






Hanwha Solutions

Sustainability Report 2022

ABOUT THIS REPORT

The Interactive User Guide

Hanwha Solutions' Sustainability Report is published in an interactive PDF format. Users can visit the corresponding websites and watch videos through the pdf file to enhance their understanding of each issue.

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Report Overview

Hanwha Solutions publishes its Sustainability Report annually to transparently disclose its sustainability activities and performances in terms of the environment, society, and governance and communicate with stakeholders.

Principles on Report Preparation

First, this report has been prepared according to the procedures required under the 2021 Global Reporting Initiative (GRI) Standards and the criteria for preparing global sustainability reports. Second, it reflected recommendations under the Sustainability Accounting Standards Board (SASB) and the Task Force on Climate-Related Financial Disclosures (TCFD) to disclose activities performed to resolve main industrial issues. Third, it abided by the global sustainable management initiative indicators: 10 principles of the UN Global Compact (UNGC) and Sustainable Development Goals (SDGs) of the United Nations (UN). Finally, the financial information of this report was prepared based on the Korean International Finance Reporting Standards (K-IFRS).

Reporting Period

This report indicates the financial and non-financial performance from January 1, 2021, to December 31, 2021. However, some outcomes include the first half of 2022 in terms of the information's materiality and timeliness. Moreover, the quantitative data indicates the performance in the last three years (2019-2021) to allow for annual trend analysis

Reporting Scope

The financial performance stated in this report includes the consolidated financial information of Hanwha Solutions' head office and national and international business sites. The non-financial performance stated in this report focuses on Hanwha Solutions' head office and all national business sites operated by its five divisions.

Report Assurance

The financial data stated in this report has been independently audited by KPMG Samjong Accounting Corp. The non-financial data stated in this report has been independently audited by Korea Management Registrar Inc. to ensure objectivity and reliability.

Contact Point for Report Inquiries

For any inquiries on this report, please contact the ESG Secretariat below:

Department in charge	ESG Secretariat
Contact point	+82-2-729-2700
E-mail	fairlaw@hanwha.com
Address	86, Cheonggyecheon-ro, Jung-gu, Seoul, Republic of Korea
Website	http://www.hanwhasolutions.com

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Introduction

“Sustainable solutions for all, from energy to materials”
Hanwha Solutions makes a better future with distinctive technologies and solutions to provide a sustainable growth for all.

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CEO Message

It has been two years since the outbreak of the global pandemic COVID-19, which still persists up to this day. Various risks have heightened uncertainties in our societies, including but not limited to the war between Ukraine and Russia and headwinds in global supply chains.

Paradoxically, however, the global risks are reminding us once again that humanity is as one, and that we are partners who must stride together hand in hand toward sustainable growth.

Therefore, Hanwha Solutions will fulfill corporate and social responsibilities and roles to settle global matters, including climate crisis and environmental pollution. Furthermore, we will turn crisis into opportunity and go forward to plan a new and brighter future.

We boldly proposed our goal last year to accomplish “Net Zero,” which means no more GHG emissions by 2050.

To this end, Hanwha Solutions plans to expand renewable energy and power, increase the percentage of using clean fuels like hydrogen, and utilize various carbon-neutral technologies.

First, starting from this year, our Ulsan, Eumseong, and Jincheon business sites will participate in the “Green Premium,” a program to purchase power based on renewable energy. Next, we will expand the consumption percentage of renewable energy among our energy mix to 21% by 2030 and 100% by 2050.

With accumulated climate tech, Hanwha Solutions will head toward sustainable growth by resolving the global energy crisis and environmental pollution issues.

In the eco-friendly energy sector, we are purchasing premium photovoltaic (PV) products with high efficiency from especially the US and European markets. Moreover, we are implementing futuristic energy businesses that supply ICT (information and communications technology)-combined renewable energy. In the hydrogen sector, we are securing core technologies, such as water electrolysis and hydrogen storage tank technologies, to take action in the hydrogen market.

We will also speed up our waste plastic recycling project to establish a circular economy and eco-friendly bioplastic research.

Hanwha Solutions will further strengthen our ESG management, focusing on each and every field in the environment, society, and governance. Last year, we established our ESG Committee under the Board of Directors (BOD) and enacted the “Charter of the Corporate Governance Structure” to establish a sound structure for corporate governance.

Meanwhile, we have initiated the Safety and Health Management Committee, which includes external experts as participants to accomplish zero accidents and hazards in business sites. Second, we are advancing our safety and prevention system by establishing the safety management computer system. Finally, we aim to build a safety culture through campaigns and education.

Moreover, we are expanding ESG (environmental, social, and governance) education and support programs to reinforce our suppliers’ sustainability competency and have acquired the ISO 37301 certificate for the international organization for standardization for the compliance management system.

Dear respectable stakeholders,

We, Hanwha Solutions, promise to grow as a company that provides technological solutions for energy and materials and jump up as a leading global company that paves the way for a brighter future.

We hope our stakeholders, including but not limited to our employees, shareholders, suppliers, and communities, will join and support us to overcome challenges and achieve innovation.

Thank you.

June 29, 2022
CEO Koo Yung Lee






Company Profile

Company Overview

As of the end of March 2022

Company	Hanwha Solutions Corporation
Established in	1965
CEO	Koo Yung Lee, Du Hyoung Ryoo, Dong Kwan Kim, Eun-Soo Kim, Yi Hyeon Nam
Head office location	Hanwha Building, 86, Cheonggyecheon-ro, Jung-gu, Seoul, Republic of Korea
Credit rating (corporate bonds)	Korea Ratings AA- (stable) Nice Information Service AA- (stable)
Main businesses	<ul style="list-style-type: none"> Chemical Division Producing Korea's first Polyvinyl Chloride (PVC) and petrochemical industry-based products, such as Polyolefin (PO), Toluene Diisocyanate (TDI), and Chlor-Alkali (CA)
	<ul style="list-style-type: none"> Qcells Division Providing smart solutions from Photovoltaic (PV) modules and systems, PV plants, to electric power retail
	<ul style="list-style-type: none"> Advanced Materials Division Research and development (R&D) and production of automotive materials, solar materials, electronics materials, and hydrogen tanks to lead the future mobility industry
	<ul style="list-style-type: none"> Galleria Division Providing premium distribution services in department stores, fashion, and food and beverage businesses
	<ul style="list-style-type: none"> Insight Division Developing renewable energy, large-scale real estate, and premium housing as a comprehensive developer

Established in 1965, Hanwha Solutions' five divisions create a harmonious synergy effect and provide solutions in various fields through differentiated technologies and innovation. It aims to make a better future for humanity and the earth by leading sustainable business growth through smart, eco-friendly solutions.

Hanwha's spirit	Trust and Loyalty				
	<p>"Trust" – faith that is created when promises that need to be kept, are kept. "Loyalty" – placing great value on every relationship and doing your part on your own initiative</p>				
Core values of Hanwha employees	 CHALLENGE	 DEDICATION	 INTEGRITY		
	<p>Instead of settling for the existing standards, people with the spirit of a challenger pursue the best that come from changes and innovation.</p>	<p>People who demonstrate dedication try their best for the greater good while thinking highly of relationships with companies, customers and colleagues</p>	<p>People of Integrity act properly based on principles and their sense of pride.</p>		
Vision	Sustainable solutions for all, from energy to materials				
Mission	We aim to deliver sustainable solutions for the planet through smart energy solutions and customer-focused materials.				
Business Statement	Chemical Division We push the boundaries of what's possible and develop customer-centric solutions to lead the way to a sustainable future.	Qcells Division A company that creates a greener future through 100% clean and 100% ethical energy solutions	Advanced Materials Division As a global leader with advanced lightweight composites and film materials, we're developing sustainable solutions that make the world a better place.	Galleria Division We are a premium content producer that delivers on leading global trends and a differentiated customer experience as the premier retailer in South Korea.	Insight Division A total solution expert that develops Future Energy Platforms

A Top-Tier Company Providing Added Value by Distinctive Technologies and Solutions

Since its establishment in 1965, the Chemical Division has contributed to raising the quality of human life. It was the first company in Korea to produce Polyvinyl Chloride (PVC) along with basic petrochemical products, including but not limited to Polyethylene (PE), Chlor-Alkali (CA), and Toluene Diisocyanate (TDI). It pursues continuous growth as a creative and competitive chemical leader from basic petrochemical materials to high-value-added businesses, including the eco-friendly plasticizer Eco-DEHCH, hydrogenated hydrocarbon resin (H-HCR), and specialty isocyanate (XDI). Moreover, it fulfills eco-friendly corporate responsibilities by developing eco-friendly technologies and products, such as recycling waste plastics and biochemical. Based on its leading technological edge, the Chemical Division puts shared growth with clients as its top priority. It will grow into a competitive global eco-friendly company by adding value and enhancing the competitiveness of unit prices for its products.



No.1 Premium Contents Producer

Since its founding in 1976, Galleria Division has specialized in retail services throughout Korea, and now currently has five stores within the major cities across Korea: Seoul, Suwon Gwanggyo, Daejeon Time World, Cheonan Center City, and Jinju. The Galleria Luxury Hall was Korea's first to introduce the concept of a luxury goods store and boasts a line-up of the most luxurious brands in Korea. It is now Korea's flagship premium department store that provides high-end global brand curations and the highest level of VIP services. Along with the Galleria Luxury Hall, the Galleria network includes second-to-none local department stores representing each region in Korea and provides trendy brands, high-quality food culture, contents, and innovative interior designs for differentiated customer experiences.



A renewable solution provider of clean power

Under the "Completely Clean Energy" slogan, Qcells Division will continue producing clean energy and a clean world to benefit humanity. Being a total global solutions provider of PV products, it has not only built and operated plants for the midstream sector required to produce PV cells and modules but also secured a downstream value chain for electric power retail. It is an active player in the global market.



An advanced-materials tech company that shares growth with customers

The Advanced Materials Division has an innovative lineup of products and technology in the fields of lightweight composite materials, solar materials, electronic materials, and hydrogen tanks. We have established local production and R&D centers in North America, Europe, China, and South Korea. Such connections have enabled us to expand our trusted partnership with various global partners.



Korea's No. 1 Developer of Green Energy with Premium Expertise

For a fresh start, Insight Division has integrated the existing City Development Division, the Renewable Department of the Qcells Division, and the Galleria Division, a premium lifestyle provider. Based on each division's expertise, including green energy, smart green complex, and premium lifestyle, it has established a platform and created a new business model and value through an integrated value chain of planning, development, operation, and financial instruments. It is no longer a traditional developer as it is growing into a total solutions expert focusing on the integrated development of various fields, from renewable energy to premium lifestyles.



Financial Key Figures

Hanwha Solutions implements sustainable management with various stakeholders to create a shared value.

Based on the consolidated financial statements as of 2021, the company has recorded KRW 10,725.2 billion of sales and has shared KRW 13,719.2 billion with stakeholders, including but not limited to clients, shareholders, investors, and employees, to contribute to creating economic and social values.

2019–2021 Management Performance

(Unit : KRW 100 million)

Total assets



Sales



Operating profits

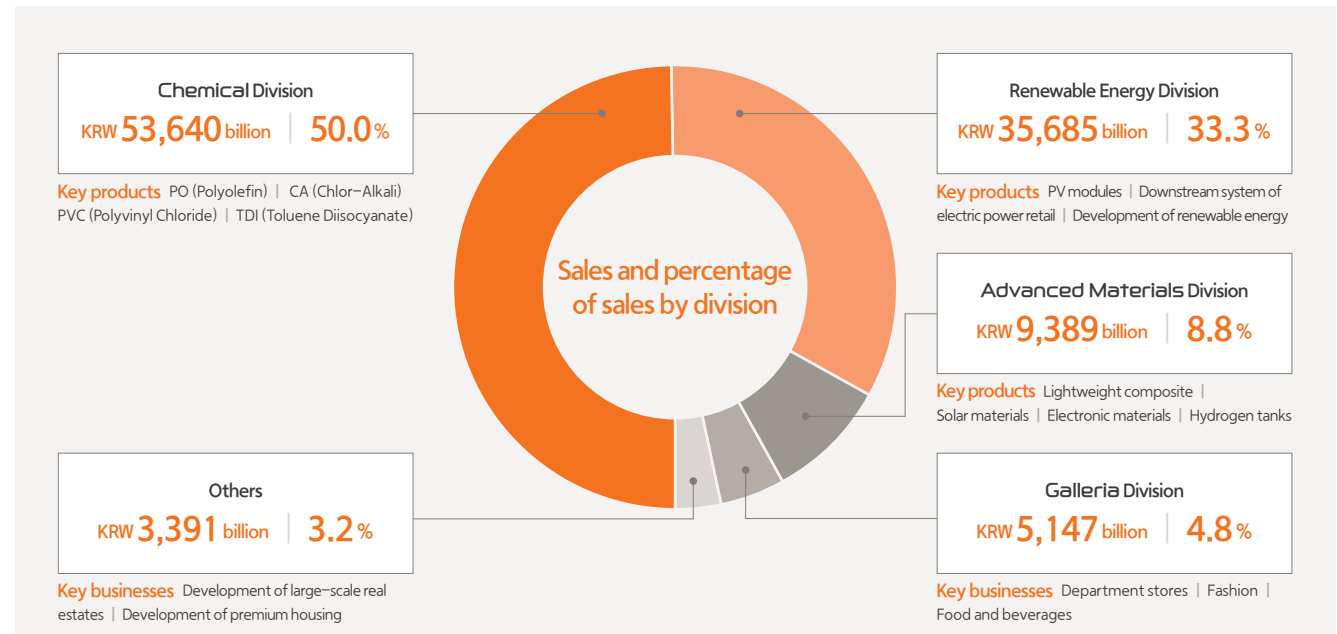


Operating profit rate



2021.12.31. Based on consolidated financial statements

Sales and Percentage of Sales by Division



Status of the creation and distribution of economic value

(Unit : KRW 1 million)

Classification	Calculation criteria	2021
Companies	Acquisition of tangible assets	474,300
Clients	Sales	7,395,685
Shareholders/Investors	Interest costs	88,373
Employees	Salary + Welfare + Retirement benefits	763,354
Suppliers	Purchase costs + Outsourcing service costs	4,822,489
Community	Donations	3,976
Government	Tax and public imposts + Corporate taxes	171,051

Global Network

Chemical Division



- Domestic Network** 10 Points – Head Office, Hanwha Solutions Chemical Division R&D Institute, Yeosu Production Site, TDI Production Site, Ulsan 1 Production Site, Ulsan 2 Production Site, Ulsan 3 Production Site, Daegu Branch Office, Busan Branch Office, and Gwangju Branch Office
- Global Network** 8 Points – Asia: Hanwha Chemical (Ningbo) Co., Ltd., Hanwha Chemical (Shanghai) Co., Ltd., Hanwha Chemical Corporation Beijing Representative Office, Hanwha Chemical Corporation Guangzhou Representative Office, Hanwha Chemical (Thailand) Co., Ltd., Hanwha Chemical Malaysia Sdn.Bhd, Hanwha Chemical India Pvt. Ltd.
– Middle East: International Polymers Company (IPC)

Qcells Division



- Domestic Network** 5 Points – Head Office, Hanwha Solutions Corporation (EumSeong Plant), Hanwha Solutions Corporation (JinCheon Plant), Pangyo R&D Center, Gasan R&D Center
- Global Network** 12 Points – Asia: Hanwha Q CELLS (Qidong)Co., Ltd., Hanwha Q CELLS Malaysia Sdn. Bhd., Hanwha Q CELLS Japan Co., Ltd.
– Americas: Hanwha Q CELLS America, Inc., Hanwha Q CELLS USA Corp., Hanwha Q CELLS USA, INC., Hanwha Q CELLS Canada, Corp., Hanwha Q CELLS Chile SpA
– Europe/Middle East: Hanwha Q CELLS GmbH, Hanwha Q CELLS France SAS, Hanwha Q CELLS Turkey
– Oceania: Hanwha Q CELLS Australia Pty Ltd

Advanced Materials Division



- Domestic Network** 6 Points – Head Office, Sejong Office, Eumseong Plant, Busan Office, Research Center, and Lightweight Composite Material Development Center
- Global Network** 11 Points – Asia: Hanwha Advanced Materials Shanghai Co., Ltd., Hanwha Advanced Materials Beijing Co.,Ltd., Hanwha Advanced Materials Chongqing Co., Ltd.
– Americas: Hanwha Advanced Materials America LLC, Hanwha AZDEL, Inc., Hanwha Advanced Materials Mexico S.De R.L. De C.V., North America Business Center(NABC), Hanwha Cimarron
– Europe: Hanwha Advanced Materials Europe, s.r.o., Hanwha Advanced Materials Germany GmbH, Europe Business Center

Galleria Division



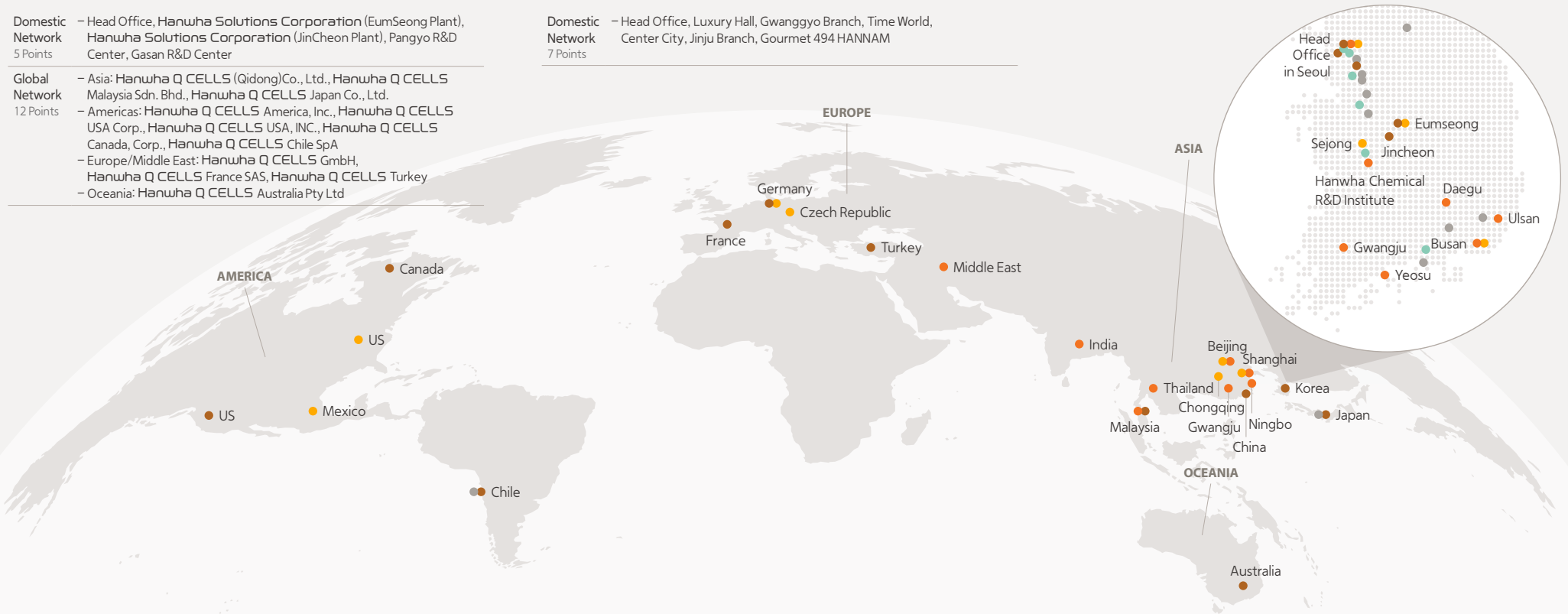
- Domestic Network** 7 Points – Head Office, Luxury Hall, Gwanggyo Branch, Time World, Center City, Jinju Branch, Gourmet 494 HANNAM

Insight Division



- Domestic network** 9 Points – Gimhae Techno Valley, Yongin Techno Valley, Anseong Techno Valley, West Ochang Techno Valley, 2nd Yongin Techno Valley, H Techno Valley, Ulsan KTX Station Area Complex, Pungho and Jangcheon Districts of Changwon, Chuncheon Jade (Jade Palace, Jade Garden)
- Global Network** 7 Points – Asia: TMK A, TMK B (Japan subsidiaries)
– Americas: Cabrero, Centauro, San Alberto, Caldera, Chequen (Chile corporation)

* Urban development projects implemented in the Insight Division refer to ongoing projects



ESG Highlights

Hanwha Solutions aims to create future growth engines by meeting the various ESG requirements of stakeholders, developing world-class eco-friendly technologies, and service innovation.

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ESG Management

ESG Management System

Under the vision of “Sustainable Solutions for All,” Hanwha Solutions pursues to establish environmental, social, and governance (ESG) management in a long-term view amid a rapidly changing global business environment for sustainable growth. Accordingly, it collects various stakeholder opinions, plans the direction of sustainable management, and fulfills such plans to contribute to creating not only economic values but also social and environmental values.

ESG Management Governance

Hanwha Solutions has installed an ESG Committee under the Board of Directors (BOD) to enhance the effectiveness and transparency when implementing ESG management at a company level. The ESG Committee deliberated and reported four agendas regarding ESG management, including the Report on Measures to Accomplish 2050 Net Zero in 2021, and has been holding the ESG Committee once every quarter. Hanwha Solutions also operates the ESG Secretariat, a working-level organization, to support activities assigned to the ESG Committee. ESG-related elements, including climate change, safety, human resources (HR), and quality, have been categorized into eight modules and are designated based on the degree of expertise and relevance to each department in charge. Each department takes full responsibility for fulfilling its roles.

Status of ESG Committee Meetings

Date of meeting	Agenda details
2021.5.11	Bill on the nomination of the ESG Committee Chairperson
2021.7.29	Report: Bill on the Report on the Progress of ESG Management
2021.10.28	Report: Bill on the publication of the Sustainability Report
	Report: Bill on the Report on the Measures to Accomplish 2050 Net Zero



ESG Management Organization



Main Activities and Performance of ESG Management

Hanwha Solutions transparently discloses each sector of environmental, social, and governance (ESG) management from 2021 to the first half of 2022 to fully execute its corporate and social roles and responsibilities.

<p>Environmental</p>	<p>Responding to 2050 Net Zero</p> <ul style="list-style-type: none"> • Disclosing the roadmap for 2050 Net Zero • Participating in K-RE100 and K-EV100 • Issuing green bonds (four in 2021) • Signed an MOU on reducing carbon with the Korea National Park Service 	<p>Developing eco-friendly technologies</p> <ul style="list-style-type: none"> • Developing carbon molecular sieves (CMS) technologies • Developing eco-friendly materials and rPE packaging materials by waste recycling • Expanding investments in food technology companies, such as New Age Eats, Finless Foods, and DaNAGreen 	<p>Expanding eco-friendly products</p> <ul style="list-style-type: none"> • Acquired the Environmental Product Declaration (EPD) on 30 products, including Eco-DEHCH and EVA products • Acquired France's Carbon Footprint (CFP) on PV modules • Implementing the LCA on key products • Executing the "Right!EARTH," "Right!cREdit" campaigns 	<p>Key Certificates and Awards from 2021 to the First Half of 2022</p> <ul style="list-style-type: none"> • Acquired the Honors Awards in the carbon management sector from the CDP (Carbon Disclosure Project) Korea Awards • Nominated as an excellent company in the energy and materials sector for ESG management • All department stores of the Galleria Division certified as green stores by the Ministry of Environment • Accomplished No. 1 in market share for housing and business PV modules in the US in 2021 • Accomplished No. 1 in Germany's 2022 Life & Living Awards for three consecutive years in the photovoltaic (PV) sector • Qcells Division nominated as the "Top Performer" for six consecutive years in the 2021 PV Module Reliability Scorecard by PV Evolution Labs (PVEL) • Acquired ISO 37301 for its certified compliance management system • Acquired ISO 37001 for its certified anti-bribery management system
	<p>Internalizing the safety culture</p> <ul style="list-style-type: none"> • Declaring the goal of "realizing a workplace with zero accidents and hazards" • Launching the Safety and Health Management Committee • Enacting the Safety Golden Rules • All workplaces being 100% certified by ISO 45001, the safety and health management system 	<p>Strengthening communication with customers</p> <ul style="list-style-type: none"> • Participated in the "JEC WORLD 2022," an international composite materials exhibition in Paris, France • Participated in "Intersolar Europe 2022", the largest PV exhibition in Europe 	<p>Co-existence and win-win growth with suppliers</p> <ul style="list-style-type: none"> • Signing MOUs to support ESG assessment for small and medium-sized enterprises (SMEs) • Signing MOUs for collaboration in the ESG sector to support eco-friendly startup company 	
	<p>Securing sound governance</p> <ul style="list-style-type: none"> • Establishing the ESG Committee under the BOD • Enacted the charter of corporate governance • Established the mid- to long-term policy for shareholder returns • Announcing performance quarterly and establishing the Non-Deal Roadshow (NDR) 	<p>Establishing a transparent corporate culture</p> <ul style="list-style-type: none"> • Distributing legal compliance guidelines and reviewing checklists • Completed taking measures on all received reports of ethical/compliance violations • Ethical and compliance training completed by all employees 	<p>Managing and responding to risks in advance</p> <ul style="list-style-type: none"> • Enacted risk management regulations at the company level • Operating risk councils and dedicated departments under the BOD • Strengthening ESG risk management 	
<p>Social</p>				
<p>Governance</p>				

2021 External ESG Assessments



Class A-



Overall grade A



Straight A

ESG Investing

Roadmap for ESG Investments

In March 2021, Hanwha Solutions has acquired the Green Financing Framework Certificate for meeting the international guidelines—Green Bond Principles 2018 and the Green Loan Principles 2020—from Sustainalytics, an ESG risk rating institution. Hanwha Solutions plans to expand investments to continuously create eco-friendly values especially through its Qcells Division, the leader of the PV business, and will consistently propel procurements of ESG investments.



Post Report for ESG Investments

In 2021, Hanwha Solutions has procured three green bonds in foreign currency based on the second party opinion (SPO) for green and sustainability bonds by Sustainalytics. For green bonds in domestic currency (KRW), Hanwha Solutions has complied with the Green Bond Principles (GBP), Social Bond Principles (SBP), and Sustainability Bond Guidelines (SBG) established and enacted by the International Capital Market Association (ICMA), along with methodologies stipulated under the green bond guidelines by Korea's Ministry of Environment. Furthermore, its green bonds in Korean won (KRW) have been certified by external rating agencies (Korea Ratings and Nice Information Service).

Issuance Status of Green Bonds in 2021

Green bonds in foreign currency

- In April 2021, Hanwha Solutions issued CNY 1 billion of green bonds (guaranteed by Credit Guarantee and Investment Facility (CCIF) – To refund previous loans (investment loans of Hanwha Q CELLS(Qidong) Co., Ltd., the PV cell/module producer) to Hanwha Q CELLS Co Ltd., the holding company of the PV business
- In September 2021, Hanwha Qcells Malaysia Sdn. Bhd. issued MYR 150 million (guaranteed by CCIF) – For Hanwha Q CELLS Malaysia Sdn. Bhd., the producer of PV cells and modules, to finance facility investments
- In October 2021, Hanwha Solutions issued EUR 100 million of green bonds (guaranteed by Shinhan Bank) – For financing of the acquisition of RES Méditerranée, a French renewable energy company

Green bonds in KRW

- In June 2021, Hanwha Solutions issued KRW 100 billion of publicly subscribed, no-warranty ESG bonds – To refund facility funds of Hanwha Solutions Qcells Division (JinCheon Plant 2)



Double Materiality Assessment

Hanwha Solutions introduced a double materiality assessment system regarding critical issues of corporate sustainability in social and environmental views and all risks that may incur a crucial impact on corporate finance. Hanwha Solutions drew ESG issues reflecting social, environmental, and financial impacts by collecting various opinions of stakeholders. Such impacts will be actively reflected in corporate management activities.

We noted 15 reported ESG issues in business activities through the double materiality assessment system, selected Top 5 priority core ESG issues, and provided a detailed report containing only core activities, performances, and goals.

Double Materiality Assessment Process



Report on the Results of the Double Materiality Assessment

Governance

Environmental

Social

Core Issue	ESG issues	Level of impact			Stakeholders				Page of report	Related GRI
		Social/ Environmental	Financial	Employees	Clients	Shareholders/ Investors	Suppliers	Community		
Governance	Expanding business portfolio centered on future growth and strengthening R&D for new technologies	●	●	●	●	●	●	●	20–23	Non GRI
	Securing sound governance	●	●	●	●	●	●	○	58–61	2–9~14
	✓ Reinforcing compliance and ethical management	●	●	●	●	●	●	●	28–30, 62–64	2–27
	Protecting companies' core technologies and client information	●	●	●	●	●	●	○	68–69	418–1
Environmental	✓ Promoting activities to accomplish net zero and climate change response activities	●	●	●	●	●	●	●	16–19, 80–87	201–2, 302, 305–1~5
	✓ Complying with environment-related regulations and managing harmful chemicals and air pollutants	●	●	●	●	●	●	●	30, 35–37, 72–73	305–7, 306
	Water stewardship and management of water pollutants	●	●	●	●	●	●	●	36, 72	303
	✓ Establishing strategies to develop clean technologies and expanding investment	●	●	●	●	●	●	●	20–22	Non GRI
	Establishing a virtuous resource circulation system and expanding relevant activities	●	●	●	●	●	●	●	23, 37–38	306–2
Social	Attracting key talents and strengthening employees' abilities	●	●	●	○	●	●	●	43–44	404
	Creating a corporate culture that encourages the diversity of employees and respects human rights	●	●	●	●	●	●	●	46–47	405, 406
	Fair performance evaluation and compensation	●	●	●	○	●	○	○	45	404–3
	✓ Strengthening the occupational safety and health system to respond to serious accidents	●	●	●	●	●	●	●	24–27, 39–41	403
	Managing sustainable supply chains (e.g., transparent selection of suppliers, responsible procurement of raw materials)	●	●	●	●	●	●	○	51–53	414
Responsible product management (managing the quality and safety of goods and services)	●	●	●	●	●	●	●	48–50	416	

Sustainable Solutions

“Sustainable Solutions, Sustainable Tomorrows”

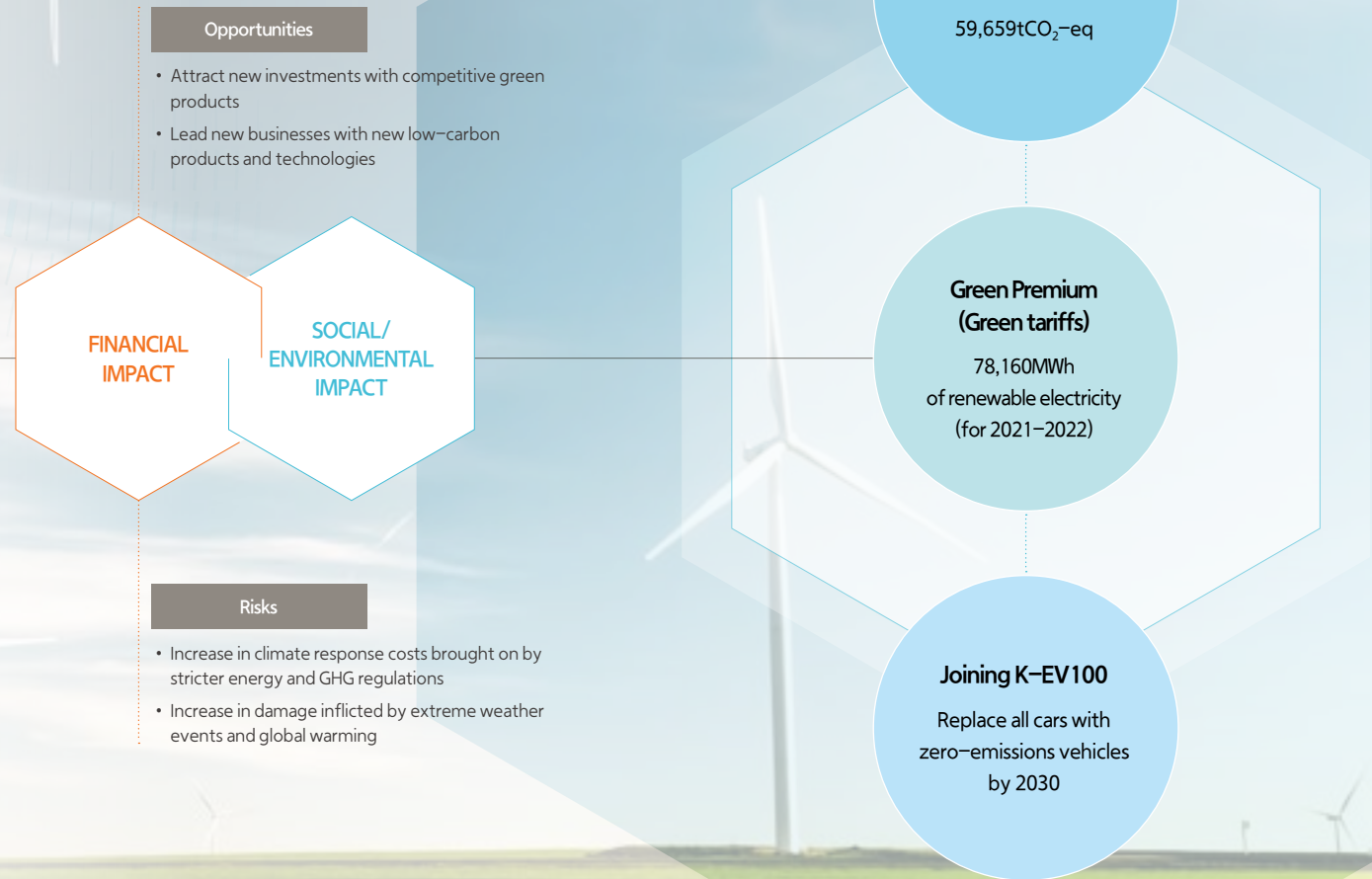
Hanwha Solutions builds a cleaner future with cutting-edge green technologies, and leads the efforts for a better tomorrow for nature and humanity.



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SUSTAINABLE SOLUTIONS 1

2050 NET ZERO PATHWAY

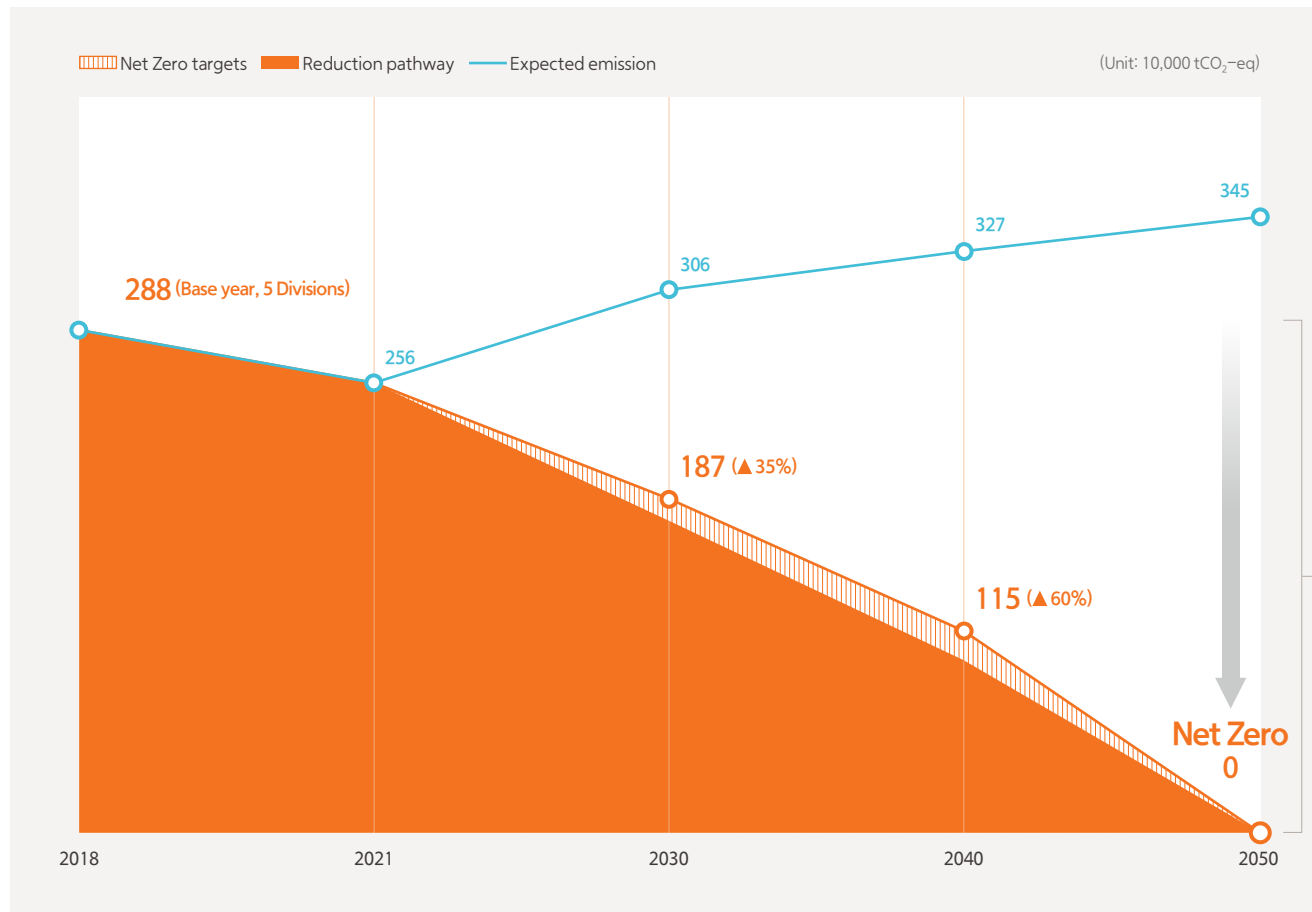


Issue Approach

Climate change poses a challenge to all mankind and demands enhanced corporate responsibility for environmental agendas. Hanwha Solutions will turn the crisis into a new business opportunity to provide meaningful and sustainable solutions.

2050 Net Zero Roadmap

To achieve net zero by 2050, Hanwha Solutions plans to reduce GHG emission to 35% below the 2018 emissions by 2030, and 100% by 2050. We are engaged in company-wide efforts to achieve the targets, including joining K-RE100 for renewable energy transition, replacing fossil fuels with hydrogen-based fuels, and actively developing carbon capture, utilization, and storage (CCUS) technologies.



