

Sustainable solutions for all, from energy to materials

 **Hanwha Solutions**
2022 Company Overview



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**About
Hanwha Group**

Hanwha Overview

After our founding in 1952, Hanwha has grown into a Fortune Global 500 company. Our business expertise and synergies in manufacturing & construction, finance, and services & leisure are respected around the world. Our focus, well-executed strategies, and aggressive investments have helped us to successfully overcome the toughest challenges in key industries in chemical, aerospace & mechatronics, solar energy, and finance.



Aerospace &
Mechatronics

Hanwha Corporation
Hanwha Aerospace
Hanwha Defense / Hanwha Systems
Hanwha Techwin / Hanwha Precision
Machinery / Hanwha Power Systems



Finance

Hanwha Life
Hanwha General Insurance
Hanwha Investment & Securities
Hanwha Asset Management
Hanwha Savings Bank



Chemical &
Energy

Hanwha Solutions Chemical Division /
Q CELLS Division /
Advanced Materials Division
Hanwha Impact / Hanwha Energy
Hanwha TotalEnergies Petrochemical
YECHUN NCC



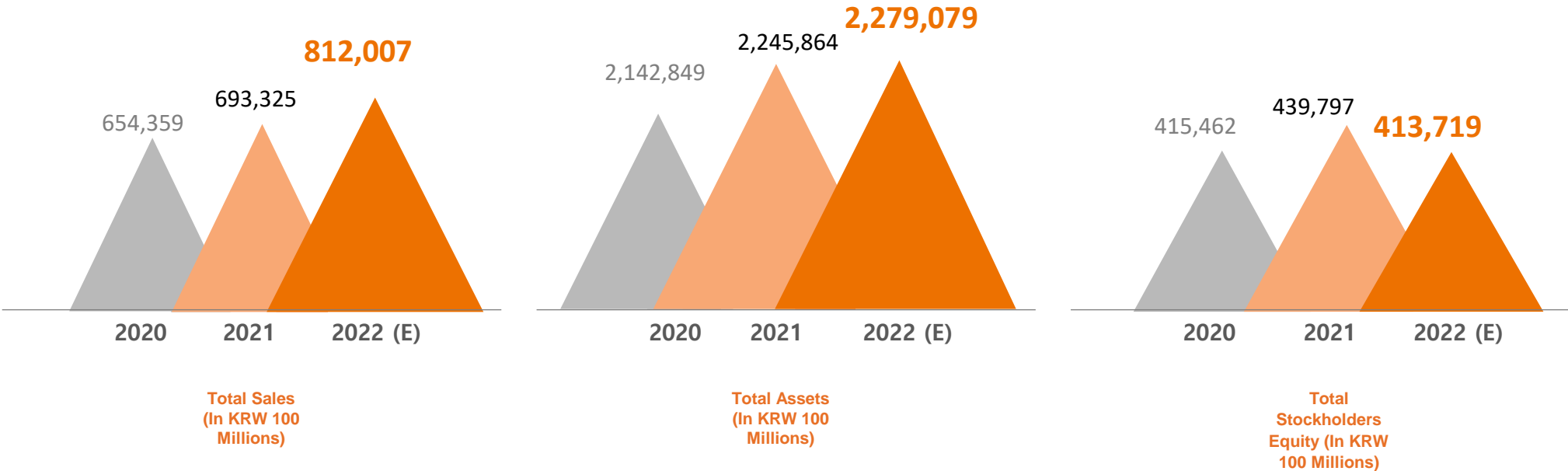
Construction &
Services

Hanwha Engineering & Construction
Hanwha Hotels & Resorts
Hanwha Solutions Galleria Division /
Insight Division
Hanwha Connect

Hanwha Financial Highlight

Hanwha is the 7th largest business enterprise in South Korea based on total assets.
 We continue to grow every year due to our stable financial structure.

(On a consolidated basis)





**About
Hanwha Solutions**

Hanwha Solutions Overview

Hanwha Solutions provides a range of solutions in various fields with differentiated technology and innovation. We are growing as a global leader in responding to climate change with smart eco-friendly energy solutions and customer-focused materials. We are committed to enriching the future with sustainable solutions for all.



Company Name Hanwha Solutions Corporation

Year Founded 1965

No. of Employees 6,759 (As of December 31, 2021)

CEOs Lee Koo Yung, Kim Eun Soo, Nam Yi Hyeon, Ryoo Du Hyoung, Kim Dong Kwan

Head Office Hanwha Building, 86 Cheonggyecheon-ro, Jung-gu, Seoul, Korea

Major Business

Chemical Division

South Korea's first PVC producer, who provides petrochemical-based products such as PO, TDI and CA

Q CELLS Division

A provider of total energy solutions, from solar modules and systems to renewable energy plant development/construction and energy retail

Advanced Materials Division

A leader in the future mobility industry, producing lightweight composite materials, solar materials, and hydrogen tanks

Galleria Division

A premium retail service provider that operates department stores, fashion and F&B businesses

Insight Division

A leading developer of renewable energy plants, cities and smart multifunctional industrial complexes (building in compliance with RE100 as well as for logistics/IDC, etc.), and premium lifestyle facilities

Hanwha Solutions Vision & Mission

Hanwha Solutions is quickly being recognized as a global leader in energy and material technology-based solutions driven by the new vision of “Sustainable solutions for all, from energy to materials.”

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.

