea Photovoltaic Industry Association	Aug. 2021
	KANG SEOK JOO	Inside Director	Male	Former Vice President/Head of RF Business Division, Gigalane Current Head of Management Planning 1 Office, HD Hyundai	Mar. 2022
Outside Directors	KIM YONG WON	Outside Director	Male	Former Advisor, Samil PwC Current Adjunct Professor, College of Business Administration, Kookmin University	Mar. 2025
	LEE JEONG SEOP	Outside Director	Male	Former Head of Environmental Policy, Ministry of Environment Current Advisor, Kim & Chang	Mar. 2025
	YEO HWAN SEOP	Outside Director	Male	Former Director, Institute of Justice Current Attorney, Yeo Hwanseop Legal Office	Mar. 2024

Board Skills Matrix

(As of March 31, 2025)

Name	Leadership	CEO Experience	Risk Management	Finance & Accounting	Policy & Administration	Sales & Marketing	Legal & Regulatory	Gender	Qualifications
PARK JONG HWAN	●	●	●		●	●	●	Male	-
KANG SEOK JOO	●		●			●		Male	-
KIM YONG WON	●		●	●				Male	CPA
LEE JEONG SEOP	●		●		●		●	Male	-
YEO HWAN SEOP	●		●		●		●	Male	Lawyer

Board of Directors

Board Operation

Board Functions

The Board of Directors is responsible for establishing core business management policies, making decisions on key operational matters, and overseeing the performance of directors. The board also reflects the diverse needs of both internal and external stakeholders in shaping management strategies and making critical decisions. It uses an integrated risk management system to proactively respond to potential risks arising from a rapidly changing global environment, thereby enhancing corporate value and customer satisfaction.

Convening and Holding Board Meetings

In principle, the Board of Directors convenes at least once per quarter and may hold special meetings when urgent matters arise. To ensure efficient operations, board members are notified in advance and given adequate time to review agenda items. Resolutions are passed by a majority vote of attending directors, unless otherwise specified in laws or the Articles of Incorporation. All decisions are documented and maintained in official meeting minutes.

Board Training

We conduct annual training or meetings exclusively for outside directors, aligned with the board's meeting schedule. This helps promote independent decision-making and enhance their competencies, as well as ensure efficient performance of their duties. In 2024, training topics included the roles of the Audit Committee and the recent developments in financial regulations, the latest trends in AI transformation, as well as the impact of the U.S. presidential election and the global economic outlook. All outside directors participated in the training program.

Board Support

To support effective board operations and enhance the expertise of outside directors, we have established internal regulations that provide for professional assistance, including access to external experts at the company's expense when necessary. To strengthen the board's independence, regular meetings are held exclusively for outside directors, and the internal regulations were also revised to offer customized training programs upon request.

Board Operation

Resolution		Attendance	
Resolved	Reported	Inside Directors	Outside Directors
15 items	10 items	100%	100%

Board Training

Date	Attending Outside Directors	Training Topics
Oct. 11, 2024	OH JEONG KU, YEO HWAN SEOP, KIM SEONG MOON	· Roles of the Audit Committee and recent developments in financial regulations · Understanding of AI transformation, latest industrial trends, and our company's strategic directions · Impact one month ahead of the U.S. presidential election and its global economic outlook

2024 Board Meetings

No.	Date	Agenda Items	Decision	% in Favor
1st	Feb. 5, 2024	Approval of the 8th Financial Statements	Approved as proposed	100%
		Approval of the 8th Operating Report	Approved as proposed	100%
		Approval of amendments to the Board of Directors Regulations	Approved as proposed	100%
		Report on the operational status of the Internal Accounting Control System in 2023	Reported	-
2nd	Feb. 20, 2024	Approval of the convocation of the 8th regular general meeting of shareholders and the purpose of the meeting	Approved as proposed	100%
		Report on the operational status evaluation of the Internal Accounting Control System in 2023	Reported	-
		Report on the operational status of the Fair Trade Compliance Program (CP)	Reported	-
3rd	Mar. 26, 2024	Approval of the convocation of the 8th regular general meeting of shareholders and the purpose of the meeting	Approved as proposed	100%
		Appointment of a member of the Outside Director Recommendation Committee	Approved as proposed	100%
		Appointment of a member of the ESG Committee	Approved as proposed	100%
4th	Apr. 23, 2024	Approval of amendments to the internal accounting management regulations	Approved as proposed	100%
		Approval of amendments to the regulations of the Board of Directors	Approved as proposed	100%
		Approval of amendments to the regulations of the Audit Committee	Approved as proposed	100%
		Approval of the establishment of the Compensation Committee, the appointment of committee members, and the enactment of committee regulations	Approved as proposed	100%
		Report on Business Performance for 2024 Q1	Reported	-
5th	Jul. 24, 2024	Approval of EPC contract signing	Approved as proposed	100%
		Approval of facility investments	Approved as proposed	100%
		Report on Business Performance for 2024 H1	Reported	-
		Report on the introduction of board evaluation	Reported	-
		Report on the review of the compliance control standards	Reported	-
6th	Oct. 22, 2024	Report on Business Performance for 2024 Q3	Reported	-
7th	Dec. 13, 2024	Designation of record date for shareholder confirmation	Approved as proposed	100%
		Approval of transaction limits between the company and the third parties, including directors, for 2025	Approved as proposed	100%
		Report on the Business Plan 2025	Reported	-
		Report on the Board Evaluation Results in 2024	Reported	-

Board of Directors

Committees under the Board

Composition and Roles of Audit Committee

In accordance with the Commercial Act, we have established an Audit Committee under the Board of Directors. The committee is composed entirely of outside directors, none of whom have affiliations with major shareholders or have conducted business transactions with our company in the past three years. The members bring diverse expertise in accounting, finance, law, management, and risk oversight, enabling the committee to provide effective supervision over financial audits, executive performance, financial soundness, and accuracy in financial reporting. The chair of the committee is a certified public accountant, ensuring a high level of professional competence.

Supporting Organization for Audit Committee

To support the efficient and effective operation of the Audit Committee, we may establish a dedicated support team reporting directly to the committee. The head of this team must be appointed with the committee's consent. Following a review of the proposed roles and responsibilities, the support team will be formally established and its leader appointed in consultation with the committee.

Approval of Non-audit Service

To maintain the independence of external auditors, we conduct a thorough preliminary review of any proposed non-audit service agreement with them before finalization. Information related to non-audit services is transparently disclosed transparently in our business reports. Any significant matters identified during the provision of such services are reported to the Audit Committee and disclosed through regular filings to ensure full transparency.

Composition and Roles of Outside Director Recommendation Committee

To ensure fairness and transparency in the appointment of outside directors, candidates are nominated and selected through the Outside Director Recommendation Committee. In compliance with the Commercial Act, a majority of the committee members—three out of five—are outside directors. The chairperson is also selected from among the outside directors to support transparent and fair oversight. The committee convenes prior to the general meeting of shareholders to recommend candidates and review their qualifications, areas of expertise, alignment with shareholders' interests, and potential risks to our corporate value.

Composition and Roles of ESG Committee

Our ESG Committee is composed of one inside director and three outside directors. Each member brings expertise in law, finance, accounting, and business administration, positioning the committee as the control tower for our sustainability management. The committee is responsible for defining the direction of our ESG initiatives and making key decisions required for effective planning and implementation. It also addresses ESG-related issues in business operations, including environmental responsibilities, occupational safety and health, ethics, and compliance. In 2024, the committee established KPIs for reducing GHG emissions and set intensity reduction targets per KRW unit, taking into account the nature of our business operations.