2050 Net Zero Strategy

Scope 1, 2 (Direct and indirect emission)	1 Increase energy efficiency > 10% or higher <ul style="list-style-type: none"> Reduce yearly energy consumption by at least 0.5%, by improving energy intensity through adopting high-efficiency facilities, improving processes, and optimizing operations
	2 Use renewable electricity (K-RE100) > 70% or higher <ul style="list-style-type: none"> Transition to green power from renewable energy sources 21% by 2030, 37% by 2040, and 100% by 2050
	3 Transition to hydrogen-based fuel > 15% or higher <ul style="list-style-type: none"> Build infrastructure to achieve 100% transition by 2040 using self-produced hydrogen Procure and produce Hydrogen mixed steam or 100% Hydrogen combustion steam
	4 Carry out carbon capture/utilization and reduction projects > 5% or higher <ul style="list-style-type: none"> Capture CO₂ from incinerators and facilities unviable for fuel transition, and turn it into raw materials using autonomously-developed conversion technologies Carry out R&D projects to achieve commercial application by 2035 Use offset programs to improve reduction results and contribute to national emission reduction
Scope 3 (Value chain)	5 Adopt green fuels and build a circular economy <ul style="list-style-type: none"> Reduce emission by adopting biomass-based fuels Reduce supply chain carbon emission by recycling plastic waste

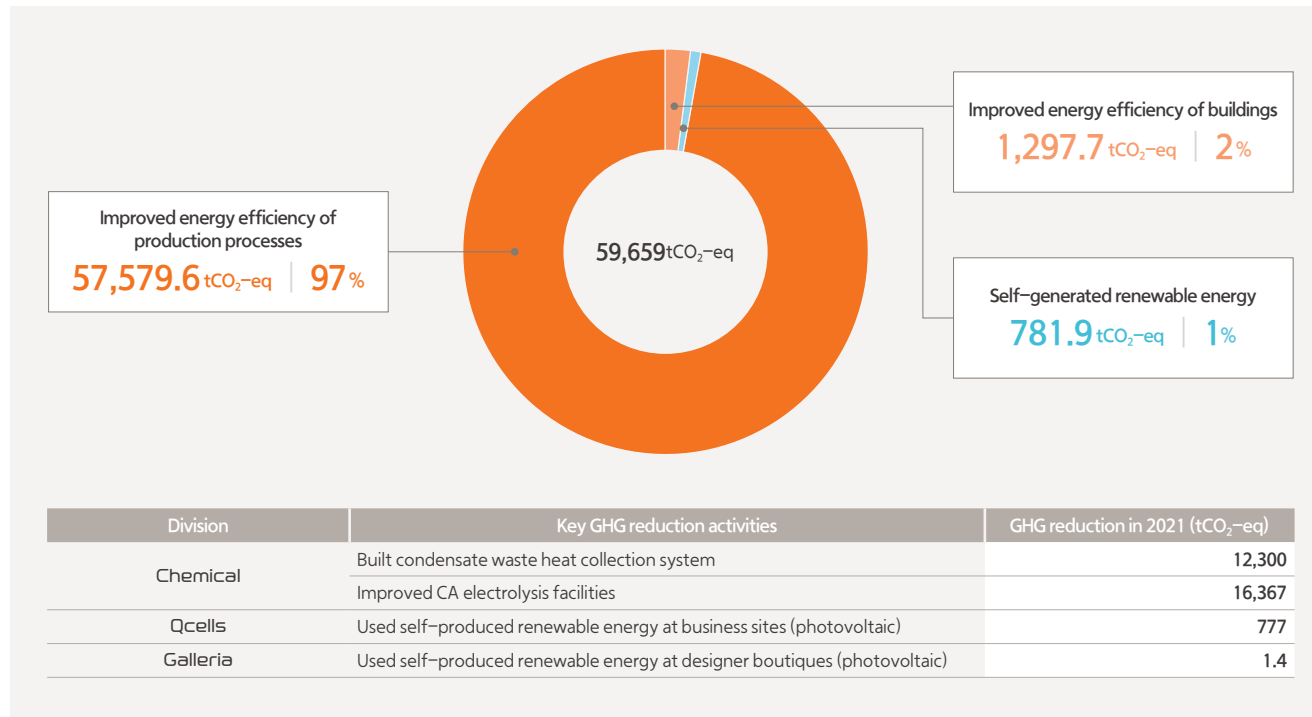
Climate Response Activities in 2021

Key GHG Reduction Activities in 2021

In 2021, Hanwha Solutions reduced GHG emission by 59,659tCO₂-eq by improving energy efficiency in its buildings and production processes and producing renewable energy.

The Chemical Division built a condensate waste heat collection system and improved on the CA electrolysis facilities. The Qcells and Galleria Divisions reduced GHG emission by adopting photovoltaic energy at business sites and using self-produced renewable energy at designer boutiques.

GHG Reduction in 2021



SPECIAL CASE

CDP 'Carbon Management Sector Honors'



Hanwha Solutions received 'Carbon Management Sector Honors' at the CDP Korea Climate Change & Water Awards ceremony 2021 by the Carbon Disclosure Project (CDP), a world-renowned sustainability management organization. Classified as Leadership (A-) grade, the Company gained credit for expanding into renewable businesses such as solar, wind and green hydrogen storage / distribution and ramping up the development of Plastic to Chemicals (PTC) technology and bioplastic technology.

Hanwha Solutions will continue its climate response efforts across all businesses and achieve 2050 Net Zero through green energy projects and material/technology innovations.

Climate Response Activities in 2021

Joining K-RE100 and K-EV100

Hanwha Solutions became the first Korean renewable energy firm to join the K-RE100 (Korean Renewable Energy 100%) initiative. The Chemical and Qcells Divisions joined the Green premium program (Green tariffs) of the Korean government, and purchased 76,160MWh of renewable energy in 2021 and 2022. In order to achieve its K-RE100 targets faster, the company is also considering numerous options to increase its renewable energy rate from 1% to 21% by 2030, 37% by 2040, and 100% by 2050 using photovoltaic, green hydrogen, and CCUS technologies.

Hanwha Solutions also joined the K-EV100 (Korean Electric Vehicle 100%) campaign, the Korean project for a transition into non-polluting vehicles. The campaign aims to replace all vehicles owned/rented by businesses with electric or hydrogen cars by 2030.



Carbon Molecular Sieve (CMS) Development

The Chemical Division is currently working on technologies to indigenize the production of carbon molecular sieves (CMS), a black pallet-shaped material capable of selectively absorbing and separating gas molecules (such as CO₂) from industrial gas. The project forms a part of the Korean government's about KRW 6 billion '2021 Carbon Industry Base Development Project.' Hanwha Solutions signed an MOU with the Korea Evaluation Institute of Industrial Technology, and plans to work with Aspe, the Korea Carbon Industry Promotion Agency, the Korea Institute of Industrial Technology, and the Korea Institute of Convergence Textile, to complete the assurance procedure for the pilot facilities by 2025.

Hanwha Solutions plans to develop carbon molecular sieves (CMS), thereby boosting the efficiency of CO₂ capture, utilization, and storage (CCUS) technology, and use CMS as the main material for achieving 2050 Net Zero.



SPECIAL CASE

MOU for Net Zero and Nature Preservation with the Korea National Park Service



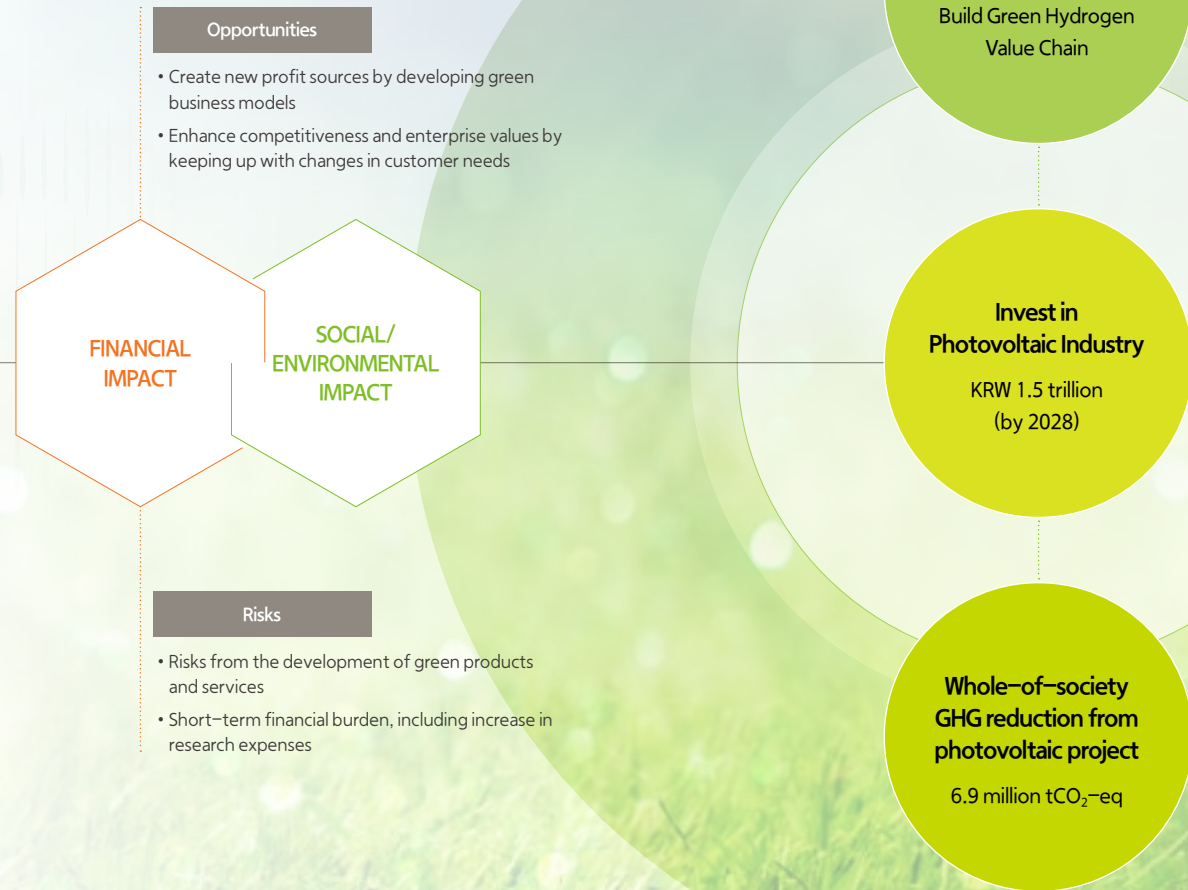
National parks take up 6% of Korea's total lands. Absorbing 3.2 million tons of CO₂ every year, they serve as a massive green carbon storage. However, climate crisis and air pollution pose a grave challenge to national parks. Hanwha Solutions signed an MOU with the Korea National Park Service, and pledged to provide various solutions to protect national parks and their nature. The company plans to reduce carbon emission and protect park ecosystems, and build an ESG cooperation model for more sustainable national parks.

Hanwha Solutions' Three Solutions for Carbon Reduction for National Parks

- 1 Increase green energy sources based on photovoltaic technology
- 2 Recruit researchers and provide research funds to key climate change research facilities
- 3 Improve energy efficiency and living environment at villages in national parks

SUSTAINABLE SOLUTIONS 2

GREEN BIZ INNOVATION



Issue Approach

COVID-19 and lifestyle changes drove value-driven consumption and ethical consumption, which raised the demand for green products and services.

Hanwha Solutions is mindful of how its activities affect the environment and committed to developing new green business models and creating sustainable environments.

Green Technology

'Virtuous Hydrogen Cycle' through Electrolysis Technologies

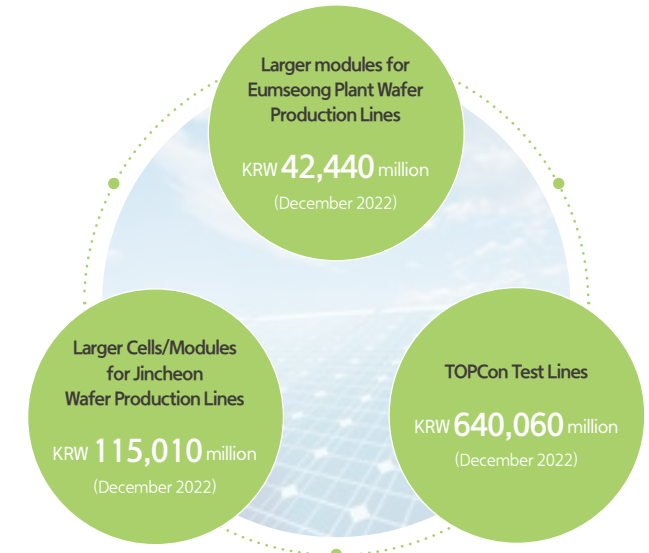
Hanwha Solutions is actively engaged in research on the anion exchange membrane electrolysis cell (AEMEC) technology, to take the lead in the hydrogen market. Water electrolysis creates hydrogen and oxygen by electrolyzing water. It is a core technology for creating green hydrogen without carbon emission.

Hanwha Solutions has strengthened its hydrogen value chain, in which Qcells Division produces renewable energy using photovoltaic and wind power systems, the Chemical Division uses electrolysis to mass-produce green hydrogen, and securely store and transport the hydrogen in type-4 hydrogen tanks made of advanced plastic composites. Hanwha Solutions plans to stay ahead in the hydrogen production and storage sectors, and enhance its competitive edge as a global top-tier company.



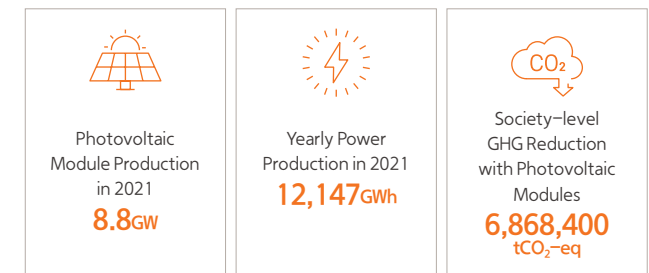
KRW 1.5 Trillion Investment to Stay Ahead in the Next-Gen Photovoltaic Market

The Qcells Division invested KRW 157.4 billion in its Jincheon and Eumseong plants to build production lines for large wafers, and invested another KRW 64 billion in tunnel oxide passivated contact (TOPCon) facilities. The new cell lines powered by the high-efficiency TOPCon technology will provide the company with Korea's largest cell production capacity of 5.4GW, and the company plans to begin TOPCon cell production starting in 2H 2022. The company will continue to expand its photovoltaic production facilities and invest KRW 1.5 trillion in R&D efforts by 2025, to improve its competitive edge and standing in the photovoltaic market. Hanwha Solutions has the largest shares in leading photovoltaic markets in the United States, Europe, and other regions. The company leads the global market with its enhanced photovoltaic cell-module value chain. In recognition of its thorough quality control, high-quality products, and proactive customer services, in 2021, Hanwha Solutions was named 'Top Brand PV' in Europe and Australia, which is the company's eight and sixth consecutive win, respectively.



Society-level GHG Reduction with Photovoltaic Modules

In order to fulfill its social responsibility as a global business and minimize the effect of climate change, Hanwha Solutions promotes eco-friendliness with its photovoltaic modules, and proactively participates in GHG reduction efforts.



* Production calculated based on the carbon emission coefficient of plants in each country, and the average peak daylight hours.

SPECIAL CASE

Hanwha Motiev, an Electric Vehicle Charging Service

The Qcells Division took a step further from its photovoltaic power plant business, to launch an electric vehicle charging service called Hanwha Motiev. Hanwha Motiev builds charging infrastructure, and provides customers willing to install charging stations with comprehensive services including consulting, investment, operation, and maintenance. The company plans to expand its customer base starting with parking garages at Hanwha buildings and commercial buildings, installing 2,000 to 3,000 charging systems (including fast charging systems) by 2022.



Hanwha Solutions Announces New Qcells Brands

On April 5, 2022, the Qcells Division redefined its missions and core values, and renewed its new slogan, brand identity, and product identities, to achieve a sustainable future. Hanwha Solutions continues its efforts to build a greener tomorrow, promote ESG values, and become a truly green company.



Green Investment

Investment in Novoloop for a Plastic Circular Economy

Hanwha Solutions was one of the co-investors who invested USD 21 million in Novoloop, a startup based in California, United States. Novoloop is the owner of the Oistre™ technology, which decomposes polyethylene (PE) into raw materials and uses them to produce green thermoplastic polyurethane (TPU). Hanwha Solutions plans to expand its green technology portfolio by investing in ‘climate techs’ designed to upcycle plastic wastes while drastically reducing CO₂.

Investment in Food Tech Company

Hanwha Solutions has invested in various food tech firms including New Age Eats (formerly New Age Meats), a substitute meat startup in the United States, Finless Foods, which develops cell-cultivated tuna, and DaNAGreen, a Korean cultivated meat startup. In response to the growing interest in health and animal rights issues, Hanwha Solutions will lead in the investment, and development of the alternative food market.

Investment in Lancium, a Data Center Power Management Startup in the US

In November 2021, Hanwha Solutions spent USD 100 million (approx. KRW 120 billion) to partially acquire Lancium Technologies, a United States startup specializing in datacenter power management. The acquisition will allow Hanwha Solutions to combine its renewable energy capabilities and Lancium’s know-how in IT-based power management, through which the company plans to build a new business model for stable supply and production of green energy and accelerate its transition into a ‘future energy business.’

Increased Share in REC Silicon, a US Polysilicon Producer

In March 2022, Hanwha Solutions purchased a 4.67% share of REC Silicon from Norway’s Aker Horizons for USD 44 million, which increased its share from the previous 16.67% to 21.34% and made the company the largest shareholder. REC Silicon operates two plants in the United States that produce special gases and polysilicon. It is renowned for its ‘clean polysilicon’ production powered by hydroelectric energy, which leaves little carbon footprint.

As the largest shareholder, Hanwha Solutions will improve the company’s price competitiveness through rapid and strategic decision making, and actively engage in efforts to increase the demand for photovoltaic products. In addition, by securing green polysilicon production capabilities for photovoltaic power generation, Hanwha Solutions has built a system for achieving ‘completely clean energy.’

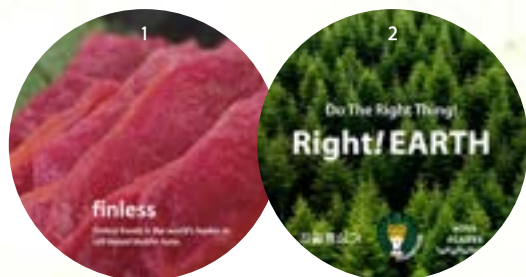
Green Consume

‘Right!EARTH’, ‘Right!cREdit’ Project

The Galleria Division has initiated a wide range of efforts to promote green consumption, including the ‘Right!EARTH’ project in 2021. Galleria Department Stores encourage customers to join pro-environmental activities such as using ‘ecobags’ or shopping bags, using tumblers and personal containers, and doing away with disposable products. The Galleria Division also launched the ‘Right!cREdit’ project, which provides ‘G Cash’ or adds VIP scores based on customers’ contribution to pro-environmental activities.

Key Activities of the ‘Right!EARTH’ Project

- Display and sell upcycled products
- Display artworks using photovoltaic energy
- Sell air-purifying plants for carbon reduction
- Display and sell collaboration products with eco-friendly designers



- 1 Food Tech
- 2 ‘Right!EARTH’ Project


Green Product

Successful domestic production of EBA for Ultra High Voltage Cables

The ethylene butyl acrylate (EBA) market is rapidly growing, driven by the increasingly higher demand for ultra high voltage cables with high energy efficiency required for net zero, renewable energy infrastructure, and the replacement of old power grids. The **Chemical** Division successfully indigenized the semi-conductive materials used for ultra high voltage cables, and plans to commercialize the product.

The EBA is highly resistant to heat and moisture, and offers superb protection against electrical damage, which made it a popular choice for ultra high voltage cables (110kV or higher). Korea uses more than 6,000 tons of EBA each year, which means that **Hanwha Solutions'** EBA may generate import substitution effects worth KRW 15 billion. The company plans to combine EBA with cross-linked polyethylene (XLPE), an insulation material for power loss prevention, into a package, and use it to secure company presence in key overseas markets.

Hanwha Solutions EBA (Ethylene Butylacrylate Copolymer)

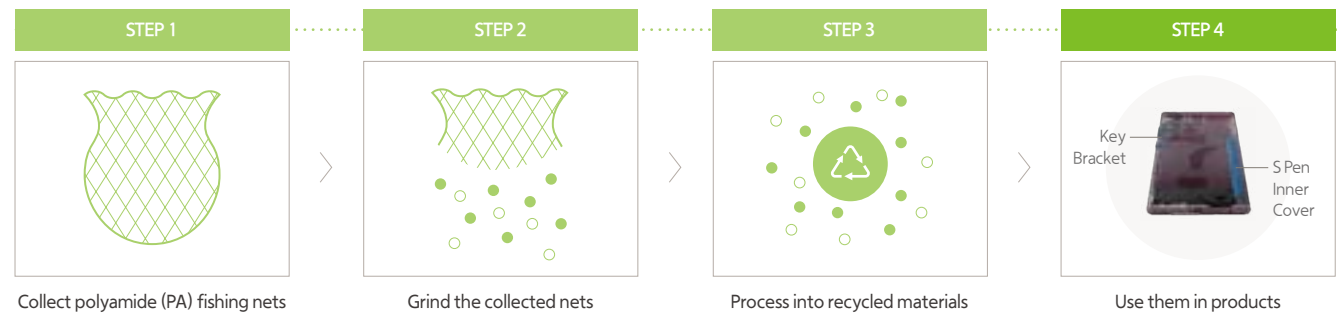


Insulator (XLPE)
prevents power loss

Inner/outer semi-conductive layer
Blocks electricity and prevents discharging (around 60% of EBA)

High-value materials with excellent heat/moisture resistance	Offers superb protection against electrical damage	Used in ultra high voltage cables (110kV or higher)
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Recycling of Marine Plastic



Development of Green Materials

Green Materials Recycled from Marine Wastes

Hanwha Compound, a fully owned subsidiary of **Hanwha Solutions**, succeeded in mass-producing pellet-type green materials from abandoned fishing nets in the ocean. The materials are used in **Samsung's** latest smartphone models. Most of these fishing nets are made of polyamide (PA), or 'nylon,' which becomes brittle after prolonged exposure to seawater and ultraviolet rays. **Hanwha Compound** found a way to grind and process them into recycled materials, to be used in products. The company subsequently obtained an ocean bound plastic (OBP) certification from UL, an international certification body, for the material's durability, eco-friendliness, and applicability to electronic devices.

R&D for Green Packing Materials

As part of its ESG management efforts, **Hanwha Solutions** signed an MOU for joint development of green packing materials with **Mirae Well Life**, a Korean personal care product manufacturer, and **DITEC**, a packing film manufacturer. In the MOU, the companies stated their vision to replace more than half of the packing materials for personal care products with green materials by 2030. **Hanwha Solutions** and **DITEC** plan to improve the quality of materials recycled from plastic waste, and use the materials to develop green packing materials. **Mirae Well Life** has pledged to use the developed materials in its key products including its 'all's well' tissues. **Hanwha Solutions** also declared a goal to use recycled polyethylene (rPE) in 80% of industrial packing bags produced in its Yeosu and Ulsan plants by 2030 for higher resource cycle efficiency. The company plans to develop more green PE materials with wide applications as cosmetic containers, industrial packing materials, and packing materials for household supplies, etc.

SUSTAINABLE SOLUTIONS 3

SAFETY WORKPLACE



Issue Approach

The enactment of the Serious Accidents Punishment Act poses higher regulatory and management risks from safety accidents. Hanwha Solutions works with its employees and partners to create safer workplaces and foster a sustainable corporate culture.

Accident- and Disaster-free Workplaces

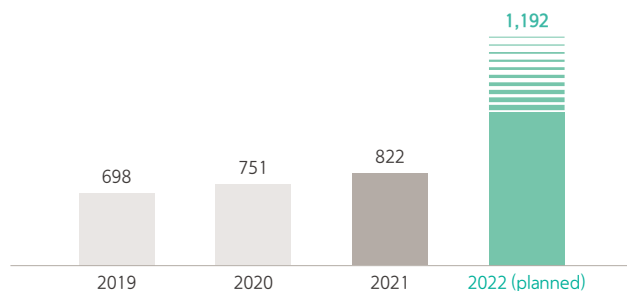
Safety, Health, and Environment Management System

In February 2022, Hanwha Solutions organized a declaration ceremony where the company declared its safety, health, and environment goals designed for better safety for employees, citizens, and the social environment, as well as goals to achieve accident- and disaster-free workplaces. The company took a step further from its existing disaster control framework to promote safety, health, and environment as its core management goals and create an organizational culture where everyone voluntarily complies with the rules. Each plant digitalized its safety diagnosis system and built systems for monitoring and providing rapid response to fires, gas leaks and other accidents, as well as smart disaster prevention platforms capable of detecting and addressing risk factors through AI-based data collection and analysis powered by IoT sensors. In addition, in 2021 alone, the company spent KRW 82.2 billion on safety and health projects. It plans to further increase the investment by 45% (KRW 119.2 billion) to manage and prevent safety and health risks at workplaces.



Safety and Health Investment/Spending

(Unit : KRW 100 million)



Safety, Health, and Environment Management Goals

Achieve accident- and disaster-free workplaces and net zero

- 01 Foster a mature safety culture where everyone voluntarily complies with safety rules, on the basis of an advanced safety, health, and environment management system
- 02 Remove potential causes of accidents to achieve accident- and disaster-free workplaces and continue to offer activities to promote employees' health
- 03 Promote a virtuous resource circulation and optimal energy use across all operations to achieve net zero directly related to human survival, and continue to reduce pollutants to create green workplaces
- 04 Actively communicate and engage with employees, partners, customers, local residents and stakeholders to enhance the company's system for safety, health, and environment cooperation

Safety and Health Management Committee

For fundamental prevention of occupational accidents, Hanwha Solutions organized the Safety and Health Management Committee tasked with building a safety and health management system, monitor and improve on the system's operation, and discuss the overall operation of safety and health management activities.

The Safety and Health Management Committee consists of internal members including the CEO, Production Safety Coordinator, and plant unit heads. In addition, the company appointed leading experts such as Professors Chi-nyon Kim, Hyuck-myun Kwon, and Woo-bum Lee as external experts to ensure objective and meaningful safety and health management activities. Each year, Hanwha Solutions develops and reports Safety and Health Plans and key decisions to the Board of Directors for approval.



Activities to achieve safe workplaces

Safety Golden Rules

Hanwha Solutions enacted the Safety Golden Rules for on-site employees to prevent accidents caused by human factors, thereby improving their safety and health management capabilities as well as safety culture and awareness across the company value chains including the head office, plants, and partners.

Safety Golden Rules

- 1 Obtain a permit to work and check safety measures before work
- 2 Wear appropriate protective equipment depending on the area and task type
- 3 Suspend all work in case danger is detected
- 4 Remove all flammables from the workplace before hot work and measure gas density on a regular basis
- 5 Measure oxygen/gas densities on a regular basis in confined spaces
- 6 Cut off power before power system maintenance
- 7 Remove and label hazardous chemical substances before work
- 8 Wear a safety harness and lock snap hooks during elevated work



Safety Leadership Building

The Chemical Division seeks the internalization of the 'safety mindset' by improving the safety capabilities of leaders at each level. It works with expert organizations to define concrete roles and actions of executives, team leaders, specialized/shift managers and other leaders, and develop and implement possible improvements. The company also evaluates teams and partners across various safety/health/environment management activities including accidents, compliance with management systems, and participation in self-management activities, and select outstanding teams and partners in different categories for safety, health, and environment awards. These activities are designed to foster a safety culture where leaders actively engage in safety management activities and all members of the organization voluntarily comply with the rules.

Direction of Change for Safety Leadership



Accident Prevention Campaign

The Ulsan and Yeosu plants instituted safety awareness campaigns for executives, employees, and partners to prevent industrial accidents and raise safety awareness. During the campaign, plant unit heads and executives gathered before the working hours to share reminders for conducting safe work and spread messages for safe work practices and compliance with safety rules by making banners, pickets, and promotional materials. The two plants also distribute safety leaflets and operate monthly Safety Knowledge Levelup programs.



Galleria Safety Campaign

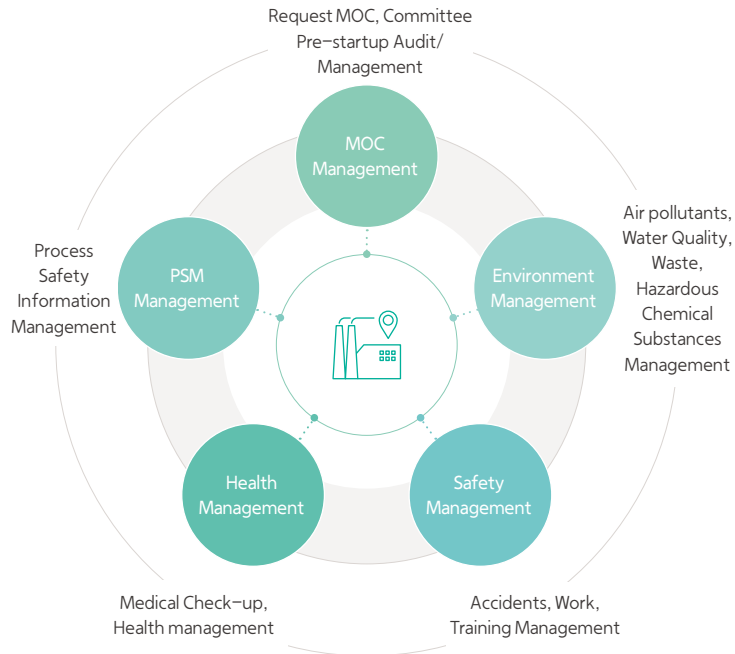
The Galleria Division launched a safety campaign to raise the safety awareness of executives, employees, and partners, prevent accidents, create pleasant work environments, and build a mature safety culture. The Galleria Division set out seven rules for safety, health, and environment compliance, and posted the rules at key locations within each establishment to encourage voluntary compliance. The Galleria Division spares no effort to foster safe work environments, build healthy workplaces, and reestablish itself as a department store trusted by all.

Activities to achieve safe workplaces

Digital-Based Safety Environment Management System

Hanwha Solutions built an enterprise-wide safety, health, and environment (SHE) online portal in an effort to stay ahead in the age of digital transformation (DT). The company built a scientific and advanced decision making system based on data analysis to ensure rapid sharing of information, and automated SHE tasks for improved productivity. It also preemptively detects and removes SHE-related risk factors.

SHE Portal System



TDI Plant: Lightning Protection System Certification

In recent years, the legal requirements for appropriate lightning protection systems (LPS) have attracted increasing attention, in relation to the Chemical Division Substances Control Act and the Act on the Safety Control of Hazardous Substances, etc. As such, TDI Plant of Hanwha Solutions has steadfastly worked on removing or minimizing lightning risks within workplaces to ensure stable operation of the plant.

The plant received a plant lightning rod safety inspection by the Korea Electrical Safety Corporation (KESCO) in September 2019, followed by preparations to obtain an LPS certification between May and December of 2020 including new and improved lightning rods at substations and control rooms, and 17 new low-voltage main panel surge protector devices (SPDs). KESCO inspected the improvements during the final review conducted between May and June of 2021, and issued an LPS certification on August 2, making the TDI plant the third LPS-certified plant in Korea.



TDI Plant
KESCO Certification Ceremony

Ulsan 2 Plant: PSM Grade 'P'

After obtaining Grade 'S' in 2020, Hanwha Solutions has steadfastly worked toward improving its process management system (PMS) grade by organizing a task force for PMS re-evaluation, and identifying/addressing on-site risk factors. As a result, in October 2021, Ulsan 1, 2, and 3 Plants obtained the highest grade (P).

Under the PMS framework, business owners preemptively identify and remove risk factors that may cause serious industrial accidents, and manage its processes and facilities in a systemic and steadfast manner. Each plant is granted one of four grades (P/S/M+/M-) based on employee interviews (including the plant unit heads), on-site inspection, and document reviews regarding the 12 elements of the PSM. Hanwha Solutions will continue to enhance safety practices and effectiveness of all executives and employees to achieve safe workplaces.

SUSTAINABLE SOLUTIONS 4

REGULATORY COMPLIANCE



Issue Approach

Ethical and compliance issues may pose serious risks for a company's business activities.

Hanwha Solutions is a global company that complies with all laws and regulations in Korea and other countries and fulfills its social roles and responsibilities. The company strives to foster a clean and ethical corporate culture.

Efforts to foster a compliance culture

Hanwha Solutions Compliance Activity Goals

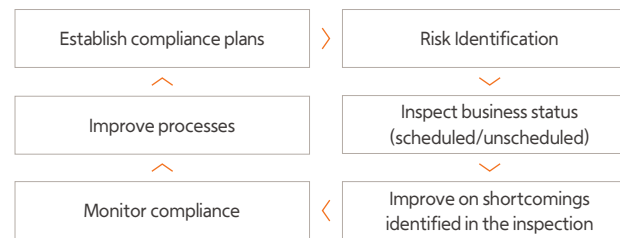
Hanwha Solutions prevents risks by raising employees' compliance awareness through various compliance activities including compliance training and inspection, while striving for sustainable growth by improving management stability.

Carry out compliance-related activities

New/revised laws in Korea and overseas	Key Points	Activities and Outcomes of Hanwha Solutions
<p>Fair Transactions in Subcontracting Act (implemented on February 18, 2022)</p>	<ul style="list-style-type: none"> Requires a non-disclosure agreement and defines detailed terms of the agreement. Allows courts to order submission of documents, and expands the scope of retained documents 	<ul style="list-style-type: none"> Revised the regulations on the operation of the voluntary internal transaction committee for tighter enforcement rules, in keeping with the amendment to the Monopoly Regulation and Fair Trade Act Expands the scope of internal control by adding mandatory review in trading with overseas affiliates Established a compliance training system to ensure compliance and raise ethical and compliance awareness Requires executives and employees to receive training on relevant statutes (Fair Transactions in Subcontracting Act, Monopoly Regulation and Fair Trade Act, and Improper Solicitation and Graft Act) and practical aspects of response to industrial safety accidents
<p>Three Fair Economy Acts (implemented on December 30, 2021)</p>	<ul style="list-style-type: none"> Revised the Commercial Act to prevent uncontrolled abuse of major shareholders' rights, protect minor shareholders' rights and interests, and improve the transparency of corporate decision making structures Revised the Monopoly Regulation and Fair Trade Act to prevent the abuse of market power by large conglomerates, rationalize the enforcement system, and support innovation-driven growth, in line with the demand for fair competition 	
<p>Foreign Corrupt Practices Act (FCPA) (revised on July 3, 2020)</p>	<ul style="list-style-type: none"> Expanded the scope of anti-bribery provisions Statute of limitations for FACA violation (6 years for violations of accounting provisions) Greatly expanded the scope of sanctions and jurisdiction, and published the 2nd edition of the FCPA Resource Guide 	

Hanwha Solutions complies with the ethical principles as well as the relevant laws and regulations to maintain a healthy competition and fulfill its role as a corporate citizen as it operates.

Compliance Operation Process



Key Directions of Compliance Activities

Raise compliance awareness	<ul style="list-style-type: none"> Compliance training Compliance letters Information on newly enacted and revised laws/regulations
Enhance Risk Prevention	<ul style="list-style-type: none"> Standardize key contracts Risk control functions: risk verification, evaluation, and measures at each department
Improve management stability	<ul style="list-style-type: none"> Stricter internal transaction committee minimize the possibility of unfair support or other issues Stricter legal reviews against transactions requiring board approval Enhanced compliance programs (CPs) for fair trade laws/regulations
Improve trust	<ul style="list-style-type: none"> Compliance system certification management

Compliance Guidelines and Checklists

Hanwha Solutions has established the compliance guidelines and checklists tailored to the company's businesses to encourage compliance management in daily tasks.

Key Guidelines and Checklists

- Changes in key statutes and important court decisions
- Checklist for preventing abuse of superior positions under the Monopoly Regulation and Fair Trade Act
- Checklist for compliance with the Fair Transactions in Subcontracting Act
- Manual on response to industrial safety accidents
- Manual on response to supplier rehabilitation/bankruptcy
- Regulations on the management of account receivables

Compliance Efforts for Environmental Management

Hanwha Solutions prevents risks by monitoring ever-changing requirements under the relevant laws and regulations in Korea and other countries. In particular, the company seeks to enhance its sustainable management capabilities by monitoring, responding to, and complying with the latest changes in global regulations related to GHG reduction, environment impact, and safety and health.