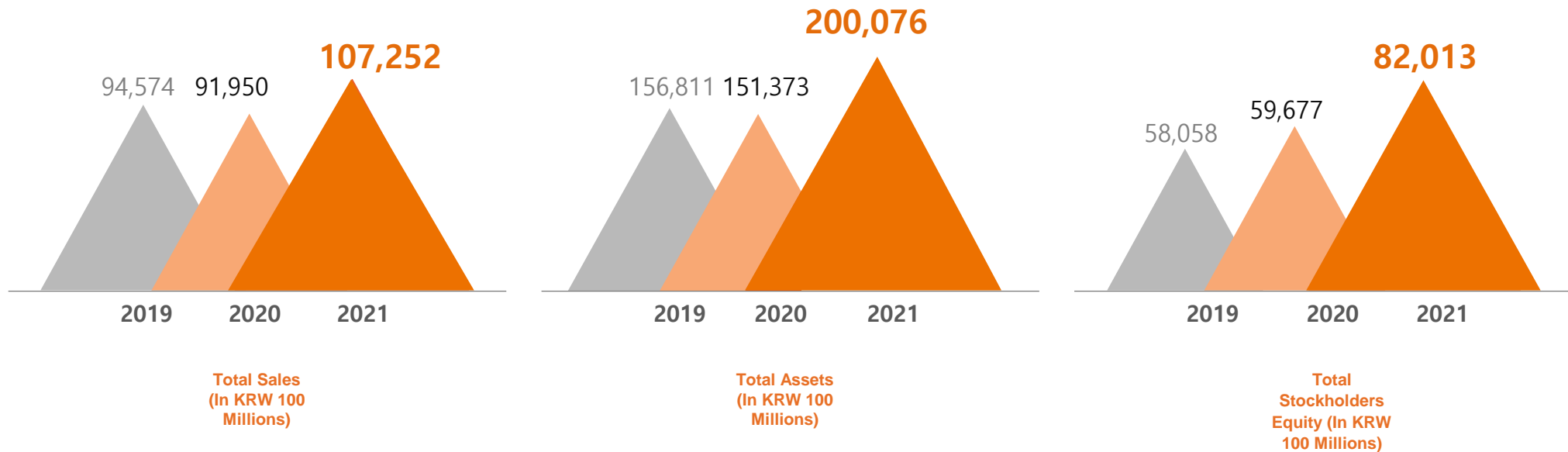
Business Statement

Chemical (Chemical Division)	Solar Energy (Q CELLS Division)	Advanced, lightweight composite materials (Advanced Materials Division)	Retail Service (Galleria Division)	Real Estate Development (Insight Division)
We push the boundaries of what's possible and develop customer-centric solutions to lead the way to a sustainable future.	We aim to create a more sustainable future by providing clean energy solutions.	As a global leader with advanced lightweight composites and film materials, we're developing sustainable solutions that make the world a better place.	We are a premium content producer that delivers on leading global trends and a differentiated customer experience as the premier retailer in South Korea.	We are a total solutions platform that creates future value by converging finance with development projects in green energy, smart multifunctional industrial complexes, and premium lifestyle facilities.

Hanwha Solutions Financial Highlights

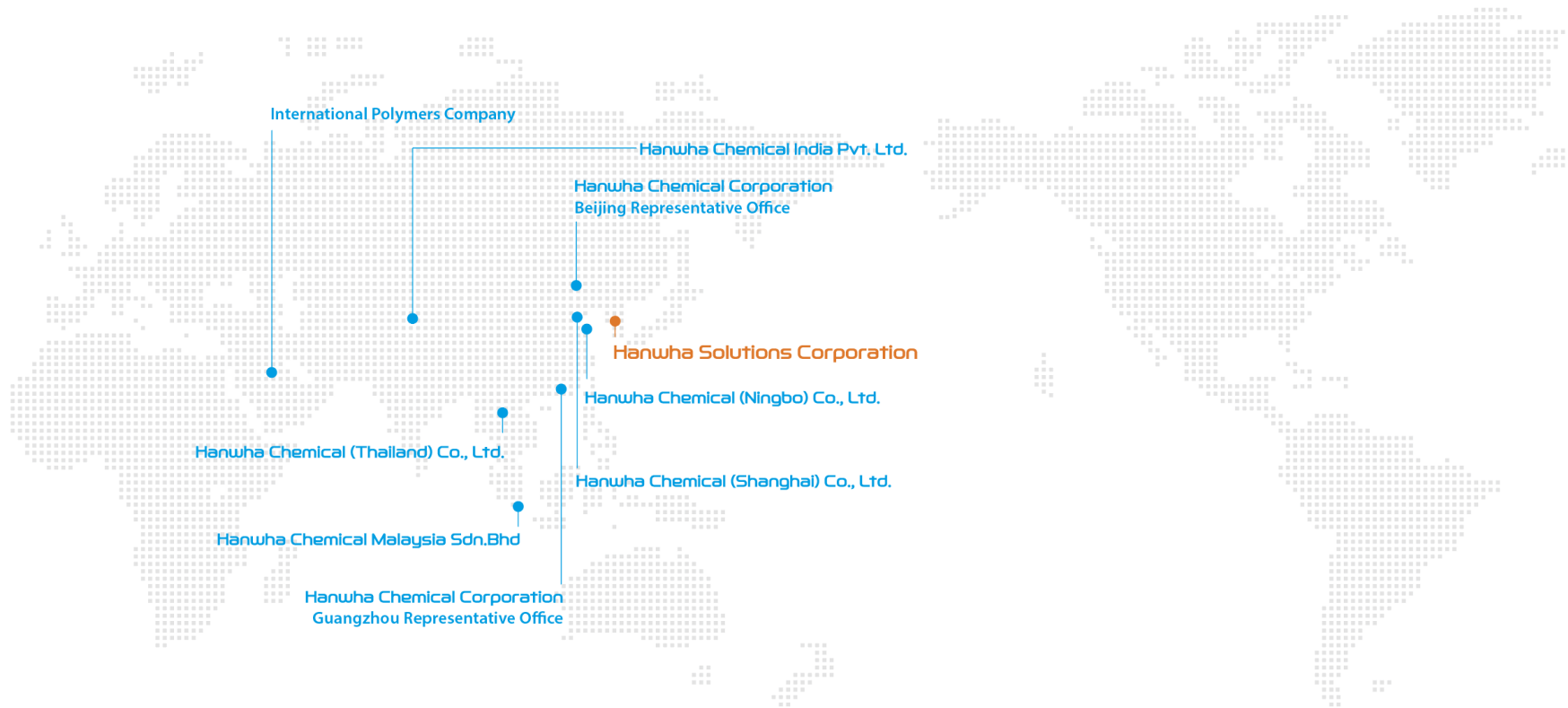
Despite drastic changes across markets and industries, Hanwha Solutions continues to grow in a consistent and stable manner through efficient business restructuring and business portfolio diversification.

(On a consolidated basis)



Hanwha Solutions Global Network (Chemical Division)

Chemical Division is responding to the rapidly changing global business environment with 8 global networks in Asia and the Middle East, with its headquarters in Seoul.



● Domestic Network

11

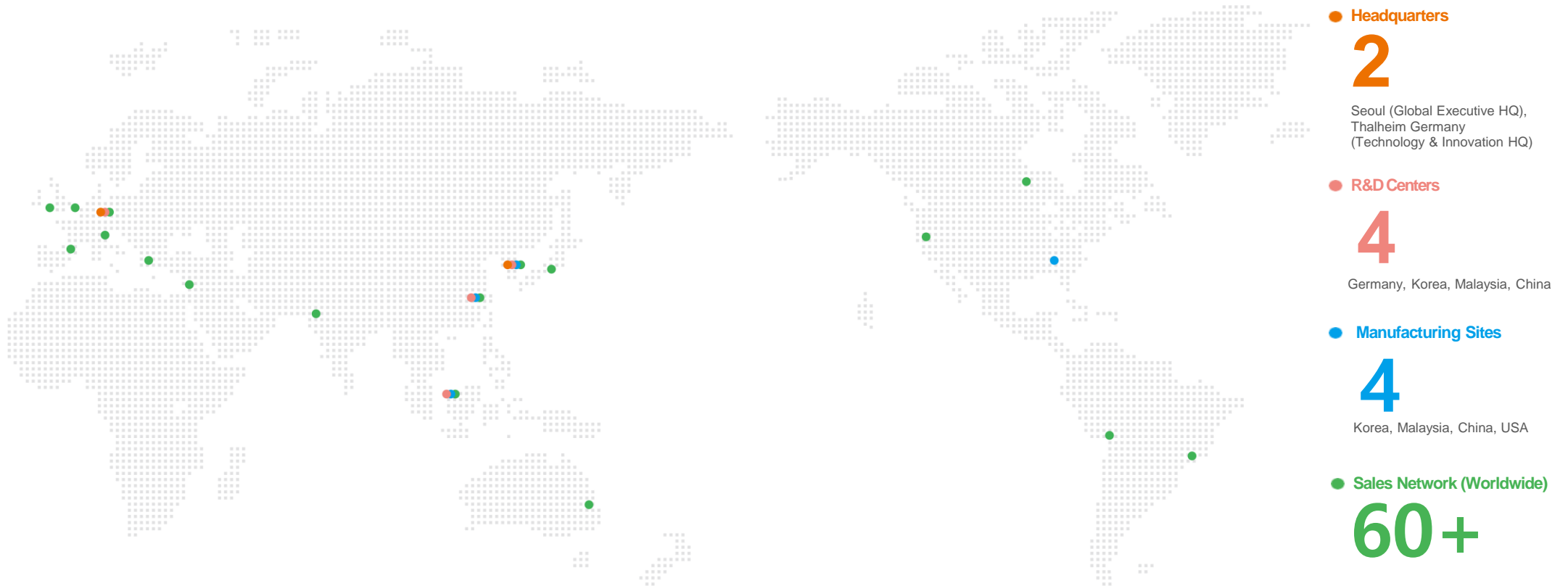
Seoul Headquarters,
Daeduck R&D Center,
Pangyo R&D Center,
Yeosu Plant, TDI Plant, Ulsan Plant 1,
Ulsan Plant 2, Ulsan Plant 3,
Daegu Branch, Busan Branch,
Gwangju Branch