Composition of Audit Committee

(As of March 31, 2025)

Position	Outside Director	Outside Director	Outside Director
Name	YEO HWAN SEOP	KIM YONG WON	LEE JEONG SEOP
Areas of Expertise	Legal & Regulatory	Finance & Accounting, Risk Management	Environment, Policy & Administration

Performance of Non-audit Services

(Unit: KRW million)

Fiscal Year	Date of Contract	Service Details	Period	Compensation
9th	-	-	-	-
8th	-	-	-	-
7th	May 2022	Review and audit of financial information for a specific period	May 2022 – Mar. 2023	70

Composition of Outside Director Recommendation Committee

(As of March 31, 2025)

Position	Inside Director	Outside Director	Outside Director	Outside Director
Name	PARK JONG HWAN	YEO HWAN SEOP	KIM YONG WON	LEE JEONG SEOP
Areas of Expertise	Leadership, Risk Management	Legal & Regulatory	Finance & Accounting, Risk Management	Environment, Policy & Administration

Composition of ESG Committee

(As of March 31, 2025)

Position	Inside Director	Outside Director	Outside Director	Outside Director
Name	PARK JONG HWAN	YEO HWAN SEOP	KIM YONG WON	LEE JEONG SEOP
Areas of Expertise	Leadership, Risk Management	Legal & Regulatory	Finance & Accounting, Risk Management	Environment, Policy & Administration

Board of Directors

Committees under the Board

Composition and Roles of Compensation Committee

To ensure objectivity in determining compensation, we have established a Compensation Committee. All members of the committee are independent outside directors, appointed to ensure fairness and transparency in decision-making. The committee is responsible for reviewing and approving the compensation cap for directors and the compensation standards for executives. These matters are submitted to general shareholders' meeting for final approval.

Evaluation of the Board

Compensation Structure

The performance salary of our executive management is divided into a performance bonus and a long-term bonus. The performance bonus is paid at the beginning of the following year and is based on both quantitative indicators—such as revenue, order volume, and operating profit—and qualitative indicators, including leadership and expertise. Long-term bonuses are designed to prevent short-termism and maximize sustainable value creation. They are paid based on evaluation over a deferral period of at least three years and are determined by indicators, such as organizational performance assessments and short-term net income over the evaluation period. Outside directors and audit committee members receive a fixed base salary, without a performance bonus, to maintain their independence.

Board Evaluation

To assess the effectiveness of our board composition, we implemented a performance evaluation system for the board and outside directors in 2024. The evaluation is conducted annually and applies to all board members. The framework is divided into board performance and individual outside director performance. It includes 25 items across the categories of the board's roles and responsibilities, structure, operations, committees, and follow-up measures on evaluation outcomes. Based on the results of the performance evaluation for 2024, the board was found to be properly structured and operating effectively, fulfilling its duties and responsibilities.

Compensation for the Board

In 2024, we reached KRW 442,371 million in total revenue and KRW 3,502 million in operating profit. Based on these results, at the 9th Annual General Meeting of Shareholders held in March 2025, the total compensation cap for five directors—including three outside directors—was approved at KRW 1,400 million, maintaining the same level as the previous year.

Composition of Compensation Committee

(As of March 31, 2025)

Position	Outside Director	Outside Director	Outside Director
Name	YEO HWAN SEOP	KIM YONG WON	LEE JEONG SEOP
Areas of expertise	Legal & Regulatory	Finance & Accounting, Risk Management	Environment, Policy & Administration

Compensation Basis and Structure

Category	Description
Pay basis	· Executive compensation is determined by board-approved criteria and paid within the compensation cap approved at the general meeting of shareholders
Base salary	· The base salary consists of position-based and title-based pay, and is paid in equal monthly payments. - Position-based salary: determined by the role or position - Title-based salary: determined by the title
Performance salary	· The performance salary is determined by organizational/individual performance and target operating profit performance - Quantitative indicators: revenue, order volume, operating profit, etc. - Qualitative indicators: leadership, expertise, and responsibilities demonstrated in achieving business objectives

Compensation Overview

(Unit: KRW 1,000)

Category	2022	2023	2024
Total board compensation	788,438	761,666	775,352
Average compensation per director	157,688	152,333	155,070
Total CEO compensation	608,438	509,666	516,352
CEO-to-employee pay ratio	8.0%	6.8%	7.2%

*Excluding retirement benefits

Shareholders

Exercising Shareholder Rights

Shareholder Return Policy

We place the highest priority on protecting shareholder value and interests by actively reviewing policies that promote shareholder engagement. Dividend decisions are made within the limits of distributable earnings, based on a comprehensive assessment of profit levels, investment plans for future growth, and financial structure. We are committed to maintaining a dividend payout ratio of at least 30%, based on net income in our separate financial statements. Our dividend policy is designed to enhance shareholder returns and is determined with consideration of capital expenditures, cash flow, financial soundness, and dividend stability. This policy is subject to change, depending on the market conditions and economic outlook.

Notification about General Meeting and Convening

We hold an annual general meeting of shareholders within three months following the end of each fiscal year and convene extraordinary general meetings as necessary. Shareholders are notified of the meeting date, venue, and agenda at least two weeks in advance, either in writing or electronically. For meetings involving shareholders who hold less than 1% of the total voting shares, notice is provided by publishing announcements at least twice in both The Korea Economic Daily and Maeil Business Newspaper, or through the electronic disclosure system, to ensure full access to information and protect shareholder rights.

Resolutions and Voting Rights at the General Meeting

In principle, resolutions at the general meeting are adopted with the approval of a majority of voting rights held by attending shareholders and at least one fourth of the total issued shares, unless otherwise specified by law. Each shareholder is entitled to one vote per share in accordance with the Commercial Act and the Articles of Incorporation. Shareholders may exercise their voting rights through a proxy, provided that a proxy authorization letter is submitted to our company in advance.

Communication with Shareholders

We are committed to transparent disclosure through corporate briefings and public disclosure systems. Quarterly business performance is announced in February, April, July, and October, and the earnings data is published on our official website for shareholders. Investor meetings with our IR team are also available by appointment. Key corporate information is transparently disclosed through our website and regulatory platforms such as DART and KIND.

Protection of Shareholder Rights

We uphold transparency in related-party and self-dealing transactions by requiring prior approval from the Board of Directors for all transactions involving major shareholders and stakeholders. Transactions amounting to KRW 10 billion or more, or exceeding 5% of our capital or total equity, are classified as large-scale and require prior board resolution and disclosure. If there are any self-dealing transactions involving directors or major shareholders, they are reported to and approved by the board in advance. These approvals requires the consent of at least two thirds of all directors.

Status of Issued Stocks for HD Hyundai Energy Solutions

(As of Dec. 31, 2024)

Category	Authorized shares	Issued shares	Issuance ratio
Common stock*	30,000,000 shares	11,200,000 shares	37.3%

*We do not issue any classes of shares such as convertible preferred shares.

Major Shareholders of HD Hyundai Energy Solutions

(As of Dec. 31, 2024)

Shareholder	No. of shares	Percentage
HD Korea Shipbuilding & Offshore Engineering	6,000,000 shares	53.57%

The 9th General Meeting of Shareholders (Mar. 2025)

	Agenda Item	Decision
No. 1	Approval of the 9th financial statements	Approved as proposed
No. 2-1	Appointment of inside director (PARK JONG HWAN)	Approved as proposed
No. 2-2	Appointment of outside director (KIM YONG WON)	Approved as proposed
No. 3	Appointment of outside director as audit committee member (LEE JEONG SEOP)	Approved as proposed
No. 4	Appointment of audit committee member (KIM YONG WON)	Approved as proposed
No. 5	Approval of directors' compensation cap	Approved as proposed

Ethics and Compliance

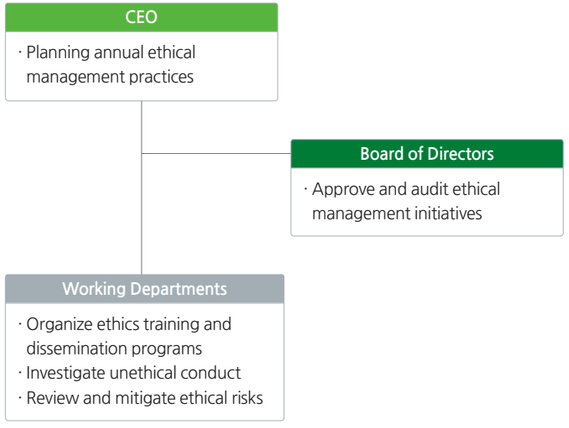
Ethical Governance

Roles and Responsibilities in Governance

Governance Body of Ethical Management

We have established ethical governance to foster a culture of integrity and fulfill our responsibilities as a corporate citizen. Based on HD Hyundai Group's ethical management principles, the Board of Directors and the CEO develop annual ethical management plans, which are then implemented by relevant departments through initiatives.