Carry out compliance activities related to SHE

New/revised laws in Korea and overseas	Key Points	Activities and Outcomes of Hanwha Solutions								
<p>Framework Act On Carbon Neutrality And Green Growth For Coping With Climate Crisis (implemented on March 25, 2022)</p>	<ul style="list-style-type: none"> Declared the national 2050 carbon neutrality vision and set medium/long-term national GHG reduction targets Businesses are required to reduce GHG emission to 40% below the 2018 emission by 2030 	<p>In November 2021, Hanwha Solutions declared its 2050 Net Zero target before the implementation of the Framework Act On Carbon Neutrality And Green Growth For Coping With Climate Crisis to raise awareness on the climate crisis and join the relevant efforts of the global community. The company is working toward systemic achievement of the net zero target, and plans moving toward a green production structure.</p>								
<p>Act on the Control and Aggravated Punishment of Environmental Offenses (implemented on February 19, 2021)</p>	<ul style="list-style-type: none"> Provides for aggravated punishment, control, and prevention of environmental pollution and damage 	<p>In order to prevent damage caused by environment pollution, Hanwha Solutions provided all executives and employees with training focusing on the seriousness of the pollution issue and the need for strict management of environmental facilities. In addition, the company continues to identify and implement improvements through company-wide environment sessions and inspections, and reviews and requires each production team to manage its facility operations on a regular basis using its own environment facility review checklist.</p>								
<p>Integrated Environmental Management (implemented on January 01, 2017)</p>	<ul style="list-style-type: none"> Provides for investigation and analysis of the impact (additional pollution/total pollution) of pollutant emission on nearby environments (air/water) Implemented in five phases on businesses subject to integrated environmental management, starting in 2017 	<p>Hanwha Solutions has established the principles and standards for environmental management aligned with the environment laws/regulations/policies/practices in Korea and other countries, and conducts annual environmental management reviews through its environment-energy system, thereby measuring and managing environmental impact from business sites. In addition, for improved management of hazardous materials, the company strictly manages hazardous materials used in products and other materials used by product plants in accordance with the international standards and initiative. In particular, in December 2002, the company established its own hazardous material management standards (for four major heavy metals) to protect workers' safety and health and minimize the impact on the global environment and ecosystems by preemptively responding to hazardous materials regulations in Korea and other countries (Industrial Safety and Health Act, Chemicals Management Act, EU REACH, etc.).</p> <p>Acquisition Status for Integrated Environmental Permits</p> <table border="1" data-bbox="954 1193 2085 1289"> <thead> <tr> <th colspan="2">Chemical Division</th> <th>Advanced Materials Division</th> <th>Qcells Division</th> </tr> </thead> <tbody> <tr> <td>Yeosu 3 and Ulsan 2 Plants (obtained in 2021)</td> <td>Yeosu 1/2, Ulsan 1/3, and TDI Plants (scheduled for 2022)</td> <td>Sejong Plant (scheduled for 2023)</td> <td>Jincheon Plant (scheduled for 2024)</td> </tr> </tbody> </table>	Chemical Division		Advanced Materials Division	Qcells Division	Yeosu 3 and Ulsan 2 Plants (obtained in 2021)	Yeosu 1/2, Ulsan 1/3, and TDI Plants (scheduled for 2022)	Sejong Plant (scheduled for 2023)	Jincheon Plant (scheduled for 2024)
Chemical Division		Advanced Materials Division	Qcells Division							
Yeosu 3 and Ulsan 2 Plants (obtained in 2021)	Yeosu 1/2, Ulsan 1/3, and TDI Plants (scheduled for 2022)	Sejong Plant (scheduled for 2023)	Jincheon Plant (scheduled for 2024)							
<p>Serious Accidents Punishment Act (implemented on January 27, 2022)</p>	<ul style="list-style-type: none"> Mandates corporate management executives to ensure the safety and healthy life of all workers at their business sites Responsible management executives are punishable for serious accidents caused by their failure to fulfill their safety and health requirements 	<p>Following the enactment of the Serious Accidents Punishment Act in 2021, Hanwha Solutions revised the relevant procedures and regulations through external consulting, and established the organizations to implement safety and health measures. In addition, the company sought to improve its compliance practices by providing the relevant training to executives and employees. Hanwha Solutions will continue to reduce the risks of serious accidents, and respond to possible accidents based on the response manual to prevent exacerbation and ensure rapid response.</p>								

ESG Performance

Hanwha Solutions will expand its sustainable value through active and authentic corporate activities by pursuing a diverse portfolio, through continuous service improvement using creativity and competitiveness in technological innovation.

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ENVIRONMENTAL

Hanwha Solutions strives to reduce damages to the natural environment and build a sustainable society. We endeavor to provide green solutions for all, by constantly pursuing technological development and innovating our products.

KEY PERFORMANCE

SHE Management System and Investment	Environmental Management	Safety and Health Management
Declaring goals of Safety, Health & Environment (SHE) management Achieve accident- and disaster-free workplaces 	All plants ISO 14001 certified 	Safety and Health Management System (ISO 45001) 100% certification rate 
Safety, Health & Environment (SHE) Establishing a decision-making process 	30 products Acquired Environmental Product Declaration 	Safety and Health of Manufacturing Plants Promotion of internalization activities 
Investment in Safety, Health & Environment (SHE) in 2021 KRW 132.6 billion 	Eco-friendly sales in 2021 KRW 639.8 billion 	Health check-up for employees, etc. in 2021 9,243 persons 

SHE Management System and Investment

Safety, Health and Environment (SHE) Management System

SHE Management Strategy

Hanwha Solutions has established an environment which respects and values health and safety and prioritizes them in its corporate management strategy. This is necessary for sustainable development and the fulfilment of social responsibility. As a result, in 1991 – for the first time in Korea – we announced and promoted ECO-YHES, a safety and environmental activity program, which was utilized company-wide.

In February 2022, we announced a new set of Safety, Health and Environment (SHE) goals and policy. The policy states that we must realize an accident- and disaster-free workplaces and net zero which would apply both internally and externally. We have systemized and are carrying out SHE management according to the PDCA cycle required by the ISO.



KEY PERFORMANCE

Declaring goals of Safety, Health & Environment (SHE) management



Achieve accident- and disaster-free workplaces

Safety, Health & Environment (SHE)



Establishing a decision-making process

Investment in Safety, Health & Environment (SHE) in 2021

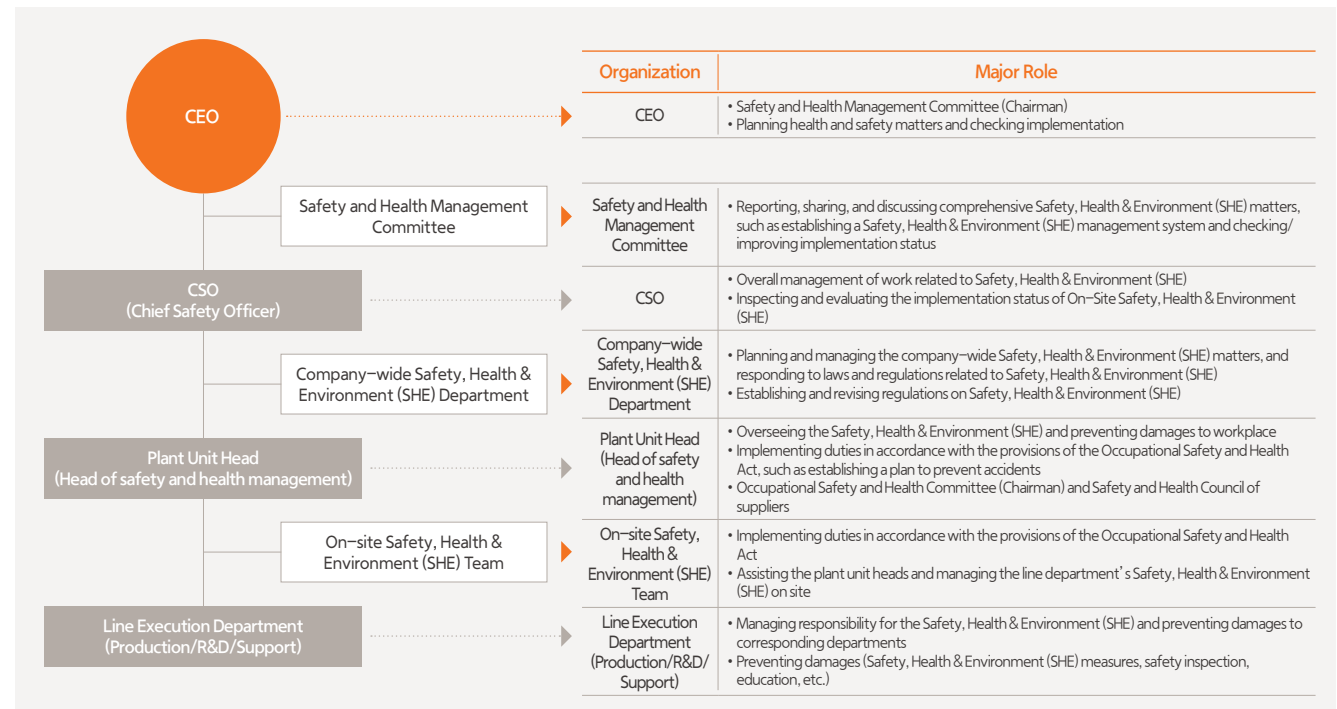


KRW 132.6 billion

To reach its goal of sustainable business management, Hanwha Solutions regards SHE management as its top priority. To do this, the company works earnestly to maximize SHE performance by strengthening the SHE management system, and by attracting active investment into it.

SHE Management Organization

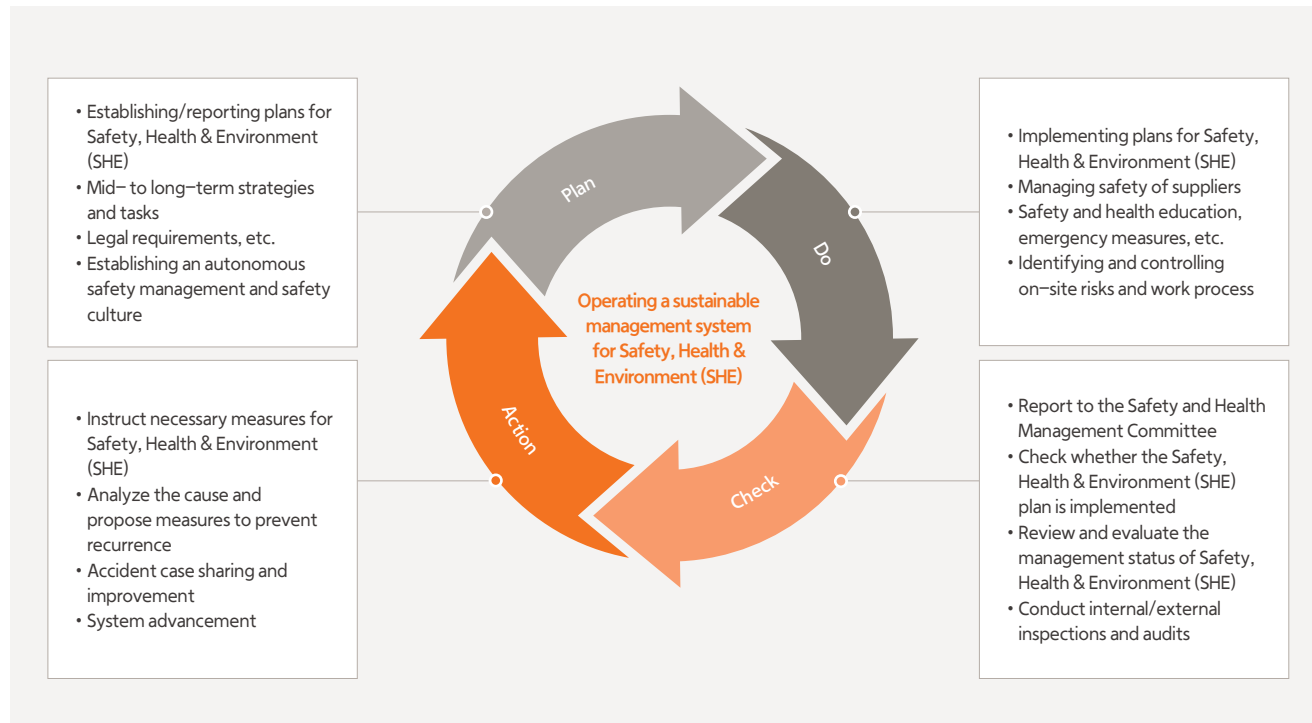
Hanwha Solutions has strengthened the company-wide Safety, Health & Environment (SHE) governance system, with the view of building a safe and environment-friendly workplace. The operation of an independent Safety, Health & Environment (SHE) organization led by the Chief Safety Officer (CSO) guarantees rationality and objectivity in decision-making, while promoting compliance with the law and prevention of accidents. In particular, with the CEO as the chairperson, we regularly conduct activities to prevent and mitigate accidents. To do this, we operate the Safety & Health Management Committee (SHMC), which consists of the CSO, as well as company-wide Safety, Health & Environment (SHE) executives, Plant Unit Heads and outside experts.



Operating the SHE Management System

Hanwha Solutions establishes autonomous standards that are stricter than the requirements of domestic and international laws. This is to operate a sustainable management system for Safety, Health & Environment (SHE) based on an advanced system and strong execution process. In addition, in accordance with the PDCA Cycle required by ISO, we are systematically implementing the SHE management. Through periodic inspection and certification by external experts, we review and continuously improve the effectiveness and adequacy of the system.

Operating a management system based on systematic Safety, Health & Environment (SHE)

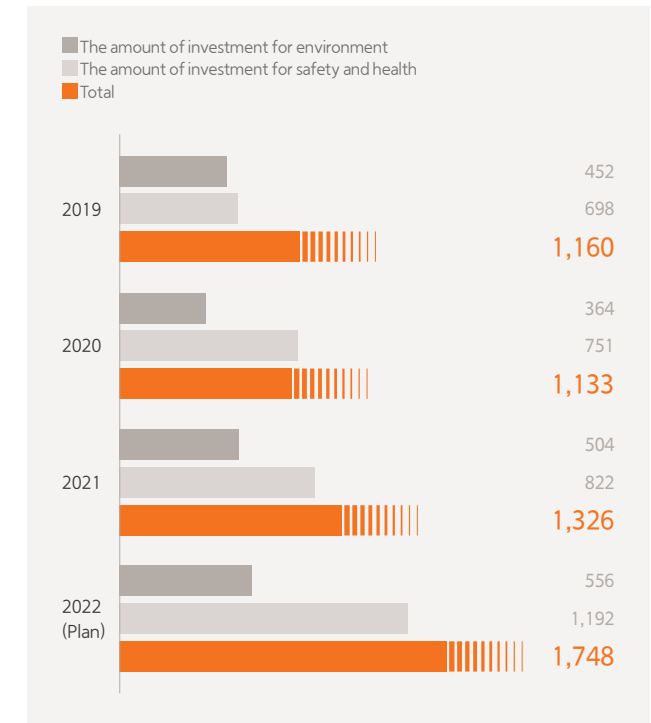


Investment and Expenditure for SHE Management

Hanwha Solutions will continue to invest every year to improve the Safety, Health & Environment (SHE). In 2021, a total of KRW 132.6 billion was invested to eliminate and prevent accident risk factors such as installation of emission reduction facilities for environmental pollutants, replacement of old facilities, supplementation of firefighting facilities, and improvement of working environment. Furthermore, we are planning an investment of KRW 174.8 billion.

Expenses for Safety, Health & Environment (SHE)

(Unit : KWR 100 million)



Environmental Management

Environmental Management Strategy

Environmental Management System (ISO 14001) Certified

Since certified by ISO 14001, a global environmental management system standard, Hanwha Solutions has consistently maintained the plant-wide standard compliance level. Furthermore, to further solidify the environmental management system, we plan to expand the scope of certified plants such as research institutes.

Division	ISO 14001 Certification Status
Chemical	• 8 plants including Plant 1/2/3 in Yeosu, TDI Plant, Plant 1/2/3 in Ulsan
Qcells	• Jincheon Plant, Eumseong Plant 2
Advanced Materials	• Sejong Plant, Eumseong Plant, Busan Plant
Galleria	• Luxury Hall, Gwanggyo Branch, Center City Branch, Jinju Branch

KEY PERFORMANCE

All plants

ISO 14001 certified



30 products

Acquired Environmental Product Declaration



Eco-friendly sales in 2021

KRW 6,398 billion



Hanwha Solutions makes every effort to develop eco-friendly technologies and continuously improve the environment, creating a sustainable future through environmental management.

Environmental Performance Management

Hanwha Solutions is actively promoting environmental management with the goal of minimizing environmental impacts and improving the company's sustainability. In addition, we are managing and improving the performance through the internal/external evaluation system of environmental performance.

Every year, we set a target to reduce per unit GHG emissions, and in particular, reducing air & water pollutants and waste by 3% of per unit to manage reduction performance. In addition, we reduced pollutants emission by installing Low NOx Burner and establishing wastewater monitoring infrastructure to reduce these in 2021.

In particular, the Chemical Division of Hanwha Solutions has been conducting company-wide environmental sessions under the supervision of executives in charge of production safety twice a year since 2020 to minimize environmental risks and preemptively respond to them. Through the environmental session, 99 improvement tasks were identified, of which 65 were completed as of 2021, and we will continuously discover and complete the tasks. In addition, we try to prevent environmental accidents and comply with laws and regulations by conducting periodic environmental inspections on-site under the supervision of the head office.

Environmental Performance and Goals of Hanwha Solutions

KPIs	Unit	Goals in 2021	Performance in 2021	Goals in 2022
Greenhouse gas (GHG) emission intensity	tCO ₂ -eq/ KRW 100 million	38.7	34.1	33.1
Air pollutant (NOx, SOx and dust) emission intensity	kg/KRW 100 million	3.27	2.7	2.62
Water consumption intensity	ton/ KRW 100 million	245.5	245.1	237.8
Waste disposal intensity		0.64	0.53	0.51

On the basis of annual intensity

3% reduction target

Managing Environmental Pollutants

Air Environment Management

Hanwha Solutions is establishing a management system for and monitoring air pollutants and odor-causing substances generated at plants. By installing a Telemetry System (TMS) in the process facility, we are constantly measuring and managing the air pollutant emissions. In addition, we continuously minimize air pollutant emissions by periodically implementing LDAR (Leak Detection And Repair) activities on non-point pollutant sources which may leak. In addition, consultation for reducing odor-causing substances is in process and being applied in stages.

Water Management

Hanwha Solutions operates its own water quality analysis laboratory at each plant to check the properties (pH, TOC, SS) of wastewater generated by each process on a daily basis.

We analyze pollutant emissions in real time through the establishment of wastewater monitoring infrastructure, and strictly monitor the concentration of hazardous substances in water to keep it within 30% of the legal limit at all times, through measures such as installing CCTVs and emergency water tanks in the final wastewater and rainwater outlets to prevent the discharge of harmful substances. For sustainable water use, we are constantly monitoring countries and regions with a high level of water stress as suggested by the World Resources Institute (WRI) when operating the business, and it is confirmed that there are currently no regions with such high level.

Management of Soil Contamination

To prevent soil contamination caused by waste generated in the production process and to protect the surrounding ecosystem, Hanwha Solutions regularly conducts soil contamination inspections for each plant. In the case of specific substances under control that may cause soil contamination, it is recommended that a separate storage facility be installed, and soil contamination is frequently tested to minimize the impact on the soil.

Waste Management

Hanwha Solutions strives to establish a virtuous cycle of resources throughout the entire process, from raw material purchase to product production and delivery. We encourage recycling of waste by setting resource circulation goals. In addition, we designate and manage raw/subsidiary material reduction targets as KPIs to reduce waste emissions.

Waste Reduction Activities | We not only conduct periodic analysis on waste generated in the production process, but also minimize the environmental impact of waste by recycling and establishing storage facilities. In addition, the entire waste treatment process is recorded and managed through the government's 'Allbaro System'. The waste stored was previously treated exclusively by a specialized treatment company, but the risk of waste treatment was resolved by changing the waste properties so that the waste can be easily contracted to multiple companies for treatment. In particular, the TDI Plant of Chemical Division changed the treatment method so that it can be directly treated by solidifying the existing liquid waste with solvents, and this is expected to reduce the amount of waste by 20%.

SPECIAL CASE

Awarded as an Excellent Company for voluntary reduction of fine dust

As fine dust causes issues nationwide, Qcells Division participated in the "Voluntary Agreement on Fine Dust Reduction" hosted by Chungcheongbuk-do Provincial Office in April 2018. In order to contribute to clean air quality, we set a reduction target of 4% (3.9 tons) for 4 years (2021–2024). In particular, we have implemented various reduction activities from generation to emission, such as replacing nitrogen oxide (NOx)-causing substances by closely examining raw materials used in the process and improving the removal efficiency of treatment facilities. In this regard, we achieved a high performance of reduction by 24% (31.5 tons) in 2021 compared to the base year (average of 2019–2020), and were selected as an 'Excellent Company for Reducing Fine Dust in 2021' by Chungcheongbuk-do Provincial Office.

SPECIAL CASE

Jincheon-gun and Hanwha Solutions Collaborate to Resolve Complaints

The Jincheon-gun plant of Hanwha Solutions is the largest solar cell production plant in Korea, with a daily production volume of nearly 2 million units. Since the plant's expansion in 2017, the amount of wastewater has increased, and residents have experienced inconvenience due to overflow of sewage and wastewater. To solve this problem, we installed a transfer pump for forced drainage and performed restoration construction for the sagging drainage pipelines. In addition, Jincheon-gun provides related data such as water and sewage network diagrams, and Hanwha Solutions has taken charge in offering design services and paying service costs to find solutions, and plans to invest a total of KRW 600 million within 4–5 years. We are creating an environment in which the company and the local community coexist by resolving long-lasting complaints.

SPECIAL CASE

Received the Prime Minister's Award as a 'Leading Company for Resource Circulation' in 2021

Since 2020, Jincheon Plant of Hanwha Solutions has been allocated a cyclical usage rate and final disposal rate every year in accordance with the performance management system of resource circulation. By continuously reducing the generation of chemical substances and waste, in 2021, the final disposal rate exceeded the standard target by 145.51%. In recognition of these efforts, the plant was recognized for outstanding performance of leading companies in resource circulation in 2021 and received the Prime Minister's citation.

Management of Hazardous Chemical Substances

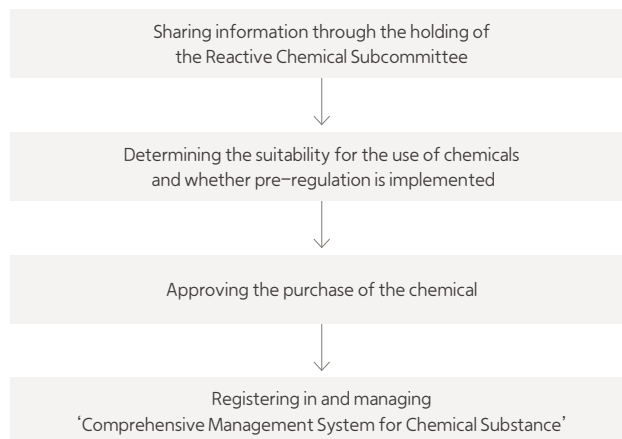
Improvement of Chemical Management System

Hanwha Solutions monitors domestic and overseas chemical-related laws and global regulations. In accordance with these laws, the use, transport and storage management of chemical substances are regularly inspected to prevent harmful or hazardous practices. We have created a database of all chemical substances handled at each plant, inquired about hazardous information on products, managed the Material Safety Data Sheet (MSDS) and material information from suppliers, and operated them systematically. In addition, when using new chemical substances, we will carry out safety review through the Reactive Chemical Subcommittee and then the registration process to provide safer products to customers.

Efforts to Reduce Emissions of Hazardous Chemical Substances

Hanwha Solutions is constantly reviewing and lab-testing processes to reduce the emission of hazardous chemical substances. In particular, the Jincheon Plant of Qcells Division is developing and applying a recipe that can significantly reduce the amount of chemical input per product by closely examining the hazardous chemical substances used in the etching process. Through this, we achieved a reduction in the use of alkaline chemicals by more than 34% compared to 2020.

Process of New Chemical Introduction



Environmental Management Activities

Promoting Virtuous Cycle of Resources

Hanwha Solutions is taking the lead in transforming the business structure into a virtuous cycle of resources by developing technologies such as the PTC (Plastic to Chemicals) technology, which produces naphtha based on pyrolysis oil for waste plastics, the bio-based plastic technology and the biodegradable plastic technology. In addition, we use eco-friendly raw and subsidiary materials for manufacturing and sales, and do not attach labels for ease of recycling. When packaging products, only recyclable raw materials such as PP and PE are used, and according to the packaging material structure evaluation system in the "Resource Recycling Act", it was awarded as "Excellent in Recycling". In particular, in the case of protectors used for exterior protective packages of solar modules, raw and subsidiary materials composed of more than 85-90% recycled materials are used, contributing to the circulation of domestic resources. Furthermore, by June 2022, Hanwha Solutions has set as our goal to not only track the content of recycled raw materials to increase the rate of resource recycling, but also provide GRS (Global Recycled Standard) certification (proving compliance with environmental, social and chemical responsibilities) and RCS (Recycled Claim Standard) certification, which proves transparency in the use of recycled raw materials. Through these measures, it is expected that we will be able to contribute to the resource circulation economy by managing the entire process of production, warehousing, use, delivery and disposal of recycled products.

Control Union, a global eco-friendly certification body headquartered in the Netherlands, issues eco-friendly certifications such as GRS, RCS, and OBP.

Global Recycled Standard (GRS) Certification

To certify products containing 20% or more recycled raw materials, GRS is an eco-friendly certification to prove that recycled raw materials have been used.



Recycled Claim Standard (RCS) Certification

This certification applies to products containing 5% or more recycled raw materials, and verification of the source of recycled raw materials and transparency of the use of recycled raw materials through trace management of all production processes are required.



Green Store Certificate

All locations of Galleria Division have installed eco-friendly facilities and operated stores in accordance with Examination Requirements for Green Store Certificate by the Ministry of Environment. Through this, the Galleria Division was designated as a Green Store, a distribution store that contributes to environmental improvement, and is maintaining its certification. We are encouraging customers to participate in eco-friendly and sustainable consumption, and are continuously contributing to promoting the sales of eco-friendly products.

Eco-friendly Building Certification

Hanwha Building, the headquarters of Hanwha Solutions, is operated in an eco-friendly manner by introducing energy-saving technologies such as LED installation and illuminance control, BEMS and insulating glass for exterior walls. Through this, we were certified with an Excellent Rating in Green Building Certification and Grade 1 for Energy Efficiency Rating.

Promoting Biodiversity Activities

Hanwha Solutions is monitoring ecological activities to preserve biodiversity in cooperation with the Korea National Park Service. For example, in the sub-alpine zone of Mt. Jiri (1,300-1,900 meters above sea level), we are supporting the investigation and restoration of conifers, such as the Korean fir, which are dying in large numbers.

In addition, all Hanwha Solutions worksites have conducted annual environmental impact assessments based on ISO 14001 requirements, and implemented environmental cleanup activities once a quarter in cooperation with environmental groups such as county offices and nature conservation associations. In addition to periodic purification activities around industrial complexes, we are striving to fulfill our social and environmental responsibilities by conserving the environment of the local community through "One company, One River" or "One Company, One Mountain" program.

Purchasing Eco-friendly Products

Hanwha Solutions has established eco-friendly green purchasing and management guidelines, and based on this, preferentially purchases eco-friendly certified raw and subsidiary materials and goods from suppliers. By focusing on practical eco-friendly purchasing, we are striving to prevent waste of resources and environmental pollution, and make efforts to ensure that our customers receive more stable products.

Eco-friendly sales and purchases¹⁾

(Unit: KWR 100 million)

Division	2019	2020	2021
Amount of eco-friendly sales ²⁾	219	5,904	6,398
Amount of eco-friendly purchases	2.8	3.5	2.3

1)Eco-friendly sales and purchases are calculated as the sum of the five divisions.

2)Including 6 products for which the Environmental Product Declaration of Chemical Division has been acquired In 2021, solar modules that have been rated as Grade 1 in carbon certification of the Qcells Division, and the sales of eco-friendly products in the Galleria Division

Environmental Product Declaration and Certification of Eco-friendly Products

The Chemical Division promoted Environmental Product Declaration (EPD) by certifying 39 products with in 2021. These 39 products were categorized according to 7 items accredited by the Ministry of Environment, namely carbon footprint, water footprint, ozone depletion, acidification, eutrophication, resource footprint and photochemical smog. By April 2022, 30 products, including plasticizers and EVA, have obtained certifications, and 9 products are expected to be certified within 2022. Qcells Division is also promoting eco-friendly certifications, such as International EPD and EPEAT, an eco-friendly certification system for US electronic products. In addition, we are promoting the 'Photovoltaic Module Carbon Certification System', which quantifies the total amount of greenhouse gas emission per unit throughout the module manufacturing process. So far, a total of 267 product groups have acquired low-carbon module certification, and among them, Q.PEAK DUO was certified as Grade 1 by the carbon certification system for the first time in Korea. In particular, in 2018, we upgraded the existing solar module and developed a floating photovoltaic system to be deployed in water spaces such as dams and waterways. The product has met the standard of the floating photovoltaic test (KSC-8561) for its eco-friendliness.

Implementing LCA of Products

Hanwha Solutions is expanding the production of eco-friendly products from the product planning stages in consideration of their environmental impact. In this regard, we are conducting LCA to comprehensively estimate potential environmental impacts at all stages, from raw material acquisition to transportation, manufacturing and disposal.

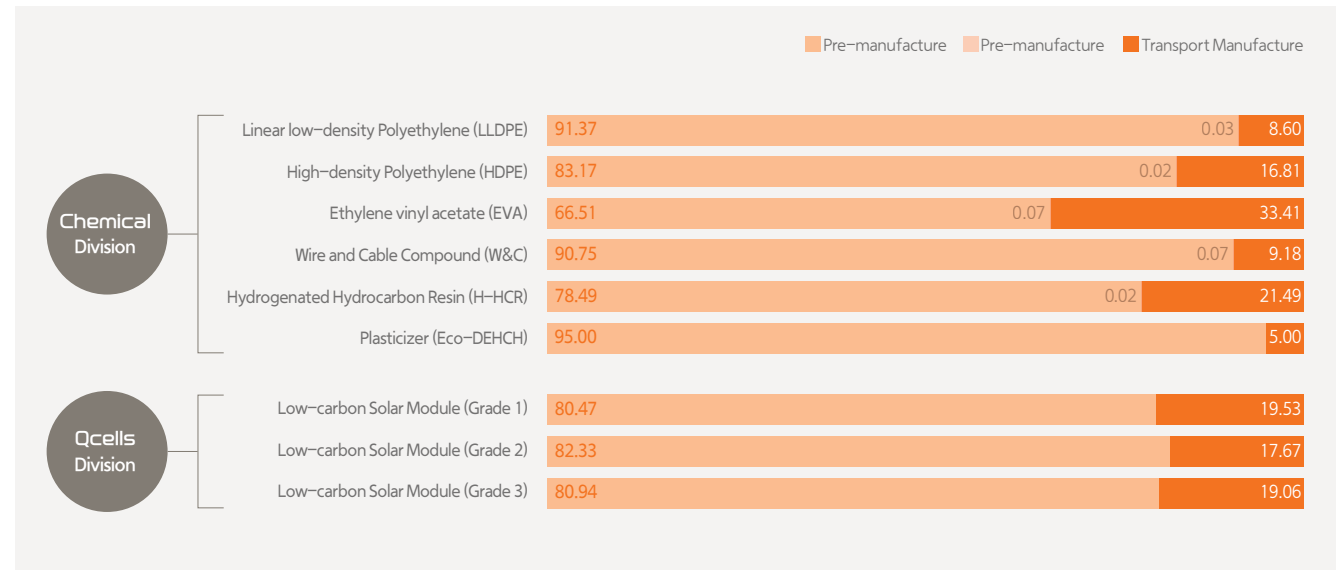
Most greenhouse gases generated in the entire production process of Hanwha Solutions are generated in the pre-manufacturing stage, therefore we plan to address this problem through the use of natural and renewable raw materials. We plan to continue our efforts and investment to reduce greenhouse gas emissions and minimize environmental impacts through LCA analysis of all products.

The Chemical Division conducts an entire process evaluation for various environmental impact categories in accordance with international standards of LCA. In order to quantitatively analyze the impact on the environment in the entire production process, we have established and systematically managed a database of factors affecting the environment, such as the content ratio of raw materials in each product, production period, the status of additives, transportation, etc. In addition, by 2023, we are proceeding to improve the LCA process and expanding the application of LCA to all products.

The Qcells division is conducting an LCA on solar module production in order to obtain a carbon footprint certification called CFP (Carbon Footprint for Product) in the French market. We acquired CFP certification for the first time among domestic companies.

Carbon emissions throughout the entire process of main product

(Unit: %)



Safety and Health Management

Safety and Health Strategy and Management System

Safety and Health Promotion Strategy

In order to realize an “accident- and disaster-free workplaces”, we have identified and implemented three mid- to long-term strategies and six strategic tasks through analysis of previous accidents, safety culture diagnosis and employee interviews.

Strategy	System Level-up	Risk Management	Enhance Mindset
Strategic Task	SHE management system sophistication	Strengthen accident prevention and response activities	Establish voluntary safety management culture
	Improving the performance of SHE	Establishing eco-friendly plants	Strengthen Risk identification capability

Hanwha Solutions is continuously removing potential risk factors that may occur in the workplace, and strives to create a safe workplace enabling workers to work with relief.

Acquired Certification Related to Safety and Health

Hanwha Solutions has been certified by the international standard ISO 45001 to verify the soundness of safety and health management according to the standard and to promote it more systematically. Furthermore, in order to improve the level of safety and health at each location, we have additionally been certified by ISO 22301 and Seismic Safety Facility Certification System, monitor possible risks in advance such as conducting internal inspections every year, and introduce external audits to improve it.

Division	Status of certification related to safety and health
Chemical	• Safety and health management system (ISO 45001) certified (all plant sites)
Qcells	• Safety and health management system (ISO 45001) certified (all plant sites)
Advanced Materials	• Safety and health management system (ISO 45001) certified (all plant sites) • Business Continuity Management System (ISO 22301) certified (Sejong Plant)
Galleria	• Safety and health management system (ISO 45001) certified (all locations) • Seismic Safety Facility Certification System certified by the Ministry of the Interior and Safety (Jinju)

Establishment and improvement of safety and health management system

KEY PERFORMANCE

Safety and Health Management System (ISO 45001)
100% certification rate

Safety and Health of Manufacturing Plants
Promotion of internalization activities

Health check-up for employees, etc. in 2021
9,243 persons



Safety Management Activities of Plants

Safety Risk Prevention Activities

Hanwha Solutions regularly conducts risk assessments to identify direct/indirect risk factors and manage them to fulfill its obligations to secure safety and health. In order to comply with the Serious Accident Punishment Act, we have established a response manual and guidelines for serious accidents and report the results of monthly inspections to the head of the plant. In addition, through consulting from external specialized organizations and self-audits, we have established action plans for plants to prevent serious accidents and are carrying out improvement activities.

Strengthening the Capability to Respond to Emergencies

Hanwha Solutions has supplemented the emergency response system to minimize human and material damages in case of emergencies, and revised emergency scenarios of plants. In addition, we conduct comprehensive emergency response trainings every year with various scenarios to quickly respond to fires, explosions, counter-terrorism, hazardous chemical substances transport accidents, and leakage of toxic substances that may occur in plants. After the training, we identify problems through evaluation and analysis, improve them, and make every effort to prevent damage from accidents.

SPECIAL CASE

Galleria Center City

Services to accident preparedness drills and contribution to safety

Galleria Division regularly conducts emergency response drills in which employees participate, such as how to respond to emergencies in the plants, and actively participates in joint fire drills and accident response drills with related organizations. Through this, we received a citation from the governor of Chungcheongnam-do for contribution to safety and drills for accident preparedness in 2021. Following this, in 2022, we were awarded a citation from the Ministry of the Interior and Safety in recognition of our contribution to national disaster management drills and community development.

Spread of Safety and Health Culture

Diagnosis of Safety Culture Level

Hanwha Solutions annually conducts the ECO-YHES Will 2.0, Hanwha Solutions' safety culture diagnosis tool, consisting of 50 questions in 5 sectors including safety leadership, regular safety management, line responsibility system, education and training and communication for employees and suppliers, to evaluate the level of safety culture of the company. According to the evaluation results, the Safety Leadership Reinforcement Project was carried out to improve areas with relatively low scores. In addition, we are striving to improve the Safety, Health & Environment (SHE) activities of the departments, such as reflecting KPIs of each department and expanding rewards. In order to raise the overall level of company-wide safety culture, we are consulting a professional organization. We also plan to strengthen the on-site autonomous safety management system through activities such as diagnosing the safety management system and execution capability, measuring the safety atmosphere, and diagnosing the implementation management system for accident prevention.

Safety Culture Improvement Project



Inspecting Safety of the Plants

In order to prevent accidents that can impact not only employees but also local communities through periodic safety inspection activities, Hanwha Solutions conducts joint inspections between labor and management at each plant every quarter and inspects on a monthly basis by each department. We also conduct thematic inspections related to chemical leaks, jamming and collisions, and establish and periodically implement special inspection to prepare for storms and floods, thaws and monsoon seasons. In addition, the plant head conducts an audit once a quarter and implements Q-EAM, a safety environment assessment, conducted by supervisors of each department to prevent safety accidents.

SPECIAL CASE

TDI plant achieves 15-fold accident-free goals



Hanwha Solutions' TDI plant achieved 15 times its goal (5,756 days) of zero accidents as of June 5, 2022 since announcing our accident-free campaign on September 2, 2006 with the efforts of all employees and suppliers to prevent industrial accidents. To commemorate this achievement, an event was held to reward those who achieved 15 times the goal of accident-free campaign and a safe environment, reward was given to our employees and employees of suppliers. Hanwha Solutions will continue to regard safety as our top priority and strive to continuously maintain accident-free workplaces with suppliers.

Safety and Health Education for Employees

Hanwha Solutions conducts a survey on annual training Needs to enhance the effectiveness of safety training for employees. Based on the opinions from this survey, we systematically establish and operate an education plan in consideration of the safety and health education plan, its subject and method, etc. Particularly in 2021, in order to strengthen the workers' capability to identify risks, we have been upgrading and operating the education system by ① introducing a participatory operation method such as discussion and practice centering on in-house experts, ② reorganizing the content based on field practices and cases, and ③ training differentiated education according to employees' jobs and grades.

Safety and Health Management Policy for Partners

Each worksite of Hanwha Solutions is participating in the Safety and Health Cooperation Program hosted by the Korea Occupational Safety and Health Agency. In addition, we are preventing plant-wide accidents by signing the Oath of Compliance Regarding the Four Mandatory Safety Rules in Industrial Sites with our suppliers. In particular, the TDI Plant signed a voluntary safety agreement supervised by the contractor to improve safety management capabilities and prevent disasters according to this agreement. In order to improve the safety and health management capabilities of our suppliers, we are creating a healthy safety culture with them by planning various programs, such as periodically conducting joint and circulating inspection of the plants.

Safety and Health Support Program for Suppliers

Safety and Health Support Program for Suppliers

Support to obtain safety and health certification	<ul style="list-style-type: none"> Support to obtain international standard certification for suppliers to strengthen their management capabilities for Safety, Health & Environment (SHE) <ul style="list-style-type: none"> With our support, the supplier company Chungwoo acquired certification for the safety and health management system (KOSHA-MS).
Support for Performance Compensation	<ul style="list-style-type: none"> Rewards for suppliers achieving goals of Accident-free Campaign, companies and employees with excellent Safety, Health & Environment (SHE) capacity
Support for safety and health education	<ul style="list-style-type: none"> Holding quality meetings for Safety, Health & Environment (SHE) by the supplier manager Holding resolution conference to internalize management culture for Safety, Health & Environment (SHE) Implementing safety campaign to prevent accidents Conducting safety education at least once a year for suppliers, including risk assessment education Strengthening the establishment of COVID-19 prevention measures for suppliers

Support for Health of Employees

Occupational Health Management Activities

Hanwha Solutions conducts continuous monitoring, such as inspecting the working environment of its plants, through an external specialized agency on a semi-annual basis. Potentially harmful factors such as hazardous chemical substances and noise are identified in the workplace. Based on the measurement results, preventive measures for recommendations are established and implemented to create a pleasant and safe work environment. In particular, ventilation facilities are mandatory in operation to reduce workers' exposure to chemicals that can cause occupational diseases. Through this, we are protecting our employees from diseases and injuries by removing, replacing and isolating risk factors.