● Global Network (Asia and the Middle East)

8

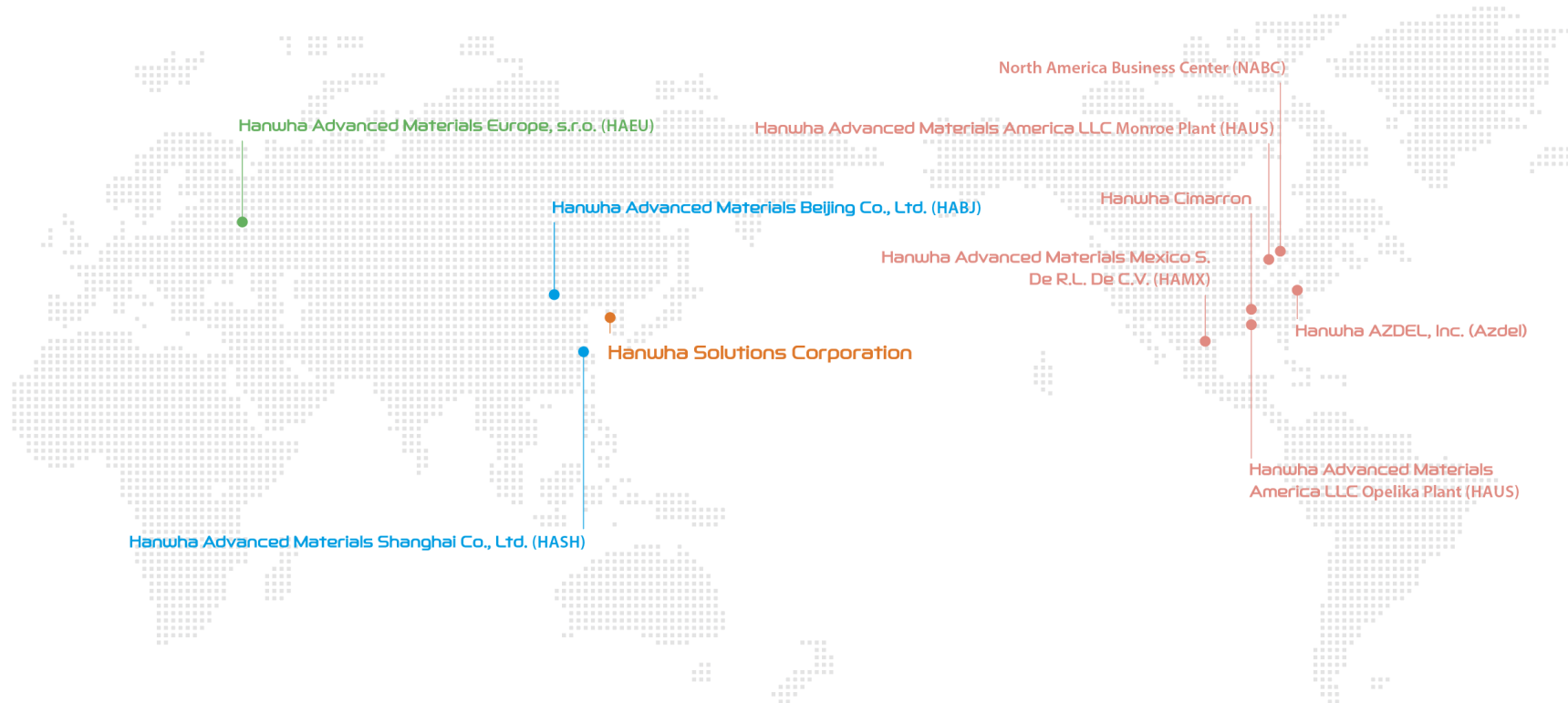
Hanwaha Solutions Global Network (Q CELLS Division)

Q CELLS Division works closely with global R&D and manufacturing sites to maintain the highest level of quality across manufacturing, sales and support.



Hanwha Solutions Global Network (Advanced Materials Division)

Advanced Materials Division has 9 global networks across the Americas, Asia, and Europe.
We are continuously expanding the networks to actively respond to global sourcing needs.



● Domestic Network

5

Seoul Headquarters, Sejong Plant, Eumseong Plant, Busan Plant, Suwon R&D Center

● Global Network (Americas)

6

● Global Network (Asia)

2

● Global Network (Europe)

1

Hanwha Solutions Global Network (Insight Division)

Our Insight Division has four global networks in Asia and South America.
We are pioneers in the global market and leverage our global leading experience and expertise on daily basis.



● Domestic Network

14

Seoul Headquarters, Seosan Techno Valley, Gimhae Techno Valley, Gyeonggi Hwaseong Bio Valley, Yongin Techno Valley, Anseong Techno Valley, 2nd Yongin Techno Valley, Seochang Techno Valley, H Techno Valley, Ulsan Multifunctional Complex, Anseong Logistics Center, Taejeon Anmyeon Clean Energy, Goheung Floating Solar Power Plant

● Global Network (Japan)