Ethical Management Structure



Ethical Management Strategy

Foundation for Ethical Management

Core Ethical Values

In our pursuit to become a trusted and respected company, we apply HD Hyundai Group's core ethical values to all aspects of our operations. Inspired by the forest that symbolizes coexistence and mutual prosperity, we uphold the values of fairness, ownership, responsibility, enthusiasm, safety, transparency, and trust (FOREST). Based on these values, we are committed to creating an environment that supports the growth and advancement of all stakeholders.

Core Ethical Values



Direction of Ethical Management

Our commitment to ethical management drives us to become a company that partners and suppliers choose to engage with, that shareholders are confident to invest in, that employees are proud to work for, and that upholds corporate responsibilities to the nation and society.

HD Hyundai Group's Directions for Ethical Management

Shareholders	Profitability & transparency	· Corporate value creation · Transparent disclosure of business operations · Fair treatment of shareholders and dividend distribution	Consumers	Customer satisfaction	· Promotion of Consumer Rights · Technology Development · Quality Improvement
Suppliers & Competitors	Fairness	· Sound business practices · Protection of technology and trade secrets · Fair talent scouting	Workers	Integrity	· Respect for Individual Dignity and Privacy · Improvement of Working Conditions · Prohibition of Discriminatory Practices
Government	Compliance	· Ethical and transparent relationships · Support for policies · Tax compliance	Local community	Corporate citizenship	· Environmentally Responsible Management · Social Contribution Activities

Ethics Charter

We practice ethical management by adhering to the HD Hyundai Group Ethics Charter. Since its declaration in 2005, the charter has embodied a business philosophy rooted in integrity. In December 2023, the charter was revised to reflect HD Hyundai's updated core values, reinforcing a more consistent and effective approach to ethical practice.

Ethics Training

To ensure consistent and effective implementation of ethical management strategies, we organize regular training on our ethical code for our employees. In 2024, the training was conducted to reinforce standards for ethical conduct while carrying out self-assessments by executives, office and research staff, and all team leaders in production and technical positions.

Compliance Training

We offer regular compliance training programs for newly appointed executives, department heads, team leaders, key managers, and new hires. The training covers such topics as the Fair Trade Act, the Subcontracting Act, case studies on consultation, and contract risk management. Each program is tailored to reflect the roles and responsibilities of different positions.

Compliance Officer and Internal Control Standards

To prevent and manage legal risks, we have appointed a compliance officer responsible for organizing compliance training sessions and fair trade compliance programs. This officer also monitors our business operations to ensure that we remain within the boundaries of laws and regulations.

Appointment of Compliance Officer

Name	Date of Appointment	Career Highlights
KIM YUN HWA	Aug. 8, 2022	- HD Hyundai Electric (2020–2022) - HD Hyundai Energy Solutions (2022–Present)

Activities of Compliance Officer in 2024

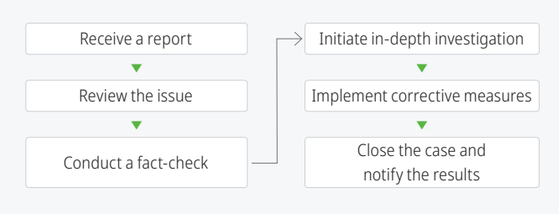
Compliance Control	
Mar. 2024	Compliance inspections (Fair Trade Act, Subcontracting Act, etc.)
Apr. 2024	Inspection of production process in supply chain
May 2024	H1 compliance training (Subcontracting Act, Act on the Protection, etc. of Temporary Agency Workers) - Module Manufacturing Technology Team, HR Team
Oct. 2024	H2 compliance training (Subcontracting Act) - Production Department, Procurement Team
Nov. 2024	Self-assessment of ethical management compliance
Fair Trade Compliance Program (CP)	
Feb. 2024	Declaration of Ethical Compliance Management
Feb. 2024	Report of fair trade compliance program to the board

Ethics and Compliance

Ethics and Compliance Risk Management

Fair Trade Compliance Program (CP)

To promote transparent and fair business management, we officially declared our commitment to fair trade compliance in 2022 and distributed the Fair Trade Compliance Handbook throughout the organization, which includes information on the Fair Trade Act and the Subcontracting Act. In accordance with the provisions of the Fair Trade Compliance Program, we also assess our implementation and adherence to fair trade regulations at least once a year and report the results to the Board of Directors. To raise awareness among employees, we conducted training on the Fair Trade Act in May and October 2024.



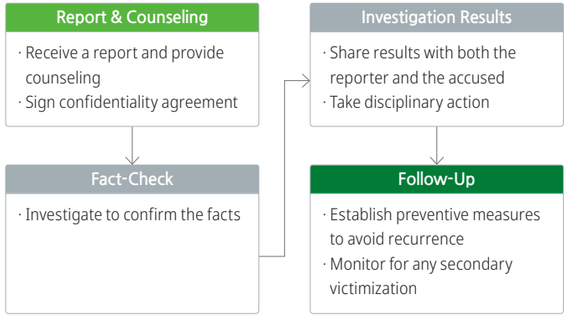
Anti-corruption Risk Assessment

To identify and prevent corruption risks, we conduct an annual assessment focused on anti-corruption practices. This assessment involves identifying compliance and ethical risks related to the Fair Trade Act, the Subcontracting Act, and the Anti-corruption Act, and assessing the severity of these risks. Identified risks are then categorized into five levels: negligible, minor, moderate, major, and critical. Based on the urgency and severity of the findings, we implement appropriate measures to address them.

Grievance Handling Committee

Our Grievance Handling Committee is committed to addressing unethical conduct in the workplace and assisting in the resolution of employee concerns. The committee reviews reported cases related to bullying, sexual harassment, and gender discrimination in the workplace. It ensures that the voices of affected individuals are heard through counseling and monitors situations to prevent secondary victimization. The committee also reviews potential disciplinary measures for offenders and implements preventive actions to avoid the recurrence of similar incidents.

Grievance Mechanism



Grievance Handling Data

No. of cases reported	No. of cases handled	Percentage of handled cases (%)
0	0	-

Whistleblower Protection

To maintain the strict confidentiality of whistleblower identities and reports, we have implemented the Whistleblower Protection and Reward Program. Reporters' identities are not disclosed without their consent, and no retaliation or discrimination is allowed for legitimate reporting. If a report contributes to preventing financial loss, recovering revenue, or reducing costs, and meets the reward requirements, then the reporter is eligible for a reward of up to KRW 1 billion. Moving forward, we will continue to promote ethical practice and create a culture of fairness and integrity.

Ethical Standards for HR Evaluations

We incorporate ethics and compliance standards into our employee evaluations. For managers in positions of team leaders or higher, ESG management criteria account for 5% of their MBO evaluations. If any ethical violations are identified, penalties will affect their performance evaluations. During promotion reviews, a point-based system is used where any disciplinary actions for misconduct result in point deductions. This approach ensures that ethical management standards are reflected in performance assessments and promotion decisions.

Disciplinary System

The Human Resources Committee, or Disciplinary Committee, is held to implement strict disciplinary measures for unethical conduct based on the nature and severity of each case. Our disciplinary system ranges from minor disciplinary measures—such as warnings and reprimands—to major disciplinary measures, including salary reductions and dismissal. We ensure that fair and appropriate decisions are made against unethical conduct in principle.

Risk Management

Governance

Risk Governance

Roles and Responsibilities in Governance

Company-wide Risk Management

We have established a board-led risk management framework to ensure stable business operations by effectively managing both financial and non-financial risks. Under the Board of Directors, the ESG Committee plays a key role in reviewing ESG policies and issues, as well as supporting the execution of operational tasks. In our efforts to manage a wide range of ESG risks—including those related to environmental responsibilities, occupational safety and health, ethics and compliance, supply chain, and information security—and assess opportunities, we have developed a sustainable management framework that can adapt to a fast-changing market environment.