Health Promotion Program

Hanwha Solutions carries out various health promotion activities under the supervision of health managers within plants for the health management of their employees. We also subscribe to group accident insurance and cooperate with specialized organizations to provide 1:1 customized psychological counseling and health education to promote mental health. In the case of departments with tasks that might occur on the musculoskeletal system disorder in the workplace, we are investigating harmful factors for the musculoskeletal system of the human body and are eliminating or reducing these factors. Special health medical examinations are also conducted semi-annually for workers who are in charge of work which exposes them to harmful factors in the process. Furthermore, we support the health check-ups of employees and their spouses for their healthy family life. As a result of the health check-up, we operate a program to improve the health of those smoking and diagnosed with obesity, high blood pressure, hyperlipidemia, etc.

COVID-19 Prevention Activities

Hanwha Solutions has implemented a contingency plan against infectious diseases to prevent the spread of COVID-19 for customers, our employees and employees of suppliers. Along with personal hygiene management rules, periodical publicity and training were conducted for employees to comply with the quarantine rules at plants according to social distancing measures.

SOCIAL

Hanwha Solutions contributes to a better future and sustainable growth for everyone.
 In addition, we strive to grow together with stakeholders based on a respectful culture that considers people and society.

KEY PERFORMANCE

Talent/Human Rights and Diversity	Product Responsibility and Customer Satisfaction	Sustainable Supply Chain Management	Community Engagement and Development
Certified as a Best Family Friendly Management (Chemical and Galleria Divisions) 	Company-wide quality management system (ISO 9001) Acquired certification 	Amount of Shared Growth fund KRW 81 billion 	Local community council operation 
Reorganization of the company-wide HR system to build a horizontal organizational culture 	Number of proposals to enhance quality competitiveness 24,729 cases 	2021 Shared Growth Index Good 	Total donation amount in 2021 (company + employees) KRW 4.3 billion 
Smart work activation for establishment of non-face-to-face work environment 	VOC throughput in 2021 100% 	Reinforcing ESG capabilities of suppliers Support 	Social contribution activities in 2021 Number of beneficiaries 18,498 

Talent/Human Rights and Diversity

Employee Recruitment

Fair Recruitment without Discrimination

Hanwha Solutions complies with International Labor Organization conventions and labor-related laws in Korea. Accordingly, child labor and forced labor are prohibited, and we do not discriminate in recruitment, placement, promotion, salary, education, etc. due to the gender, religion, political opinion, social status, nationality or race. In addition, by establishing consistent evaluation standards through interviewer training, such as the interviewer certification system, we guarantee equal opportunities to all applicants and operate a fair recruitment system. Furthermore, Hanwha Solutions strives to stabilize jobs for the underprivileged, such as granting additional points to those who are officially registered during the recruitment process and those eligible for national veterans.

Hanwha Solutions listens to the voices of its members, expands the scope of communication and cooperation, and develops and operates educational programs to provide continuous support so that the members can develop together with the company.

Efforts to Secure Excellent Talents

Hanwha Solutions is actively recruiting talents by utilizing various channels that reflect non-contact communication, such as job counseling through SNS (KakaoTalk open chat), non-face-to-face interviews, as well as the existing intern system and industry-university cooperation. In addition, in order to expand our global business and strengthen our competitiveness, we are constantly hiring internal and external experts with outstanding capabilities on eco-friendly energy and materials such as solar power and hydrogen. Through the convertible intern program for recruitment, we are selecting practical talents with job expertise. In particular, we tightened the verification stage of applicants' practical competency and job expertise by directly participating in the entire recruitment process, from document screening to job evaluation. In the case of interns, they receive the same wages and benefits as regular employees, and after an internship for three months, they are converted to regular employees through a final interview.

Reinforcing Employee Competency

Course of Direction for Talent Development

Hanwha Solutions has established career development plans for all employees, and is implementing a systematic talent development strategy based on the training system for each job and position. We specify the types of talent needed to carry out specific business strategies, such as global talents for overseas business, engineer talents to contribute to productivity improvement, and technology R&D talents to lead innovative growth. In addition, we provide various training programs to strengthen the competencies of our employees and enhance competitiveness by establishing strategies for nurturing talents. In addition, in order to check the degree of development of employees after the training, a multi-faceted diagnostic evaluation is conducted to measure and manage the effectiveness. We conduct a multi-faceted evaluation of leadership and job competency for Career Level 3 or 4 every year, analyze the trend of changes according to the results of the multi-faceted diagnosis and use it as data for education and coaching.

KEY PERFORMANCE

Certified as a **Best Family Friendly Management** (Chemical and Galleria Divisions)



Reorganization of the company-wide HR system to build a horizontal organizational culture



Smart work activation for establishment of non-face-to-face work environment



Company-wide education system diagram

Category	Leadership				Global				Common/Value			
Executives	1:1 coaching		Executive Training Course						Executive Onboarding		Innovative Leader Course	
CL4(P)	Organizational Management Competencies	PL leadership coaching	Leadership Diagnosis / Feedback	Promotion candidates					Career Beginner course	Career employee mentoring	Value practice activities	Sexual harassment prevention / Preventing workplace harassment / Improving disability awareness
CL4					Reinforcing leadership education according to career level	Promotion Applicants	Global job training	Language training support for sojourning applicants				
CL3	Junior Changeup	Global talents	Global BIZ competency	HPMP								
CL2					New hire introduction							
CL1	Introduction for new hires											

Retention of New Hires

We are operating an onboarding program that includes mentoring and training to help new hires understand the company culture and quickly adapt to a new work environment. In this program, new and senior employees performing similar tasks are designated as mentees and mentors respectively to jointly carry out activities that can strengthen their job competency, providing an opportunity to foster teamwork between mentors and mentees. For employees at the beginning stages of their careers, a welcome gift is provided, company introduction and mid- to long-term strategies are shared, and training courses such as HR system and welfare information are provided to help them quickly adapt to work and achieve a sense of belonging.

Career Management Program

Hanwha Solutions is implementing Job Market program as a voluntary and planned career management support program for employees. This is a system for selecting new personnel within the organization by notifying them on the internal bulletin board and receiving applications from employees who are interested in a job.

The HR department holds regular written and 1:1 meetings every year for career development and listening to employees' grievances and support requests. We strive to enhance job commitment and satisfaction by providing feedback on individual job evaluation and reputation, and by designing a career path that suits their performance and aptitude.

Support for Retirees' Re-employment

Hanwha Solutions provides education and counseling programs for retirees over the age of 50 who wish to be re-employed or start a business so that employees can lead a sustainable and stable life after retirement. Through this, we are supporting long-term career preparation so that retirees can plan their lives for themselves.

Strengthening job expertise



Enriched Trainings for Business Insights

In order to strengthen business competitiveness, the Galleria Division is implementing a nurturing program to promote digital-based communication and mutual learning among employees with the topic of on-site business projects. We held a workshop to discuss future plans among employees and to induce business ideas. In addition, we support developing insight by inviting celebrities to give special lectures, etc.



Hanwha Solutions operates an in-house digital transformation training program to nurture digital professionals among employees. An 8-hour basic competency learning course was held, including theoretical education on understanding digital technology and data analysis practice using Python and Excel programs, etc. In order to more systematically manage and strengthen the big data analysis capabilities of our employees, we have prepared a four-step in-house certification system consisting of User, Professional, Expert, and Master certificates by reflecting the practical use of the work and the performance of in-house instructors.

In addition to nurturing big data experts, Hanwha Solutions held a company-wide workshop under the theme of 'Digital Way of Working' for team leaders to spread the DT culture.



Cultivating global trends through overseas market research support

The Galleria Division operates the "Galleria Grand Tour", an overseas market research program, to visit famous fashion and retail regions in the Americas, Europe, and Asia to strengthen employees' global knowledge and to inspire insights on future trends.

Compensation for Fair and Reasonable Performance

Fair Performance Evaluation System

Hanwha Solutions reorganized its HR system to lead the performance in connection with mid- to long-term business, aiming at nurturing competent and competitive talents and HR focusing on role-centered functions, and held Zoom meetings with all employees.

Furthermore, the Evaluation Feedback Guidelines were distributed to evaluators to promote free communications between evaluators and evaluation recipients about performance assessment and to provide a positive influence on the growth of the organization and individuals. We are about to launch a team-based goal management system, an online performance evaluation method, for goal management and frequent feedback among team members. Through this, it is expected that communications between team leader and team members will become more specific and clear, and the final evaluation will be made based on accumulated feedback data, allowing for a fair evaluation based on clear and objective evidences.

Reasonable Compensation System

Hanwha Solutions relaxed the system of minimum length of stay for each position and activated a Fast Track system so that anyone, regardless of position, age or gender, can maximize their capabilities and achieve rapid growth. In addition, we flexibly manage a fixed ratio for each evaluation grade to prevent distortion of evaluation and establish a comprehensive promotion system centered on roles and capabilities. When calculating bonus, we are establishing a performance compensation system focusing on the company's mid- to long-term strategic tasks as well as creating short-term performance by linking financial and strategic performance.

In addition, Hanwha Solutions grants Restricted Stock Units (RSUs) to executives. RSU is an advanced performance-related compensation system, which is being adopted by many US Silicon Valley tech companies such as Google, Facebook, and Tesla, instead of stock options. RSU maturity of stock-based compensation in Hanwha Solutions is 5-10 years, which is linked to mid- to long-term performance.

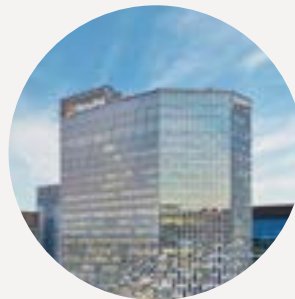
Change in the Way of Work

Smart Work Activation

By introducing Microsoft Teams as a company-wide collaboration platform in 2021, we have built a smart workplace environment where employees can focus on their work via PC and mobile devices regardless of work environment. Real-time collaboration through video conferencing, work report, schedule and work data sharing, etc., as well as year-round goal management for individual goal settings and performance checks are also being carried out by using Teams. Hanwha Solutions strives to innovate the work culture, supporting non-face-to-face communication, collaboration and a mobile work environment.

SPECIAL CASE

Establishing a Smart Office System



Hanwha Solutions minimizes unnecessary waste of resources and improves space efficiency by building a smart office work environment that supports a digital-based remote work environment. To create a horizontal work atmosphere, we are operating an autonomous seating system and a meeting room reservation system that allows employees to work wherever they want, and are promoting flexible work environments such as setting ground rules for each team.

Welfare System

Hanwha Solutions is doing its best to improve stability of livelihood and welfare so that employees can focus on their work during working hours and enrich their lives outside of working hours. Therefore, we are operating various welfare programs for such as corporate, family and leisure life to increase the morale and motivation of organizational members to induce work commitment and to enjoy a better quality of life.

Welfare system

<p>PC-OFF system Supporting "Work-Life Balance" by limiting PC use outside of working hours</p>	<p>Implementing a flexible working system Telecommuting system, staggered commuting system that adjusts commuting time for each employee, and flexible working system that limits average working hours per week to 40 hours</p>
<p>Refresh point system Granting Refresh points worth up to KRW 700,000 to activate annual leave</p>	<p>Paternity leave 4 weeks leave granted within 3 months following birth of baby</p>
<p>Sabbatical month system Implementing sabbatical month for the promotion of executives, promotion of career level, and employees in long service to recharge employees</p>	<p>Tuition support for employees' children middle/high school/university</p>

Organizational Culture of Diversity and Inclusion

Corporate Culture for Non-discrimination

Hanwha Solutions strives to establish an open and fair corporate culture by forbidding discrimination based on gender, age, academic background and region, and respecting diversity. We embrace the physically weak with congenital and acquired disabilities, and continue to provide generous supports so that they can develop their own capabilities.

In addition, we have established and implemented plans for each Division to resolve social structural discrimination that women may experience. In the future, we plan to establish evaluation standards in case of returning from maternity and parental leave, and to establish a corporate culture of diversity and inclusion by providing leadership education for female managers, and making continuous efforts to practice social responsibility.

Building a Horizontal Organizational Culture

Hanwha Solutions promoted a company-wide reorganization of positions and titles to build a horizontal organizational culture, and integrated the titles of Staff, Assistant Manager, Deputy Manager and Manager into Pro. In addition, in order to emphasize the role within the organization rather than the hierarchical relationship, the existing five leveled positions have been simplified to four levels from CL1 to CL4. In this regard, Hanwha Solutions has laid the foundation for the free expression of opinions among team members and to freshen up as an efficient organization centered on competence.

Communication with Millennials and Gen Z

Hanwha Solutions is operating the Reverse Mentoring system, centered on management, to communicate directly with the MZ generation and deepen mutual understanding. This system is a mentoring program in which Millennials and Gen Z, employees become mentors to management or executives to share the latest trends or knowledge, and to share ideas such as technology coaching. Through online and offline mentoring, communication between generations is being activated, and a consensus can be formed by listening to each other's opinions.

Better Workplace for Women

Hanwha Solutions endeavors to form a corporate culture of Work & Life Balance so that female employees can continue to work, from the HR system including hiring, evaluation and promotion of personnel management, to maternity and childcare support programs including guaranteed maternity leave and breastfeeding time. The Chemical and Galleria Divisions have maintained the Best Family Friendly Management certification from the Ministry of Gender Equality and Family in recognition of their efforts to implement various policies for the welfare of employees.

Supporting system for work-family balance

Supporting system for pregnancy	Supporting system for childbirth	Supporting system for child-rearing
<p>Mom's Package This system provides a package consisting of a system guide, work support products and congratulatory gifts to pregnant female employees.</p> <p>Reduction of working hours during pregnancy Paid leave system in which employees can apply to reduce their working hours by up to 2 hours per day (within 12 weeks or more than 36 weeks after pregnancy)</p> <p>Pregnancy support A system that provides support for up to 30 days at a time or up to 3 times (the first 30 days are paid leave), or financial support up to KRW 2 million</p> <p>Fetal examination time allowed A system that regularly guarantees paid examination time for 4 hours a day</p>	<p>Miscarriage and stillbirth leave The number of paid leave days is differentially granted according to the period of pregnancy in case of miscarriage or stillbirth.</p> <p>Congratulatory money for childbirth A system that provides congratulatory money equivalent to 250,000 won to employees who have given birth to a child</p> <p>Maternity leave A system that grants leave for up to 90 days (120 days in case of multiple births) in total before and after childbirth</p> <p>Paid nursing time allowed A system that guarantees paid nursing time for at least 30 minutes twice a day (for one year after childbirth)</p> <p>Maternity leave A system that grants leave for up to 6 months before and after pre- and post-natal leave for pregnant and child-rearing female employees, separately from parental leave</p>	<p>Reduction of working hours for employees with children in child-rearing period Reduced working hours of 15 - 35 hours per week (used in units of at least 3 months and up to 2 years)</p> <p>Parental leave A system that allows up to one year of leave per child for employees raising children under the age of 8 or under the second grade of elementary school (available for eligible male and female employees)</p> <p>Parental Leave/ Reinstatement Counseling System A system that provides counseling before returning to work in order to minimize long-term work vacancies</p> <p>Childcare leave before and after school A system that supports employees with children who will soon enter elementary school or who have just entered elementary school for up to 30 days before or after the date of entrance</p>

Hanwha Qcells Sports Team for the Disabled

The Qcells Division founded and operates the largest sports team for the disabled in Korea. The team consists of sports including soccer, swimming, weightlifting, shooting, rowing and goalball, and 35 athletes belong to it as of the end of December 2021. After recruiting athletes, we regularly pay them salary as well as provide various sports equipment and training venues. We are actively supporting athletes so that they can concentrate on sports, such as paying prize money to winning athletes in domestic and international championships.

SPECIAL CASE

The disabled sports team of Hanwha Qcells, Winning 28 medals at the National Paralympic Games



The Hanwha Qcells Disabled Sports Team, won a total of 28 medals in 4 categories at the 41st National Paralympic Games held in Gumi-si, Gyeongsangbuk-do from October 20 to 25, 2021. In addition, to celebrate this achievement, Qcells Division paid rewards to 22 athletes who won medals and provided daily necessities such as beddings to athletes with difficult living conditions. Hanwha Solutions plans to keep supporting Disabled Sports Team in order to develop together with the local community in Chungcheongbuk-do and discover outstanding disabled athletes.

Human Rights Protection in Workplace

Efforts to Spread a Culture of Respect for Human Rights

Hanwha Solutions respects the human rights of all stakeholders, including employees, suppliers, and customers. As a member of the UN Global Compact Network (UNGC), we support the ten principles of human rights, labor, environment and anti-corruption, and strive to respect and protect human rights.

Operating Grievance Counseling and Reporting System

Hanwha Solutions operates a variety of channels, such as an in-house private bulletin board, an e-mail window dedicated to grievance counseling and a hotline where you can report directly to HR management. This is to take actions against unethical and human rights violations such as workplace harassment and sexual harassment, as well as grievances experienced by employees while performing their work. In particular, in 2021, we opened a non-face-to-face Zoom channel so that employees of all plants could consult about their work or personal concerns frequently. In addition, we implemented an ombudsman system to evaluate performance online and listen to grievances and opinions about the working environment, and appointed a grievance officer for each plant. The reported contents are processed promptly and are reported to the CEO on a regular basis. In addition, we absolutely guarantee anonymity and identity protection so that we do not treat reporters or victims unfavorably.

Human Rights Education for Members

Hanwha Solutions is conducting human rights education for all employees to further spread the culture of respecting human rights and to prevent human rights risks in advance. In addition to legal compulsory education such as prevention education against workplace bullying, sexual harassment prevention education, and education to improve awareness for the disabled once a year, the message for creating a healthy corporate culture is periodically announced on the internal bulletin board so that all executives and employees can strengthen their awareness of human rights issues.

Employee Communication

Diagnosing Organizational Culture

Hanwha Solutions encourages the free expression of opinions by conducting a company-wide survey every year for employees to diagnose the organizational culture, and promote better understanding of leadership, values, behavior patterns, work atmosphere and HR system among employees. Through this, we are endeavoring to maintain a healthy and advisable corporate culture by diagnosing the status of organization culture, identifying potential issues and problems occurring within the organization, and planning directions for future improvement.

Activation of Internal Communication Activities

Hanwha Solutions pursues a horizontal culture and free communication to successfully lead organizational innovation. To this end, we are continuously carrying out open communications by holding meetings with the CEO and regular town hall meetings for each division. In the town hall meetings, the CEO and executives anonymously listen to employees' questions and answer them in real time, so that management directly understands employees' grievances and shares the company's vision and direction with all employees to create a culture of transparent and honest communications.

Building Trust in Labor-management Relations

Hanwha Solutions complies with the Constitution and laws to ensure that employees' rights, such as workers' rights to organize, collective bargaining and collective actions, should be guaranteed. Furthermore, we aim for smooth communication and win-win cooperation between the labor and the management, negotiating wages with the labor union and conducting collective bargaining. In addition, we hold individual labor-management council meetings at the headquarters and each plant on a quarterly basis to collect grievances and opinions about employees' working conditions and personnel system, and promote mutual growth with the goal of corporate development and employee welfare.

In 2021, we expanded labor-management communication channels, such as establishing the "Solution Inside System" to communicate with job groups that have not joined a labor union, and pursuing strong communications with them.

Promoting internal communication in the Chemical Division

Internal communication bulletin board 'Square' | Square means a space where the amount of information is squared by sharing useful information, and the pleasure is squared by communicating with each other. It serves as a communication window to deliver important company news to internal members first. In addition, we are contributing to improving the knowledge level of our employees by sharing content on various topics such as organizational culture, economic and industrial trends and the humanities.

Online newsletter 'Solmate' | The online newsletter 'Solmate' is organized into 9 main categories such as a "Chemical, Now" section, employee stories, etc. In this regard, company news and useful content are published monthly to employees and their families. In addition, by providing a separate section where members can directly participate in, we are aiming for a newsletter that everyone can create together.

Operating 'Communication Day' | The Chemical Division holds a 'Communication Day' every two months to create a happy workplace through in-depth understanding among employees. Each team has time to get to know the team members and to reflect on the identity of our team, contributing to vitalizing exchanges and strengthening fellowship among employees.

Product Responsibility and Customer Satisfaction

Hanwha Solutions pursues continuous innovation in quality by improving its quality management system, and strives to provide outstanding products and services by actively collecting customer opinions through various channels.

Quality Management Promotion System

Quality Management for Customers

Hanwha Solutions places customer satisfaction as its top priority in management. In this regard, we strive to become a global company that provides the best products and services so that we can grow together with our customers. By establishing a company-wide standard policy for quality and guidelines, we are implementing customized quality management system for the line of products. All employees strive to understand the corporate quality guidelines and participate in the implementation of quality management, with the goal of achieving customer satisfaction.

Establishing a Professional Organization for Quality Control

Hanwha Solutions pursues quality improvement and product optimization. To achieve this, the company has a specialized department and person in charge of quality management for each process, production stage and product, so that the consistent quality management system can be operated at each plant in Korea and overseas. In addition, a separate organization is formed to reflect customer needs, manage quality issues and respond to customer claims to support innovation activities for their satisfaction.

Quality Management Innovation Activities

Acquisition and Management of Quality Management Certification

In order to provide qualified products and services to our customers, we have acquired the ISO 9001 certification, an international standard, as well as additional certifications for each division, and maintained those through continuous monitoring.

Status of product and service quality certification by divisions

Chemical	<ul style="list-style-type: none"> Acquired quality management system certification (ISO 9001:2015) Acquired Japan Hygienic Olefin and Styrene Plastics Association (JOHSPA) certification for additives (LLD3120, LLD4300N, LLD4300) in PE products Acquired hygiene and safety certification for 'CA Hypo' water treatment agent
Qcells	<ul style="list-style-type: none"> Acquired quality management system certification (ISO 9001:2015) Acquired 'TÜV Rheinland' (QCPV, Quality Controlled PV) certification for solar module quality control Conducted global certification inspections (IEC, UL, MCS, JPEC, KS and CFP) for solar module products
Advanced Materials	<ul style="list-style-type: none"> Acquired Automotive Quality Management System (IATF 16949) and quality management system (ISO 9001:2015) certifications Acquired Business Continuity Management System (ISO 22301) certification (Sejong Plant) Achieved higher grades in regular supplier evaluations by automotive OEMs Acquired aerospace quality management system (AS9100) certification
Galleria	<ul style="list-style-type: none"> Certified as 'Excellent', the highest grade in the 'Ministry of Food and Drug - Safety Hygiene Grade Certificate' for retailers (a total of 229 retailers certified in 2021) Maintained HACCP certification for livestock products (Luxury Hall, Center City, Jinju)
Insight	<ul style="list-style-type: none"> Acquired quality management system (ISO 9001:2015) certification (renewable energy plant)

Company-wide quality policy

We establish and implement quality goals that exceed customer expectations.	We strive to reduce the manufacturing cost by continuously reducing the defect rate through process improvement.
We produce reliable products by establishing strict standards and managing product specification.	We actively respond to the ever-changing market demands, innovate quality and promote new product development with our core technologies.

KEY PERFORMANCE

Company-wide quality management system (ISO 9001)

Acquired certification



Number of proposals to enhance quality competitiveness

24,729 cases



VOC processed in 2021

100%



Main Activities for Quality Control

Hanwha Solutions implements quality control throughout the production process, in order to maintain consistent quality and specification standards. In addition, in order to respond to the requirements of the quality management system in accordance with international standards, we are promoting continuous improvement through internalization.

Main quality management activities by Division

	Chemical	<ul style="list-style-type: none"> Implementing T.O.P (Total Operation Performance) activities where all members participate in and propose ideas Proceeding S&OP (Sales and Operation Planning), a strategic meeting for each business division Establishing QM-focused management items in MES System as Data Report A technology exchange meeting is held once a year at the council between the Hanwha Solutions, Hanwha TotalEnergies and Hanwha Impact.
	Qcells	<ul style="list-style-type: none"> Sharing of best practices in manufacturing
	Advanced Materials	<ul style="list-style-type: none"> Understanding the quality management system by inviting experts and conducting group training Semi-annual quality seminars for suppliers in moulding Report on the quality trend of raw materials/products for quality control and improvement (semi-annual report) Conducting production process audits (monthly report) Inspecting activities for its compliance with quality regulations (4M, quality documents, inspection standards) * 4M: 4 elements of production such as Manpower (worker), Machine (production facilities), Material (parts/materials), Method (production method)
	Galleria	<ul style="list-style-type: none"> Conducting food safety inspections 4 times a year (PB, high-risk cooked food, eco-friendly pesticide residues, Korean beef DNA, etc.) Conducting hygiene inspections in Department store twice a year by SGS, a special examination agency for food safety.
	Insight	<ul style="list-style-type: none"> Establishing quality guidelines and a quality management system (for renewable energy plant) Implementing on-site quality inspections and conducting quality trainings for employees of suppliers Establishing a Lessons Learned Database within the construction management system

Customer Value Innovation Activities

Proposal System to Strengthen Quality Competitiveness

Hanwha Solutions operates a proposal system with the goal of 'strengthening manufacturing competitiveness through field-oriented self-improvement' centered on the manufacturing sectors. In order to encourage the quantitative and qualitative mutual growth of the proposal system, we have introduced a basic reward system for those participating in proposals, and special rewards for excellent proposers.

The Chemical Division is operating a TOP proposal system by developing a mobile app for the convenience of employees in registering their proposals.

The Qcells Division uses action learning by forming tech leader TFs consisting of professionals passionate about learning. This method of learning strives to promote mutual growth of individuals and organisations. Based on this, core tasks are studied and activities are carried out to improve quality.

Business Innovation that Reflects Customer Needs

The Chemical Division reflects the needs of eco-friendly materials through customer VOC collection and technical surveys, and has obtained and provided Environmental Product Declaration for 30 products, including PO and petroleum resin. In addition, we have developed and sold mechanical recycling products for carbon footprint reduction and are applying them to packaging materials for 25 kg bags. We also plan to expand the use of this method to packaging film.

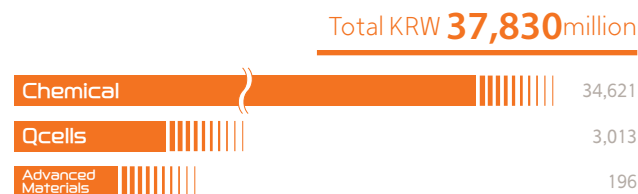
The Advanced Materials Division collects and manages customer claims for products, and reduces the claim sharing rate and upgrades the quality index through the OEM guarantee activities for automakers.

In order to meet the paradigm of Industry 4.0 and government policies, the Insight Division has built an eco-friendly innovative space model. They have accomplished this by introducing ICT-based smart services such as intelligent urban information systems, smart street lights, and hydrogen EV charging stations in the complex. As a direct result of this, we are improving productivity due to the spread of smart factories, and enhancing the satisfaction of resident companies. We are also suggesting a standard model for smart complexes in the district to induce and create youth employment.

Number of proposals (Unit: cases)



Type effect (Unit: KRW million)



Securing Quality Talents

In order to spread a culture that values quality and follows the values, Hanwha Solutions is conducting job trainings and training for internal auditors by hosting employees in quality management, or by inviting experts. Through an autonomous proposal system and small group activities, we encourage our employees to actively participate in process improvement and quality improvement. In addition, we are securing talents related to the quality control sector by operating a support system, in order to acquire qualifications of quality experts such as ISO 9001 certified auditors and VDA 6.3 auditors to strengthen professional competency for each production process.

Customer Communication

Conducting Customer Satisfaction Surveys

Hanwha Solutions conducts a satisfaction survey for each division every year in order to improve the quality of products and services, by identifying and analyzing customer needs, as well as pointing out customer dissatisfactions. Product and service improvements derived from customer satisfaction surveys are classified into sales, logistics, quality and technical support with the aim of immediate improvement. In addition, Galleria Division, where building long-term relationships with customers is of the utmost importance, conducts customer satisfaction surveys via e-mails targeted at customers who purchase its products one to two times year. Through this, we identify customer complaints and improvement, and resolve them according to priorities.

Expanding Customer Communication Channels

Hanwha Solutions provides high-quality content by utilizing online platforms such as the official website, YouTube and blogs by divisions, and through active communication with stakeholders. There, we frequently upload various interesting news about the company, like: the up-to-date trends, knowledge content related to products and services, corporate culture and recruitment. In particular, in consideration of the communication with Millennials and Gen Z, who are familiar with the digital environment, we are making every effort to deliver information swiftly by producing videos and card news, etc. In addition, for systematic customer management based on digital transformation, customer-related information such as production, sales and technical support has been integrated into the CRM (Customer Relationship Management) system.

In 2021, due to COVID-19, virtual or small-scaled meetings were held to directly visit companies, and we are actively participating in technical support and exchange events such as conferences and exhibitions to promote the company's products and services. We create customer value by identifying unmet needs during the communication process with customers and reflecting them in the company's management activities. We regularly collect and organize relevant information such as laws and regulations, new product trends and industry news, to directly produce a newsletter, and send it to the key representatives of our customers to deal with the preemptive responses to major issues.

Enhancing Communication such as Managing VOC (voice of customer)

Hanwha Solutions is establishing a VOC management system, which would systematically respond to customer inquiries and complaints. Through this, we are improving customer satisfaction by resolving matters which customers have issues with in an expedited fashion. We are also actively collecting customer opinions and reflect them in our products. Furthermore, in order to provide excellent products and stable services to our customers, we strive to find the causes of claims, take measures to prevent recurrence and build long-term relationships with customer by solving their fundamental problems.

In particular, the Galleria Division provides information on product events and other events through various SNS channels such as the official website and APP, KakaoTalk, Facebook, Instagram, T Story Blog and Naver Post. In addition, we are expanding contact points with consumers as much as possible through the integrated VOC system, main phone number for each plant, CS centers and call centers. We listen to compliments, inquiries, suggestions, and complaints through online and offline channels, and in principle, we are actively resolving the issues received through 1:1 communication between customers and service personnel. In addition, we analyze the results on a weekly and monthly basis and share the implications within the company, and separately assign CS specialists in the head office and plants to plan a system to enhance customer satisfaction, CS training and customer contact (MOT: Moment of Truth).



SPECIAL CASE

Production of promotional videos for customer marketing support

The Chemical Division planned and produced PVC promotional videos and animations jointly with KOVEC (Korea Vinyl Environmental Council) to help customers in their promotional and marketing campaigns. Furthermore, by using this as a means of publicity to people and major customers, it promotes sales and increase customers' awareness of the product.

- 1 Hanwha Solutions' Chemical Division attended the Spring General Meeting 2022 and academic conferences of Korean Institute of Chemical Engineers
- 2 Hanwha Solutions Galleria Division operates an online VOC reception channel

Sustainable Supply Chain Management

Shared Growth Promotion System

Principle of Shared Growth

Hanwha Solutions has established and complied with the Four Principles of Shared Growth to establish fair trade and prevent risks that may occur in the supply chain preemptively. As of 2021, we have signed fair trade agreements with 175 suppliers to promote support activities, thereby establishing a sustainable shared growth system. Through the Shared Growth Promotion Committee of each division, we are systematically managing exchanges and support for overall management activities with suppliers such as quality control, financial support, technical support, education and training related to shared growth.

KEY PERFORMANCE

Amount of Shared Growth fund
KRW 81 billion



2021 Shared Growth Index
Good



Reinforcing ESG capabilities of suppliers Support



Hanwha Solutions fosters a fair trading culture with its suppliers, pursues efficient communication and cooperative relationships, and maintains trusting relationships through mutual partnerships.

Supply Chain Management

Status of Suppliers

Hanwha Solutions complies with international standards and norms and has been building transparent relationships with its suppliers based on the management philosophy of ‘Going Further Together’. As of 2021, we have relationships with a total of 5,670 suppliers, and they are mainly located in areas that host our headquarters, such as Seoul and regions for Yeosu, Ulsan and Daejeon plants.

Chemical	Qcells	Advanced Materials	Galleria	Insight
1,587 companies	1,529 companies	880 companies	1,552 companies	122 companies

Four Principles of Shared Growth

Schedule of actions related to the conclusion of contracts with suppliers

- When a contract is concluded, an appropriate delivery period is needed, and when a delivery period is shortly set, an agreement is made after consultation with the supplier.
- Determining and adjusting the transaction price through calculation and adjustment for a reasonable unit price

Schedule of actions for selecting and operating a supplier

- Set standards to ensure fairness and transparency of supplier selection (registration) and cancellation criteria

Schedule of actions for installing and operating an internal review board of suppliers' transactions

- When a large-scale contract is concluded, deliberation is carried out in advance, a supplier is selected, and the appropriateness of registration & cancellation standards & procedures are reviewed.

Schedule of practices for recommendable written issuance and preservation

- Standards for documents to be provided in case of supplier transactions

Selecting Suppliers and Managing ESG Risk Assessment

Hanwha Solutions strives to establish a sustainable cooperation system by identifying and eliminating supply chain risks in advance using the Guidelines for Suppliers Selection and Management. When registering a new supplier, we conduct a review in consideration of the Safety, Health & Environment (SHE), compliance and anti-corruption, and meeting the delivery date for the sustainability in terms of ESG. We also conduct a comprehensive evaluation using a checklist for each item by reflecting for example the credit risk ratings by external specialized agencies, financial information, and stability factors for business implementation.

In addition, we conduct regular sustainability evaluations of existing suppliers such as the status of regulatory measures and credit evaluation results and operate an evaluation system for each order. Furthermore, we are strengthening our ESG management capabilities by selecting excellent suppliers according to the evaluation results and reflecting the evaluation scores when selecting the next supplier.

Evaluation management process for suppliers

1	Assessment for New Enrollment
2	Register as a new supplier
3	Regular performance evaluation
4	Deriving evaluation results
5	Operating a follow-up management program

Reinforcing ESG Capabilities of Suppliers

The Chemical Division is supporting the ESG evaluation of its Suppliers by signing MOUs with Ecredible, a credential evaluation agency, for sustainable management of major Suppliers. Currently, we evaluated environmental management and the environmental system, ethical management and social responsibility, management stability and management system for 20 small- and medium-sized Suppliers. We also established diagnostic areas to evaluate ESG. After the evaluation, ESG evaluation reports including detailed evaluation results and improvement plan for each Supplier were provided, and additional training and consulting were offered to identify weaknesses and areas for improvement, contributing to the ESG level.

Since 2016, we have been supporting the credit evaluation cost of 200 small- and medium-sized Suppliers every year. In addition, we have been planning and supporting various win-win activities by supporting the business environment of our Suppliers through consulting on energy and carbon emission reduction, etc.

Communication Activities of Suppliers

Hanwha Solutions regularly holds meetings with the representatives of Suppliers to share the company's current issues, and actively listens to their opinions. In 2021, instead of holding a face-to-face meeting, an online LAN conference was held twice in the first and second half of the year due to COVID-19. In addition, in order to raise the awareness of safety and health, we are developing and distributing a guidebook for safety and health management to establish safe workplaces.

Suppliers VOC Management

Hanwha Solutions collects the opinions of Suppliers on a monthly basis through the safety and health board. The company also listens to requests related to quality control and safety through annual meetings. In particular, the Insight Division operates an anonymous open chat room to collect opinions, and employees can easily access it through a QR code.

Win-win cooperation support activities

Major programs for shared growth

Technical/ Educational Support

- Support for eco-friendly startup company
- Training employees from Suppliers (training for fair trade compliance and encouraging participation in external training)
- Providing Suppliers with ESG management-related books

Financial support

- Operating Win-Win Fund
- Introduction and operation of a win-win payment system
- Early payment of distribution fees before holidays
- Increasing cash settlement ratio (100% cash payment to small- and medium-sized Suppliers)
- Support for loans using electronic accounts receivable as collateral
- Reducing sales commission rate of Suppliers

Strengthening competitiveness

- Cost support for Suppliers credit evaluation
- ESG evaluation of Suppliers and support for their expenses
- Support for new product development and promotion
- Support for patent application

Technical/Learning Support

Support for eco-friendly startup company | Hanwha Solutions is supporting startup company that can realize their social value along with innovative technologies such as eco-friendly and renewable energy by signing a Business Partnership Agreement for mutual cooperation in the ESG with the Korea International Trade Association. We provide various benefits to share growth as a business partner, such as selecting eco-friendly startup company and supporting the costs required to demonstrate business models.

Sharing knowledge and know-how | Hanwha Solutions shares its expertise and know-how, as well as field experience, with small and medium-sized Suppliers to improve quality and acquire new technologies. Through this, we are contributing to shared growth by developing the business capabilities and experiences of our partners.

Financial Support

Operating Win-Win Fund | Hanwha Solutions has promoted a Win-win fund for Suppliers through cooperation with major banks, providing loan and interest rate benefits. In addition, in May 2021, by participating in the Industrial/Financial Cooperation program to foster green energy signed by Hanwha Group and KDB Development Bank, a win-win fund worth KRW 100 billion was created for small and medium-sized enterprises related to environmentally-friendly technology. We are striving for shared growth and building a cooperative corporate eco-system.

Operating win-win payment system | In order to enable Suppliers to manage their funds smoothly, we introduced a win-win payment system for financial institutions to support early encashment at low cost based on Hanwha Solutions' excellent credit rating. By providing about KRW 100 billion in 2021 through the win-win payment system, we provided practical benefits to our partners to operate their financial stability.

Early payment of distribution fees before holidays | Prior to the Lunar New Year and Chuseok holidays, we are advancing payments for small and medium-sized Suppliers that are expected to experience difficulties in raising funds. In 2021, approximately KRW 40.3 billion was paid in advance to 652 major Suppliers. In addition, we purchase regional specialty products and present them as holiday gifts to our partners' employees and major customers, creating a win-win culture with our partners and also contributing to the revitalization of local economy.