2

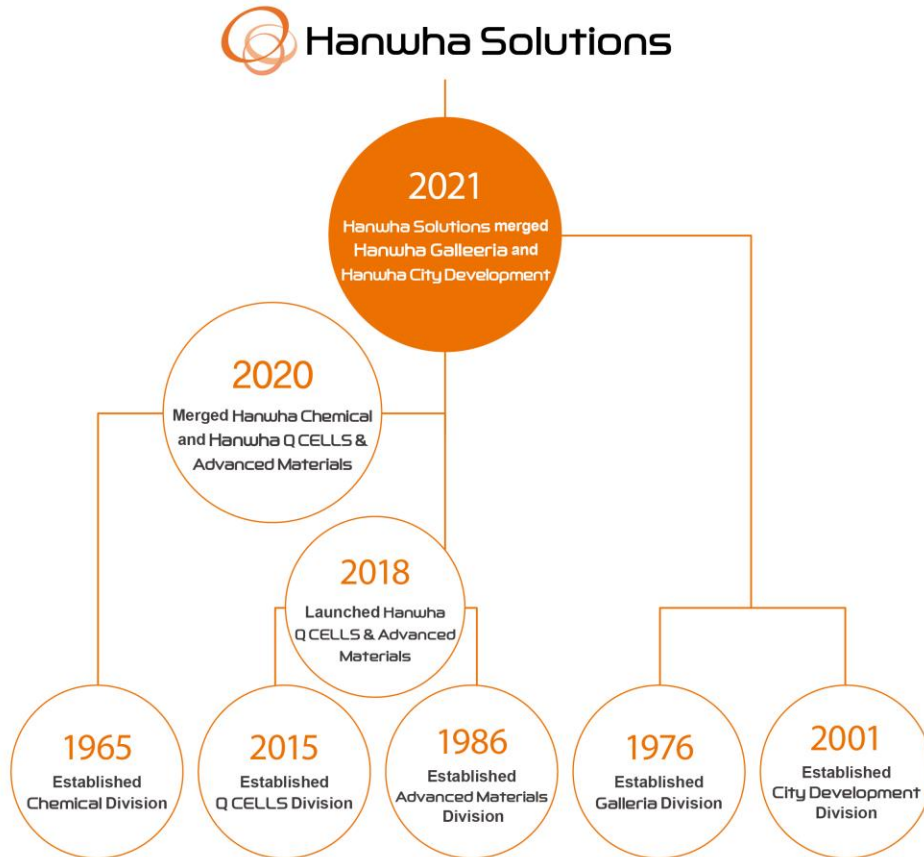
Niseko A, Niseko B

● Global Network (Chile)

2

1st and 2nd Namdong Solar Power Plant

Hanwha Solutions History



- 2022 • Launched Insight Division by renaming City Development Division by restricting Q CELLS GES and Galleria premium lifestyle business units
- 2021 • **Hanwha Solutions merged Hanwha Galleria and Hanwha City Development**
- 2020 • Launched Hanwha Solutions through the merger of Hanwha Chemical and Hanwha Q CELLS & Advanced Materials
Galleria Division, launched Galleria Gwanggyo and GOURMET 494 Hannam City Development Division, established West Ochang Techno Valley Corporation
- 2019 • Q CELLS Division, succeeded in mass-producing 15GW of Q.ANTUM solar cells
City Development Division, established Anseong Techno Valley Corporation
- 2018 • Q CELLS Division, merged with Hanwha Advanced Materials to become Hanwha Q CELLS & Advanced Materials
- 2017 • Advanced Materials Division, established Chongqing Corporation
- 2016 • Chemical Division, acquired Hanwha Fine Chemical
Advanced Materials Division, built an automotive parts and materials plant in Monterrey, Mexico
- 2015 • Chemical Division, merged with Hanwha SolarOne and Hanwha Q CELLS to form Hanwha Q CELLS, acquired Samsung Total Petrochemicals and Samsung General Chemical
Q CELLS Division, acquired SolarOne
City Development Division, established Gyeonggi Yongin Techno Valley Corporation
- 2014 • Advanced Materials Division, changed its corporate name to Hanwha Advanced Materials after selling the construction materials business
Galleria Division, renewed Galleria Luxury Hall West
- 2013 • Chemical Division, established Hanwha Chemical Malaysia SDN. BHD.
Galleria Division, spun off Beans & Berries as a social enterprise
- 2012 • Q CELLS Division, acquired Germany-based Q CELLS
Galleria Division, renewed Galleria Luxury Hall Food Hall (GOURMET 494)

Hanwha Solutions History

- 2011 • Chemical Division, entered the polysilicon business
- 2010 • Chemical Division, changed its corporate name to Hanwha Chemical Corporation, completed construction of Ningbo PVC Plant in China
Q CELLS Division, acquired Hanwha Solarfun to become Hanwha SolarOne
Galleria Division, launched Galleria Center City
City Development Division, established Gyeonggi Hwaseong Bio Valley Corporation
- 2009 • Advanced Materials Division, built an automotive parts and materials plant in Ostrava, Czech Republic
City Development Division, established Gimhae Techno Valley Corporation
- 2007 • Galleria Division, launched Galleria Jinju branch
City Development Division, established Seosan Techno Valley Corporation
- 2006 • Galleria Division, launched the 1st Beans & Berries store
City Development Division, established Asan Techno Valley Corporation
- 2004 • Chemical Division, opened its Beijing Office
Galleria Division, renewed Galleria Luxury Hall and renamed it to Luxury Hall West and Luxury Hall East
- 2002 • Chemical Division, developed ASR at the Daedeok R&D Center
- 2001 • City Development Division, established Daedeok Techno Valley Corporation
- 2000 • Galleria Division, acquired Dongyang Department Store Co., Ltd.
- 1999 • Q CELLS Division, founded Q-Cells AG in Germany
- 1997 • Galleria Division, launched the former Dongyang Department Store Timeworld (now Galleria Timeworld)
- 1996 • Chemical Division, developed an in-house technology to produce high-content EVA for shoes
- 1995 • Chemical Division, developed its LLDPE production technology for insulation
Galleria Division, renamed to Hanwha Stores Co., Ltd.
- 1994 • Chemical Division, changed its corporate name to Hanwha General Chemical
- 1989 • Galleria Division, launched the former Hanwha Department Store Cheonan branch
- 1986 • Advanced Materials Division, expanded into the automotive materials industry
- 1985 • Chemical Division, completed South Korea's first EVA production line at its Ulsan Plant
Galleria Division, acquired Hanyang Stores Co., Ltd. and incorporated into Hanwha Group affiliates
Galleria Division, launched Parco (now Galleria Luxury Hall East)
- 1980 • Chemical Division, completed construction of the Hanyang Chemical Yeosu Plant and Dow Chemical Korea Yeosu Plant
- 1979 • Galleria Division, launched Hanyang Shopping Center Yeongdong branch (now Galleria Luxury Hall West)
- 1977 • Galleria Division, established Hanyang Super Co., Ltd.
- 1975 • Galleria Division, launched Hanyang Store Yeoui branch
- 1965 • Chemical Division, established the Korea Hwasung Plant

Hanwha Solutions Business Strategy

Hanwha Solutions leverages its business strategies to become a global energy and materials solution leader as we enhance the value of life and create a sustainable future.