Risk management practices are regularly reported to the Board of Directors by the Chief ESG Officer (Head of Finance and Accounting). In addition, we have appointed the executive officer responsible for production at the Eumseong Plant as the Chief Safety Officer (CSO) to oversee any risks that may arise during the production process.

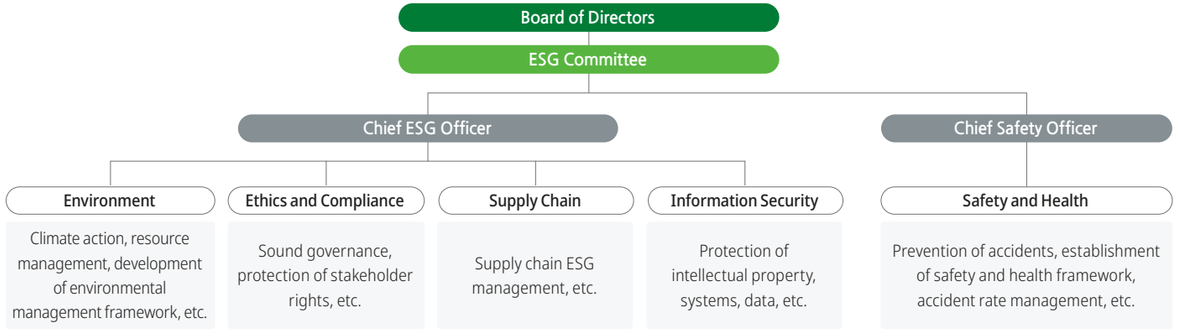
Department-level Risk Management

Our risk management framework is designed to address risks in each business unit. Financial risks are managed by the Financial Analysis Team, production risks by the Production Planning Team, and sales-related risks by the Sales Planning Team. Each team is responsible for identifying high-probability risks in advance, regularly reviewing them, and discussing action plans.

External Auditor

To ensure the effectiveness of our risk management practices, we undergo annual audits by an independent external auditor. The auditor reviews our financial statements and internal financial control system, contributing to risk oversight. Indicators that may significantly impact stakeholder decision-making—such as consistent application of accounting policies, effectiveness of control system design and operation, and integrity of asset listings—are examined as part of the audit process.

Integrated Risk Management Framework



Strategy

Risk Management Strategy

Risk Management Process

Risk Identification and Assessment

Leveraging a set of data, including previous business performance, we analyze changes to industry-related regulations, shifts in the economic environment, and the expectations and demands of stakeholders to identify risks. These identified risks are regularly assessed for materiality to ensure that they remain within an acceptable range that aligns with our value creation strategy. We conduct a materiality assessment annually to determine our key risks.

Response to Risks

Our risk management strategies outline limits and standards to prevent risks from exceeding acceptable thresholds. These strategies and systems are designed to adapt to changes in market conditions and business environment and are reviewed regularly. They also define management standards and procedures. Training is offered to ensure that all employees understand their respective roles and responsibilities, thereby fostering a strict and disciplined control environment. In addition, the Audit Committee reviews the implementation and compliance of risk management strategies and procedures, as well as assesses the effectiveness of the risk management framework across executive management.

Risk Management

Risk Management

Risk Management Strategy

Key Risk Management

Credit Risk Management

Credit risks associated with our trade receivables, other receivables, and assets under contract largely depend on the individual characteristics of our clients. Since most of our clients are financially sound the impact of sovereign credit risks is considered limited. Nevertheless, we maintain provisions against credit risks based on both individual and collective assessments, taking into account historical loss rates to prepare for potential exposure.

Liquidity Risk Management

To prevent losses that could impair our financial stability or the overall financial soundness of our consolidated entity, we manage liquidity risks. Our primary focus is to maintain sufficient liquidity to ensure the timely repayment of maturing liabilities. To prevent liquidity risks associated with repayment of financial liabilities, we regularly monitor liquidity forecasts and manage to ensure that covenant breaches do not occur. Based on these forecasts, we manage surplus funds by using a variety of financial instruments with appropriate maturities and liquidity (e.g., interest-bearing current accounts, time deposits, and on-demand savings accounts) to ensure efficient capital allocation.

Market Risk Management

We are exposed to foreign exchange risk arising from sales and purchases denominated in currencies other than the Korean won. To manage market risk, including the impact of exchange rate fluctuations on financial instruments and future cash flows, we conduct quarterly reviews of our transaction currencies and optimize our income while keeping our risk within acceptable limits.

Potential Risk Management

Identifying and Addressing Potential Risks

We identify potential risks that may affect our business operations over the mid- to long-term and establish response strategies accordingly.

Response to Potential Risks

Led by the ESG Committee, we engage in in-depth discussions on identified risks and prioritize issues based on their impact. For high-priority risks, preemptive response strategies are developed through resolutions by the ESG Committee and the Board of Directors. Our Chief ESG Officer, along with all employees, monitors financial and non-financial risks, as well as potential risks, to ensure the timely formulation and execution of effective strategies and actions, thereby mitigating the impact of these risks.

Opportunity Factors

Since launching Korea's first PERC module in 2014, we have continued to lead the market by releasing a module with Grade 1 Certification for Carbon Emissions in 2020 and a high-efficiency, low-carbon TOPCon module in 2024. By taking advantage of this success, we've sustained our growth. In response to the global rise of ESG management, we expect to see the continuous growth of the solar energy sector as a key driver of the low-carbon community.

Response to Potential Risks

	Risk Overview	Action Plan
Growing Global Uncertainty	The second Trump administration led to the repeal or reduction of the U.S. Inflation Reduction Act (IRA); intensified protectionism, including the introduction of broad-based tariffs and renewed special tariffs on China; increased financial market volatility due to monetary policy transitions; and enhanced real debt burdens, slowing down global economic growth.	· Drive sustainable growth by enhancing competitiveness through new product launches and improving productivity. · Enhance financial risk management capabilities to address credit, liquidity, and other financial risks.
Increase in Raw Material Prices	A reduction or elimination of the 13% export VAT rebate on Chinese solar modules, along with agreements among Chinese manufacturers to cut production and ease price competition, is expected to increase prices of raw materials.	· Launch products tailored for residential, commercial/utility, and floating solar markets. · Increase demand for domestically-produced cell products with Grade 1 Certification for Carbon Emissions.
Climate Action	There is a growing need for environmentally responsible practices across the value chain to address climate change rooted in GHG emissions and ensure human survival and corporate sustainability.	·Develop a roadmap to achieve mid- to long-term strategies and targets for GHG emission reduction. ·Strengthen climate response strategies by participating in CDP and other global initiatives.
Stricter Human Rights Regulations	The upcoming enforcement of the EU Corporate Sustainability Due Diligence Directive will make human rights due diligence and disclosure mandatory, requiring companies to build a human rights management framework and conduct impact assessments and mitigation measures.	· Establish a human rights governance framework, including Human Rights Management Committee, Human Rights Management Declaration and Regulations. · Reinforce area of improvements based on human rights impact assessments and identify the impact on human rights across supply chain and conduct assessments.
Supply Chain ESG Management	As the ESG regulations extend from internal operations to the supply chain, the industry is facing growing pressure to enhance ESG management practices related to human rights and environmental issues across suppliers.	· Follow the HD Hyundai Group's supply chain management policies e.g., Supplier Code of Conduct. · Conduct ESG management assessments of domestic and global suppliers, establish a management framework, and support issue-specific risk mitigation.

Risk Sensitivity Analysis

Financial Risk Sensitivity

We analyze the impact of key risks on core operating indicators—such as our revenue, profit and loss, and corporate value—and incorporate their sensitivity analysis into our financial planning. In cases where actuarial assumptions, including those related to defined benefit obligations, change within a reasonable range between the beginning and end of the reporting period, we assess their financial impact and disclose the results in our business report.