Early payment for distribution fees during holidays in 2021 (unit: KRW billion)



Contribution to revitalization of local economy | The Chemical Division is contributing to revitalizing the local economy of small businesses and traditional markets in Yeosu and Ulsan by purchasing gift certificates worth about KRW 440 million in 2021.

Customized Shared Growth Program for Distribution Suppliers in the Galleria Division

Support for loans using electronic accounts receivable as collateral

Supporting financial liquidity through collateralized loans using electronic accounts receivable in connection with financial institutions (enabling early receipt of about 2 weeks for Suppliers)

As of 2021, managing an average of **KRW 21 billion** in monthly funds for about 190 small and medium-sized Suppliers

Reducing sales commission rate of Suppliers

Implemented a policy related to reducing the sales commission rate by 1-4% from 2012 for small and medium-sized Suppliers

Supported in an amount equivalent to about **KRW 26 million** for 27 small- and medium-sized Suppliers (as of 2021)

Support for production incentives for livestock breeding families

- Provided local livestock farms with about KRW 100 million free of charge for calves transferring or shipping, etc.
- In the case of Gangjin Maeku, a Korean beef brand in Jeollanam-do, it supports the cost of breeding and a subsidy of up to KRW 1 million per animal as a shipping grant.

About 280 animals were shipped, and annual sales target of about **KRW 4.9 billion** were achieved.

Pioneering a market for excellent products from small and medium-sized partners

- Operating 'Arumduri', a store dedicated to local excellent products
- Branding support through consultation on market support, quality certification, design improvement, storytelling, etc.
- Applying a 10% lower sales commission rate compared to other suppliers

Achieving a total annual sales of **KRW 2.6 billion** as 125 small and medium-sized brands entered the 'Areumduri' store as of 2021

Responsible Purchasing

Realizing ESG purchasing

Hanwha Solutions established the Eco-Friendly Product Purchasing and Management Guidelines to actively promote eco-friendly purchasing. According to this, when purchasing products, we focus on purchasing eco-friendly certified materials and equipment, as well as high-efficiency and environment-improving facilities. We will take the lead in eco-friendly purchasing that minimizes the impact on environment. We will do this principally by considering the eco-friendliness of all suppliers and raw materials that affect product production.

Purchase amount of eco-friendly products in 2021 (Unit: KRW 100 million)



Conflict Minerals Management

As a member of the UN Global Compact Network (UNGC), Hanwha Solutions supports the ten principles of human rights, labor, environment and anti-corruption. Accordingly, we intend to fulfill our social responsibility by prohibiting the use of unethically mined conflict minerals including environmental destruction and human rights violations in conflict area. In addition, in order to prevent supply chain risks in advance, we take charge in managing the material procurement system, by not only continuously screening regions related to conflict minerals, but also conducting regular evaluations of Suppliers that supply raw materials.

Community Engagement and Development

Sustainable Social Contribution

Social Contribution Promotion System

Hanwha Solutions has built a solid relationship of trust with the local communities through its founding principle of Business Patriotism, and the motto of Credibility and Loyalty. There is no greater proof to how committed Hanwha Solutions is to meeting its social responsibilities through its philosophy of Going Further Together.

To this end, the Hanwha Social Volunteering Team was formed for each division, and all employees voluntarily visit neighbors and facilities in need in local communities and conduct various volunteering activities.

Hanwha Solutions intends to create a bright future by creating a society with sharing and consideration through a variety of sincere social contribution activities, and by cultivating the value of social innovation through eco-friendly activities.

Operation of Local Community Council

We continue to communicate with local community stakeholders to discover local issues and seek solutions together.

The Yeosu Plant of Chemical Division is forming a local council for sincere communication with the local residents. It also plans to organize social contribution activities by listening to opinions and requests of the residents. In addition, in order to respond to the environment, a key issue in corporate management, a group of environmental experts and professors was formed to comprehensively collect various opinions together with the YMCA.

In addition, the Ulsan Plant is continuously promoting social contribution activities for children and youth, people of national merit, crime victims, the elderly and the disabled to contribute to the development of local communities and problem-solving.

SPECIAL CASE

Stepping-Stones Project for NEET

We recognize the social problem of NEET, which refers to young people who do not work and have no will to work, in local communities. In this regard, we are working with Ulsan Jung-gu Social Welfare Center to help young people adapt to society by implementing the Stepping-Stones Project, a mid- to long-term project, for 5 years. We discover NEETs through on/offline programs and focus on nurturing supporters for them. We support the NEETs by providing individual counseling or home visits to the participants and their families of the program, as well as providing supporter training or peer counselors who have escaped from seclusion. As of the end of May 2022, a total of 140 online social activities were conducted, and we will take the lead in creating a new social environment that can solve the problems of reclusive and isolated youth and creating a community culture that embraces the underprivileged.

KEY PERFORMANCE

Local community council
in operation



Total donation amount in 2021 (company + employees)
KRW 4.3 billion



Social contribution activities in 2021
Number of beneficiaries 18,498



Philosophy >

Going Further Together

Vision >

We will find solutions for everyone to enjoy a better future.

Better solutions for a better future

Mission >

Finding sustainable solutions to environmental and social problems.

Activity directions >

Response to climate change

Contribution to communities

“Creating a Clean School” Campaign



Hanwha Solutions and Hanwha Group have been conducting eco-friendly social contribution activities using solar power since 2011. In addition, Hanwha Solutions has been conducting the “Creating a Clean School” campaign as a “Happy Sunshine Season 2” event from 2021. In selected elementary schools, we have installed solar power generation facilities that can produce eco-friendly electricity, air showers, window-type air ventilation devices, and wall greening to keep students safe from fine dust and viruses and to support children to lead a sustainable life.



Community Environmental Conservation Activities



Hanwha Solutions provides solar power generation facilities to vulnerable families in Jincheon-gun. In the Sejong area, activities such as removal of alien species (thorn gourd), improvement of village landscape using waste pallet wood, and production and donation of eco-friendly beanbag chairs using products produced at plants are in progress. In 2022, in connection with Gyeryongsan National Park, we plan to expand environmental conservation activities through ecological forest restoration activities and alien species (bes, ragweed) removal activities.



“Environmental Solution to Become One with the Green Earth” Program



Hanwha Solutions is running a program to respond to climate change with the Green Umbrella Child Fund. This program consists of campaigns to inform people about the climate crisis in our daily lives and encourage people to participate in environmental action, participatory online environmental education to inform people about the climate crisis and energy saving practices, and support for an energy efficiency improvement campaign targeting groups made vulnerable by the climate crisis. In 2021, the ‘Together, Eco-Christmas’ campaign was held to inform people about the widespread death of the Korean fir, a representative species used as a Christmas tree, due to climate change, and encouraged them to participate in energy saving practices.

Donation of Solar Modules to Hurricane-impacted Areas in Colombia



The Qcells Division donated a 310kW solar module to the La Guajira region of Colombia, through the IPSE under the Ministry of Mineral Energy of Colombia. It can be used to restore the power infrastructure of educational facilities used by about 5,600 students.



SPECIAL CASE

Floating solar power plant of Hapcheon Dam with resident participation



In November 2021, the Qcells Division started operating a floating solar power plant at Hapcheon Dam. This is the world’s largest dam-based floating solar power plant with a capacity of 41 MW, which can supply power to 60,000 people (about 20,000 households) annually. In addition, as a resident participatory power generation project with a total investment of KRW 92.4 billion, 1,400 local residents invested KRW 3.1 billion, sharing a portion of the power generation revenue every year. We hired local residents for construction of the power plant, and used local construction companies and heavy equipment, as well as vessels from the local fishing industry to transport the floating equipment. Furthermore, we plan to hire local residents as additional manpower and environmental watchers while maintaining the power plant for 20 years.

Happy Sharing Refrigerator Project



In Yeosu, the ‘Happy Sharing Refrigerator Project’ has been opened for local residents who are in the blind spot of welfare. The campaign started with 5 locations in 2020 and has now expanded to 10 locations. Local residents lead in sharing refrigerated goods and anyone can easily donate groceries to the refrigerator installed in the community center, while other residents take as much as they need. In addition, we are taking the lead in spreading the culture of sharing in local communities by providing sanitary products necessary for the elderly on the island.

Hope Sharing Campaign



Hanwha Group has been participating in the Hope Sharing Campaign of the Community Chest of Korea since 2003. Hanwha Solutions is also participating in this campaign every year and has donated a total of KRW 1 billion from 2021 to overcome the difficult situation of COVID-19 that has lasted for the past two years. The donations are used to support the underprivileged, such as the disabled and low-income group, and to build and maintain social welfare facilities.



‘Right!Galleria’ Campaign



The Galleria Division has been conducting the ‘Right!Galleria’ campaign. Through this, we strive to deliver the right values for environmental protection, respect for life and a culture of safety. In particular, we are conducting various activities for children and animals based on the value of ‘respect for life’. Through the HAYAN (Helping All Young children’s Activities & Needs) project, we support children with incurable diseases and bridge the educational gap experienced by children from vulnerable families. In addition, PARAN(Protection of Animal Rights & Animal Needs) support in creating a culture with companion animals, such as organizing animal protection groups, providing small shelters and sponsoring individual activists.

Create a Brighter World Fund



To help neighbors in need, the “Creating a Brighter World” fund has been donated by deducting a certain amount from monthly salaries with the voluntary participation of executives and employees. The company operates in the form of a Matching Grant, in which an amount equivalent to 1.5 times the amount donated by employees is additionally donated. In 2021, we donated KRW 850 million to the Creating a Brighter World Fund, which our employees and the company raised together



Employee charity event ‘Love Aid’



The Galleria Division has been holding the ‘Love Aid’ event since 2018 with the goal of revitalizing the organizational culture and contributing to local communities. Employees participated in the 2021 Love Aid event and proposed suggestions for volunteer activities through the internal bulletin board. The event proceeded in three stages. First, if volunteers were recruited by directly suggesting the content, time, and place of volunteer activities, employees who wanted to participate in the volunteer activity expressed their intention to participate in through comments or donated money to the volunteer activity they wanted to support. As a result, in 2021, Love Aid conducted a campaign with a total of 181 employees under the topic of “Funding in Love with Your Neighbors” to reflect on the meaning of year-end sharing and donation. At the same time, through in-house crowdfunding, employees directly took charge of the fundraising event and donated approximately donations worth of KRW 7 million.



GOVERNANCE

Hanwha Solutions seeks to earn trust through its efforts to create ESG value from perspectives of various stakeholders based on a transparent and sound corporate governance structure.

KEY PERFORMANCE

Corporate Governance	Ethics and Compliance	Risk Management	Personal Information Protection and Cybersecurity
2021 Enactment of Corporate Governance Charter 	Compliance inspections (total of business divisions) 10 times 	Company-wide Establishment of risk management regulations 	All employees Security Pledge Completed 
Number of Board Meetings held in 2021 10 times 	All business divisions ISO 37301 and ISO 37001 certified 	ESG risk Strengthening management 	External online service in Galleria Division ISMS Certification 
2021 Establishment of Mid- to Long-term Shareholder Payout Policy 	Reporting violations of ethics and compliance in 2021 100% measures done 	Internal control system Operational sophistication 	Number of privacy information leaks in 2021 0 

Corporate Governance

Governance Policy

Enactment of Corporate Governance Charter

In December 2021, Hanwha Solutions enacted and announced the Corporate Governance Charter, which aims to realize the transparent and sound corporate governance, protect shareholders' rights and interests, and engage in fair corporate activities. The Corporate Governance Charter is an institutional means that effectively manages and supervises corporate management and at the same time adjusts and regulates the interests of shareholders, board of directors and other stakeholders. Hanwha Solutions endeavors to establish a more balanced governance system by securing fairness, transparency and independence in the governance structure.



KEY PERFORMANCE

2021

Enactment of Corporate Governance Charter



Number of Board Meetings held in 2021

10 times



2021

Establishment of Mid- to Long-term Shareholder Payout Policy



Hanwha Solutions operates a sound and stable corporate governance structure for sustainable growth of the company, a sense of responsibility to shareholders and protection of the rights of them. In this regard, we aim to enhance the trustability and value of the company by transparently communicating with relevant stakeholders.

Board Composition

BOD Composition

Hanwha Solutions' Board of Directors is transparently composed of all directors appointed at the general shareholders' meeting in accordance with the legal procedures stipulated by relevant regulations such as the Commercial Act and the Articles of Incorporation, and is operated in an independent and reasonable manner. In order to establish responsible management in a rapidly changing business world, the representative directors of each division form the in-house directors. In accordance with Article 29 of the Articles of Incorporation (Number of Directors), we retain more than half of the outside directors who demonstrate expertise in various fields. As of the end of March 2022, the BOD consists of 11 members, including 5 in-house directors and 6 outside directors, and the ratio of outside directors is 54.5%.

(As of the end of May 2022)

Role	Name	Position	Gender	Year of birth	Specialty	Major career	Appointment date	Term of office
Inside Directors	Koo Yung Lee	Chairman of the Board/ CEO of the Qcells	Male	1964	General Manager of Qcells Division	Yonsei University, Political Science and Diplomacy (Former) Head of Hanwha Qcells Module Business Unit	2021.03.24 (re-appointed)	2 years
	Du Hyoung Ryoo	CEO of the Advanced Materials Division	Male	1965	General Manager of Advanced Materials Division	Seoul National University, Business Administration (Former) CEO of Hanwha Energy	2022.03.23 (re-appointed)	2 years
	Dong Kwan Kim	CEO of the Strategy Division	Male	1983	General Manager of Strategy Division	Harvard University, Politics (Former) CCO of Hanwha Qcells & Advanced Materials	2022.03.23 (re-appointed)	2 years
	Eun-Soo Kim	CEO of the Galleria Division	Male	1962	General Manager of Galleria Division	University of Colorado, Master of International Economics (Former) CEO of Hanwha Galleria	2021.03.24 (newly appointed)	2 years
	Yi Hyeon Nam	CEO of the Chemical Division	Male	1964	General Manager of Chemical Division	Seoul National University, Industrial Chemistry (Former) Head of Hanwha General Chemical's New Business Promotion Department	2022.03.23 (newly appointed)	2 years
Outside Directors	Man-Gyu Choi	Chairman of the Audit Committee	Male	1955	Finance/Accounting	Konkuk University, Department of Agricultural Economics (Former) Vice President, Woori Bank	2022.03.23 (re-appointed)	2 years
	Amanda Bush	Outside Director	Female	1977	Petrochemical and energy M&A (lawyer)	Univ. of Texas School of Law (J.D.) Partner of Augustine Capital Partners (Current) Jackson Walker LLP	2022.03.23 (re-appointed)	2 years
	Satoshi Shima	Outside Director	Male	1958	Establishment of new business strategy	Nagoya University, Economics (Former) SoftBank President Son Jeong-eui's Office Manager	2022.03.23 (re-appointed)	2 years
	Jeong-Ho Seo	Chairman of the Internal Transaction Committee	Male	1969	Law (lawyer)	Seoul National University, Business Administration (Current) Lawyer at Law Firm Wiz	2022.03.23 (re-appointed)	2 years
	Ji-Hyeong Park	Chairman of the Outside Director Recommendation Committee/ ESG Committee	Male	1968	Economics (Professor)	PhD in Economics, University of Wisconsin (Current) Professor, Department of Economics, Seoul National University	2022.03.23 (re-appointed)	2 years
	Han-Joo Lee	Outside Director	Male	1972	Global IT	University of Chicago, Biology (Current) CEO of Bespin Global Co., Ltd.	2021.03.24 (newly appointed)	2 years

Director Appointment Process and Criteria

Hanwha Solutions appoints directors at the general shareholders' meeting in accordance with the Commercial Act and the Articles of Incorporation. Our Board of Directors is composed of members with diverse perspectives and expertise, providing a framework for managing and supervising the company more objectively. Prior to the general shareholders' meeting, major occupations and biographies related to the candidate directors to be appointed are announced in Korean and English to provide sufficient information for reviewing the specific career information and the suitability of any candidate. In the case of external directors, the most suitable candidate director is selected from among the candidates recommended by the Outside Director Recommendation Committee, which consists of all external directors, and the committee takes into account the candidate's independence, expertise, diversity, practical experience and compliance with commercial laws.

Independence, Professionalism and Diversity of BOD

Hanwha Solutions has a transparent governance structure under the basic principle of "management centered on the board of directors and committees". In accordance with the rules of the BOD, directors with special interests on an agenda cannot exercise their voting rights, and we are strengthening the decision-making function and independence of the BOD through a system in which such directors are not considered in the number of directors present.

In addition, Hanwha Solutions' board members have the necessary expertise and diversity regardless of race, nationality and gender. In order to provide accurate and sufficient corporate information in a timely fashion to the world, our board of directors are made up of global experts from various fields, including foreigners (USA, Japan) and women, and we strive to make decisions based on active discussions at the board of directors.



(Unit : %)

Ratio of domestic/foreigner members		Gender ratio		Proportion of professional fields on the board of directors	
● Korean	81.82	● Male	90.91	● Business and Management	45.45
● Foreigner	18.18	● Female	9.09	● Finance/Accounting and Economics	18.18
				● Strategy	18.18
				● Law	9.09
				● Global	9.09

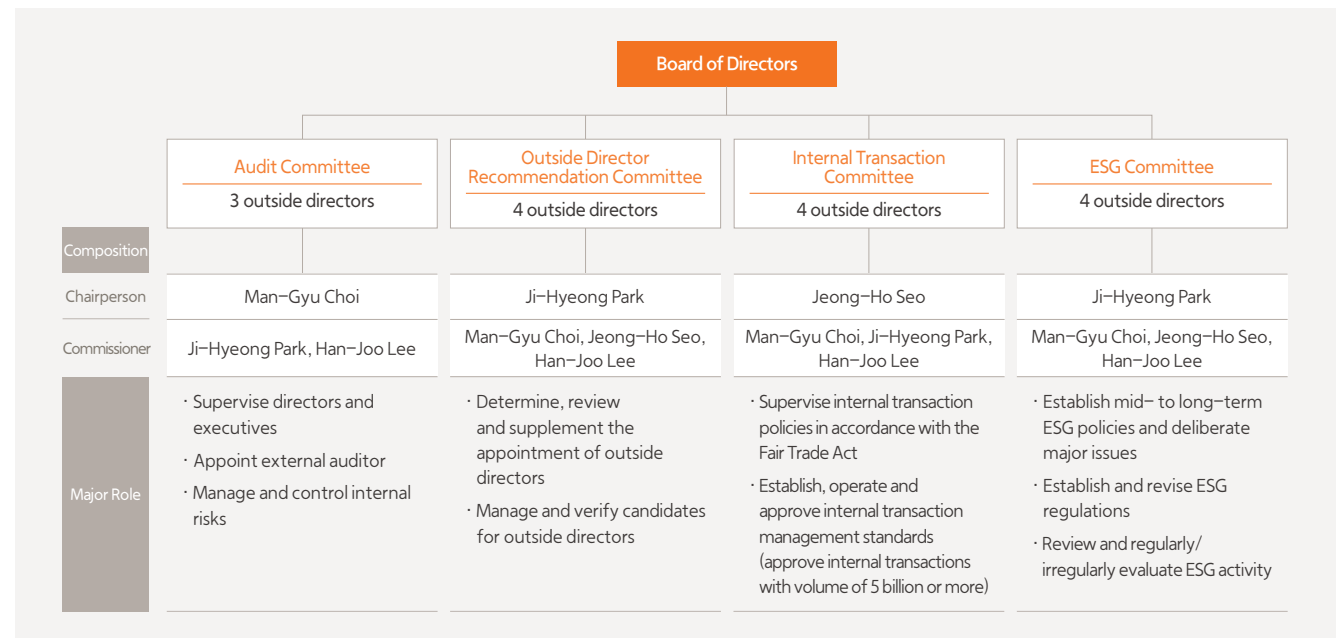
Committee within the Board of Directors

Hanwha Solutions has created four committees (Audit Committee, Internal Transaction Committee, Outside Director Recommendation Committee, ESG Committee) composed exclusively of outside directors, under the Board of Directors to secure professionalism and objectivity in decision making, as well as to review agendas more thoroughly. The purpose, regulations and activities of each committee are regularly disclosed in detail on Hanwha Solutions' website. In addition, the internal monitoring system audit opinion is prepared on the committee operation and status, with each committee being thoroughly supervised to operate effectively.



Composition and Roles of Committees within the Board of Directors of Hanwha Solutions

(As of the end of May 2022)



Current status of committees within the BOD in 2021

(As of the end of May 2022)

Composition	Number of Board Meetings	Agenda
Audit Committee	6	11 (5 resolutions and 6 reports)
Internal Transaction Committee	8	23 (resolutions)

Composition	Number of Board Meetings	Agenda
Outside Director Recommendation Committee	1	1 (resolution)
ESG Committee	3	4 (1 resolution and 3 reports)

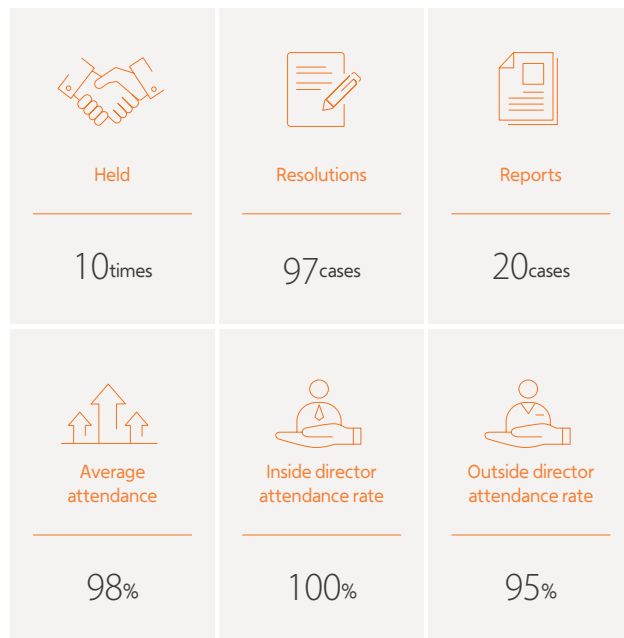
Operation of BOD

Activities of BOD

Hanwha Solutions holds regular board meetings on a quarterly basis and ad-hoc board meetings according to the circumstances and agendas. By sharing detailed information on the agenda of BOD up to 7 days prior to the meeting, it provides enough time for directors to review the agenda, so that more in-depth discussions can take place. In 2021, the Board of Directors held a total of 10 meetings, and the major issues decided were “approval on the submission (draft) of major investment conditions for participation in the negotiation of equity investment in Monolith Materials of the United States”, “approval on the execution of a Share Purchase Agreement for equity acquisition and investment in Lancium” and “enactment of a corporate governance charter”.



Activity and attendance of BOD



Enhancing the Expertise of Outside Directors

Hanwha Solutions provides a suitable environment for external directors to efficiently perform their duties in the BOD and committees within the BOD, by providing various activities and information. In 2021, a total of six training sessions were undertaken, introducing the current status and issues of major businesses by divisions to enhance their understanding of Hanwha Solutions’ management activities and job competency. In particular, in the case of the Audit Committee, internal and external trainings are provided on a regular basis to enhance the understanding of the internal accounting management system and the latest amendments to relevant laws, and to clearly recognize the roles and responsibilities of the Audit Committee members in the ESG era.

Current status of training for outside directors

Training date	Outside Directors in attendance	Main content of training
2021.03.25	Man-Gyu Choi, Jeong-Ho Seo, Ji-Hyeong Park, Han-Joo Lee	Introduction of Chemical Division (PO, CA, PVC and TDI) Introduction of Qcells Division (module, system, GES and DES) Introduction of Advanced Materials Division (Tank Business Team)
Training hours: 2 hours 40 minutes in total Lecturer: 9 employees at team leader level or higher		

Current status of training for Audit Committee

Education date	Attendance rate	Main content of education
2021.02.17	100%	Audit Strategy and ICFR (Internal Control of Financial Reporting)
2021.04.22	100%	The COVID-19 Era and ESG: In the era of change, what should we prepare for? The role of ESG Reporting and Audit (Committee)
2021.05.11	100%	Introducing annual audit schedule and focus area
2021.07.15	100%	2019-2020 Audit Status and Implications of the ICFR (Internal Control over Financial Reporting) and Notices of the Audit Committee
2021.12.31	100%	Major issues in the ICFR (Internal Control over Financial Reporting) and responses to the consolidated ICFR (Internal Control over Financial Reporting)

Evaluation and Remuneration of BOD Members

Evaluation of Outside Directors | In the case of inside directors, Hanwha Solutions conducts regular evaluations such as CEO and company evaluations. In the case of outside directors, a comprehensive internal evaluation is conducted at the end of their two-year term on whether they have provided appropriate advice in regards to critical management decisions as experts in their respective fields, and their professionalism and initiative as external directors. The results of this evaluation are comprehensively reflected in the re-appointment decision to encourage the Board of Directors to actively perform their duties and conduct responsible management.

Remuneration of Directors | In the case of outside directors, to enhance the transparency and fairness of their roles and to strictly supervise and check the company’s business activities, the remuneration is paid within the limit of total director remuneration approved at the general shareholders’ meeting (limit of directors’ remuneration: KRW 9 billion).

Payment status for remuneration of BOD members

(Unit : KRW million)

Role	Total remuneration	Average remuneration	Number of persons
Inside Directors	3,900	780	5
Outside Director	252	84	3
Audit Committee member	244	81	3
Total	4,396	400	11

* As of the end of December 2021, the calculation includes remuneration for directors who have retired within the current period

** In the case of inside directors, outside directors and members of the Audit committee are excluded. In the case of outside directors, members of the Audit committee are excluded.

Shareholder-Friendly Management

Equity and Capital structure

According to the Articles of Incorporation of Hanwha Solutions, a total of 300,000,000 shares that can be issued, and the price for each share to be issued is KRW 5,000. As of December 31, 2021, the total number of shares issued is 192,402,234.

Disclosure for Transparent Management Information

Hanwha Solutions regards transparency as the highest virtue of corporate management in order to establish a sound governance structure based on sustainable growth. In addition, we aim to provide timely and accurate information to the shareholders and market stakeholders regarding overall business activities. We promptly disclose corporate information required by the law and, if necessary, transparently disclose any matters that have a significant impact on decision-making of shareholders and stakeholders. In addition, we set the scope for disclosure of corporate information so that all stakeholders can access it at the same time, and we do not favor or discriminate against specific users of the information. Based on the ESG management system, Hanwha Solutions intends to transparently disclose ESG management activities and performance, establish ESG policies for corporate sustainable growth, and faithfully implement them.

Voting Rights Status

Item	Stock type	Number of shares
Total number of shares issued	Common shares	191,278,497
	Preferred shares	1,123,737
Non-voting shares	Common shares	698,117
	Preferred shares	1,123,737
Number of shares with revived voting right	Common shares	-
	Preferred shares	1,123,737
Number of shares with voting right	Common shares	190,580,380
	Preferred shares	1,123,737

Strengthening Protection of Shareholder Rights and Interests

Shareholder Protection Policy | Hanwha Solutions grants share appraisal rights as a way to gather opinions of minority shareholders and to protect the rights of dissenting shareholders in the event of a major change in the ownership structure or major business of the company. In addition, to encourage the participation of shareholder through voting, we have introduced a written voting system and an electronic voting system, which allow people to exercise their voting rights without attending the general shareholders' meeting. Through proxy solicitation for all the shareholders, we strive to protect shareholders so that they can comfortably exercise their voting rights.

Strengthening shareholder communications | Hanwha Solutions communicates with shareholders and investors through various activities and channels such as the company website and regular IR conference calls. Aside from management activities, we transparently disclose information about the company's commitment to ESG management and activities through the publication of sustainability reports and corporate governance reports.

Main IR Activities

(As of the end of May 2021)

Item	Contents	Performance
IR (Investor Relations)	• Quarterly earnings announcement (conference call & audio webcasting), Korean/English earnings announcement and data release	4 times in total
NDR (Non-Deal Roadshow)	• Domestic: Regular implementation of NDR following IR (both offline and online) • Overseas: IR Regular NDR and irregular overseas NDR (online)	6 times in total (domestic: 4 times, overseas: 2 times)
Conference/ Corporate Day	• Meeting with investors by participating in domestic and overseas conferences and Corporate Day events hosted by securities companies	10 times in total (domestic: 3 times, overseas: 7 times)
1 on 1/ visit meeting	• Frequent response to visit meetings/ conference calls	130 times

Implementation of shareholders' proposal right system | Hanwha Solutions is implementing a shareholders' proposal rights system that gives shareholders the right to propose agendas at the general shareholders' meeting to directors if they hold 5/1,000 or more of the total number of issued shares. Through the shareholders' proposal right system, shareholders more actively participate in Hanwha Solutions' management by expressing their opinions directly, and Hanwha Solutions gathers the opinions of various shareholders. In addition, by reflecting this process on the board of directors, we are creating a more innovative and shareholder-friendly management environment through mutual communications.

Shareholder return policy | Hanwha Solutions announced the mid- to long-term shareholder return policy to enhance shareholder value in 2021. The company plans to use 20% of the consolidated free cash flow for shareholder return over the next five years. Dividends, including shareholder returns and buy-back, are also disclosed about one month before the general shareholders' meeting to communicate with the shareholders and the market. The dividend payout ratio of the last five years of Hanwha Solutions is posted on the company website, so that the shareholder return can be more predictable.

SPECIAL CASE

Announcement of mid- to long-term shareholder payout policy

Hanwha Solutions announced the mid- to long-term shareholder return policy at the 48th general shareholders' meeting and IR. In addition, the notice of convening the general shareholders' meeting and notice of the convocation were sent to shareholders to inform them of the dividend plan. Hanwha Solutions plans to allocate 20% of its consolidated free cash flow to shareholder return in accordance with the company's performance-based shareholder return policy.

Consolidated free cash flow

Consolidated operating income (after removing one-off gains) - Net interest expenses - Corporate tax expenses + Depreciation expenses - Increase/decrease in working capital - CAPEX & acquisition of investment assets

Ethics and Compliance

As a company that fulfills its social responsibilities, Hanwha Solutions sets the standard of actions and values by executives and employees as ethical management, and is enhancing transparent and fair management performance based on the trust of stakeholders.

Ethics and Compliance System

Ethics and Compliance Promotion Principles

Corporate ethics and compliance are changing from the perspective of passive responsibilities or internal control to a perspective that emphasizes the active fulfillment of responsibilities by all stakeholders. Hanwha Solutions is practicing advanced ethical and compliance management based on company-wide ethical standards to fulfill its corporate social responsibilities, and to minimize risks caused by unethical corporate activities. In addition, we are implementing a systematic ethical and compliance management system, by presenting practical guidelines for ethical management that customers, partners and employees should follow.



KEY PERFORMANCE

Compliance inspections (total of business divisions)
10 times



All business divisions
ISO 37301 and ISO 37001 certified



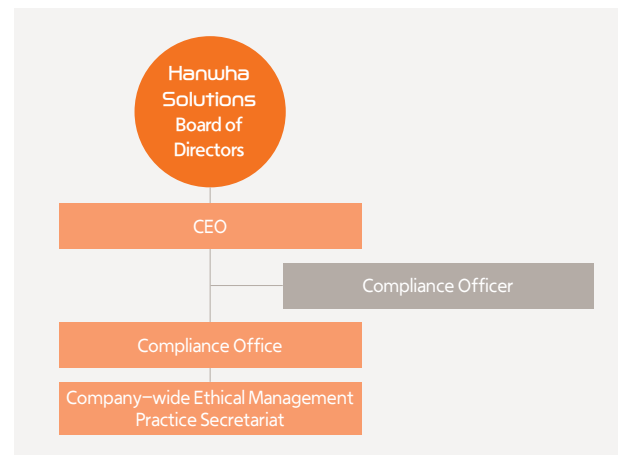
Reporting violations of ethics and compliance in 2021
100% measures taken



Ethics and Compliance Governance System

Hanwha Solutions appoints the head of compliance from the Strategy Division as a Compliance Officer through a resolution of the Board of Directors to support the Board of Directors' functions in managing and supervising the company in accordance with corporate law and its own compliance control standards. The Compliance Officer conducts regular compliance inspections and reports the results to the Board of Directors at least once a year, and thoroughly manages whether the company and its employees comply with ethical and compliance management principles. In addition, the Compliance Officer operates the Compliance Office, which is a department in charge of ethical management and compliance work directly under the CEO. There is also an Ethical Management Practice Secretariat under the Officer to disseminate ethical values and management principles throughout the company, and to promote ethical management in our daily lives. We are trying to change and enhance our awareness.

Compliance Promotion Organization



Implementing Advanced Ethics and Compliance

Hanwha Solutions acquired the international standard certification for anti-bribery management system (ISO 37001) and compliance management system (ISO 37301) to reduce risks of legal violations, enhance corporate external credibility, and promote domestic and overseas business activities. We are promoting advanced ethical and compliance management that meets global standards by identifying, evaluating, and inspecting ethical management, fair trade and bribery risks at the company level, in advance.

SPECIAL CASE

Acquisition of compliance and anti-bribery management system certification for two consecutive years

Hanwha Solutions received international standards of anti-bribery management system (ISO 37001) and compliance management system (ISO 37301) from the Korea Management Registrar, and was recognized for its transparent management performance at the global level for the first time in the domestic chemical and energy industries for two consecutive years. In particular, ISO 37301 is an international standard established by the International Organization for Standardization (ISO) in April 2021, and is awarded after rigorously examining compliance policies and compliance risk management standards rather than the previously acquired certification in the field of compliance management (ISO 19600). Hanwha Solutions will continue to strengthen its compliance and anti-corruption management system to fulfill its corporate social responsibilities while ensuring the satisfaction and trust of stakeholders.



Major Ethics and Compliance Activities

Strengthening Compliance and Anti-Corruption Management

In order to faithfully practice the requirements of new international standards such as ISO 37301, Hanwha Solutions has established, revised and distributed the company-wide compliance and anti-corruption policies and management manuals. This manual is a document to ensure the effective and appropriate implementation of the compliance practices and the anti-corruption management system. Accordingly, it was established to communicate the basic directions and responsibilities of compliance management and the anti-corruption management system by specifying the compliance and anti-corruption responsibilities for each department and the interaction of processes by business functions.

Diagnosis of Ethics and Compliance Implementation Status

Regular and Irregular Compliance Inspection | Hanwha Solutions conducts regular compliance inspections for all organizations in the Compliance Office under the direction of the Compliance Officer, and the inspection results are reported to the Board of Directors. The person in charge of compliance inspection in each department conducts self-inspection on a semi-annual basis, based on four criteria: general, civil/commercial, criminal/fair trade/licensing, and others. In the event of non-compliance, we will submit a backup measure and response plan to the Compliance Office, monitor implementation, and continuously manage compliance risks.

Operation of ethics counseling and reporting system | In order to establish a sound ethical and compliance culture, Hanwha Solutions operates an in-house reporting channel for violations of ethical standards and compliance that might occur at work.

By allowing employees to voluntarily report unethical business instructions or issues related to unfair trade and corruption to the Ethics Management Practice Secretariat, we are thoroughly maintaining ethics and dealing with compliance violations.

In addition, Hanwha Solutions has an "ethical management HOT LINE" channel, through which stakeholders such as customers and suppliers' employees can report, if they have any questions about ethical management, or if an employee has suffered as a result of violation against the code of ethics, or corruption. Reports are sent directly to the Ethics Management Practice Secretariat, and after the facts are checked, follow-up actions will be quickly taken. The identity of and content reported by the whistleblower – through internal whistleblowing and through the hotline – are kept strictly confidential based on the compliance control standards. Also, this whistleblowing system is operated in a way so that the whistleblower is not subjected to any repercussions.

Compliance and Anti-Corruption Policy

- Hanwha Solutions recognizes the importance of compliance and anti-corruption management, and place its top priority on conducting business in a way that secures the trust and transparency of its employees and customers.
- Hanwha Solutions must comply with relevant laws and company regulations in implementing its work.
- Hanwha Solutions thoroughly excludes anti-corruption activities that offer, demand and promise bribes, kickbacks and improper solicitations.
- Hanwha Solutions clearly distinguishes between public and private affairs and gives fair opportunities to all employees.
- Hanwha Solutions strives to create a sound economic ecosystem by actively informing and encouraging the company's stakeholders of the internally established compliance and anti-corruption culture.
- Employees of Hanwha Solutions can raise issues with reasonable confidence based on trust without fear of retaliation in good faith.
(New clause inserted according to ISO 37031)
- Hanwha Solutions guarantees the authority and independence of the compliance officer for compliance and anti-corruption management.
(New clause inserted according to ISO 37031)

Ethical Management HOT LINE

Ethical Management Practice Secretariat

Ethical Management Practice Secretariat, 24th Floor, Hanwha Building, 86 Cheonggyecheon-ro, Jung-gu, Seoul

TEL 02-6049-0746 E-Mail hccethics@hanwha.com

Performance of internal compliance and ethics inspection activities

2021 **Number of compliance inspections** **2** times in each division (10 times in total)

2021 **Number of violations detected** Number of cases based on internal compliance inspections – **0** cases

2021 **Number of reports of ethics and compliance violations** Number of cases received in the reporting channel – **3** cases (100% measures taken)

Ethics and Compliance Culture Expansion Activities

Internalization of employee ethics and compliance | Hanwha Solutions is raising the awareness of ethics and compliance management by providing regular ethics and compliance education for all executives and employees. We are operating a training curriculum for compliance and anti-corruption, which includes ethical management, anti-graft law (anti-corruption training) and trade secret protection training. In addition, after completing the training, a test is conducted, and if the score is not met, the completion of the training is recognized only if the resit exam is passed, so that all employees can fully understand the relevant content and strengthen their compliance standards.

In addition, Hanwha Solutions publishes a compliance letter to all employees every month to provide information on business-related laws/regulation trends and compliance management, so that they can carry out ethical and compliance management in their daily lives. In particular, twice a year during the holidays, we are actively encouraging a culture of ethical management participation by sending Ethics and Compliance Management Letters related to ethical discernment and behavioral standards, to employees, customers and business partners.

Employee pledge and inspection of ethics and compliance | Hanwha Solutions seeks to establish a transparent and faithful corporate culture by sharing its will to practice the world's best ethical and compliance management, to its executives and employees. In line with this, Galleria Division held an ethical pledge that shows the commitment of its employees in faithfully implementing the Code of Ethics Practice Guidelines, which is the standard for judging the behaviors and values of employees, thereby raising awareness of the company's ethical and compliance values. Furthermore, we are forming a corporate culture in which all executives and employees participate in ethical and compliance management by conducting self-diagnosis that evaluates compliance with ethical standards and practice guidelines.