	Chemical (Chemical Division)	Solar Energy (Q CELLS Division)	Advanced, lightweight composite materials (Advanced Materials Division)	Retail Service (Galleria Division)	Real Estate Development (Insight Division)
Strategy	<ul style="list-style-type: none"> • Strengthen existing business competencies <ul style="list-style-type: none"> - Advance product portfolio and improve cost competitiveness • Diversify technology-based businesses <ul style="list-style-type: none"> - Develop high-value-added resources, materials and healthcare products • Boost digital transformation <ul style="list-style-type: none"> - Continue to generate profit by transforming the ways of working from analog to digital 	<ul style="list-style-type: none"> • Diversify business portfolio <ul style="list-style-type: none"> - Enter the German energy retail business in 2019 and expanded into other markets including the US, Europe, Australia, and Japan - Expand energy system solution sales - Promote downstream businesses 	<ul style="list-style-type: none"> • Foster promising new businesses of the future <ul style="list-style-type: none"> - Develop composite materials for high pressure Type 4 tank, aviation and advanced films 	<ul style="list-style-type: none"> • Enhance the department store's premium competencies <ul style="list-style-type: none"> - Ensure the highest, premium quality - Develop world-class, luxury product lineup across the region - Expand core VIP customers • Diversify business portfolio based on VIP customers <ul style="list-style-type: none"> - Build a new premium digital platform - Accelerate the growth of our premium complex development business 	<ul style="list-style-type: none"> • Develop assets with high future value <ul style="list-style-type: none"> - Enhance asset value by developing IDC and logistics center, which are essential facilities in the Fourth Industrial Revolution era • Expand renewable energy platforms <ul style="list-style-type: none"> - Create sustainable high-added-value by expanding its platform from PV EPC to investment, development, and operation • Bolster premium real estate and contents businesses <ul style="list-style-type: none"> - Expand luxury lifestyle platform business by developing premium residence, hotel, and lifestyle content
Sustainability Insight	<ul style="list-style-type: none"> • Explore eco-friendly businesses <ul style="list-style-type: none"> - Develop green hydrogen business • Build a circular economy system <ul style="list-style-type: none"> - Promote chemical recycling - Develop bio-based chemicals & polymers - Develop bio-degradable polymers 	<ul style="list-style-type: none"> • Lead the smart energy lifestyle market <ul style="list-style-type: none"> - Create an efficient energy lifestyle that enables solar energy-based power generation, storage and control using PV and ESS businesses - Contribute to the economic use of eco-friendly electricity for consumers through our energy retail business, targeting prosumers and self-consumption markets 	<ul style="list-style-type: none"> • Enter the eco-friendly vehicle supply chain market <ul style="list-style-type: none"> - Expand the supply of battery housings for electric vehicles and CVM • Improve fuel efficiency by reducing vehicle weight <ul style="list-style-type: none"> - Enhance fuel efficiency by supplying lightweight composite materials such as StrongLite and SuperLite 	<ul style="list-style-type: none"> • Develop ESG product lineup and expand customer service <ul style="list-style-type: none"> - Develop eco-friendly, life- and ethics-themed private brands and promote brand collaborations • Improve eco-friendly corporate culture <ul style="list-style-type: none"> - Enhance energy efficiency and recycling rate at the workplace - Expand social environmental movement through the "Right! Galleria" campaign 	<ul style="list-style-type: none"> • Develop smart and green industrial complex (RE100) <ul style="list-style-type: none"> - Pursue sustainable values and innovation of existing complexes by developing a smart green industrial complex complying with RE100 - Develop ecological green city by linking parks and green areas • Advance renewable energy <ul style="list-style-type: none"> - Provide RE100 and eco-friendly energy via diverse routes, such as third-party PPAs and direct PPAs

Business Portfolio
Chemical



Chemical Division Overview

Established in 1965, Chemical Division is a producer of PVC (polyvinyl chloride), the first in South Korea. We also produce LDPE (low-density polyethylene), LLDPE (linear low-density polyethylene), CA (chlorine and caustic soda), and TDI. By producing basic chemical products necessary in everyday life, we are improving the quality of life around the world.

Business Area

We built a batch production system that ranges from PO, PVC, CA, and TDI. As South Korea's leading chemical company, we are transforming into a global eco-friendly company by expanding our portfolio of high-value-added products, enhancing cost competitiveness and developing eco-friendly products.



PO (Polyolefin)



PVC (Polyvinyl Chloride)



CA



TDI

Chemical Division Key Products

PO (Polyolefin)



Boasting outstanding physical properties and environmental stability, PO is a polymer used in a wide variety of applications from daily consumer goods to high-tech industrial materials. In 1972, we succeeded in producing LPDE for the first time in South Korea, and are now producing wire and cable compounds, adhesives for hygiene products, and hydrogenated hydrocarbon resins.

Products

LDPE, LLDPE, EVA, HDPE, wire and cable compounds, hydrogenated hydrocarbon resins.

PVC (Poly Vinyl Chloride)



PVC is a general-purpose plastic widely used for applications such as synthetic leather, packaging, flooring, toys, and textiles. In 1966, we became the first company in South Korea to produce PVC. Since then, we also developed ECO-DEHCH, a premium eco-friendly plasticizer, which was the first of its kind in South Korea.

Products

PVC (Straight/paste/CPVC), DEHCH (Eco-friendly plasticizer), plasticizer/OA/PA/MA

CA (Chlor-Alkali)



Chlor-alkali, also known as CA, is an inorganic chemical product represented by chlorine and caustic soda. It is used in various fields such as inorganic chemical products, paper, textiles, metals, electricity and electronics. We are striving to secure global competitiveness while maintaining our No. 1 market share in CA domestically.

Products

Caustic soda, chlorine, EDC, VCM, ECH, sodium hypochlorite

TDI (Toluene Diisocyanate)



TDI is commonly used across a wide array of industries and in everyday life, such as polyurethane foam and paint adhesives. We are enhancing our global competency within the polyurethane industry through the localization of high-purity XDI, a specialty chemical material for optical lenses, for the second time in the world.

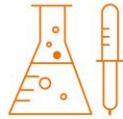
Products

TDIs, TDI derivatives, TM, TDAs, XDI

Chemical Division R&D

For over 30 years since its inception, Chemical Division's Daeduck R&D Center has been committed to developing forward-looking technologies as we pursue a better tomorrow.

R&D Mission



Securing future growth engines



Strengthening existing business competencies



Creating a pool of experts



Building a global R&D network

Major Research Area



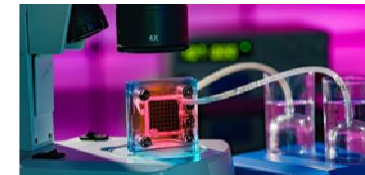
PO/PVC polymerization technology and product development



Eco-friendly plasticizers



Polymerization/chemical catalysts



High-value-added isocyanate



Functional polymers



Chemical processes



Water electrolysis



Eco-friendly materials/processes

Business Portfolio
Q CELLS



Q CELLS Division Overview

Q CELLS Division is a global provider of total energy solutions. Building on our flagship business of solar cells/modules, we are expanding our business horizon to include energy storage and management systems, distributed power solutions, and green energy solutions.

Under the mission of “We aim for a greener tomorrow with complete clean energy solutions,” we are becoming a powerhouse in key global markets by capitalizing our technology, quality, and product competitiveness.

Business Area

We offer “Completely Clean Energy” solutions, from solar cells/modules and systems, distributed power solutions to, renewable energy plants, and more .



Solar Cells/Modules



Energy Solutions Systems



Green Energy Solutions



Distributed Power Solutions

Q CELLS Division Key Products & Services

Solar Cells/Modules



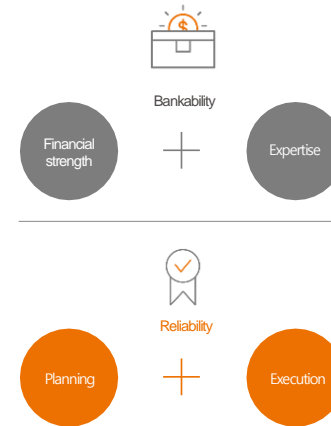
Our world-renowned solar modules, produced by our proprietary Q.ANTUM cell technology, are high-quality photovoltaic products that have enabled us to achieve No. 1 market share in key major markets due to their high efficiency, performance, and quality.