Non-financial Risk Sensitivity

The ESG Committee under the Board of Directors defines the strategic direction of our ESG initiatives and makes decisions regarding planning and implementation. The committee also supports the execution of operational tasks while identifying and managing non-financial ESG risks associated with occupational safety and health, ethics and compliance, supply chain, and information security.

ESG Factbook

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Consolidated Financial Data

Summary of Consolidated Financial Statements

Category	Unit	2022 (7th)	2023 (8th)	2024 (9th)
Current assets	KRW million	490,182	361,110	318,190
Cash and cash equivalents	KRW million	68,761	104,930	140,390
Trade and other receivables	KRW million	140,423	84,490	77,403
Contract assets	KRW million	0	20	5,828
Inventories	KRW million	273,182	168,208	83,410
Other current assets	KRW million	7,816	3,462	11,159
Non-current assets	KRW million	162,644	140,947	135,584
Long-term financial assets	KRW million	2,294	2,266	2,271
Long-term trade and other receivables	KRW million	119,450	94,813	87,541
Tangible assets	KRW million	8,122	10,175	9,542
Right-of-use assets	KRW million	32,778	33,693	36,230
Total assets	KRW million	652,825	502,057	453,774
Current liabilities	KRW million	237,449	105,253	70,005
Non-current liabilities	KRW million	33,844	25,247	14,086
Total liabilities	KRW million	271,293	130,500	84,090
Share capital	KRW million	56,000	56,000	56,000
Capital surplus	KRW million	105,855	105,855	105,855
Accumulated other comprehensive income	KRW million	4,686	4,728	2,643
Retained earnings	KRW million	214,992	204,974	205,186
Total equity	KRW million	381,533	371,557	369,684

Summary of Consolidated Profit & Loss Statement

Category	Unit	2022 (7th)	2023 (8th)	2024 (9th)
Revenue	KRW million	984,812	546,120	422,371
Operating profit (loss)	KRW million	90,166	17,543	3,503
Net income (loss) for the year	KRW million	60,610	(2,867)	114
Earnings (loss) per share	KRW million	5,412	(256)	10

Distribution to Stakeholders

Category		Unit	2022 (7th)	2023 (8th)	2024 (9th)
Suppliers	Cost of raw materials	KRW 1,000	830,115	311,819	230,770
Employees	Employee benefits expense	KRW 1,000	20,479	20,010	17,346
Shareholders & Investors	Interest expense	KRW 1,000	1,828	3,312	1,062
	Dividends paid	KRW 1,000	6,720	0	0
Government	Corporate income tax expense (benefit)	KRW 1,000	14,333	(574)	(2,667)
	Taxes and dues	KRW 1,000	417	341	420
Local Community	Donations	KRW 1,000	136	210	225

Environmental Data

GHG Emissions

Category	Unit	2022	2023	2024
Total GHG emissions (Scope 1+2)	tCO_2eq	38,240	41,779	19,982
Direct emissions (Scope 1)	tCO_2eq	3,565	6,162	1,851
Indirect emissions (Scope 2)	tCO_2eq	34,675	35,617	18,132
Emission intensity (per revenue)	tCO_2eq/ KRW billion	38.8	76.5	47.3

Energy

Category	Unit	2022	2023	2024
Total energy consumption	TJ	753	780	401
Energy intensity (per revenue)	TJ/KRW billion	0.8	1.4	1.0
Non-renewable energy consumption	TJ	753	780	401
Direct energy consumption	TJ	29.5	37.4	23.0
Indirect energy consumption	TJ	724.6	744.3	379.0
Electricity consumption	TJ	724.5	744.1	378.7
Steam/heat consumption	TJ	0.1	0.3	0.3
Renewable energy generation	MWh	4,786	4,712	4,120
Renewable energy sold	MWh	4,786	4,712	4,120
Renewable energy self-consumption	MWh	0	0	23

Water

Category	Unit	2022	2023	2024
Total water withdrawal	m^3	417,887	516,561	206,866
Water withdrawal intensity (per revenue)	m^3/KRW billion	424	946	490
Withdrawal for public water supply	m^3	417,887	516,561	206,866
Water discharge	m^3	356,076	360,562	69,347
Water consumption	m^3	61,811	155,999	137,519
Water consumption intensity (per revenue)	m^3/KRW billion	62.8	285.6	325.6

Air Pollutants

Category	Unit	2022	2023	2024
Nitrogen oxides (NOx) emissions	kg	4,237	1,146	682
Sulfur oxides (SOx) emissions	kg	27	60	46
Total suspended particles (TSP) emissions	kg	734	2,075	280

Water Pollutants

Category	Unit	2022	2023	2024
Total organic carbon (TOC) emissions	kg	717	505	116
Biochemical oxygen demand (BOD)	kg	338	82	40
Suspended solids (SS) emissions	kg	506	367	83
Total nitrogen (TN) emissions	kg	2,845	1,895	239
Total phosphorus (TP) emissions	kg	21	12	2

Environmental Data

Waste

Category	Unit	2022	2023	2024
Total waste generated	ton	7,601	7,281	3,348
Total Waste reused or recycled	ton	7,584	7,261	3,343
Reuse and recycling rate	%	99.8	99.7	99.9
General waste generated	ton	5,169	4,979	2,724
General waste Reused or recycled	ton	5,169	4,979	2,724
General waste Landfilled	ton	0	0	0
General waste Incinerated	ton	0	0	0
Designated waste generated	ton	2,432	2,303	624
Designated waste Reused or recycled	ton	2,415	2,282	619
Designated waste Landfilled	ton	0	0	0
Designated waste Incinerated	ton	17	21	5
Construction waste generated	ton	0	0	0
Construction waste Reused or recycled	ton	0	0	0
Construction waste Landfilled	ton	0	0	0
Construction waste Incinerated	ton	0	0	0

Green Procurement

Category	Unit	2022	2023	2024
Environmental investments	KRW 100 million	2.6	2.7	3.3
Green sales	KRW 100 million	1,572	402	104
Green purchases	KRW 100 million	354	138	0
Percentage of green purchase	%	4.35	4.59	0

Green purchase refers to revenue from products with Grade 1 Certification for Carbon Emissions by the Ministry of Trade, Industry and Energy.

Social Data

Employees

Category	Unit	2022	2023	2024
Total number of employees	Person	253	240	225
Total number of executives	Person	5	5	5
Total number of non-executive employees	Person	248	235	220
Number of permanent employees	Person	190	201	197
Male	Person	166	170	166
Female	Person	24	31	31
Number of fixed-term employees	Person	58	34	23
Male	Person	38	23	14
Female	Person	20	11	9
Age under 30	Person	56	45	23
Age 30–49	Person	162	147	157
Age over 50	Person	30	43	40
Korean nationals	Person	245	232	217
Mexican nationals	Person	1	1	1
Chinese nationals	Person	2	2	2

The data has been updated due to changes in criteria for executive and non-executive employees.

Recruitment and Retention

Category	Unit	2022	2023	2024
New hires	Person	24	7	9
Turnover	Person (%)	17(10.4%)	18(9.5%)	20(10.0%)
Voluntary turnover	Person (%)	14(8.5%)	15(7.9%)	17(8.5%)
Average length of employment	Year	7.9	9.1	10.2
Male	Year	9	10.3	11.5
Female	Year	2.6	3.6	4.4

The data has been updated due to changes in criteria for new hires.

Performance Evaluation and Compensation

Category	Unit	2022	2023	2024
Employees subject to regular performance evaluation	Person	141	153	151
Number of employees evaluated for regular performance	Person	121	145	146
Percentage of employees evaluated for regular performance	%	85.8	94.8	96.7
Average employee salary	KRW million	76	75	72
Male	KRW million	82	80	78
Female	KRW million	45	47	45

The data has been updated due to changes in criteria for performance evaluation and compensation.