Fair Trade Compliance

Spreading a Culture of Fair Trade Compliance

Hanwha Solutions strives to protect the rights and interests of various stakeholders by abiding by the principles of fair trade, introducing and faithfully implementing the four principles of fair trade. In case of subcontracting or transactions, the operating department goes through an internal deliberation process through the creation of a checklist to comply with the law, and manage to prevent any violations.

In particular, Galleria Division appoints a fair trade compliance managers, and through regular annual inspections, we identify any violations of the fair trade principle in advance, and provide feedback to prevent risks. For systematic operation of fair trade compliance, the company, each branch, headquarters, compliance council, and compliance officers of the sanctions committee all cooperate to maintain fair market competition.

Reinforcement of subcontracting law management and implementation | In 2021, the subcontracting law was extended to apply to companies. This includes the registration of general contractors under the Framework Act on the Construction Industry in Qcells Division. Accordingly, in order to comply with the 'Four Actions for Compliance with Subcontracting Laws' and to prevent risks that may arise in practice, we provided trainings on the Subcontracting Act and the Framework Act on the Construction Industry to working-level executives, employees in charge of subcontracting and those who wish to comply with.

In addition, by distributing the Guidelines for the Subcontracting Act and checklists that provide guidance on situations that may arise in the plants and construction work related to subcontract transactions, the business departments can systematically comply with the law. If the contract is larger than a certain size, we are managing it through the compulsory subcontract transaction review.

Fair Trade Compliance Activities

Hanwha Solutions is spotting risk factors through regular annual inspections and identifying them in advance in order to spread voluntary compliance with fair trade. In addition, we have a compliance guide for each of the work functions, in order to thoroughly comply with relevant laws. We also strengthen fair trade compliance activities and establish a fair trade culture, by providing regular training and feedback for working-level employees.

Reinforcement of Internal Transaction Management

With the recent revision of the Fair Trade Act, compliance risks related to internal transactions are increasing, such as expanding the scope of regulations for the unfair support and exploitation of personal interests. The Compliance Committee of Hanwha Group has established and distributed the Internal Transaction Review Guidelines to respond to stricter internal transaction regulations for all affiliates.

Hanwha Solutions independently operates the Internal Transaction Committee to review internal transactions between all domestic affiliates. In addition, in order to comply with the Fair Trade Act, the review regulations on internal transactions have been completely revised. By establishing the principle of competitive bidding, improving administrative procedures and improving document formats to review internal transactions, we are creating a transparent and fair ecosystem to prevent unfair trade practices between affiliates.

Risk Management

Strengthening Risk Management

Integrated Risk Management System

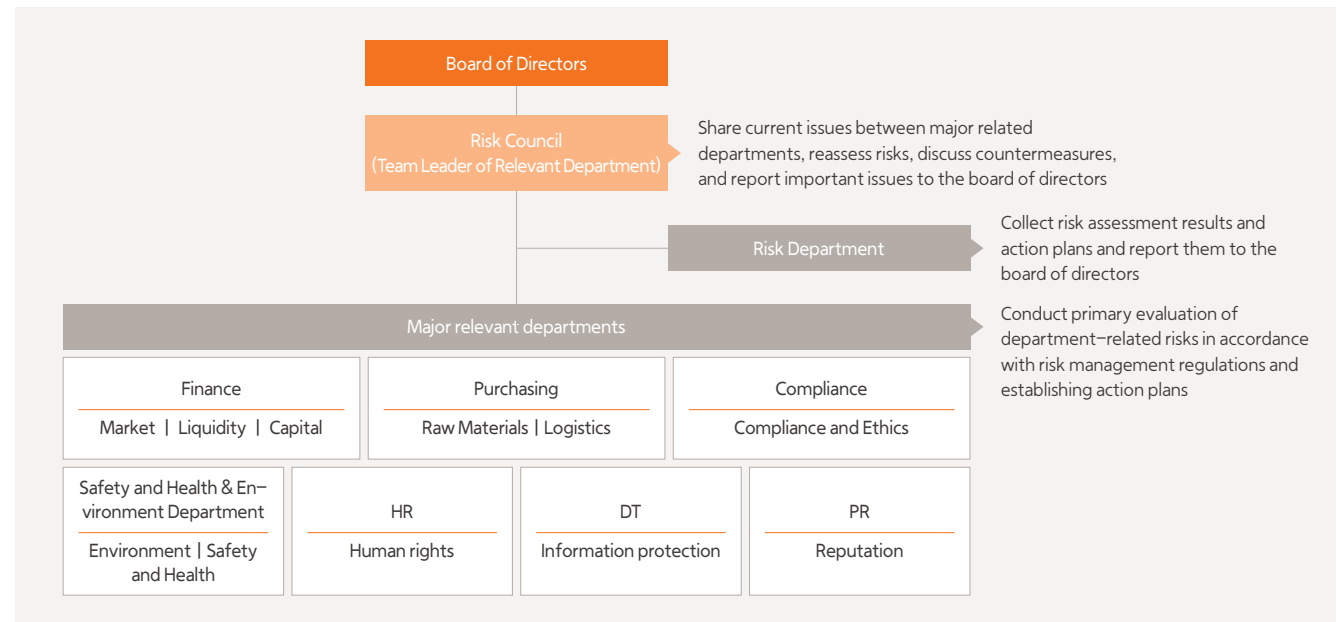
In December 2021, Hanwha Solutions established new company-wide risk management regulations to identify and prevent risk factors throughout business activities in advance and establish response procedures accordingly, laying the foundation for maintaining the soundness of company management. The regular risk assessment is conducted annually, when each department's business plan is established, and random assessments can be conducted whenever there are changes in management activities, such as the enactment or revision of laws, release of new products and services and organizational restructuring.

Hanwha Solutions is minimizing corporate risks by enacting company-wide risk management regulations, establishing a response organization and decision-making system according to risk types, and responding systematically and promptly to various possible risk factors.

Risk Management Governance

Hanwha Solutions organizes a risk council under the BOD. Within the company, the risk management personnel is designated for each division to conduct systematic risk management activities. The Compliance Officer was appointed as the head of the risk department to oversee all procedures related to risk assessments and actions. In this regard, the Compliance Officer are given the duty and authority to report the results of risk assessments and actions to the BOD. The Compliance Officer identifies risks by relevant departments, assigns risk grades, takes necessary action, manages them overall, and reports the results to the board of directors to strengthen the company-wide risk reporting system and proactively prevents risk factors. In addition, when major issues arise, they are reported to the management and decision-making is made through in-depth discussions on various risks with the management.

Risk Management Organization



KEY PERFORMANCE

Company-wide

Establishment of risk management regulations



ESG risk

Strengthening management



Internal control system

Operational sophistication



Risk Management Process

Hanwha Solutions has established a risk management process to recognize operational and financial risks and to identify and respond to possible issues in a timely manner. At the company level, we are operating a five-step risk management process, which is composed of risk identification, evaluation, and countermeasures set-up, monitoring and reporting. Furthermore, by calculating the risk impact according to the strategic importance, urgency, and impact on management, we established a response plan for each risk grade in four steps, and are responding by continuously monitoring potential risk factors.

Risk Management Process

STEP 1	Risk Identification	· Risk identification by relevant departments
STEP 2	Risk Evaluation	· Primary risk assessment by relevant departments – Risk level I ~ III, no level – Risk consulting group’s re-evaluation available
STEP 3	Countermeasures Set-up	· The risk department notifies relevant departments of the final risk ratings · Prepare risk mitigation action plans for relevant departments
STEP 4	Monitoring	· Relevant departments re-evaluate ratings on a monthly basis and implement plans according to risk measures · Monitor performance results through meetings of management units by grades
STEP 5	Board Reporting and Approval	· Implement action plans for each risk level and report the results once a year · The risk council reports on the adoption agenda or approval.

Response measures by risk level

Risk Level	Risk Monitoring	Set-up and Management of Response Plan	Report to BOD
Level I	Monthly department-level risk assessment ↓ Under occurrence of new risk(s) or change of risk level, communicate with designated risk department	Planning and company-level management (through company-level meetings)	Implement action plans for each risk level and report the results once a year
Level II		Planning and office/department-level management (through office-level meetings)	
Level III		Planning and team-level management	
No Level		Team-level management	

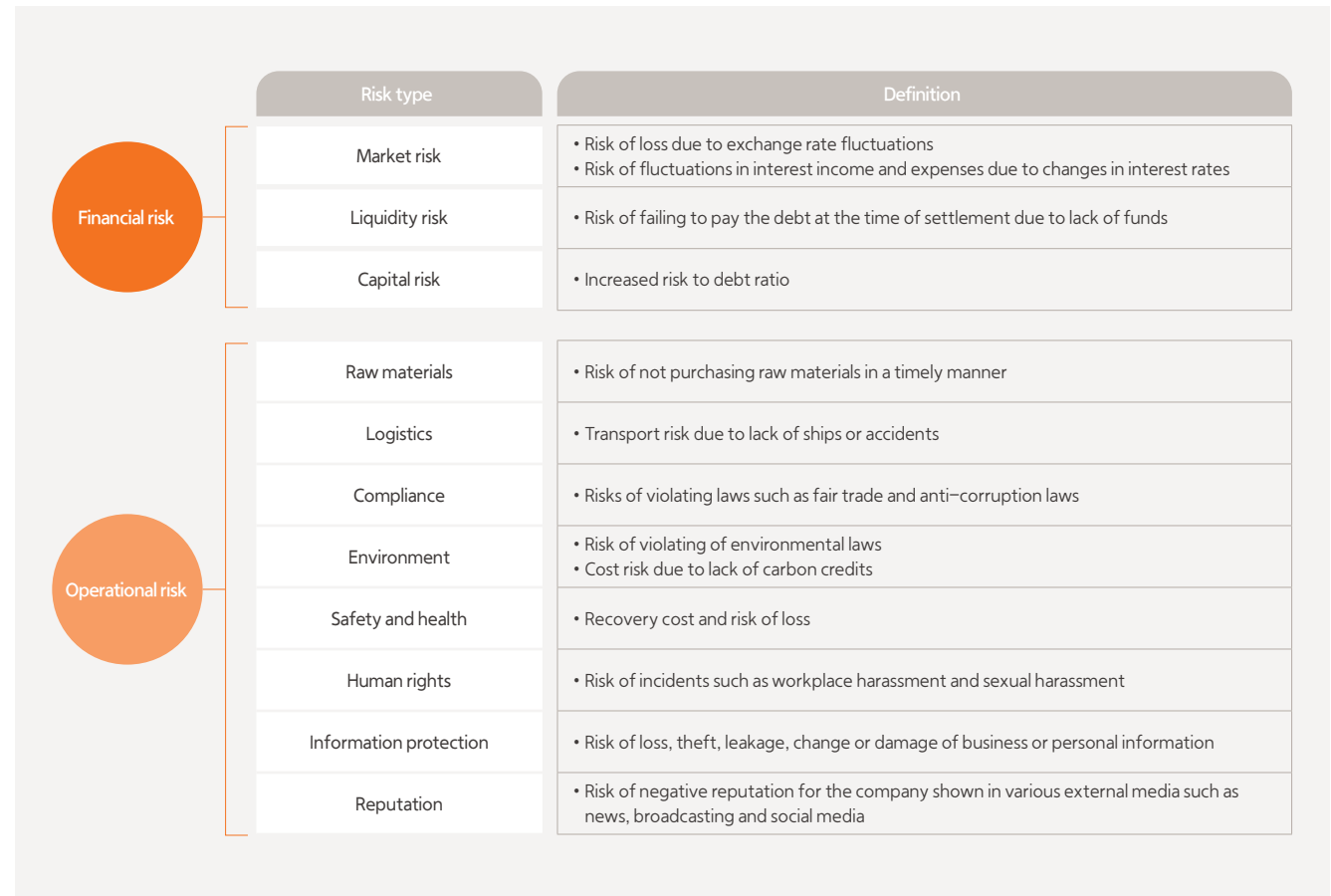
Risk Management by Type

Financial Risk Management

Even in situations where risks such as market, liquidity, and capital can occur, we are constantly monitoring possible financial risk factors to ensure stable and sustainable management performance. Financial risks are mainly managed by the finance team, and management policies are established in close cooperation with the relevant departments to identify, evaluate and respond to them.

Operational Risk Management

In order to respond to a rapidly changing business environment and to increase market volatility, we recognize and manage various ESG issues that affect overall business sustainability and related operational risks. In addition, we are proactively responding to ESG risks that may arise during business operations by planning and implementing strategic countermeasures.



ICFR (Internal Control over Financial Reporting)

Improving Operation of Internal Control System

In order to respond to the level of certification of external auditors tightened from “Review” to “Audit” due to the full revision of the Act on External Audit of Stock Companies in 2018, we has completed the improvement of the company-wide internal accounting management system by reflecting the revised standards through consulting with an external accounting institution. Through this, we introduced the Internal Accounting Management System (ICARUS) and formed a dedicated team for internal accounting, improved the efficiency of design and operation evaluation, and secured independence from management evaluation. In addition, we established standards for performance evaluation of the internal accounting management system, reflected it in the KPI evaluation of members and identified internal and external changes that would have significant impact on the internal accounting management system through the operation of semi-annual risk identification meetings. We are making efforts to recognize company-wide business risks in advance and establish countermeasures.

Audit and Reporting of ICFR

Hanwha Solutions has been certified by an independent external auditor as to the adequacy of the operation of ICFR (Internal Control over Financial Reporting). The CEO and internal accounting manager use the design and operation status of ICFR announced by the Operating Committee of Internal Control over Financial Reporting as a reference standard, and check the effectiveness of ICFR every business year, and report the operating status of ICFR to the Audit Committee, the Board of Directors and the general shareholders’ meeting. The Audit Committee evaluates the operation status of the ICFR report based on the best standards for evaluation and reporting from an independent standpoint. In addition, this report will be reported to the BOD to voluntarily correct any shortcomings or weaknesses at the company level, and the adequacy of the audit plan and audit results is reviewed through communication with external auditors.

Establishment of Consolidated ICFR Program

In order to respond to the introduction of the consolidated Internal Control over Financial Reporting to be introduced in 2023, we implemented a project to establish a consolidated Internal Control over Financial Reporting program with an external accounting institution. In addition, in 2022, we plan to secure accounting transparency and improve reliability by reinforcing internal control systems and improving processes for major subsidiaries at home and abroad through correcting shortcomings and managing changes.

Tax Risk Management

Tax Management Policy

In order to fulfill the obligations for tax reporting and payment as stipulated by law, Hanwha Solutions attaches great importance on tax policy operation such as sincere tax payment, management of tax risk through legal compliance and improvement of objectivity and transparency. In addition, we have documented and faithfully fulfills various obligations such as tax payment required by domestic and foreign tax laws and related regulations.

Tax Information Disclosure

Hanwha Solutions transparently discloses corporate tax payment-related information to all stakeholders through the audit report and sustainability report disclosed on the Financial Supervisory Service’s Electronic Disclosure System (DART).

Tax Risk Management

Hanwha Solutions has established a tax management process to respond to various tax risks from changes in the external environment. Tax-related issues are reported to the management according to the importance of tax type and amount, and we continuously monitor and respond to the enactment and revision of domestic and foreign tax laws, regulations, precedents and government policy trends.

In addition, we enhances the reliability and accuracy of the tax adjustment and accounting process through the ICFR (Internal Control over Financial Reporting), and in the event of any uncertainty or significant risk related to tax laws, the final decision is made based on the advice of a tax expert, a reply to a question from the tax authority or an authoritative interpretation to prevent tax risks in advance.

Tax Management Policy

1. Hanwha Solutions strictly complies with the tax laws and related laws of the countries where domestic and overseas corporations are located, reporting and completing tax obligations, and maintains a transparent and sound relationship with the tax authorities of these countries.
2. Hanwha Solutions does not unfairly use the tax rate structure or tax system for the purpose of tax evasion or transfer profits to Tax Haven in an improper way.
3. When dealing with third parties and related parties, Hanwha Solutions checks whether the regular price is applied in accordance with the method stipulated by the tax law.
4. Hanwha Solutions faithfully implements tax declaration and payment, as well as submission of various tax materials according to the tax laws and regulations enacted by the government and the authoritative interpretation, based on financial information managed in accordance with the accounting regulations and ICFR (Internal Control over Financial Reporting).

Personal Information Protection and Cybersecurity

Information Protection System

Information Protection Policy

Hanwha Solutions has established and operated internal information protection policies and management systems in accordance with various domestic and international security-related laws and regulations, such as trade secret protection, industrial secret protection and privacy protection laws, and GDPR (General Data Protection Regulation). In addition, we continuously monitor the latest information protection trends to revise our internal policies and share them so that all employees can access them at all times.

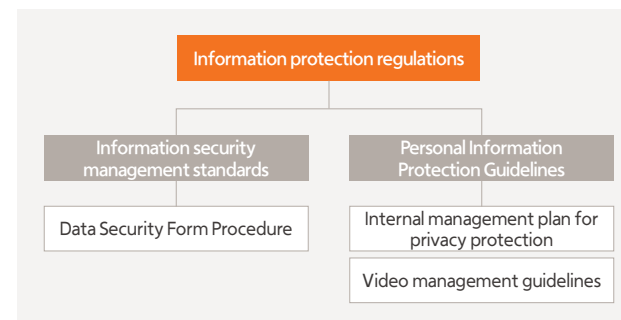
Information Protection Governance

Hanwha Solutions appoints a CISO (Chief Information Security Officer) to manage systematic information protection. The CISO organizes the Information Security Committee with the participation of the heads of information system operation, human resources and support departments, and is in charge of deliberation and resolution on major information protection issues within the company. In addition, information protection related departments are promoting various information protection activities and improvement activities to increase employees' security awareness.

Certification of the Information Protection Management System

In order to systematize information security management, Hanwha Solutions first acquired the ISMS (Information Security Management System) certification for external online services in Galleria Division. Since acquiring the ISMS certification, we have been operating a continuous and systematic information security management system. In 2022, we plan to expand the scope of the certification examination for information security management system to the entire company.

Regulations and management system for information security



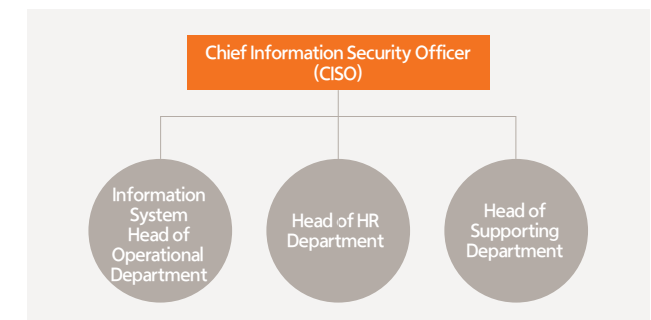
Core Management Area of the Information Protection

Hanwha Solutions establishes a plan by determining four core business areas for information protection, and is creating a stable information protection environment by continuously monitoring the risks. In addition, according to the company-wide risk management manual, we are responding quickly by dividing the risk management into 4 stages (normal-caution-warning-risk), and we are trying to minimize information security risks.

Four Core Business Areas of Information Protection

1 Establishment, implementation and improvement of information protection plan	2 Identification and evaluation of information protection risks and establishment of measures for information protection
3 Periodic inspection and improvement of the current status of information protection	4 Establishment and implementation of plans for information protection education/simulation training

Organizational Chart of the Information Security Committee



KEY PERFORMANCE

All employees

Security Pledge Completed



External online service in Galleria Division

ISMS Certification



Number of privacy information leaks in 2021

0



Personal Information Protection

Management of Personal Information Protection

In order to protect the privacy of information collected from customers and employees, Hanwha Solutions has established and operated internal management plans and guidelines for personal information protection in compliance with laws. In addition, a person will be appointed to design, operate and manage the company-wide personal information policy, also to ensure that we properly comply with all personal information management regulations at the department level.



Protection of Personal Information Rights of Information Subjects

Hanwha Solutions respects the personal information self-determination rights of data subjects, and explicitly obtains prior consent from data subjects when collecting and using personal information. Furthermore, we are applying the marking standards according to the Personal Information Protection Act so that data subjects can more clearly recognize the consent process for collection and use of personal information.

Risk Management for Customer Information

In order to more safely manage customer-related personal information, we are establishing management procedures to identify and prevent internal and external risk factors. When internal employees handle customer information, we will check whether it is appropriate for the purpose of use, suitability of authority, history and recall. In addition, access control procedures are established so that unauthorized access from outside can be blocked in advance, and when accessing systems containing customer information, a more reliable authentication method with two or more steps is applied.

Selection and Education of Personal Information Handlers

For the secure management of personal information, the Galleria Division regularly designates holders with access rights as the personal information handlers. We provide education and inspection of personal information protection at least once a year for our employees, and in 2021, 866 employees completed the training. In addition, we are endeavoring to prevent leakage of personal information by checking the records of access to the personal information processing system once a month.

Spread of Information Protection Culture

Strengthening Information Security Incidents and Response Capabilities

Response training through simulated scenarios against hacking emails and infiltrations | Hanwha Solutions conducts incident response trainings to prevent information security breaches twice per annum. Based on 10 scenarios classified according to the purpose and method of infiltration, we conducted a simulated infiltration test for cyber threats such as ransomware and DDoS (distributed denial of service). In addition, we are raising awareness of security among our employees by providing training in response to malicious emails such as advertisements and phishing emails containing malicious codes.

Strengthening cybersecurity capabilities | Hanwha Solutions operates an integrated security control center to prevent and promptly respond to cyber threats and breaches. By monitoring traffic flow in real time through the control center, we are always prepared for any malicious codes or external hacking attempts. When data over a certain capacity is transmitted to the outside, it is immediately detected and information is stored by blocking malicious and suspicious traffic.

Raising Employees' Awareness for Information Protection

Hanwha Solutions shares and pledges to "10 best practices for information protection" for all executives and employees to raise their information protection awareness. We conduct information protection and information protection trainings for all employees at least once a year to encourage the practice of information protection, and actively participate in various industrial security activities as a member of the National Core Technology Security Academy of Korea, including external seminar trainings.

In addition, periodic information protection guidelines and precautions are provided through company-wide "Security Day" events and emails sent to all employees. The quarterly Clean Office Day is held to encourage all employees to recognize the importance of information protection and security and implement protection and security practices on their own.

Information Protection Support for Business Partners

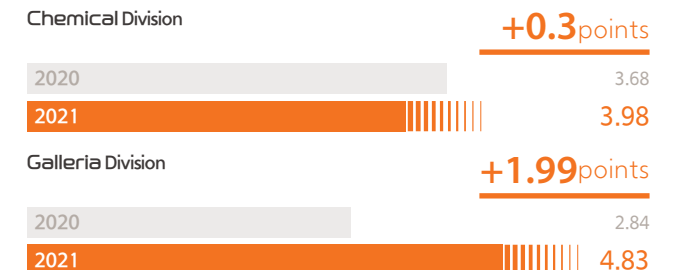
Hanwha Solutions supports suppliers' information protection activities to spread the information protection culture. When contracting with a partner, a security agreement is mandatory, and when the contract is terminated, personal information security management such as destruction of information is conducted to thoroughly prevent risks associated with leakage of personal information. In addition, we will review the checklist of suppliers during the project. In particular, in the case of Galleria Division, regular inspections and trainings are carried out twice a year for companies entrusted with private data.

Information Security Checks

Infrastructure vulnerability diagnosis | Hanwha Solutions diagnoses and improves infrastructure vulnerabilities through security verification activities of IT systems that reflect the latest trends in the first and second half of every year. In addition, when introducing new assets and systems, secure coding is applied and security reviews are conducted to ensure the information security.

Evaluating information protection level | Hanwha Solutions has developed and is operating a "Information Protection Management Maturity Model" in four areas: administrative security, physical security, technical security and personal information protection. In accordance with the Information Protection Management Maturity Model, the level of security implementation in each area is evaluated annually, and improvements are identified to raise the security awareness of employees and control the leakage of the company's original technology.

Assessment result for information protection maturity



ESG Factbook

Economic	071
Environmental	072
Social	075
Governance	078

Economic

Consolidated statement of financial position

(Unit : KRW 1 million)

Classification	2019	2020	2021
Assets			
Current assets	5,322,650	4,958,365	6,073,960
Cash and cash equivalents	1,084,516	1,199,837	1,567,163
FVTPL - financial assets	1,061	2,920	
FVTOCI - financial assets	1		
Other financial assets	492,890	192,785	229,553
Trade receivables and other receivables	1,572,846	1,457,526	1,631,759
Other current assets	370,438	327,678	331,309
Inventories	1,479,892	1,431,588	2,231,502
Current income tax assets	23,271	10,521	16,789
Non-current assets held for sale	297,734	335,510	65,885
Non-current assets	10,358,479	10,178,955	12,523,570
FVTPL - financial assets	2,129	1,858	33,629
FVTOCI - financial assets	46,597	48,541	56,186
Other financial assets	75,725	62,139	209,559
Long-term trade receivables and other receivables	4,627	3,837	2,839
Investments in associates and joint ventures	2,720,817	2,685,164	3,438,403
Investment property	158,043	142,187	212,428
Property, plant and equipment	6,594,033	6,416,485	6,451,599
Intangible assets	421,170	413,851	1,580,567
Right-of-use assets	246,990	309,714	381,096
Other non-current assets	15,965	16,286	35,938
Deferred tax assets	72,382	78,892	121,327
Finance business assets			1,410,042
Total assets	15,681,129	15,137,320	20,007,572

Classification	2019	2020	2021
Liabilities			
Current liabilities	5,831,012	5,251,126	5,787,890
Trade payables and other payables	1,573,035	1,556,392	2,441,733
Short-term borrowings	3,384,514	2,971,926	2,611,134
Other financial liabilities	205,562	222,158	292,209
Provisions	60,855	51,059	54,458
Other current liabilities	559,727	302,576	296,578
Current income tax liabilities	47,319	147,015	91,778
Non-current liabilities	4,044,269	3,918,479	4,774,478
Long-term trade payables and other payables	5	15	173,506
Long-term borrowings	2,984,059	2,716,648	3,263,693
Other financial liabilities	218,861	379,992	469,362
Net defined benefit liabilities	411,795	446,565	455,223
Long-term employee benefits	25,682	27,893	26,716
Provisions	90,675	106,858	112,193
Other non-current liabilities	7,545	6,382	5,880
Deferred tax liabilities	305,648	234,127	267,905
Finance business liabilities			1,243,957
Total liabilities	9,875,282	9,169,604	11,806,325
Equity			
Equity attributable to owner of the Company	5,728,169	5,929,092	8,159,421
Capital stock	821,171	821,171	978,241
Capital surplus	804,504	798,470	2,003,249
Capital adjustments	(2,918)	(10,328)	(24,176)
Accumulated other comprehensive income	(70,523)	(110,010)	150,693
Retained earnings	4,175,935	4,429,789	5,051,414
Non-controlling interests	77,678	38,623	41,826
Total equity	5,805,847	5,967,715	8,201,247
Total liabilities and equity	15,681,129	15,137,320	20,007,572

Environmental

In April 2021, the Galleria and Insight Divisions concluded the merger process and were added to this year's report; therefore, this year's report contains data from five business divisions in total (Chemical, Qcells, Advanced Materials, Galleria, Insight). Moreover, the Insight Division was established from a merger of the Urban Development Division, the Green Energy Solution (GES) Business Division of Qcells, and the Premium Lifestyle Business Division of Galleria. From 2022, it will manage ESG data as a unified division.

Environmental Management

Greenhouse Gas (GHG)

Classification	Unit	2019	2020	2021
Total GHG emissions (Scope 1 + Scope 2) ¹⁾²⁾	tCO ₂ -eq	2,638,538	2,400,496	2,557,067
Emissions by KRW (based on sales under separate financial statements)	tCO ₂ -eq/ KRW 100 million	41.0	39.5	34.1
Scope 1	tCO ₂ -eq	387,563	409,402	411,718
Scope 2		2,250,975	1,991,094	2,145,349
Scope 3 ³⁾		4,467,694	5,009,985 (Verified amount: 2,189,390)	4,699,172 (Verified amount: 4,464,700)
GHG reductions (Scope 1 + Scope 2)		46,716	37,592	59,659
GHG reduction activities	Initiatives	91	84	158

1) Scope 1 and 2 emissions in 2021 may be modified after the finalization of the Statement on GHG under the Carbon Emissions Trading Scheme in Korea.

2) Emissions from the Galleria and Insight Divisions have been counted and included after the merger (2021)

3) Scope 3 emissions have increased than the base year (2019) due to the change of boundary being applied and increased production.

Air Pollutants

Classification	Unit	2019	2020	2021
Nitrogen oxide (NOx)	Ton	176	182	173
Sulfur oxide (SOx)		2	6	11
Dust		22	20	18

Energy

Classification	Unit	2019	2020	2021
Total energy consumption		52,331,952	47,546,836	49,920,949
Direct energy consumption	Subtotal	5,229,817	6,069,912	5,309,595
	Gasoline	10,256	9,129	11,812
	Diesel	19,479	18,825	19,311
	Kerosene	7,253	6,522	41,126
	LPG	280,878	683,898	543,614
	LNG	1,826,558	3,436,188	3,434,153
Indirect energy consumption	Others	3,085,393	1,915,350	1,259,578
	Subtotal	47,102,135	41,476,924	44,611,354
	Power	41,676,652	36,305,841	39,117,812
	Steam	5,425,483	5,171,083	5,493,542
Consumption by KRW (based on sales under separate financial statements)	GJ/ KRW 100 million	813	782	666
Total energy consumption	KRW 100 million	5,187	4,958	5,002
Energy consumption reductions	GJ	839,191	550,955	986,166
Amount of power consumed at business sites	MWh	4,341,180	3,781,690	4,081,659
Amount of renewable energy consumed at business sites		3,009	3,154	12,863

Water Pollutants

Classification	Unit	2019	2020	2021
Chemical oxygen demand (COD)	Ton	332	371	356
Biochemical oxygen demand (BOD)		329	290	115
Suspended solids (SS)		271	222	185

Water and Wastewater

Classification	Unit	2019	2020	2021
Water consumption	Ton	17,704,414	16,962,399	18,359,667
Recycled water		980,736	743,374	898,024
Water recycle rate	%	5.5	4.4	4.9
Amount of wastewater generated	Ton	6,774,412	6,647,346	7,359,409
Total consumption amount in "high" and "extremely high" regions among the total water intake	%	0	0	0

* Both the water and wastewater recycling amount are included in the recycling water amount

Waste

Classification	Unit	2019	2020	2021	
Total amount of generated waste	Ton	92,158	78,376	83,767	
General waste		Landfill	21,601	16,974	17,275
		Incineration	5,261	3,915	3,927
		Recycling	48,317	25,995	29,909
Designated waste		Landfill	277	530	250
		Incineration	2,895	3,395	3,448
		Others	13,694	15,187	14,755
	Recycling	114	12,379	14,204	
Rate of recycled waste	%	52.6	49.0	52.7	
Waste disposal costs	KRW 100 million	99	93	106	

Hazardous Chemical Substances

Classification	Unit	2019	2020	2021
Amount of hazardous chemical substances	Ton	366	339	306

* Based on pollutant release and transfer register (PRTR)

Environmental Training

Classification	Unit	2019	2020	2021
Hours of environmental training	Hours	16,114	19,999	17,365
Employees participating in environmental training	Person	4,438	4,775	4,370

Environmental Management System

Classification	Unit	2019	2020	2021
Certification rate of the environmental management system (ISO 14001)	%	90	85	89
Certified business sites	Sites	18	17	17
Business sites subject to certification		20	20	19

* Business sites are considered as targets for certification based on their business registration certificate. The Sheet Molding Compound (SMC) business site of the Advanced Materials Division has been closed as of 2021.

Environmental Regulations

Classification	Unit	2019	2020	2021
Violation cases of environmental regulations	Cases	0	0	0
Total amount of penalties	KRW	0	0	0

Environmental Investments and Expenditures

Classification	Unit	2019	2020	2021
Environmental investments	KRW 100 million	209	136	246
Environmental expenditures	million	253	246	258

Eco-Friendly Sales and Purchases

Classification	Unit	2019	2020	2021
Eco-friendly certifications	Cases	2	127	273
Sales of eco-friendly products	KRW 100 million	219	5,904	6,398
Purchases of eco-friendly products		2.8	3.5	2.3

Safety and Health Management

Occupational Accidents

Classification		Unit	2019	2020	2021
Cases of serious accidents	Employees	Cases	0	0	0
	Suppliers		0	0	0
Ratio of death due to occupational accidents	Employees	%	0	0	0
	Suppliers		0	0	0
Rate of occupational accidents (Accidents / Workers) * 100	Employees	%	0.09	0.03	0.13
	Suppliers		0.11	0.09	0.15
Lost Time Injured Rate (LTIR) (Number of lost time injuries for the year * 1,000,000) / (Total hours worked for the year)	Employees	-	0.59	0.22	0.75
	Suppliers		0.76	0.88	0.78
Occupational Illness Frequency Rate (OFIR) (Number of occupational diseases for the year * 1,000,000) / (Total hours worked for the year)	Employees	-	0.00	0.00	0.00
	Suppliers		0.00	0.00	0.00

* Including the number of accidents in factories abroad

Training on Occupational Safety

Classification	Unit	2019	2020	2021
Hours of occupational safety training	Hours	170,278	171,350	168,296
Participants of occupational safety training	Person	4,783	5,436	5,295

* The data of occupational safety trainings includes both employees of both Hanwha Solutions and its suppliers.

Safety and Health Management System

Classification	Unit	2019	2020	2021
Certification rate of the safety and health management (ISO 45001)	%	100	95	100
Certified business sites	Sites	20	19	19
Business sites subject to certification		20	20	19

* Business sites are considered as targets for certification based on their business registration certificate. The Sheet Molding Compound (SMC) business site of the Advanced Materials Division has been closed as of 2021.

Health Management

Classification		Unit	2019	2020	2021
Status of health checkups	Total	Person	8,907	7,963	9,243
	Employees		7,210	6,890	7,476
	Spouse and family		1,175	514	1,295
	Suppliers		522	559	472

Social

In April 2021, the Galleria and Insight Divisions concluded the merger process and were added to this year's report. This year's report contains data from five business divisions in total (Chemical, Qcells, Advanced Materials, Galleria, Insight).

Employees

Status of Employees

Classification		Unit	2019	2020	2021
Total employment					
Total number of employees (in Korea)		Person	6,688	6,672	6,747
Employment type	Permanent employees	Person	6,400	6,496	6,524
	Percentage of permanent employees	%	95.7	97.4	96.7
	Temporary	Person	288	176	223
	Percentage of temporary workers	%	4.3	2.6	3.3
Gender	Male	Person	5,581	5,602	5,650
	Female		1,107	1,070	1,097
Age groups	Ages under 30	Person	2,077	1,944	1,744
	Ages 30 to 39		2,170	2,249	2,379
	Ages 40 to 49		1,301	1,241	1,298
	Ages 50 to 59		1,101	1,201	1,291
	Ages 60 or above		39	37	35
By rank	Executives	Person	94	98	121
	General and senior managers		1,308	1,446	1,565
	Assistant managers		687	655	676
	Staff		486	450	404
	Non-management		4,113	4,023	3,981
By occupation	Management team	Person	94	98	121
	General personnel		2,167	2,222	2,268
	Researcher		311	320	320
	Office personnel		208	209	207
	Professionals		3,623	3,649	3,609
	Temporary employees		285	174	222
By region	Korea	Person	6,688	6,672	6,747
	Overseas		101	110	157
Years of continuous service					
Average years of continuous service		Years	14.1	10.1	10.8

* Voluntary turnover includes retirement and change of jobs apart from non-voluntary cases, such as voluntary retirement or quitting one's job for further academic studies. Non-voluntary turnover cases include regular retirement, disciplinary retirement, and resignation under instruction or advice.

Classification		Unit	2019	2020	2021
Diversity of employees					
Female personnel	Female managers (Manager level or higher)	Person	136	163	195
	Percentage of female managers	%	9.7	10.6	11.6
Marginalized classes	Persons with disabilities	Person	151	142	159
	Persons with national merits		165	165	158
	International employees		23	23	25
New Recruiting					
New employees (in Korea)		Person	490	236	558
Employment type	Permanent (as new employees)	Person	130	74	235
	Permanent (as experienced employees)		147	74	162
	Temporary		213	88	161
Gender	Male	Person	377	172	433
	Female		113	64	125
Age groups	Below 30	Person	286	131	234
	30-50		188	96	283
	51 or older		16	9	41
Turnover and retirement					
Turnover and retirement cases (for regular employees)		Person	450	296	399
Reason for turnover/retirement	Voluntary turnover	Person	400	246	354
	Non-voluntary turnover		50	50	45
Gender	Male	Person	344	241	314
	Female		106	55	85
Age groups	Ages under 30	Person	196	119	155
	Ages 30 to 39		128	77	142
	Ages 40 to 49		48	34	47
	Ages 50 to 59		29	18	12
	Ages 60 or above		49	48	43
Turnover rate	Voluntary turnover rate	%	6.3	3.8	5.4
	Non-voluntary turnover rate		0.8	0.8	0.7

Parental Leave

Classification		Unit	2019	2020	2021
Those who took parental leave	Male	Person	8	11	12
	Female		52	53	64
Those who must return after parental leave	Male	Person	5	10	12
	Female		50	65	50
Those who returned after parental leave	Male	Person	4	10	12
	Female		47	63	45
Percentage of returners after parental leave	Male	%	80.0	100.0	100.0
	Female		94.0	96.9	90.0

Training Performance of Employees

Classification	Unit	2019	2020	2021
Total training costs	KRW 1 million	5,442	2,189	2,281
Total training hours	Hours	81,813	63,848	58,041
Total trainees (employees)	Person	12,796	7,993	10,316
Training costs per person	KRW 1,000	850	337	350
Training hours per person	Hours	12.8	9.8	8.9

* Courses reflected in the training performance of employees include The Prevention of Sexual Harassment Course, The Course to Raise Awareness of Persons with Disabilities, The Prevention of Workplace Bullying Course, etc.

** The training costs and hours per person have been calculated by dividing the total training costs and hours with the number of regular employees.