Energy Solutions System



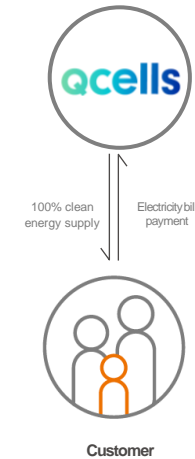
Our Q.HOME CORE is an ideal integrated energy solution that combines solar inverters, energy storage systems, and energy monitoring services to ensure efficient eco-friendly energy consumption, while reducing electricity costs for residential consumers.

Green Energy Solutions



Renewable energy plants are a reliable energy source and competitive economic investment that leverage our EPC solutions with financial stability, expertise, and product excellence.

Distributed Power Solutions



Our Q CELLS Division pursues a variety of power supply services to fulfill country-specific needs. By leveraging GELI, our US-based leading energy storage solutions and software provider, we will expand our energy retail business based on distributed power solutions that connect small-scale power generation, such as solar and wind power.

Q CELLS Division R&D

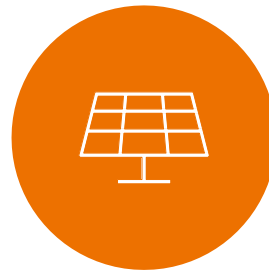
Our Q CELLS Division employs a unique combination of R&D, pilot productions, and testing to develop and apply innovative manufacturing methods for the creation of high-tech products. We are setting new technology standards in the industry.

R&D Center



Germany, South Korea,
Malaysia, China

Technology Innovation



Q.ANTUM technology,
Q.ANTUM DUO technology,
Q.ANTUM DUO Z technology,
Q CELLS yield security,
Q.ANTUM NEO technology

Technology Leadership



World record 19.5%
Setting the standards
Cumulative PERC cell production of 25GW+
Securing highest yields under real conditions

Business Portfolio

Advanced Materials



Advanced Materials Division Overview

Advanced Materials Division has an innovative lineup of products and technology in the fields of lightweight composite materials, solar materials, and electronic materials. 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.

Business Area

As a global leader with advanced lightweight composites, solar materials and electronic materials, we are developing sustainable solutions that make the world a better place.



Lightweight Composite Material



Type 4 Composite Material



Solar Material



Electronic Material

Advanced Materials Division Key Products



StrongLite (GMT, glass fiber reinforced thermoplastics)

A composite material in the form of a plate, reinforced with polypropylene resin (PP) and glass fiber mat, StrongLite has strength levels comparable to steel, but with 20-25% less mass. It is widely used such as bumpers and chair backs.



SuperLite (LWRT, low weight reinforced thermoplastics)

SuperLite is a composite sheet material that can be thermoformed at low pressure. It boasts outstanding strength relative to its weight, and also possesses sound absorption and trimming qualities. The materials are used in various products such as automobile headliner and underbody.



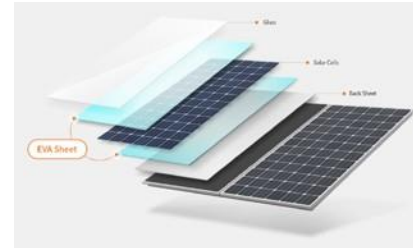
SMC (Sheet Molding Compound)

With excellent moldability, SMC is a composite molding material used for bathroom ceiling panels, water tanks as well as truck beds and tailgate lids for automobiles. It is especially popular for battery housing of eco-friendly vehicles.



Type 4 Composite Material Tank

Molded high-functional carbon fiber reinforced composite material, the Type 4 composite material tank is used for high-pressure gas or hydrogen storage, such as CNG (compressed natural gas) tanks and hydrogen tanks. It is used as tube skids for transporting hydrogen fuel for passenger cars, buses and trucks.



Solar Materials (EVA sheet, back sheet)

Leveraging more than 30 years of experience with sheet manufacturing technology, we independently develop, produce, and supply EVA and back sheets used for solar modules.



LinkTron (High-functional film for mobile devices and displays)

We produce materials for FPCB (Flexible Printed Circuit Board) such as coverlay film (insulation film), 3-layer FCCL and bonding sheet (adhesive sheet).

Advanced Materials Division R&D

Advanced Materials Division is diversifying its business lines by expanding into lightweight composite materials and developing more advanced thermoforming technologies. We are also developing high-function and high-quality film materials that will drive the market forward. We are constantly developing and acquiring unique and innovative technologies that can strengthen the competitiveness of the three key industry segments we focus on—automotive, electronics, and solar.

Vision

Leading in the development of global materials and components technology

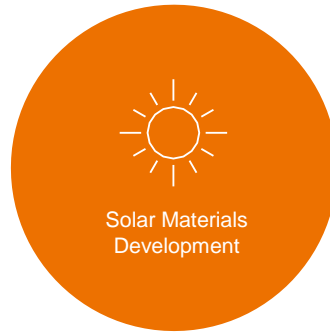


Lightweight Composite
Materials Development

We lead the world in the production of lightweight automotive materials and have secured our competitive advantage through integrated technology from materials to final products.

Vision

Developing new materials and providing customized solutions through platform technology expansion

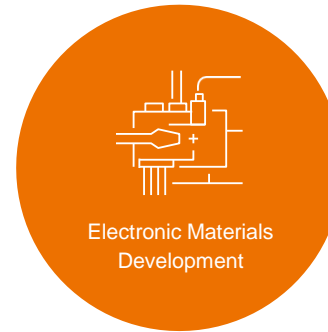


Solar Materials
Development

After entering the solar materials market, we focused our attention on developing new material sheets. We also worked on expanding our product lineups for solar cells and module materials.

Vision

Establishing a full-lineup of the highest quality, flexible circuit materials



Electronic Materials
Development

Specializing in the localization of FCCL materials, we concentrated on circuit materials for next generation products such as 5G mobile communications and IoT devices.

Vision

Delivering global top hydrogen transportation and storage solutions through unique liner materials and technologies



Hydrogen Tank
Development

Providing high transport efficiency with the world's only certified high-capacity, high-pressure hydrogen tank

Business Portfolio
Galleria



Galleria Division Overview

Since its founding in 1976, Galleria Division has specialized in retail services throughout Korea.

Along with our Galleria Luxury Hall, the first and highest quality luxury store in South Korea, we own a number of local department stores across the nation. Each offer an unparalleled suite of upscale shopping experiences by showcasing global fashion trends, fine dining, and premium services.

Business Area

Galleria Division operates five stores within the major cities across Korea: Seoul; Suwon (Gwanggyo); Cheonan; Daejeon; and Jinju. We also operate other retail businesses, including global fashion brand sourcing and F&B services.



Department Store



Fashion



F&B

Galleria Division Key Business

Department Store



The Galleria, which was the first department store to introduce the luxury goods concept in Korea, delivers high-end brand curation and the ultimate in VIP service. There are five locations across South Korea and each are the No.1 retailer in its respective region. The Galleria is known for providing a differentiated customer experience with trendy brands, high-quality food, and innovative space design.

Fashion



Galleria Division offers exclusive direct sourcing of global luxury fashion houses such as Stefano Ricci and Fauré Le Page, as well as American upscale casual wear brand James Perse. You will also find US lifestyle retailer Fred Segal and Korea's first fashion boutiques, such as G.STREET 494+ and G.STREET 494 HOMME, making us a leading fashion company by introducing the world's latest trends in real time.