Diversity in the Workplace

Category	Unit	2022	2023	2024
Female employees	Person (%)	44(17.4%)	42(17.5%)	40(17.8%)
Female managers	Person (%)	0(0%)	1(2.3%)	1(2.6%)
Female non-managers	Person (%)	45(21.7%)	42(22.6%)	39(22.0%)
Female employees in STEM fields	Person (%)	6(17.1%)	9(24.3%)	5(13.9%)
Veterans	Person (%)	3(1.2%)	2(0.8%)	2(0.9%)

Parental Leave

Category	Unit	2022	2023	2024
Number of employees who took parental leave	Person	7	3	3
Male	Person	6	3	3
Female	Person	1	0	0
Returned from parental leave and remained employed for at least 12 months	Person	6	4	1
Male	Person	4	4	1
Female	Person	2	0	0

Social Data

Employee Training

Category	Unit	2022	2023	2024
Total training hours	Hour	579	594	740
Training hours per employee	Hour/Person	2.3	2.5	3.3
Total training expenses	KRW mil.	29	101	50
Training expense per employee	KRW mil./Person	0.115	0.421	0.222
Employees who completed training	Person(%)	193(76.3%)	198(82.5%)	220(97.8%)

The data has been updated due to changes in criteria for executive and non-executive employees.

Occupational Health and Safety (Employees)

Category	Unit	2022	2023	2024
Total working hours	Hour	484,120	452,504	432,343
Fatality rate	Cases per 200,000 working hours	0	0	0
No. of fatal incidents	Case	0	0	0
Lost time injury frequency rate (LTIFR)	Cases per 1 million working hours	2.1	0	2.3
No. of lost time injuries	Case	1	0	1
Total recordable injury frequency rate (TRIFR)	Cases per 1 million working hours	6.2	13.3	9.3
No. of recordable injuries	Case	3	6	4
Occupational illness frequency rate (OIFR)	Cases per 200,000 working hours	0	0	0
No. of occupational illness cases	Case	0	0	0
Near miss frequency rate (NMFR)	Cases per 200,000 working hours	0	0	0
Number of near miss cases	Case	0	0	0

Occupational Health and Safety Management System (OHSMS)

Category	Unit	2022	2023	2024
Percentage of OHSMS certification	%	100	100	100
No. of work sites subject to OHSMS certification	Site	1	1	1
No. of OHSMS-certified work sites	Site	1	1	1

Social Contribution

Category	Unit	2022	2023	2024
Volunteer hours	Hour	84	56	46
Cash donations	KRW million	115.2	23.6	9.8
In-kind donations	KRW million	42.9	5.4	38.7

Occupational Health and Safety (Suppliers)

Category	Unit	2022	2023	2024
Total working hours	Hour	987,936	836,430	422,380
Fatality rate	Cases per 200,000 working hours	0	0	0
No. of fatal incidents	Case	0	0	0
Lost time injury frequency rate (LTIFR)	Cases per 1 million working hours	0	0	0
No. of lost time injuries	Case	0	0	0
Total recordable injury frequency rate (TRIFR)	Cases per 1 million working hours	0	0	0
No. of recordable injuries	Case	0	0	0
Occupational illness frequency rate (OIFR)	Cases per 200,000 working hours	0	0	0
No. of occupational illness cases	Case	0	0	0
Near miss frequency rate (NMFR)	Cases per 200,000 working hours	0	0	0
Number of near miss cases	Case	0	0	0

ESG Evaluation in Supply Chain

Category	Unit	2022	2023	2024
1st-tier suppliers evaluated in documents	Company	0	30	5
Key 1st-tier suppliers evaluated in documents	Company	0	10	5
1st-tier suppliers evaluated on-site	Company	0	5	5
Key 1st-tier suppliers evaluated on-site	Company	0	4	5
Suppliers with identified risks	Company	0	0	1

Information Security and Privacy

Category	Unit	2022	2023	2024
No. of privacy violations	Case	0	0	0
No. of customers affected by privacy violations	Person	0	0	0
No. of information security violations	Case	0	0	0
No. of customers affected by information security violations	Person	0	0	0

Information Security Training

Category	Unit	2022	2023	2024
Total information security training hours	Hour	193	198	216
Training hours per person	Hour	1	1	1
No. of employees who completed information security training	Person	193	198	216

Governance Data

Board of Directors

Category	Unit	2022	2023	2024
Total no. of board members	Person	5	5	5
No. of outside directors	Person	3	3	3
No. of inside directors	Person	2	2	2
No. of other non-executive directors	Person	0	0	0
No. of male directors	Person	5	5	5
No. of female directors	Person	0	0	0
Age under 30	Person	0	0	0
Age 30–49	Person	2	2	0
Age over 50	Person	3	3	5
No. of board meetings	Meeting	7	8	7
No. of agenda items	Item	15	13	15
Average attendance rate	%	94	98	100

Board Committees

Category	Unit	2022	2023	2024
No. of outside director recommendation committee members	Person	4	4	4
Percentage of outside directors	%	75	75	75
No. of committee meetings	Meeting	2	0	2
No. of audit committee members	Person	3	3	3
Percentage of outside directors	%	100	100	100
No. of committee meetings	Meeting	6	6	6
No. of ESG committee members	Person	4	4	4
Percentage of outside directors	%	75	75	75
No. of committee meetings	Meeting	2	2	2

Stock

Category	Unit	2022	2023	2024
Total no. of issued shares	Share	11,200,000	11,200,000	11,200,000
Common shares	Share	11,200,000	11,200,000	11,200,000
Non-voting shares	Share	0	0	0
Advance notice period for general meeting location and agenda	Day	31	33	33

Ethics and Compliance Training

Category	Unit	2022	2023	2024
Percentage of employees who completed ethics training	%	96.4	86.4	108.5
No. of employees who completed ethics training	Person	239	203	204
No. of employees subject to ethics training	Person	248	235	188

Ethics Risk Assessment

Category	Unit	2022	2023	2024
No. of legal consultations on anti-corruption and economic sanctions	Case	1	0	0
No. of other legal consultations	Case	110	80	85

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GRI Index

GRI 2: General Disclosure

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	2-2	Entities included in the organization's sustainability reporting	p. 2	
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	2-4	Restatements of information	-	Specified in the notes if necessary
	2-5	External assurance	p. 76-77	
Activities and workers	2-6	Activities, value chain and other business relationships	p. 5-7	
	2-7	Employees	p. 38	
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	2-11	Chair of the highest governance body	p. 55	
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GRI 3: Material Topic

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Initiative Index

GRI Index

Economic Performance

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Environmental Performance

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Water and effluents	303-3	Water withdrawal	p. 26	
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Emissions	305-1	Direct (Scope 1) GHG emissions	p. 18	
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	305-3	Other indirect (Scope 3) GHG emissions	-	To be determined
	305-4	GHG emissions intensity	p. 18	
	305-5	Reduction of GHG emissions	p. 18	
	305-6	Emissions of ozone-depleting substances (ODS)	-	None
	305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	p. 27	
Waste	306-1	Waste generation and significant waste-related impacts	p. 27	
	306-2	Management of significant waste-related impacts	p. 27-28	
	306-3	Waste generated	p. 27	
	306-4	Waste diverted from disposal	p. 27	
	306-5	Waste directed to disposal	p. 27	

Initiative Index

GRI Index

Social Performance

Category	No.	GRI Standards	Page	Remark
Labor / management relations	401-1	New employee hires and employee turnover	p. 68	
	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	p. 37, 68	
	401-3	Parental leave	p. 37, 68	
Labor / management relations	402-1	Minimum notice periods regarding operational changes	p. 35	
Occupational health and safety	403-1	Occupational health and safety management system	p. 31-33, 62	
	403-2	Hazard identification, risk assessment, and incident investigation	p. 31-33	
	403-3	Occupational health services	p. 32-33	
	403-4	Worker participation, consultation, and communication on occupational health and safety	p. 33	
	403-5	Worker training on occupational health and safety	p. 33	
	403-6	Promotion of worker health	p. 33	
	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	p. 31-34	
	403-8	Workers covered by an occupational health and safety management system	p. 32-33	
	403-9	Work-related injuries	p. 69	
	403-10	Work-related ill health	p. 69	
Training and education	404-1	Average hours of training per year per employee	p. 69	
	404-2	Programs for upgrading employee skills and transition assistance programs	p. 35-36	
	404-3	Percentage of employees receiving regular performance and career development reviews	p. 68	
Diversity and equal opportunity	405-1	Diversity of governance bodies and employees	p. 9, 55, 68	
	405-2	Ratio of basic salary and remuneration of women to men	p. 68	