Welfare

Classification	Unit	2019	2020	2021
Total welfare costs	KRW 1 million	63,232	64,170	72,933
Welfare costs per person		9.5	9.6	10.8

Status of Labor Union Membership

Classification	Unit	2019	2020	2021
Persons eligible for union membership	Person	2,131	2,240	2,192
Union members		1,482	1,600	1,602
Rate of union membership	%	69.5	71.4	73.1
Labor-management council meetings	Sessions	80	80	80
Bills resolved by the council	Cases	519	598	553

* Qcells and Insight Divisions do not operate labor unions.

Employee Wages

Classification	Unit	2019	2020	2021	
Average Basic Salary by Gender					
Average basic salary of male employees	KRW 1,000	65,080	66,917	64,218	
Average basic salary of female employees		36,648	39,958	37,131	
Percentage	%	56.3	59.7	57.8	
Average Basic Salary by Position					
Executive position	Male	KRW 1,000	204,620	211,384	201,451
	Female		n/a	n/a	148,953
	Percentage	%	n/a	n/a	73.9
Employees excluding executives	Male	KRW 1,000	63,686	65,395	60,921
	Female		41,183	42,872	37,271
	Percentage	%	64.7	65.6	61.2

* Percentage = Average basic salary of female employees / average basic salary of male employees

Status of Performance Assessment

Classification	Unit	2019	2020	2021
Persons subject to performance assessment	Person	3,785	3,937	4,296
Employees who received regular performance assessment		3,785	3,937	4,296
Percentage of employees who received regular performance assessment	%	100	100	100

Client Satisfaction

Status of the Voice of Clients (VOC)

Classification	Unit	2019	2020	2021
Cases of client complaints received	Cases	794	1,430	1,330
Cases of client complaints processed		794	1,430	1,330
Percentage of client complaints processed	%	100	100	100

Win-Win Cooperation

Status of Suppliers

Classification	Unit	2019	2020	2021
Total number of suppliers	Number	8,838	4,826	5,670
Newly registered suppliers		1,462	1,475	1,294
Total purchases for goods/services from suppliers	KRW 1 million	3,563,232	5,204,669	7,225,997

Support for Suppliers

Classification	Unit	2019	2020	2021
Financial support (shared growth fund)	Total financing	54,000	74,000	81,000
	Executed amount	26,469	23,767	24,465
Consulting (diagnosis)	Sessions	4	-	10
ESG support		n/a		10

* Reduced support for suppliers due to COVID-19 and ESG support was initiated from 2021

Social Contribution

Status of Social Contribution Activities

Classification	Unit	2019	2020	2021	
Social Contribution Activities	Beneficiaries	Person	15,896	14,932	18,498
Donations	Total donations	KRW 1 million	6,846	6,262	4,323
	Corporate donations		6,358	5,828	3,980
	Donations by employees		488	434	344
Employees' volunteering activities	Total volunteering hours	Hours	22,256	757	202
	Volunteering hours per person		6.2	3.5	4.2

* Employees performs less volunteering activities due to COVID-19 from 2020 to 2021.

** Volunteering hours per person = Total volunteering hours / Volunteering participants

Governance

In April 2021, the Galleria and Insight Divisions concluded the merger process and were added to this year's report. This year's report contains data from five business divisions in total (Chemical, Qcells, Advanced Materials, Galleria, Insight).

BOD

Operation of the Board of Directors (BOD)

Classification		Unit	2019	2020	2021
Organization of BOD	Inside directors	Person	4	5	4
	Outside directors		5	6	6
	Percentage of outside directors	%	56	55	60
	Percentage of female directors	%	-	9	10
Number of BOD meetings held	Number of meetings held	Sessions	12	11	10
Attendance of BOD	Attendance of outside directors	%	100	97	96
	Attendance of inside directors	%	100	100	100
Average tenure of directors		Months	31	22	23
Bills opposed by outside directors		No. of cases	0	1	0

Operation of Committees under the BOD

Classification		Unit	2019	2020	2021
Audit Committee	Percentage of outside directors	%	100	100	100
	Number	Sessions	5	7	6
	Attendance rate	%	100	100	100
Internal Transaction Committee	Percentage of outside directors	%	67	67	71
	Number	Sessions	5	4	8
	Attendance rate	%	98	100	100
Outside Director Recommendation Committee	Percentage of outside directors	%	100	100	100
	Number	Sessions	1	1	1
	Attendance rate	%	100	100	100
ESG Committee	Percentage of outside directors	%	Established in 2021 (May 2021)		100
	Number	Sessions			3
	Attendance rate	%			100

Board of Directors' Remuneration

Classification		Unit	2019	2020	2021
Inside Directors	Number of directors	Person	4	5	5
	Total remuneration	KRW 1 million	4,660	2,959	3,900
	Average per capita remuneration	million	1,165	592	780
Outside Directors	Number of directors	Person	3	3	3
	Total remuneration	KRW 1 million	133	161	252
	Average per capita remuneration	million	44	54	84
Audit Committee members	Number of directors	Person	3	3	3
	Total remuneration	KRW 1 million	198	179	244
	Average per capita remuneration	million	66	60	81

* Inside directors do not include outside directors or audit committee members. The number of outside directors excludes Audit Committee members.

Ratio of Maximum Remuneration to Average Wage of Employees

Classification		Unit	2019	2020	2021
Maximum remuneration amount	KRW 1 million		3,595	1,368	2,700
Average annual salary per employee			100	75	72
Percentage of those receiving maximum remuneration compared to employees' average salaries	Times (more)		36	18	37

* Total remuneration excluding retirement benefits

Status of Owned Shares

Classification		Unit	2019	2020	2021
CEO's share ratio	%		0.01	0.01	0.01
Public institutions' share ratio			9.98	10.59	7.72

Basic Information of the Largest Shareholder

Classification	Shareholder	Unit	Shares owned	Share ratio (%)	Remarks
Shareholders with 5% or more	Hanwha Corporation	Share(s)	69,460,211	36.23	-
	National pension		14,798,870	7.72	-

Shareholder-Friendly Management

Classification	Unit	2019	2020	2021
Total cash dividends	KRW 1 million	32,576	-	-
Propensity to cash dividends	%	-13.7	-	-
Cash dividend per share (common share)	KRW	200	-	-
Introduction status of systems	Written ballot system	●	●	●
	Electronic voting system	●	●	●

* No dividends were provided in 2020 and 2021.

Ethical Management and Compliance

Status of Review of Internal Ethical Management

Classification	Unit	2019	2020	2021
Number of inspections for internal ethics and compliance	Cases	2	6	10
Status of reports on internal compliance	Reports on corruption and bribery cases	0	0	0
	Reports on ethical/compliance violations	11	8	3
	Disciplines	0	0	0

Status of Compliance-Related Violations

Classification	Unit	2019	2020	2021
Violation cases of compliance	Cases	0	1	0
Penalties imposed	KRW 1 million	0	15,687	0
Number of lawsuits filed	No. of cases	0	0	1
Cases of non-monetary sanctions		0	0	0

* Penalties imposed refer to fines, penalties, enforcement fines, etc., charged for violation of laws and regulations. Penalties under 2020 have been imposed due to infringing fair trade regulations under the Monopoly Regulation and Fair Trade Act. A lawsuit is being proceeded with to cancel such penalties.

Status of Training on Ethical and Compliance Management

Classification	Unit	2019	2020	2021
Ethics and compliance training	Hours	1,120	863	3,444
	Participants	738	860	3,444
Anti-corruption training	Hours	518	1,076	2,282
	Participants	518	1,076	2,282
Fair trade training	Hours	761	789	683
	Participants	648	789	501

Information Security

Status of Information Security Violations

Classification	Unit	2019	2020	2021
Leakage of personal information	Cases	0	0	0
Complaints of verified violations and loss of clients' personal information		0	0	0
Total monetary losses, such as penalties or fines, paid due to information security violations or cyber security accidents	KRW 1 million	0	0	0

TCFD Report

Hanwha Solutions discloses climate-related information in line with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) and strives to minimize climate risk-induced impacts on corporate finance.

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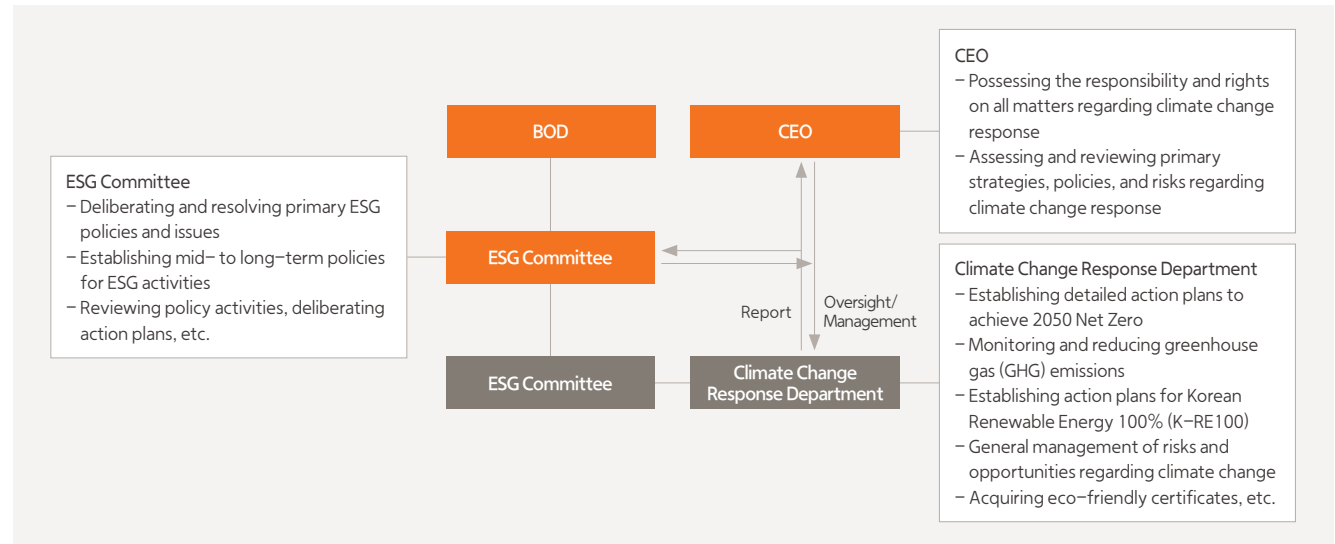
Governance

We Declare Our Support for TCFD

To transparently disclose and manage climate-related information, Hanwha Solutions publishes relevant information according to the proposal given by recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD). It has also declared its support of TCFD as of September 2021 to perform activities with higher responsibility.

Describe the board’s oversight of climate-related risks and opportunities.

Hanwha Solutions has reinforced its governance competencies regarding climate change, which is led by its Board of Directors (BOD) and fulfilled company-wide. In 2020, the company hired two international experts as outside directors to enhance expertise in energy infrastructure and develop new, future projects. In May 2021, it established the ESG Committee under the BOD to primarily deliberate and resolve key policies and issues on the environment, society, and governance (ESG) including climate change, set mid- to long-term policies for ESG activities, review policy activities, and deliberate on action plans. The ESG Committee gathers quarterly to review environmental performances, including climate change. Major agenda items discussed by the BOD and ESG Committee in 2021 include but are not limited to: investing in domestic solar power plants, issuing green bonds, taking over RES France, a renewable energy company in France, and reporting how to accomplish net zero by 2050.



KEY PERFORMANCE

Declaration of 2050 Net Zero

(Reduced 319,000 tCO₂-eq compared to 2018, the base year)



Establishment of ESG Committee and Climate Change Response Department



Established K-RE100 and declared participation in K-EV100



Agenda on Climate Change Deliberated by the BOD and ESG Committee in 2021

Date of establishment	Category	Details of agenda items
2021.04.01	Third BOD	On the investment in M10 production lines of Qcells' plants in Korea
2021.04.01	Third BOD	On the issuance of guaranteed global green bonds
2021.05.11	Fourth BOD	On the establishment of the ESG Committee under the BOD
2021.08.09	Seventh BOD	On the approval of the contract conclusion on the acquisition of RES France
2021.10.28	Eighth BOD	Report: On the report on the Qcells division's investment in Korean plants
2021.10.28	ESG Committee	Report: On the Report to Accomplish 2050 Net Zero
2021.11.18	Ninth BOD	On the investment share on REC Silicon ASA
2021.12.21	Tenth BOD	On the investment of the Chlor-Alkali 6 (CA6) expansion project

Describe management’s role in assessing and managing climate-related risks and opportunities.

Hanwha Solutions’ CEO possesses the responsibility and rights on all climate change-related matters and assesses and reviews strategies, policies, and risks regarding climate change based on reports provided by the Climate Change Response Department.

GHG reductions, the establishment of net zero plants, and other performances are reflected in the key performance indicator (KPI) of the company’s CEO and employees, on which assessment and remuneration systems operate. Moreover, each business department’s KPI is managed based on internal management goals to discharge less than the national carbon emission permit, along with the application and management of monthly profits and losses of emissions trading.

Our Organization to Respond to Climate Change

In 2021, Hanwha Solutions established the Climate Change Response Department under direct CEO control to more actively and systematically arrange a firm foundation to execute new climate change response activities. Tasks performed by the Climate Change Response Department include, but are not limited to: establishing detailed action plans to accomplish 2050 Net Zero, monitoring and reducing greenhouse gas (GHG) emissions, establishing action plans for Korean Renewable Electricity 100% (K-RE 100), general management of risks and opportunities regarding climate change, and acquiring eco-friendly certificates. In 2021, the Climate Change Response Department reported measures to accomplish 2050 Net Zero to the ESG Committee and made weekly reports regarding climate change to the CEO. It establishes company-level action plans and countermeasures for each issue and regularly reports such matters to the BOD and the executive management team. Moreover, it has established a GHG management system to proactively and more systematically manage GHG emissions in each discharge facility. It also considers GHG impact and carbon expenses when determining new investments and closing offices. Furthermore, it plans to additionally review advanced GHG management measures, such as establishing a value chain engagement to calculate and reduce Scope 3 GHG emissions.

Strategy

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

Hanwha Solutions categorize and manage climate change-related risks and opportunity factors on a short-, mid-, and long-term basis. Risks are analyzed based on transition risks (e.g., policies, reputation, market, technology) and physical risks (e.g., acute, chronic). Opportunity factors are analyzed based on elements impacting Hanwha Solutions’ business in terms of energy resources, products, services, and markets.

According to the first part of the Intergovernmental Panel on Climate Change(IPCC)’s Six Assessment Report (AR6), known as Working group I (WG I), ground surface temperatures have increased 1.09°C globally from 2011 to 2020 compared to pre-industrial levels. Therefore, Hanwha Solutions analyses physical risks arising from rapid global warming and transition process for net zero along with opportunity factors to more effectively take measures against climate crises.

Moreover, Hanwha Solutions plans to develop localized climate risk management models that meet business characteristics. Through the model, the company scientifically calculates physical risks, such as financial impact and extreme whether, incurred by transition risks and plans to utilize such calculations for establishing management strategies.

Describe the impact of climate-related risks and opportunities on the organization’s financial planning
 – Climate-related risks

Category	Term	Main risk factors	Potential risks	Potential financial impacts on Hanwha Solutions	Status of Response by Hanwha Solutions
Transition risks	Policy and Legal	Short – Long	<ul style="list-style-type: none"> – Making the expansion of GHG reductions mandatory – Emissions causing increased paid allocation or excessive free allocation – Revision of expanding carbon taxes 	Increasing expenses (for performance, emission trading, and response to regulations)	<ul style="list-style-type: none"> – “Declaration of 2050 Net Zero” (as of Oct. 2021) and establishing and implementing action plans and strategies – Reducing GHG emissions through GHG reduction activities and fortified management of GHG emissions and emission trading – Monitoring and responding to policy and regulatory trends in the energy or chemistry sector in each nation
		Mid- to long-term	<ul style="list-style-type: none"> – Increasing electricity fares due to the expanded introduction of renewable energy – Reducing spot prices of renewable energy certificates (REC) and increasing prices due to the expansion of RPS obligations 	Increasing prices (increasing electricity prices and purchase prices of renewable energy and REC)	<ul style="list-style-type: none"> – Implementing long-term purchasing of renewable energy (e.g., long-term/PPA, REC etc.) – Reviewing the mid- to long-term expansion of Self-generation
	Short – Long	<ul style="list-style-type: none"> – Regulations on global trade (e.g., EU’s Carbon Border Adjustment Mechanism (EU CBAM), carbon border tax, plastic tax) – Regulations on photovoltaic (PV) products (e.g., carbon certification system for PV modules) 	<ul style="list-style-type: none"> – Expanding the introduction of carbon border taxes – Expanding the restriction of imports of carbon-intensive products – Reinforced regulations on CO₂ generated during the production of PV products 	<ul style="list-style-type: none"> – Increasing prices (e.g., tariffs, taxes, etc.) – Less profits (Increasing regulation costs and market contraction) – Less profits (Reduced demand for our products and services) 	<ul style="list-style-type: none"> – Reducing carbon in products and processes through GHG reductions – Producing eco-friendly products (establishing a bio/circular economy) and acquiring certificates (e.g., International Sustainability and Carbon Certification Plus (ISCC+)) – Producing more products that reflect the carbon certificate system for PV modules in Korea – Producing more products that reflect France’s carbon footprint (CFP) system

Category	Term	Main risk factors	Potential risks	Potential financial impacts on Hanwha Solutions	Status of Response by Hanwha Solutions	
Transition risks	Reputation	Short – Long	Net Zero Declaration	– Reduced reliability externally in the case of failure or weak achievement	Reduced corporate value	– Arranging a foundation for continuous performance (e.g., management system, establishing internal regulations, assessment and compensation systems)
			Growing stakeholder demands for the disclosure of climate information	– Increasing possibility of potential business and legal risks due to the non-disclosure of information and greenwashing issues	Reduced corporate value Increased costs and reduced profits	– Active response to global initiatives (e.g., Carbon Disclosure Project (CDP)) and disclosing information based on scientific facts – Internalizing business structures based on initiative frames (in a process)
			Expanding negative perceptions against traditional (fossil fuel) power generation sources	– Requests for renewable energy transition plans according to evaluations or initiatives	Increased costs (energy)	– Declared our participation in K-RE 100 (as of Sep. 2021) and implementing the transition of renewable power in each business site (participated in the 2022 Green Premium and plan to reduce carbon by 21% by 2030, 37% by 2040, 100% by 2050)
	Market	Mid- to long-term	Expanding negative perceptions against fossil fuel-based products	– Reduced demand for petrochemical products	Reduced profits	– Business diversification in the recycling of Post-Consumer Recycled (PCR) and Plastic to Chemicals (PTC) and implementation of technological development – Introducing biomass-based raw materials and implementing technological development
				– Increasing demand for the use of recycled resources and eco-friendly/low-carbon raw materials	Increased costs (e.g., equipment investment)	
				– Increasing demand for the disclosure and management of products' CFP information	Increased costs	
		Mid- to long-term	Reduced demand incurring the contraction of developing and supplying traditional energies (oil/gas)	– Increasing energy prices (power/heat source)	Increased costs	– Promoting the transition to renewable energy (introducing renewable power and transitioning to hydrogen)
				– Increasing raw material prices due to reduced supply of raw materials	Increased costs	– Implementing the transition to low-carbon materials (natural gas and biomass)
	Mid- to long-term	Volatility of the low-carbon/zero carbon materials/energy market (biomass/hydrogen)	– Modifications in government policies/regulations on biomass/hydrogen – Lack of supply and increasing costs of biomass-based materials and hydrogen	Increased costs (to respond to regulations) Increased costs and reduced profits	– Monitoring policies and responding through external cooperation (established dedicated department) – Reviewing long-term agreements and direct investments	
	Long	Increasing needs for the production of renewable energy-based products	– Increasing purchasing costs of renewable energy	Increased costs (for purchasing renewable energy and REC)	– Implementing long-term purchasing of renewable energy (e.g., long-term/PPA, REC etc.) – Reviewing the mid- to long-term expansion of private power stations	
	Technology	Mid- to long-term	Increasing technological development costs and investments in eco-friendly/low-carbon materials and recycled resources	– Leading companies monopolizing the market and core technologies	Increased costs	– Diversifying technology acquisition strategies (e.g., securing professional personnel, implementing technological alliances and demonstration projects) – Implementing in-house technological development (e.g., carbon capture and utilization (CCU), water electrolysis, Plastic to Chemicals (PTC)) – Diversifying investments in low-carbon/future businesses (e.g., alternative meat)
				– Risks of research and development (R&D)/investment failure of immature technologies/businesses	Increased costs	
– Expenses arising from the transition to eco-friendly/low-carbon processes/businesses				Increased costs		
Physical risks	Acute	Short	– Volatile prices and disruptions in the supply and demand of raw materials due to extreme weather arising in regions supplying and importing raw materials	Increased (transportation) costs and reduced production and profits	– Securing the stability of procuring raw materials by obtaining multiple purchasing sources – Securing professional personnel and providing more qualified safety training to respond to emergencies – Establishing and operating manuals for company-wide response to climate change (e.g., natural disasters due to extreme weather) (e.g., heat/cold wave, torrential rain/heavy snow, drought, typhoon, earthquake, infectious disease) – Continuous expansion of recycling wastewater – Minimizing damages by establishing a proactive response system and risk assessment	
			– Impairments in production/infrastructure facilities due to extreme weather (e.g., cold wave, typhoon) in business sites	Increased (repair) costs and reduced production and profits		
			– Increasing energy consumption and GHG emissions due to extreme weather (intensified heat/cold wave)	Increased costs (e.g., energy, carbon credits)		
			– Increasing safety risks for personnel and reduced production due to extreme weather	Increased (safety response) costs and reduced profits		
			– Lack of water supply in business sites due to more countries facing water crises driven by droughts, etc.	Reduced production and profits		
	Chronic	Long	Climate/environmental change due to the rise in the average global temperature	– Modification of the scope of control due to the rise in the average global temperature		Increased (driving and repair) costs
				– Increasing frequency of occurrence of physical risks due to the rise in sea levels		Increased (repair) costs and reduced production and profits
			– Outbreak of new infectious diseases, destruction of the ecosystem, etc., due to climate change and extreme weather	Increased (safety response) costs		

– Climate-related opportunities

Category	Term	Main risk factors	Potential risks	Potential financial impacts on Hanwha Solutions	Status of Response by Hanwha Solutions
Opportunities	Short	Surplus carbon credits for GHG reduction activities	– Creating profits by selling surplus credits	– Increased profits by securing carbon credits	– Establishing and implementing GHG management and reduction strategies (2050 Net Zero) – Accomplishing GHG reduction goals by enhancing energy efficiency and energy (power/fuel) transition and acquiring carbon neutral resources by selling surplus credits – Promoting GHG reduction projects (internally/externally) based on the offset system
			– An opportunity to create additional profits through external reduction projects	– Reduced price sensitivity to fluctuations in carbon credits	
			– Reducing energy costs by enhanced process efficiency through carbon neutralization	– Reduced operating costs	
	Mid-to long-term	Policies on expanding the introduction rate of renewable energy (RE100/RPS/CHPS/ environmental emergency funds/Korean renewable energy 3020 plan)	– Reducing GHG emissions and risks arising from the use of fossil fuels	– Reduced the risk of fossil fuel prices from being exposed	– Expanding the use of renewable energy and power through the declaration of K-RE100, etc. – Transition of hydrogen-based fuels and procurement of zero carbon steam – Establishing value chains of green hydrogen produced through water electrolysis technologies – Reviewing projects to produce green power-based products and propelling technological development
			– Expanding opportunities to use green power according to the expanded application of renewable energy	– Increased profits (by selling premium products)	
			– Improving corporate reputation and strengthening investment attraction by increasing the use of renewable energy	– Increased capital flow due to investment increase	
			– Expanding the supply of domestic green hydrogen and the ecosystem of the hydrogen industry by reinforcing policies	– Increased profits by meeting rising demands for low-carbon products and services	
	Short/ Long	Securing the eco-friendly competitiveness of PV products	– Expanding the PV industry in line with policies on expanding the rate of renewable energy and power	– Increased profits by expanding low-carbon goods and services	– Increasing investments in the PV business – Producing more products that reflect the carbon certificate system for PV modules in Korea – Producing more products that reflect France’s carbon footprint (CFP) system
			– Increasing need for certified low-carbon PV products	– Increased profits by expanding low-carbon goods and services	
	Mid-to long-term	Growing demand for eco-friendly/recycled plastics, hydrogen, and circulated resource-based products (e.g., CO ₂ pyrolysis oil)	– Absorbing demands for low-carbon products and strengthening investment attraction by obtaining eco-friendly PV products	– Increased investments	– Propelling projects of physical recycling of waste plastics (introducing recycled polyethylene (rPE) packages) – R&D of chemical recycling technologies of waste plastics (Producing plastic materials by advancing the recycling of waste plastic pyrolysis oil) – Procuring eco-friendly-based materials (bio, recycled) and reviewing relevant projects – Capturing CO ₂ up to maximum reduction level, developing carbon capture and utilization (CCU) technologies, and advancing businesses – Diversification in investments (e.g., investing in US alternative meat companies)
			– Improving the brand value and increasing sales by absorbing the demand for eco-friendly and low-carbon products	– Increased profits by meeting rising demand for low-carbon/eco-friendly products and services	
			– Obtaining opportunities to develop new products through R&D	– Increased sales and investment profits by obtaining new technologies	
– Increasing sales and investment profits by pioneering and priorly occupying new markets			– Increased sales and investment profits by occupying new markets in advance		
– Reducing risks of existing oil-based businesses by diversifying business activities			– Increased investment profits by positive corporate reputation – Reduced the risk of oil-based material costs from being exposed		
– An opportunity to connect the development of new technologies (e.g., CCUS) to technological sales	– Profits arising from technical sales				

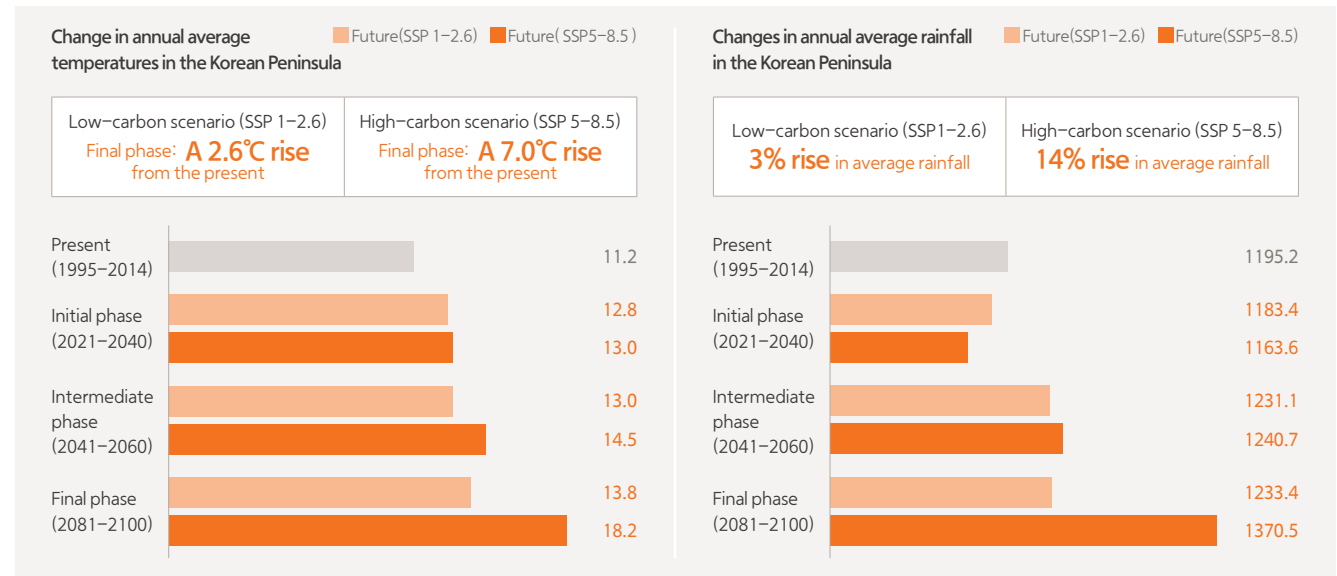
Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

According to the Representative Concentration Pathways (RCP) 8.5 scenario analysis, Hanwha Solutions identifies risks by setting torrential rain, typhoon, and heat wave as acute physical risks and setting climate and environmental changes arising from rising average temperatures worldwide as significant risk factors.

Moreover, the 2020 Report on the Prospect of Climate Change in the Korean Peninsula published by the National Institute of Meteorological Sciences (NIMS) based on the latest shared socio-economic pathways (SSP) under the 6th Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) states as follows: According to the high-carbon scenario (SSP 5-8.5) compared to the low-carbon scenario (SSP 1-2.6), it is projected that the changes in the annual average temperature and rainfall would sharply increase. If the greenhouse gas (GHG) reduction policy is carried out, climate change will be under reasonable control. Accordingly, Hanwha Solutions aims to reduce 35% of GHG by 2030 and 60% by 2040 compared to emissions under Scopes 1 and 2 in 2018 to keep the average global temperature well below 2°C (WB2C) higher than pre-industrial levels.

Moreover, to accomplish net zero by 2050, the company established corresponding strategies by analyzing and considering the International Energy Agency’s Net Zero Emissions by 2050 (IEA NZE 2050), the nationally determined contribution (NDC), and the 2050 Net Zero scenario.

Climate Change Scenario of the Korean Peninsula



Key Measures to Accomplish 2050 Net Zero

IEA NZE 2050 scenario	NDC and the 2050 Net Zero scenario of Korean government
<ul style="list-style-type: none"> - Enhancing energy efficiency and expanding renewable energy - Innovation of technologies (e.g., green hydrogen based on water electrolysis) - Expanding electric vehicles (EVs) - Electrification 	<ul style="list-style-type: none"> - Expanding the supply of EVs and hydrogen-fueled cars - Transitioning existing lead materials to biofuel- or hydrogen-based materials - Increasing the use of waste plastic materials for resource circulation - Obliterating carbon by CCUS technologies

Hanwha Solutions’ Strategies for 2050 Net Zero

Reducing Emissions under Scopes 1, 2, and 3

- Enhancing energy efficiency based on GHG reduction activities in business sites
- Transition to renewable energy and power (declaration of K-RE100)
- Transition to hydrogen-based fuels
- Transition to eco-friendly cars (declaration of K-EV 100)
- Introduction of CCU
- Recycling of waste plastic
- Introduction of biomass-based materials, etc.

Green Biz Innovation

- Establishing value chains of green hydrogen produced through water electrolysis technologies
- Expanding PV production facilities domestically and abroad
- Expanding the shares of US polysilicon production companies
- Investing in US alternative meat companies

Risk Management

Describe the organization’s processes for identifying, assessing, and managing climate-related risks

Hanwha Solutions responds to climate change regularly by identifying and assessing related issues and risks on a company level. The company administers the management process for climate change risks through its Climate Change Response Department. It also identifies physical risks regarding climate change and opportunity factors regarding transition risks on a company level by comprehending internal and external issues, requirements of stakeholders, and actual cases of damages and cases of response in the previous year.

Moreover, the company sets priorities by analyzing the degree of impact and the possibility of identified risks, reports severe risks and opportunity factors to the executive management team and ESG Committee, and establishes strategies and financial plans that reflect climate risks. For example, to accomplish its net zero goal, Hanwha Solutions reflected investment costs for net zero when conducting the economy evaluation for establishment and expansion projects (e.g., expansion of Chlor-Alkali unit). When implementing large-scale projects that can be categorized into a separate capital, it improved its process by reflecting the analysis of the increase or decrease of carbon emissions and measures to reduce such emissions.

Climate Change Risk Management Process



Metrics and Targets

Our Management of Goals to Reduce GHG Emissions

For active response against climate change, Hanwha Solutions declared 2050 Net Zero and established mid- to long-term plans to accomplish its goal. It manages various indicators, such as GHG emissions, management of profits and losses regarding carbon credits, and the amount of energy used, and reports such management activities every month to the CEO. It also fulfills improvement activities to minimize quantitatively identified environmental impact arising from corporate activities.

Furthermore, Hanwha Solutions is proceeding with a full-scale modification of its company-level GHG management system to respond to climate change more effectively. Through the measures above, Hanwha Solutions plans to secure the accuracy of multiple data required internally and externally and directly connects various computer systems in business sites through systematic management. Such data include but are not limited to: the goals and performances of each business site or team, the unit price of each product, the progress of RE100, transactions, and profits and losses of CERs. It also plans to minimize losses incurred by performing unnecessary tasks, such as the frequent management of users.



Our Activities to Manage and Reduce GHG Emissions

Hanwha Solutions is building a computer system to administer the status of GHG and energy at a company level and plans to systematically manage the goals and performances of GHG emissions, the status of carbon credits, the progress of K-RE100, and other tasks on the system.

Managing Scopes 1 and 2 GHG emission | To reduce Scopes 1 and 2 GHG emission, Hanwha Solutions plans to continue implementing activities to enhance energy efficiency in business sites and convert fossil fuel-based energy to eco-friendly energy. First, it intends to reduce GHG emissions by reducing energy consumption by lowering carbon while raising effectiveness, improving processes, optimizing operations, recovering waste heat, and improving insulation. Although Hanwha Solutions presently uses below 1% of renewable energy and power, it has declared to accomplish K-RE100 and gradually reduce GHG emissions from 21% by 2030, 37% by 2040, to 100% by 2050. As a participant of K-EV100, it has established a goal to accomplish a 100% transition to eco-friendly cars with zero emissions by 2030. Hydrogen self-produced in the chlorine and Chlor-Alkali (CA) business site will replace fuels used in processes and fuels used to produce externally procured steam. Aiming to introduce carbon capture and utilization (CCU) technologies after 2030, Hanwha Solutions is developing the corresponding technology, which concerns capturing carbon up to the marginal abatement cost (MAC) to be recycled as a material.

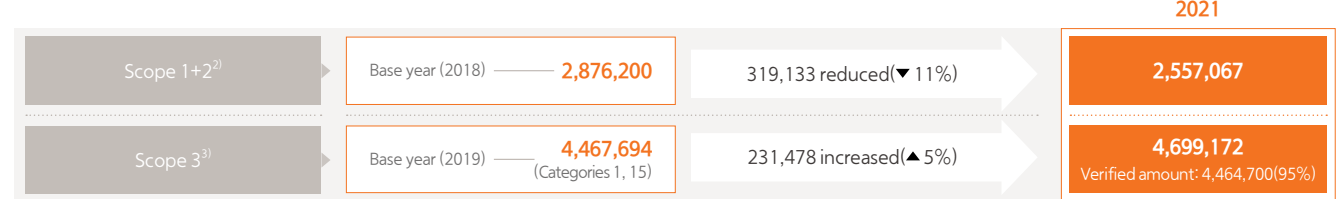
Managing Scope 3 GHG emission | Hanwha Solutions have identified purchased products and services and investments as major categories among 15 categories under Scope 3. Presently, it is updating Scope 3 to calculate emissions more accurately. More categories have been included in this process, resulting in increased Scope 3 emissions than the base year. Therefore, the company plans to reduce Scope 3 emissions according to the updated standards.

Meanwhile, to reduce Scope 3 GHG emission, The Chemical Division has identified the environmental impacts of its key products. To minimize such impacts, it will procure low-carbon, eco-friendly materials based on biomass and recycled plastics. Furthermore, The Chemical Division will not only fulfill eco-friendly transitions in its existing business areas but arrange GHG reduction measures for the supply chain and suppliers to manage GHG emissions in all phases of the corporate value chain. By 2023, it will implement a LCA on all Chemical Division products to effectively manage eco-friendly supply chains.

In 2021, the company signed MOUs with companies working in the waste plastic recycling industry to commercialize recycled polyethylene (rPE) packaging bags made by processing waste plastics into high-quality renewable materials. In 2022, it started applying rPE packaging bags in its products. By 2030, Hanwha Solutions plans to convert 80% of industrial packaging bags used in ethylene-vinyl acetate (EVA) to rPE packaging bags and supply rPE-based renewable materials to various packaging markets in the future.

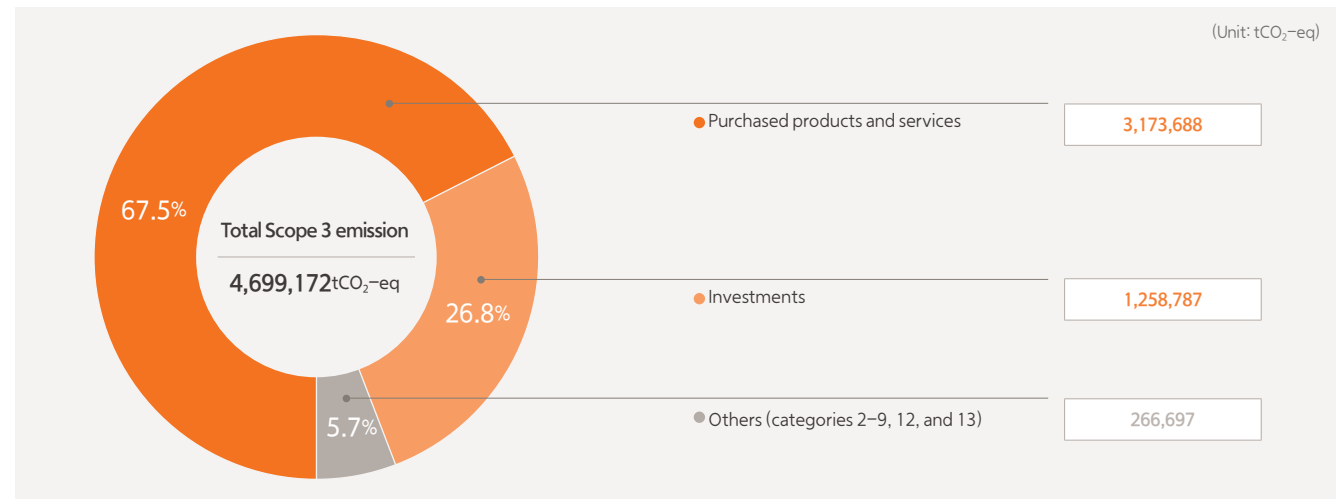
The Qcells Division diversifies supply and demand considering the carbon footprint (CFP) when purchasing wafers to produce PV modules. It also manages GHG emissions by manufacturing eco-friendly, low-carbon PV modules during production. In 2023, the company plans to establish a recycling system for PV waste panels to prepare for introducing the Extended Producer Responsibility (EPR) system for PV panels for eco-friendly recycling.