F&B



Our portfolio consists of the world's finest F&B brands, such as GOURMET 494 and VINO 494 CLASSIC. GOURMET 494, the first grocerant in South Korea, continues to usher in a new trend of food and beverage in the department store by launching the Delicery, a new food hall of deli + grocery concept. Our VINO 494 CLASSIC, the first premium wine shop in a department store, also leads the premium gourmet market. Looking ahead, we will raise our brand value by developing GOURMET 494's private brand products made with carefully selected ingredients.

Business Portfolio
Total Developer



Insight Division Overview

Our Insight Division is opening new opportunities while creating future value for the development industry.

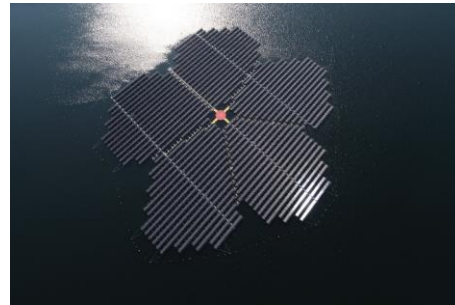
Business Area

By building a sound business portfolio of development projects—such as large-scale industrial complexes, renewable energy, and premium real estate—we are laying the foundation for sustainable growth through operation management and financing.



City Development

- New town and housing development
- IDC and logistics center development
- Smart and green industrial complex (RE100) development



Korea GES

- Renewable energy development
- Renewable energy EPC and O&M



Premium Lifestyle

- Real estate development
- Lifestyle contents development
- Complex development consulting

Insight Division City Development Cases



Daedeok Techno Valley

- Location: Yuseong-gu, Daejeon
- Project period: 2001~2009
- No. of tenant companies: 2020+
- Development area: 4,270,056m²



Asan Techno Valley

- Location: Dunpo-myeon, Asan-si
- Project period: 2004~2013
- No. of tenant companies: 110+
- Development area: 2,983,902m²



Seosan Techno Valley

- Location: Seongyeon-myeon, Seosan-si
- Project period: 2007~2016
- No. of tenant companies: 60+
- Development area: 1,985,848m²



Gimhae Techno Valley

- Location: Jinrye-myeon, Gimhae-si
- Project period: 2011~2017
- No. of tenant companies: 210+
- Development area: 1,644,111m²



Gyeonggi Hwaseong Bio Valley

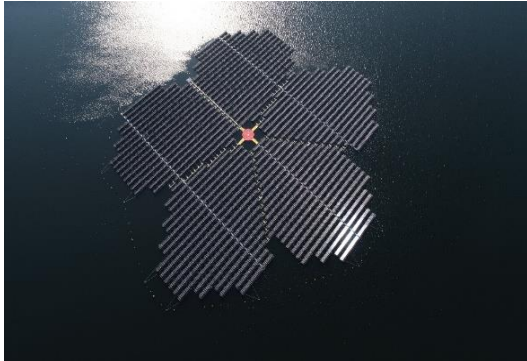
- Location: Mado-myeon, Hwaseong-si
- Project period: 2010~2017
- No. of tenant companies: 180+
- Development area: 1,739,821m²



Yongin Techno Valley

- Location: Idong-myeon, Yongin-si
- Project period: 2014~2020
- No. of tenant companies: 120+
- Development area: 840,342m²

Insight Division Renewable Energy Cases



Hapcheon Floating Solar Power Plant

- Business category: EPC
- Location: Hapcheon-gun, Gyeongsangnam-do
- Construction period: 2020~2022
- Scale: 42MW



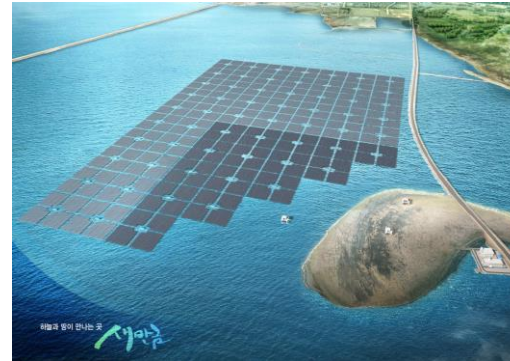
Goheung Floating Solar Power Plant

- Business category: EPC
- Location: Goheung, Jeollanam-do
- Construction period: 2021~2023
- Scale: 63MW



Cheongsong Floating Solar Power Plant

- Business category: EPC
- Location: Cheongsong-gun, Gyeongsangbuk-do
- Construction period: 2021
- Scale: 4.4MW



Saemangeum Floating Solar Power Plant

- Business category: EPC
- Location: Saemangeum area, Jeollabuk-do
- Construction period: Undecided
- Scale: 300MW

Insight Division Premium Lifestyle Cases



Jade Palace Golf Club

- Business category: Membership golf club
- Location: Seocheon-ri, Namsan-myeon, Chuncheon-si, Gangwon-do
- Course: Western Course 3,490m / Par 36 / 9H, Eastern Course 3,537m / Par 36 / 9H



Jade Garden

- Business category: Arboretum
- Location: Seocheon-ri, Namsan-myeon, Chuncheon-si, Gangwon-do
- Size: 163.528m²



Niseko Resort (Under development)

- Business category: Condominium for sale
- Location: Abuta County, Hokkaido, Japan
- No. of rooms: 113
- Estimated completion date: November 2023



Jade Villa (Under development)

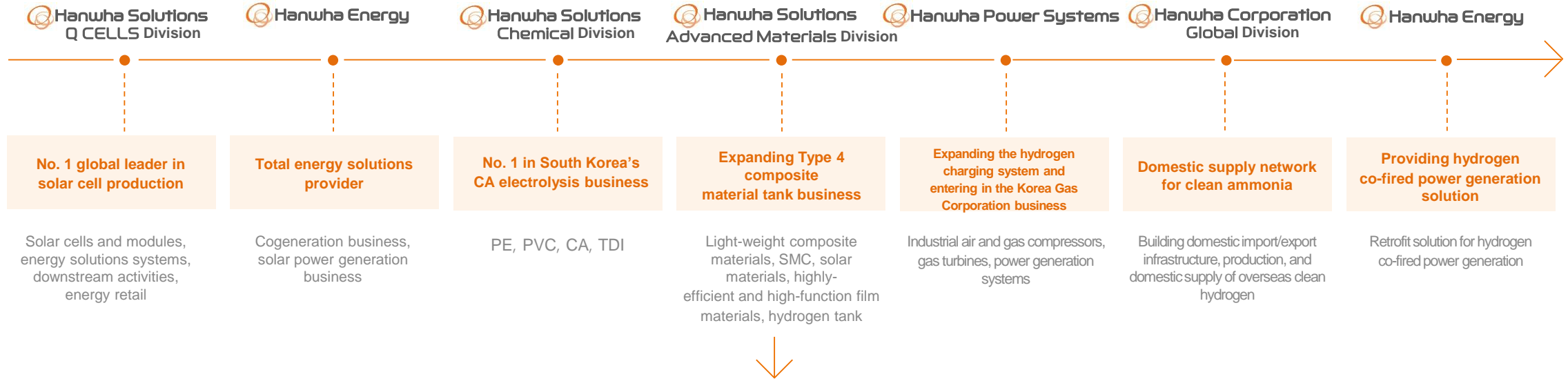
- Business category: Villas for sales
- Location: Seocheon-ri, Namsan-myeon, Chuncheon-si, Gangwon-do
- No. of villas: 32
- Estimated completion date: The first half of 2025

Business Portfolio
Green Hydrogen
Business



Hydrogen Business Value Chain

Hanwha promotes systematic projects to revitalize the hydrogen economy by leveraging green hydrogen production and supply capabilities through our renewable energy business.