Category	No.	GRI Standards	Page	Remark
Nondiscrimination	406-1	Incidents of discrimination and corrective actions taken	-	N/A
Freedom of association and collective bargaining	407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	p. 45	
Child labor	408-1	Operations and suppliers at significant risk for incidents of child labor		N/A
Forced or compulsory labor	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor		N/A
Security practices	410-1	Security personnel trained in human rights policies or procedures		N/A
Rights of indigenous peoples	411-1	Incidents of violations involving rights of indigenous peoples		N/A
Local communities	413-1	Operations with local community engagement, impact assessments, and development programs	p. 52	
	413-2	Operations with significant actual and potential negative impacts on local communities		N/A
Supplier social assessment	414-1	New suppliers that were screened using social criteria	p. 45	
	414-2	Negative social impacts in the supply chain and actions taken	p. 45	
Public policy	415-1	Political contributions		N/A
Customer health and safety	416-1	Assessment of the health and safety impacts of product and service categories	p. 46-47	
	416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	p. 32, 69	
Marketing and labeling	417-1	Requirements for product and service information and labeling		N/A
	417-2	Incidents of non-compliance concerning product and service information and labeling		N/A
	417-3	Incidents of non-compliance concerning marketing communications		N/A
Customer privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	p. 69	

Initiative Index

SASB Index

Technology &Communication(Semiconductors)

Topic	Code	Accounting Metrics	HD Hyundai Energy Solutions
GHG emissions	TC-SC-110a.1	Gross global Scope 1 emissions, and amount of total emissions from perfluorinated compounds (PFCs)	1,851 tCO_2eq
	TC-SC-110a.2	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	p. 16-18
Energy management in manufacturing	TC-SC-130a.1	Total energy consumed, percentage grid electricity, and percentage renewable	94.4%
Water management	TC-SC-140a.1	Total water withdrawn, total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress	206,866t
Waste management	TC-SC-150a.1	Amount of hazardous waste from manufacturing, percentage recycled	624t(99.2%)
Employee health & safety	TC-SC-320a.1	Description of efforts to assess, monitor, and reduce exposure of employees to human health hazards	p. 32-33
	TC-SC-320a.2	Total amount of monetary losses as a result of legal proceedings associated with employee health and safety violations	N/A
Recruiting & managing a global & skilled workforce	TC-SC-330a.1	Percentage of employees who are foreign nationals	1.36%
		Percentage of employees who are located offshore	1.36%
Product life cycle management	TC-SC-410a.1	Percentage of products by revenue that contain IEC 62474 declarable substances	N/A
	TC-SC-410a.2	Processor energy efficiency at a system-level for: servers, desktops, and laptops	N/A
Materials sourcing	TC-SC-440a.1	Description of the management of risks associated with the use of critical materials	p. 44-45
Intellectual property protection & competitive behavior	TC-SC-520a.1	Total amount of monetary losses as a result of legal proceedings associated with anti-competitive behavior regulations	N/A
Activity metrics	TC-SC-000.A	Total production	Cell: 5,426,520 units, Module: 1,233,205 units
	TC-SC-000.B	Percentage of production from owned facilities	100% (Eumseong Plant)

Independent Assurance Statement

To readers of 2024 HD Hyundai Energy Solutions Sustainability Report

Introduction

Korea Management Registrar (KMR) was engaged to conduct an independent assurance of 2024 HD Hyundai Energy Solutions Sustainability Report for the year ending December 31, 2024. The preparation, information and internal control of the report are the sole responsibility of HD Hyundai Energy Solutions' the management. KMR's responsibility is to comply with the agreed engagement and express an opinion to HD Hyundai Energy Solutions' management.

Subject Matter

The reporting boundaries included the performance and activities of sustainability-related organizations as described in HD Hyundai Energy Solutions' report:

· 2024 HD Hyundai Energy Solutions Sustainability Report

Reference Standard

· GRI Standards 2021 : 2023 (GRI)

Assurance criteria

KMR conducted the verification in accordance with the globally recognized standard AA1000AS v3 and KMR's assurance standard SRV1000 based on requirements of ISO 17029 and KMR EDV 01, and set the levels of assurance and materiality as below. Under AA1000AS v3, We assessed the adherence to the four principles presented in AA1000AP:2018—Inclusivity, Materiality, Responsiveness, and Impact—and evaluated the reliability and quality of the data and information using the GRI index specified in the report. Under SRV1000, we conducted a multidimensional review aimed at zero data errors, applying expert judgment to determine the materiality criteria.

· ISO 17029 : 2019, ISO 14065 : 2020, AA1000AS v3 : 2020 (AccountAbility), AA1000AP : 2018 (AccountAbility), SRV 1000 : 2022 (KMR), KMR EDV 01 : 2024 (KMR)
· Levels of assurance/materiality: AA1000AS v3 – Type 2/moderate

Scope of assurance

The scope of our assurance included the verification of compliance with the reporting requirements of the GRI Standards 2021. We confirmed that the following indicators of material topics were identified through the materiality assessment process.

· GRI Standards 2021 reporting principles
· Universal Standards
· Topic Specific Standards
  - GRI 205: Anti-Corruption
  - GRI 302: Energy
  - GRI 305: Emissions
  - GRI 306: Waste
  - GRI 403: Occupational Health and Safety
  - GRI 414: Supplier Social Assessment
  - GRI 416: Customer Health and Safety
  - GRI 418: Customer Privacy

As for the reporting boundary, the engagement excludes the data and information of HD Hyundai Energy Solutions' partners, suppliers and any third parties.

KMR's Approach

To perform an assurance engagement within an agreed scope of assessment using the standards outlined above, our Assurance Team undertook the following activities as part of the engagement:

· Evaluating the appropriateness of the reference standard used as a basis for preparing sustainability information and the reliability of the materiality assessment process and its findings;
· Conducting inquiries to understand the data management and control environment, processes, and information systems (the effectiveness of controls was not tested);
· Evaluating the appropriateness and consistency of the methodology for estimation (note that the underlying data was not tested and KMR has not made any estimates);
· Visiting the headquarters, determining visit sites based on the site's contribution to sustainability and the possibility of unexpected changes since the previous period and sampling data, and carrying out due diligence on a limited number of source records at the sites visited;
· Interviewing people in charge of preparing the report;
· Considering whether the presentation and disclosures of sustainability information are accurate and clearly defined;
· Identifying errors through comparison and check against underlying information, recalculation, analyses, and backtracking; and
· Evaluating the reliability and balance of information based on independent external sources, public databases, and press releases.

Limitations and Recommendations

The absence of generally accepted reporting frameworks or well-established practices on which to draw to evaluate and measure non-financial information allows for different measures and measuring techniques, which can affect comparability between entities. Therefore, our assurance team relied on professional judgment. The scope of this assurance included the confirmation of the truthfulness of claims regarding results that have already been obtained as stipulated by ISO 17029. However, the plausibility of intended claims of forecasts or hypotheses was not validated even if the related content was contained in the report.

A limited assurance evaluates the appropriateness of the criteria used by HD Hyundai Energy Solutions for preparing sustainability information on subject matters, the risk of material misstatement in the sustainability information, whether due to fraud or error, responses to risks, and disclosure of the sustainability information on subject matters. However, the scope of the risk assessment process and the subsequent procedures performed in response to assessed risks, including an understanding of internal controls, is more limited than that of a reasonable assurance.

Independent Assurance Statement

Our assurance team conducted our work to a limited extent through inquiries, analysis, and limited sampling based on the assumption that the data and information provided by HD Hyundai Energy Solutions are complete and sufficient. To overcome these limitations, we confirmed the quality and reliability of the information by referring to independent external sources and public databases, such as DART and the National GHGs Management System (NGMS).