GHG emissions in 2021 (tCO₂-eq)¹⁾



- 1) Domestic GHG emissions in 2021 may be revised after the finalization of the statement.
- 2) The total Scopes 1 and 2 GHG emission include those discharged by five divisions, so the amount of emissions may vary from the respective aggregate values of Scopes 1 and 2 according to which aggregation standard has been applied after splitting the business sites by unit.
- 3) Scope 3 is being updated. Emissions have increased over the base year due to more categories being applied than necessary and increased output. So, the indicator of emissions compared to the base year will be modified after the update of Scope 3.

2021 GHG Emissions by Category of Scope 3



Appendix

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UN SDGs Commitment

Hanwha Solutions will implement environmental, social, and governance (ESG) activities linked with the direction of sustainable management and detailed targets of the United Nation’s Sustainable Development Goals (UN SDGs). To address environmental, social, and economic issues integratively, it wishes to play an active role in practicing UN SDGs, the collective goal of humanity.

UN SDGs	Goal targets	Main Activities
<p>3 GOOD HEALTH AND WELL-BEING</p> <p>Ensure healthy lives and promote well-being for all at all ages</p>	<p>3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all</p> <p>3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p>	<ul style="list-style-type: none"> – Established the goal of realizing zero accidents and hazards in workplaces – Strengthening leadership for safety and implementing response against serious accidents – Verifying and managing environmental safety performance through internal and external examinations
<p>4 QUALITY EDUCATION</p> <p>Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>	<p>4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations</p>	<ul style="list-style-type: none"> – Operating and supporting Hanwha Qcells’ Sports Team for Persons with Disabilities – Supporting NEE Ts (Not in Education, Employment, or Training) regarding employment through the “Stepping-Stones Project” – Implementing the “Happy Sunshine Season 2, Making a Clean School” Project
<p>7 AFFORDABLE AND CLEAN ENERGY</p> <p>Ensure access to affordable, reliable, sustainable and modern energy for all</p>	<p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix</p> <p>7.3 By 2030, double the global rate of improvement in energy efficiency</p>	<ul style="list-style-type: none"> – Investing and supporting green energy solutions (in PV, wind power, etc.) – Developing water electrolysis to build green hydrogen value chains – Investing in eco-friendly energy companies (e.g., Lancium Technologies, REC Silicon)
<p>8 DECENT WORK AND ECONOMIC GROWTH</p> <p>Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</p>	<p>8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services</p>	<ul style="list-style-type: none"> – Established and complies with four major principles of shared growth – Supports suppliers by creating win-win cooperation funds – Signing MOUs for collaboration in the ESG Sector to support eco-friendly startup company
<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p> <p>Ensure sustainable consumption and production patterns</p>	<p>12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse</p>	<ul style="list-style-type: none"> – Implementing PVC Zero when producing and selling raw materials – R&D for eco-friendly PE packaging materials – R&D for eco-friendly materials with recycled marine waste
<p>13 CLIMATE ACTION</p> <p>Take urgent action to combat climate change and its impacts</p>	<p>13.2 Integrate climate change measures into national policies, strategies and planning</p> <p>13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning</p>	<ul style="list-style-type: none"> – Implementing eco-friendly management to accomplish 2050 Net Zero – Supporting climate change-related initiatives (e.g., TCFD, K-RE100) – Acquired the A- rating for Citizen Data Scientist (CDS) and Carbon Management Sector Honors
<p>15 LIFE ON LAND</p> <p>Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>	<p>15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development</p>	<ul style="list-style-type: none"> – Implementing environment impact assessment for all business sites and environment purification activities in communities – Signed an MOU with the Korea National Park Service to fulfill natural ecosystem conservation activities – Propelling the “Environmental Solutions to Unite with the Green Earth” Program
<p>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</p> <p>Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</p>	<p>16.5 Substantially reduce corruption and bribery in all their forms</p> <p>16.6 Develop effective, accountable and transparent institutions at all levels</p>	<ul style="list-style-type: none"> – Enacted risk management regulations at the company level – ISO 37301 and ISO 37001 acquired by all Hanwha Solutions’ Divisions – Executing regular review for compliance and ethics and compliance training completed by all employees







UNGC Commitment

Since 2012, Hanwha Solutions joined the global initiative UN Global Compact (UNGC) and has been supporting UNGC’s 10 principles in human rights, labor, environment, and anti-corruption and reflects them in every management task.

	The Ten Principles of the UN Global Compact	Main Activities
Human Rights	Principle 1 Businesses should support and respect the protection of internationally proclaimed human rights; and	Hanwha Solutions complies with the International Labor Organization (ILO) conventions and national and international labor laws and systems.
	Principle 2 make sure that they are not complicit in human rights abuses.	Hanwha Solutions reflects items regarding the respect and protection of human rights under the Code of Ethics and conducts human rights learnings to raise awareness of the importance of human rights.
	Principle 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;	Hanwha Solutions ensures and respects employees’ basic rights—including the right of organization, collective bargaining, and collective action—and complies with constitutional matters accordingly. It also holds quarterly labor-management council meetings to promote a win-win collaboration between labor and management.
Labour	Principle 4 the elimination of all forms of forced and compulsory labour;	Hanwha Solutions rules out all forms of forced labor.
	Principle 5 the effective abolition of child labour; and	Hanwha Solutions prohibits the employment of minors and child labor.
	Principle 6 the elimination of discrimination in respect of employment and occupation.	Hanwha Solutions guarantees equal job opportunities to all applicants and operates a fair recruitment system. Therefore, it does not discriminate against applicants by gender, religion, political opinion, social status, nationality, or race.
Environment	Principle 7 Businesses should support a precautionary approach to environmental challenges;	In November 2021, Hanwha Solutions declared “2050 Net Zero” to actively respond to climate risks and issues and implement various ESG activities to accomplish this goal. Moreover, all business sites of Hanwha Solutions have acquired the environmental management system certification (ISO 14001) to systematically and sustainably operate the safety, health, and environment (SHE) management system.
	Principle 8 undertake initiatives to promote greater environmental responsibility; and	Hanwha Solutions has declared its support for the Task Force on Climate-Related Financial Disclosures (TCFD) and discloses information according to TCFD’s recommendations. It also participates in climate change-related initiatives, such as the Carbon Disclosure Project (CDP) and K-RE100. Putting ESG management activities and minimization of environmental impact on its top priority for sustainable growth, the company puts utmost effort into fulfilling its responsibility to accomplish this goal.
Anti-Corruption	Principle 9 encourage the development and diffusion of environmentally friendly technologies.	Hanwha Solutions is expanding investments and financing for developing eco-friendly technologies like hydrogen and PV. It identifies eco-friendly business models to create a sustainable environment.
	Principle 10 Businesses should work against corruption in all its forms, including extortion and bribery.	Hanwha Solutions is Korea’s first in the chemical and energy industries to have maintained the Compliance Management System (ISO 37301) and Anti-Bribery Management System (ISO 37001) certification for two consecutive years. Thus, it fulfills transparent corporate management activities on a global level.

Communication with Stakeholders

Hanwha Solutions defines Stakeholders as all parties directly or indirectly impacting corporate managing activities, including clients, shareholders, investors, employees, suppliers, communities, and the government. It operates various communication channels to create values and listen to the voices of Stakeholders. Through these channels, it actively collects various opinions and tries to reflect them when making decisions.

Key Stakeholders	Key communication channels	Key interests	Hanwha Solutions' Key Activities
 Clients	<ul style="list-style-type: none"> - Official website and social media channels (year-round) - On-site/invitation seminars (year-round) - VOC channel (year-round) - Client satisfaction survey (annual) - Business Report, Sustainability Report 	<ul style="list-style-type: none"> - Preventing the leakage of personal information - Enhancing the quality of goods and services - Producing sustainable, eco-friendly products 	<ul style="list-style-type: none"> - Developing goods and services that reflect client needs - Executing customized quality management according to product features - Chemical and Qcells Divisions performing life-cycle assessment (LCA) - Executing and improving surveys to enhance client satisfaction
 Shareholders and investors	<ul style="list-style-type: none"> - Regular general shareholders' meeting (annual) - Temporary general shareholders' meeting (when required) - NDR and IR meetings (quarterly) - Company briefing session (quarterly) - Business Report, Audit Report, Corporate Governance Report, and Sustainability Report 	<ul style="list-style-type: none"> - Management strategies to enhance corporate value - Risk management activities - Activating shareholder-friendly management - Accurate and quick communication 	<ul style="list-style-type: none"> - Enacted the charter of corporate governance - Established the mid- to long-term policy for shareholder returns - Activities to strengthen shareholder-friendly policies - Transparent disclosure of information by publishing Business Reports, Corporate Governance Reports, and Sustainability Reports
 Employees	<ul style="list-style-type: none"> - Grievance channels (year-round) - Intranet bulletin board (year-round) - Conference sessions and workshops for employees (year-round) - Survey on corporate culture (annual) - Labor-management council (quarter) 	<ul style="list-style-type: none"> - Work and life balance - Health and safety of employees - Developing human resources and managing their career - Fair performance evaluation and compensation 	<ul style="list-style-type: none"> - Executing capacity-building programs for employees - Operating various welfare systems - Spreading the culture to respect human rights - Operating a fair and reasonable system to compensate for performance - Creating a safe and pleasant working environment
 Suppliers	<ul style="list-style-type: none"> - Grievance channels (year-round) - Meeting with the representative of each supplier (when required) - Training suppliers (year-round) 	<ul style="list-style-type: none"> - Establishing fair, cooperative relationships - Win-win management and ESG support activities - Fair trade 	<ul style="list-style-type: none"> - Established and complies with four major principles of fair trade - Strengthening suppliers' ESG capacities - Creating and operating win-win cooperation funds - Creating a safety and health guidebook for suppliers
 Community	<ul style="list-style-type: none"> - Community council activities (year-round) - Social contribution activities (year-round) 	<ul style="list-style-type: none"> - Developing and activating communities - Creating value in communities - Environmental conservation activities 	<ul style="list-style-type: none"> - Operating community councils - Executing social contribution activities for vulnerable groups - Creating a transparent donation culture
 Government	<ul style="list-style-type: none"> - Signing up and performing activities for associations (year-round) - Supporting and cooperating with public institutions and government ministries (year-round) 	<ul style="list-style-type: none"> - Complying with laws and regulations - Participating in industry-related policies - Stengthening public-private partnerships (PPPs) 	<ul style="list-style-type: none"> - Faithful payment of taxes - Creating jobs - Executing cooperative projects with government and public institutions

GRI Standards

GRI Standards	Category	Disclosure No.	Disclosure Name	Page	Note
Universal Standards					
GRI 2: General Disclosures 2021	The organization and its reporting practices	2-1	Organizational details	6	
		2-2	Entities included in the organization’s sustainability reporting	2, 9	
		2-3	Reporting period, frequency and contact point	2	
		2-4	Restatements of information	-	N/A (not applicable)
		2-5	External assurance	102-103	
	Activities and workers	2-6	Activities, value chain and other business relationships	6-7	
		2-7	Employees	75	
		2-8	Workers who are not employees	75	
	Governance	2-9	Governance structure and composition	58-59	
		2-10	Nomination and selection of the highest governance body	58-59	
		2-11	Chair of the highest governance body	58	
		2-12	Role of the highest governance body in overseeing the management of impacts	58-60	
		2-13	Delegation of responsibility for managing impacts	59, 65	
		2-14	Role of the highest governance body in sustainability reporting	11, 59	
		2-15	Conflicts of interest	59	
		2-16	Communication of critical concerns	60, 65-66	
		2-17	Collective knowledge of the highest governance body	58-59	
		2-18	Evaluation of the performance of the highest governance body	60	For more information, please refer to the Corporate Governance Report.
		2-19	Remuneration policies	60	For more information, please refer to the Corporate Governance Report.
		2-20	Process to determine remuneration	60	For more information, please refer to the Business Report.
		2-21	Annual total compensation ratio	60, 78	For more information, please refer to the Business Report.
	Strategy, policies and practices	2-22	Statement on sustainable development strategy	5, 11	
		2-23	Policy commitments	47, 90	
		2-24	Embedding policy commitments	11, 46-47	
		2-25	Processes to remediate negative impacts	65-66	
		2-26	Mechanisms for seeking advice and raising concerns	47, 63	
		2-27	Compliance with laws and regulations	28-30, 62-64	
		2-28	Membership associations	47	
	Stakeholder engagement	2-29	Approach to stakeholder engagement	91	
		2-30	Collective bargaining agreements	76	

GRI Standards	Category	Disclosure No.	Disclosure Name	Page	Note
Material Topics					
GRI 3: Material Topics 2021	Material Topics	3-1	Process to determine material topics	14	
		3-2	List of material topics	14	
		3-3	Management of material topics	14, 16-30	
Economic Performance (GRI 200)					
GRI 201: Economic Performance 2016	Economic Performance	201-1	Direct economic value generated and distributed	8, 71	
		201-2	Financial implications and other risks and opportunities due to climate change	82-84	
		201-3	Defined benefit plan obligations and other retirement plans	-	Operating the defined benefit (DB) and defined contribution (DC) retirement pension plans.
GRI 202: Market Presence 2016	Market Presence	202-1	Ratios of standard entry level wage by gender compared to local minimum wage	43	Hanwha Solutions does not discriminate by gender when recruiting, placing, promoting, or designating salaries.
		202-2	Proportion of senior management hired from the local community	75	
GRI 203: Indirect Economic Impacts 2016	Indirect Economic Impacts	203-1	Infrastructure investments and services supported	19, 54-56	
		203-2	Significant indirect economic impacts	52-56	
GRI 204: Procurement Practices 2016	Procurement Practices	204-1	Proportion of spending on local suppliers	77	
GRI 205: Anti-corruption 2016	Anti-corruption	205-1	Operations assessed for risks related to corruption	63, 79	
		205-2	Communication and training about anti-corruption policies and procedures	62-64	
		205-3	Confirmed incidents of corruption and actions taken	63, 79	
GRI 206: Anti-competitive Behavior 2016	Anti-competitive Behavior	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	64	
GRI 207: Tax 2019	Tax	207-1	Approach to tax	67	
		207-2	Tax governance, control, and risk management	67	
		207-3	Stakeholder engagement and management of concerns related to tax	67	
		207-4	Country-by-country reporting	8	For more information, please refer to the Business Report.
Environmental Performance (GRI 300)					
GRI 301: Materials 2016	Materials	301-2	Recycled input materials used	23, 37	
		301-3	Reclaimed products and their packaging materials	23	
GRI 302: Energy 2016	Energy	302-1	Energy consumption within the organization	72	
		302-2	Energy consumption outside of the organization	72	
		302-3	Energy intensity	72	
		302-4	Reduction of energy consumption	72	
		302-5	Reductions in energy requirements of products and services	38	

GRI Standards	Category	Disclosure No.	Disclosure Name	Page	Note
GRI 303: Water and Effluents 2018	Water and Effluents	303-1	Interactions with water as a shared resource	36	
		303-2	Management of water discharge-related impacts	36	
		303-4	Water discharge	73	
		303-5	Water consumption	73	
GRI 304: Biodiversity 2016	Biodiversity	304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	37	
		304-3	Habitats protected or restored	19, 37	
		304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	-	N/A (not applicable)
GRI 305: Emissions 2016	Emissions	305-1	Direct (Scope 1) GHG emissions	72, 87	
		305-2	Energy indirect (Scope 2) GHG emissions	72, 87	
		305-3	Other indirect (Scope 3) GHG emissions	72, 87	
		305-4	GHG emissions intensity	72	
		305-5	Reduction of GHG emissions	18, 72, 87	
		305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	72	
GRI 306: Waste 2020	Waste	306-1	Waste generation and significant waste-related impacts	23, 36	
		306-2	Management of significant waste-related impacts	23, 36	
		306-3	Waste generated	36, 73	
		306-4	Waste diverted from disposal	23, 36, 73	
		306-5	Waste directed to disposal	36, 73	
GRI 308: Supplier Environmental Assessment 2016	Supplier Environmental Assessment	308-1	New suppliers that were screened using environmental criteria	51, 77	
		308-2	Negative environmental impacts in the supply chain and actions taken	51, 53	
Social Performance (GRI 400)					
GRI 401: Employment 2016	Employment	401-1	New employee hires and employee turnover	43, 75	
		401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	45-46	
		401-3	Parental leave	46, 76	
GRI 403: Occupational Health and Safety 2018	Occupational Health and Safety	403-1	Occupational health and safety management system	25, 33, 39	
		403-2	Hazard identification, risk assessment, and incident investigation	27, 40	
		403-3	Occupational health services	40-41	
		403-4	Worker participation, consultation, and communication on occupational health and safety	40-41	
		403-5	Worker training on occupational health and safety	41, 74	
		403-6	Promotion of worker health	41, 74	
		403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	41	
		403-8	Workers covered by an occupational health and safety management system	39-41	
		403-9	Work-related injuries	74	
		403-10	Work-related ill health	74	

GRI Standards	Category	Disclosure No.	Disclosure Name	Page	Note
GRI 404: Training and Education 2016	Training and Education	404-1	Average hours of training per year per employee	76	
		404-2	Programs for upgrading employee skills and transition assistance programs	43-44	
		404-3	Percentage of employees receiving regular performance and career development reviews	76	
GRI 405: Diversity and Equal Opportunity 2016	Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	46, 58-59, 75, 78	
		405-2	Ratio of basic salary and remuneration of women to men	76	
GRI 406: Non-discrimination 2016	Non-discrimination	406-1	Incidents of discrimination and corrective actions taken	47, 79	
GRI 407: Freedom of Association and Collective Bargaining 2016	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	-	The business site and supplier do not exist.
GRI 408: Child Labor 2016	Child Labor	408-1	Operations and suppliers at significant risk for incidents of child labor	43, 90	N/A (not applicable)
GRI 409: Forced or Compulsory Labor 2016	Forced or Compulsory Labor	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	43, 90	N/A (not applicable)
GRI 411: Rights of Indigenous Peoples 2016	Rights of Indigenous Peoples	411-1	Incidents of violations involving rights of indigenous peoples	-	N/A (not applicable)
GRI 413: Local Communities 2016	Local Communities	413-1	Operations with local community engagement, impact assessments, and development programs	54-56, 77	
		413-2	Operations with significant actual and potential negative impacts on local communities	-	N/A (not applicable)
GRI 414: Supplier Social Assessment 2016	Supplier Social Assessment	414-1	New suppliers that were screened using social criteria	51, 77	
		414-2	Negative social impacts in the supply chain and actions taken	53	
GRI 416: Customer Health and Safety 2016	Customer Health and Safety	416-1	Assessment of the health and safety impacts of product and service categories	48	
		416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	-	N/A (not applicable)
GRI 417: Marketing and Labeling 2016	Marketing and Labeling	417-2	Incidents of non-compliance concerning product and service information and labeling	-	N/A (not applicable)
		417-3	Incidents of non-compliance concerning marketing communications	-	N/A (not applicable)
GRI 418: Customer Privacy 2016	Customer Privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	79	

SASB Index

Sector : Resource Transformation – Chemicals

Table 1. Sustainability Disclosure Topics & Accounting Metrics			Hanwha Solutions' Response
Topic	Code	Accounting Metric	Page/Data
Greenhouse Gas Emissions	RT-CH-110a.1	Gross global Scope 1 emissions	411,718tCO ₂ -eq (Domestic Sites)
		percentage covered under emissions-limiting regulations	100%
	RT-CH-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	page 82-87
Air Quality	RT-CH-120a.1	Air emissions of the following pollutants:	-
		(1) NO _x (excluding N ₂ O)	173ton
		(2) SO _x	11ton
		(3) volatile organic compounds (VOCs)	N/A
		(4) hazardous air pollutants (HAPs)	N/A
Energy Management	RT-CH-130a.1 RR-ST-130a.1	(1) Total energy consumed	49,920,949GJ
		(2) percentage grid electricity	78%
		(3) percentage renewable	0.3%
		(4) total self-generated energy	12,863MWh
Water Management	RT-CH-140a.1 RR-ST-140a.1	(1) Total water withdrawn	18,359,667ton
		(2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	No worksites with 'High Risk' water stress
	RT-CH-140a.2	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	No standards violated
	RT-CH-140a.3 RR-ST-140a.2	Description of water management risks and discussion of strategies and practices to mitigate those risks	page 36
Hazardous Waste Management	RT-CH-150a.1 RR-ST-150a.1	Amount of hazardous waste generated	32,657ton
		percentage recycled	43%
Community Relations	RT-CH-210a.1	Discussion of engagement processes to manage risks and opportunities associated with community interests	page 54-56
Workforce Health & Safety	RT-CH-320a.1	(1) Total recordable incident rate (TRIR) for (a) direct employees and (b) contract employees	0.75 for Direct Employees, 0.78 for Employees of Supplier
		(2) fatality rate for (a) direct employees and (b) contract employees	0%
	RT-CH-320a.2	Description of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks	page 41
Product Design for Use-phase Efficiency	RT-CH-410a.1	Revenue from products designed for use-phase resource efficiency	page 37-38

Table 1. Sustainability Disclosure Topics & Accounting Metrics			Hanwha Solutions' Response
Topic	Code	Accounting Metric	Page/Data
Safety & Environmental Stewardship of Chemicals	RT-CH-410b.1	(1) Percentage of products that contain Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous Substances	Hanwha Solutions is not applicable to this indicator.
		(2) percentage of such products that have undergone a hazard assessment	page 38, 48
	RT-CH-410b.2	(1) Discussion of strategy to manage chemicals of concern	page 37
		(2) Discussion of strategy to develop alternatives with reduced human and/or environmental impact	page 16-23, 37
Genetically Modified Organisms	RT-CH-410c.1	Percentage of products by revenue that contain genetically modified organisms (GMOs)	Hanwha Solutions is not applicable to this indicator.
Management of the Legal & Regulatory Environment	RT-CH-530a.1	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	page 65-66
Operational Safety, Emergency Preparedness & Response	RT-CH-540a.1	Process Safety Incidents Count (PSIC)	N/A
		Process Safety Total Incident Rate (PSTIR)	N/A
		Process Safety Incident Severity Rate (PSISR)	N/A
	RT-CH-540a.2	Number of transport incidents	N/A

Sector : Renewable Resources & Alternative Energy – Solar Technology & Project Developers

Table 1. Sustainability Disclosure Topics & Accounting Metrics			Hanwha Solutions' Response
Topic	Code	Accounting Metric	Page/Data
Hazardous Waste Management	RR-ST-150a.2	Number and aggregate quantity of reportable spills, quantity recovered	Hanwha Solutions is not applicable to this indicator.
Ecological Impacts of Project Development	RR-ST-160a.1	Number and duration of project delays related to ecological impacts	Hanwha Solutions is not applicable to this indicator.
	RR-ST-160a.2	Description of efforts in solar energy system project development to address community and ecological impacts	page 19, 21, 55
Management of Energy Infrastructure Integration & Related Regulations	RR-ST-410a.1	Description of risks associated with integration of solar energy into existing energy infrastructure and discussion of efforts to manage those risks	page 82-84
	RR-ST-410a.2	Description of risks and opportunities associated with energy policy and its impact on the integration of solar energy into existing energy infrastructure	page 21, 82-84
Product End-of-life Management	RR-ST-410b.1	Percentage of products sold that are recyclable or reusable	page 38
	RR-ST-410b.2	Weight of end-of-life material recovered, percentage recycled	No products reaching their life cycle limits.
	RR-ST-410b.3	Percentage of products by revenue that contain IEC 62474 declarable substances, arsenic compounds, antimony compounds, or beryllium compounds	Hanwha Solutions is not applicable to this indicator.
	RR-ST-410b.4	Description of approach and strategies to design products for high-value recycling	page 21-22, 38
Materials Sourcing	RR-ST-440a.1	Description of the management of risks associated with the use of critical materials	page 51, 53
	RR-ST-440a.2	Description of the management of environmental risks associated with the polysilicon supply chain	Hanwha Solutions is not applicable to this indicator.

TCFD Index

Topic	Recommended Disclosures	Mapping of CDP	Page
Governance	a) Describe the board’s oversight of climate-related risks and opportunities.	C1.1b	11, 59, 81
	b) Describe management’s role in assessing and managing climate-related risks and opportunities.	C1.2, C1.2a	82
Strategy	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	C2.1a, C2.3, C2.3a, C2.4, C2.4a	82–84
	b) Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning.	C2.3a, C2.4a, C3.1, C3.2a, C3.3, C3.4	82–84
	c) Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	C3.2, C3.2a, C3.2b	85
Risk Management	a) Describe the organization’s processes for identifying and assessing climate-related risks.	C2.1, C2.2, C2.2a	82, 86
	b) Describe the organization’s processes for managing climate-related risks.	C2.1, C2.2	82, 86
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management.	C2.1, C2.2	66, 86
Metrics & Targets	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	C4.2, C4.2a, C4.2b, C9.1	72–73, 86–87
	b) Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and the related risks.	C6.1, C6.3, C6.5, C6.5a	72, 87
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	C4.1, C4.1a, C4.1b, C4.2, C4.2a, C4.2b	17, 35, 86–87

WEF Stakeholder Capitalism Metrics

Table	Theme	Metrics	Page
Principles of Governance	Governing purpose	Setting purpose	5-6, 11-12
	Quality of governing body	Governance body composition	58-60
		Progress against strategic milestones	14-30
	Stakeholder engagement	Material issues impacting stakeholders	14, 91
		Relations between remuneration system and impacts on economy, environment, and society	45, 60-61
	Ethical behavior	Anti-corruption	28-30, 62-64, 79
Protected ethics advice and reporting mechanisms		62-64	
Risk and opportunity oversight	Integrating risk and opportunity into business process	65-67	
Planet	Climate change	Greenhouse gas (GHG) emissions	16-19, 72
		TCFD implementation	81-87
		Paris-aligned GHG emissions targets and impacts of GHG emissions	16-19, 35, 87
	Nature loss	Land use and ecological sensitivity	36-37
	Freshwater availability	Water consumption and withdrawal in water-stressed areas	36, 73
	Air pollution	Impact of air pollution	36
	Water pollution	Nutrients, Impact of water pollution	36
	Solid waste	Single-use plastics, Impact of solid waste disposal	23, 36-38
Resource availability	Resource circularity	37-38	
People	Dignity and equality	Diversity and inclusion	75
		Pay equality	76
		Discrimination and harassment incidents and the total amount of monetary losses	63, 79
		Human rights review, grievance impact and modern slavery	47
	Health and well-being	Health and safety	74
Monetized impacts of work-related incidents on organization		24-27, 33-34	
Skills for the future	Training provided	43-44	
Prosperity	Employment and wealth generation	Absolute number and rate of employment	75
		Economic contribution	8
		Financial investment contribution	61, 79
		Infrastructure investments and services supported	54-56, 77
		Significant indirect economic impacts	8, 71, 82-84
	Innovation of better products and services	Total R&D expenses, Social value generated	13, 20-23, 48-49
	Community and social vitality	Total tax paid	8
Total Social Investment(seven categories defined by CECP Valuation Guidance)*		8, 34, 76	

* Local community, human rights, diversity, tolerance, training, safety&health, and labor-management relations

Greenhouse Gas Assurance Statement

Introduction

DNV Business Assurance Korea Ltd. (“DNV”) was commissioned by Hanwha Solutions Corporation (“Hanwha Solutions”) to verify the Hanwha Solutions’ Greenhouse Gas Inventory Report for the calendar year 2021 (“the report”) based upon a reasonable level of assurance. Hanwha Solutions is responsible for the preparation of the GHG emissions data on the basis set out within the guidelines on the operation of GHG emission trading scheme (“ETS”) (Notification No. 2021-278 of Ministry of Environment)’. Our responsibility in performing this work is to the management of Hanwha Solutions only and in accordance with terms of reference agreed with them. DNV expressly disclaims any liability or responsibility for any decisions, whether investment or otherwise, based upon this assurance statement.

Scope of Assurance

The GHG emissions data covered by our examination comprise Direct emissions (Scope 1) and Energy indirect emissions (Scope 2) from Hanwha Solutions boundary of the report:

- GHG emissions under verification: GHG emissions from 2021
- Organizational boundary for reporting: Hanwha Solutions Corporation (in Korea)

Verification Approach

The verification has been conducted by DNV on February to March 2022 and performed in accordance with the verification principles and tasks outlined in the guidelines on the operation of GHG ETS (Notification No.2021-278, Korean Ministry of Environment) and the verification guideline for GHG ETS (Notification No. 2021-112, Korean Ministry of Environment). We planned and performed our work to obtain all the information and explanations deemed necessary to provide us with sufficient evidence to provide a reasonable verification opinion concerning the completeness of the emission inventory as well as the reported emission figures in ton CO₂ equivalent. As part of the verification process:

- We have reviewed the GHG emissions report for the calendar year 2021
- We have reviewed and verified the process to generate, aggregate and report the emissions

Conclusions

As a result of the work described above, in our opinion nothing has come to our attention that would cause us to believe that the GHG emissions set out in Hanwha Solutions’ report are not fairly stated. The GHG emissions of Hanwha Solutions for the year 2021 were confirmed as below:

Greenhouse Gas Emissions of Hanwha Solutions Corporation for Year 2021

(Unit: ton CO₂ equivalent)

Hanwha Solutions	Direct emission (Scope 1)	Energy indirect emissions (Scope 2)	Total emissions
Emissions for the preceding three based on years 4th commitment period	502,338	2,188,195	2,690,533
Emissions for surrender of emissions permits	411,718	2,145,349	2,557,067

※ Total emissions = Direct emissions(Scope 1) + Energy indirect emissions(Scope 2)

June 2022

Seoul, Korea

DNV Business Assurance Korea Ltd
Country Manager Jang-Sub Lee



Greenhouse Gas Assurance Statement

Verification Objective

Scope 3 GHG emissions in 2021 of Hanwha Solutions Co., Ltd. related to purchased goods and services, fuel- and energy-related emissions not included in scope 1 or scope 2 and investments.

Verification Scope

The scope of this verification is the annual greenhouse gas emissions related to purchased goods and services, fuel- and energy-related emissions not included in scope 1 or scope 2 and investments at Hanwha Solutions' domestic business sites, and Scope 3 greenhouse gas emissions were calculated based on the activity data provided by Hanwha Solutions.

Verification level

Limited Level of Assurance

Data Verified

Hanwha Solutions' annual Scope 3 GHG emissions related to purchased goods and services, fuel- and energy-related emissions not included in scope 1 or scope 2 and investments in domestic business sites in 2021 are as follows.

(Unit: ton CO₂-e/yr)

Scope 3 Category	Purchased goods and services	fuel- and energy-related emissions not included in scope 1 or scope 2	Investments	Total Emissions
Annual emissions	3,173,688.156	32,224.283	1,258,787.195	4,464,700

Verification Criteria and Protocol

The verification was performed at the request of Hanwha Solutions using the following verification standards.

- Guidelines for reporting and certification of emissions from the greenhouse gas emission trading system
- The GHG Protocol of the WBCSD/WRI
- IPCC Guideline
- Environmental Product Declaration Certification Guide (KEITI-2021-11-10)

Verification Opinion

As a result of the verification in accordance with the standards listed above, it is the opinion of BSI that:

- In conducting this verification, no visits to the verification target business site or verification of the authenticity of the data provided by Hanwha Solutions were carried out.
- This verification may be affected by limited factors such as the limitation of provided data, non-execution of on-site verification, and sampling. Due to the limitation of this verification, there is an unavoidable risk that important errors may not be found and exist.
- No material misstatement in the GHG emission calculations was detected, related records were maintained appropriately.
- The data quality was considered corresponding to the international key principles for GHG emissions verification.

June 2022

Managing Director Korea,
SeongHwan Lim



Independent Assurance Statement

To readers of Hanwha Solutions Sustainability Report 2022

Introduction

Korea Management Registrar (KMR) was commissioned by Hanwha Solutions to conduct an independent assurance of its Sustainability Report 2022 (the "Report"). The data and its presentation in the Report is the sole responsibility of the management of Hanwha Solutions. KMR's responsibility is to perform an assurance engagement as agreed upon in our agreement with Hanwha Solutions and issue an assurance statement.

Scope and Standards

Hanwha Solutions described its sustainability performance and activities in the Report. Our Assurance Team carried out an assurance engagement in accordance with the AA1000AS v3 and KMR's assurance standard SRV1000. We are providing a Type 2, moderate level assurance. We evaluated the adherence to the AA1000AP (2018) principles of inclusivity, materiality, responsiveness and impact, and the reliability of the information and data provided using the Global Reporting Initiative (GRI) Index provided below. The opinion expressed in the Assurance Statement has been formed at the materiality of the professional judgment of our Assurance Team.

Confirmation that the Report was prepared in accordance with the Core Options of the GRI standards was included in the scope of the assurance. We have reviewed the topic-specific disclosures of standards which were identified in the materiality assessment process

- GRI Sustainability Reporting Standards
- Universal standards
- Topic Specific Standards
 - GRI 201: Economic Performance
 - GRI 302: Energy
 - GRI 303: Water and Effluents
 - GRI 305: Emissions
 - GRI 306: Effluents and Waste
 - GRI 403: Occupational Health and Safety

- GRI 404: Training and Education
- GRI 405: Diversity and Equal Opportunity
- GRI 406: Non-discrimination
- 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 Hanwha 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:

- reviewed the overall Report;
- reviewed materiality assessment methodology and the assessment report;
- evaluated sustainability strategies, performance data management system, and processes;
- interviewed people in charge of preparing the Report;
- reviewed the reliability of the Report's performance data and conducted data sampling;
- assessed the reliability of information using independent external sources such as Financial Supervisory Service's DART and public databases.

Limitations and Recommendations

KMR's assurance engagement is based on the assumption that the data and information provided by Hanwha Solutions to us as part of our review are provided in good faith. Limited depth of evidence gathering including inquiry and analytical procedures and limited sampling at lower levels in the organization were applied. To address this, we referred to independent external sources such as DART and National Greenhouse Gas Management System (NGMS) and public databases to challenge the quality and reliability of the information provided.

Independent Assurance Statement

Conclusion and Opinion

Based on the document reviews and interviews, we had several discussions with Hanwha 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 Core Option of the GRI Standards. Nothing comes to our attention to suggest that the Report was not prepared in accordance with the AA1000AP (2018) principles.

Inclusivity

Hanwha 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

Hanwha 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

Hanwha 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 Hanwha Solutions' actions.

Impact

Hanwha 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

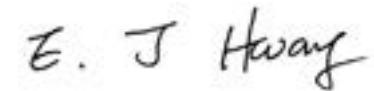
In addition to the adherence to AA1000AP (2018) principles, we have assessed the reliability of economic, environmental, and social performance data related to sustainability performance. We interviewed the in-charge persons and reviewed information on a sampling basis and supporting documents as well 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.

Competence and Independence

KMR maintains a comprehensive system of quality control including documented policies and procedures in accordance with ISO/IEC 17021:2015 – Requirements for bodies providing audit and certification of management systems. This engagement was carried out by an independent team of sustainability assurance professionals. KMR has no other contract with Hanwha Solutions and did not provide any services to Hanwha Solutions that could compromise the independence of our work.

June 2022 Seoul, Korea

CEO Eunju Hwang




Awards and Organization Memberships

Key Awards (from 2021 to the first half of 2022)

Division	Award	Awarded by
Company-wide	Carbon Management Sector Honors for the Carbon Disclosure Project (CDP)	CDP Korea
	2021 JoongAng Environment, Social, Governance (ESG) Award for Excellence in the Energy and Materials Sectors	The JoongAng Ilbo
Chemical Division	2021 IR52 Jang Young-sil Award for "Hydrogenated Hydrocarbon Resin (H+HCR)"	Ministry of Science and ICT (MSIT)
	Awarded the Grand Prize in the 2021 Award for Workplaces in the Yeosu Industrial Complex with Excellence in Safety Management	Yeosu, Jeollanam-do Province
	Received the Mayor Award for 2021 Public-Private Cooperation for Hope Welfare Support	Yeosu, Jeollanam-do Province
Qcells Division	Received the Prime Minister Award for the 2021 Nomination as a Resource Circulation Leader	Minister of Public Administration and Security
	Selected as the Top Performer of the 2021 PV Module Reliability Scorecard again for the sixth consecutive year	PVEL
	Selected as the "Best Global Company" in the 2021 Korea Consumer Awards	Korea Consumer Association (KCA)
	Selected as the 2021 Top Brand PV for the seventh consecutive year	EUPD Research
	Ranked No. 1 for the Germany Life & Living Award 2021 for the third consecutive year	German Institute for Service Quality (DISQ) and n-tv
	Selected for Excellence in Voluntarily Reducing Fine Dust in 2021	Chungcheongbuk-do Province
Advanced Materials Division	Sejong Business Site Received the Mayor's Award for Persons with National Merits on Firefighters Day in 2021	Sejong Metropolitan Autonomous City
Galleria Division	2021 Award for Contribution to Safety in Chungcheongnam-do Province and Disaster Preparedness Training (Center City)	Chungcheongnam-do Province
	2021 Award for National Disaster Preparedness Training and Contribution to Community Development (Center City)	Ministry of Public Administration and Security
	Ranked World No. 1 in the Shopping Mall Sector for the 2021 Prix Versailles Award (Gwanggyo)	UNESCO Headquarters
	Awarded as the Winner for the Social Contribution Sector for 2021 A.N.D. Awards (Awards for New Digital) (Right!EARTH)	Korea Digital Enterprise Association

Key Membership Status

Construction Guarantee	Construction Association of Korea	Korea Chamber of Commerce and Industry
Korea Electric Association	Korea Housing Construction Association	Korea Developer Association
Hydrogen Convergence Alliance (H2KOREA)	The Korean Society for New and Renewable Energy	Energy Transition Forum Korea
UN Global Compact Network Korea	The Federation of Korean Industries	Electric Contractors' Financial Cooperative
The American Chamber of Commerce in Korea	Korea Business Council for Sustainable Development	Korea Photovoltaic Society
The Korean Solar Energy Society	Korea Construction Engineers Association	Korea Economic Research Institute
Korea Golf Course Business Association (Gangwon Local Council)	Korea Fair Competition Federation	Korea International Trade Association
Korea Vinyl Environmental Council	Korea Department Store Association	Korea Industrial Technology Association
Korea Listed Companies Association	Korea Petrochemical Industry Association	Korea Alternative Energy Association
The Korean Society of Safety	Korea Electrical Contractors Association	Korea Electric Engineers Association
Korea Chlor Alkali Industry Association	Korea Photovoltaic Society	Korea Plastic Industry Cooperative
Korea Chemical Industry Council	Korea-US Economic Council	International Isocyanate Institute