Conclusion and Opinion

Based on the document reviews and interviews, we had several discussions with HD Hyundai Energy Solutions on the revision of the Report. We reviewed the Report's final version in order to make sure that our recommendations for improvement and revision have been reflected. Based on the work performed, it is our opinion that the Report applied the GRI Standards. Nothing comes to our attention to suggest that the Report was not prepared in accordance with the AA1000AP (2018) principles.

Inclusivity
HD Hyundai Energy Solutions has developed and maintained different stakeholder communication channels at all levels to announce and fulfill its responsibilities to the stakeholders. Nothing comes to our attention to suggest that there is a key stakeholder group left out in the process. The organization makes efforts to properly reflect opinions and expectations into its strategies.

Materiality
HD Hyundai Energy Solutions has a unique materiality assessment process to decide the impact of issues identified on its sustainability performance. We have not found any material topics left out in the process.

Responsiveness
HD Hyundai Energy Solutions prioritized material issues to provide a comprehensive, balanced report of performance, responses, and future plans regarding them. We did not find anything to suggest that data and information disclosed in the Report do not give a fair representation of HD Hyundai Energy Solutions' actions.

Impact
HD Hyundai Energy Solutions identifies and monitors the direct and indirect impacts of material topics found through the materiality assessment, and quantifies such impacts as much as possible.

Reliability of Specific Sustainability Performance Information

In addition to the adherence to AA1000AP (2018) principles, we have assessed the reliability of GHG emissions, Energy consumption, Water withdrawal, Wastewater generation, Accounting data, Employee status, New hires, and Average length of service data related to sustainability performance. We interviewed the in-charge persons and reviewed information on a sampling basis and supporting documents as well as external sources and public databases to confirm that the disclosed data is reliable. Any intentional error or misstatement is not noted from the data and information disclosed in the Report.

KMR's Competence, Independence, and Quality Control

Korea Management Registrar (KMR) is a verification body for the greenhouse gas emissions trading scheme, accredited by the Korea Laboratory Accreditation Scheme (KOLAS) under the National Institute of Technology and Standards of Korea for ISO/IEC 17029:2019 (Conformity Assessment - General principles and requirements for validation and verification bodies), ISO 14067, and additional accreditation criteria, ISO 14065. It is also recognized by the Korea Accreditation Board (KAB) for ISO/IEC 17021:2015 (Requirements for bodies providing audit and certification of management systems), and the National Institute of Environmental Research under the Ministry of Environment of Korea. Additionally, KMR maintains a comprehensive quality control system that includes documented policies and procedures of the KMR EDV 01:2024 (ESG Disclosure Assurance System) based on ISO/IEC 17029 requirements and compliant with IAASB ISQM1:2022 (International Standard on Quality Management 1 by the International Auditing and Assurance Standards Board). Furthermore, KMR adheres to the ethical requirements of integrity, objectivity, professional competence and due care, confidentiality, and professional behavior in accordance with the IESBA Code:2023 (International Code of Ethics for Professional Accountants). Our assurance team consists of sustainability experts. Other than providing an independent assurance, KMR has no other contract with HD Hyundai Energy Solutions and did not provide any services to HD Hyundai Energy Solutions that could compromise the independence of our work.

Limitations of Use

This assurance statement is made solely for the management of HD Hyundai Energy Solutions for the purpose of enhancing an understanding of the organization's sustainability performance and activities. We assume no liability or responsibility for its use by third parties other than the management of HD Hyundai Energy Solutions. The statement is valid as of the assurance date below. Certain events that may occur between the assurance date and the time of reading this report could have a material impact on the report, which may lead to revisions to this assurance statement. Therefore, we recommend visiting the HD Hyundai Energy Solutions website and verifying whether this is the latest version.

June 20, 2025

CEO E. J Hwang

KMR SRV1000 Sustainability Committee Assurance AA1000 Licensed Report 000-129/V3-UKIXL

Greenhouse Gas Assurance Statement

HD Hyundai Energy Solutions., Ltd.

The Korea Management Registrar Inc. (hereinafter "KMR") has conducted the verification on the greenhouse gas (hereinafter "GHG") emission (Scope 1, 2) of HD Hyundai Energy Solutions., Ltd. (hereinafter "the Company") in 2024.

SCOPE

Verification of all places of business and emission facilities under the control of the company.

STANDARDS

· ISO 14064-1:2018, ISO 14064-3:2019
· IPCC Guidelines for National Greenhouse Gas Inventories (2006)
· Operational Guidelines for Reporting and Certification of Emissions in the GHG Emission Trading Scheme
· Verification Guidelines for GHG Emissions Trading Scheme Operation
· Guidelines for GHG Target Management Scheme Operation

PROCEDURE

We conducted a risk analysis approach and on-site verification based on data evaluation, and we identified the appropriateness of the data and factors applied to GHG emission calculations based on objective evidence. The verification team verified the GHG emissions during the reporting period in a reasonable way based on the verification guidelines.

INDEPENDENT

KMR does not have any s take in the ver ified ent ity and does not conduct verificat ion with biased opinions/views. We have drawn an independent and objective verification conclusion based on the verification standards, and reviewed the every aspect of the verification we performed throughout the entire verification process through internal review.

LIMITATIONS

The verification team verified the related reports, information and data presented by the audited institution by sampling or enumeration methods. As a result, there are many inherent limitations, and there may be disagreements in the interpretation of appropriateness. Although we have tried to faithfully perform verification that meets the verification standards, we suggest that errors, omissions, and false statements that could not be found may be latent as the limitations to the verification.

OPINION

· GHG verification has been performed to meet the reasonable assurance level according to the verification standards.
· We express that no significant errors were found in the calculation of emissions during the verification process, and that relevant activity data and evidence were appropriately managed and calculated. As a result, we express an "unmodified" opinion.
· Criticality: meets the criterion, which is less than 5%
· GHGs Emission(All places)

GHGs Emission	Direct emission(Scope1)	Indirect emission(Scope2)	Total(tCO_2-eq)
2024	1,851.425	18,132.492	19,982

Energy Consumption	Fuel	Electricity	Steam	Total(TJ)
2024	23.025	378.729	.276	401

※ Note : There is a difference in the total amount of emissions and emissions by greenhouse gas and by workplace.
(Total emissions are cut to a decimal point for each workplace unit and emissions are summed up for each workplace unit.)

RESULTS

We confirm through verification that the emissions from major emission facilities have been calculated and reported without omission.

※ The abovementioned company is responsible for preparing verification data in accordance with the "Guidelines for Reporting and Certification of Emissions in the Greenhouse Gas Emissions Trading System (Ministry of Environment Notice No. 2021-278)", and KMR's responsibility is limited to the party in the verification contract according to the agreed contract terms. and is not responsible for other decisions, including investment decisions based on this verification statement.
※ The abovementioned company must comply with the use of the certification and logo marks under the contract entered into with KMR.

April 25,2025

CEO E J Hwang

KMR ISO 14064-1 IAF National Institute of Environmental Research

Membership and Online Disclosure

Memberships

Korea Photovoltaic Industry Association (KOPIA)	Korea New & Renewable Energy Association (KNREA)
Korea Environmental Engineers Association – Chungbuk Office	Korea Electrical Contractors Association (KECA)

Awards

Selected as a Top Performer by Kiwa PVEL,
a U.S. certification organization, in June 2024

Online Disclosures

Category	Description
HD Hyundai Energy Solutions Website	Company introduction, investment information, product and dealer listings, online customer support
HD Hyundai Group ESG Website	HD Hyundai Group's ESG policies and updates, indicator-specific data, and sustainability reports
HD Hyundai Group Ethical Management	Hyundai Group's ethical management approach, Code of Ethics, channels for online reporting and counseling
HD Hyundai Group Social Contribution Website	Engagement-centered campaigns that highlight the value of giving by all employees
DART (Electronic Disclosure System, Financial Supervisory Service)	Public disclosures in accordance with listing obligations or voluntary transparency practices
Corporate Briefing	Regular updates on business performance and outlook

Click on the link to open the page.


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