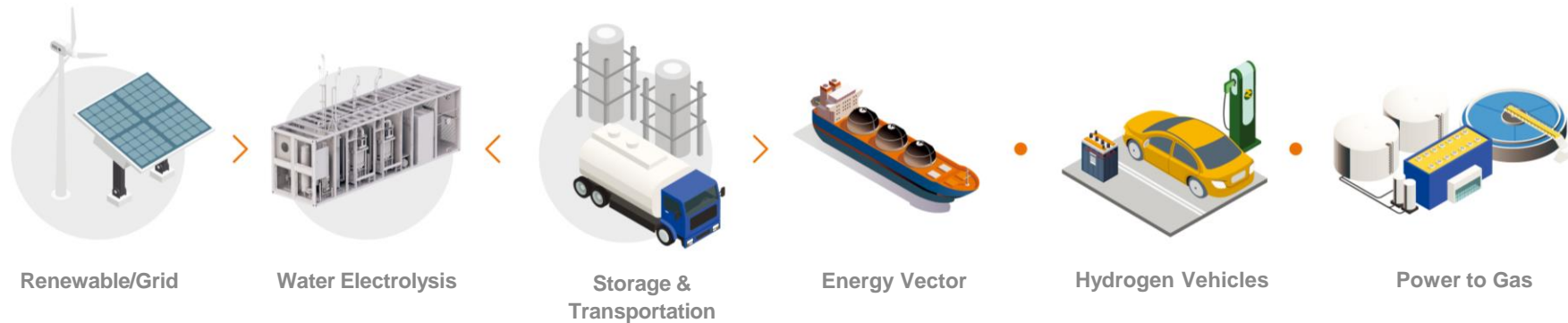


Securing "Green Hydrogen" Production and Supply Capability

Chemical Division Hydrogen Business

By leveraging Hanwha Group's hydrogen business capabilities, we have advanced into the hydrogen-based business using water electrolysis technology and moved closer to becoming a top-tier global water electrolysis technology company.

Business Model

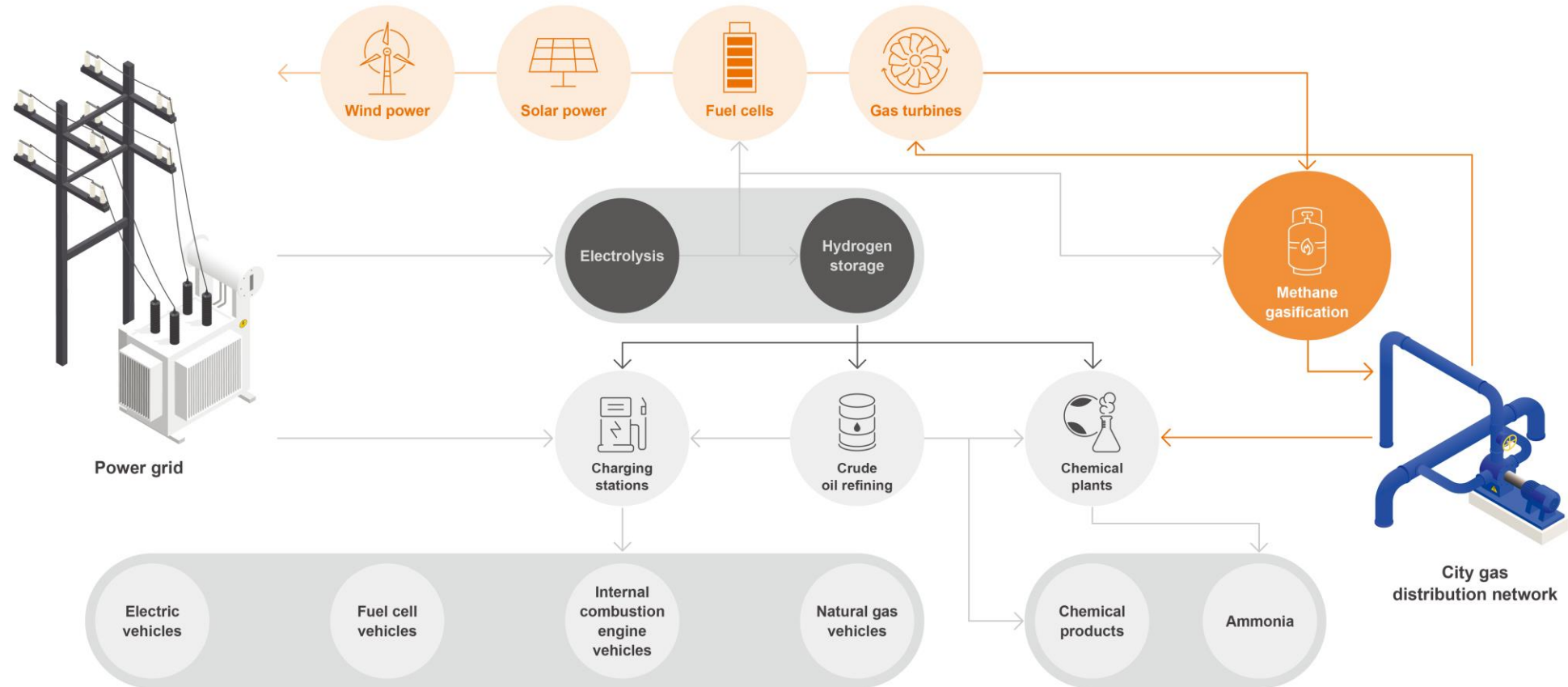


Technology Development

Source Material		MEA	Stack / System
Catalyst	Anion exchange membrane	Developing scale-up process technology	Designing and producing stack
Developing non-PGM catalyst and activating high catalysis	Developing highly-durable materials and film forming technology	Optimizing large-scale active area MEA fabrication and developing R2R continuous process technology	Flow field analysis and design / developing cell and system unit

Chemical Division Hydrogen Business

P2G Concept



Q CELLS Division Hydrogen Business

Leveraging our world-class solar energy expertise, Q CELL Division develops green hydrogen production complexes committed to making a better world through clean energy.

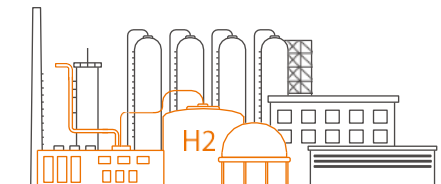
Strategic Plan

Green Hydrogen Concept and Features



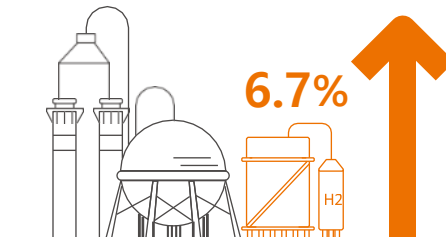
Green hydrogen is produced through electrolysis using renewable energy generated by solar or wind. Compared to other energy materials such as gray hydrogen, it has significantly lower greenhouse gas emissions.

Support for Growing Green Hydrogen



Hydrogen is advantageous for GHG reduction and long-term storage of energy. Many countries including Germany, the EU, Australia, Japan, and South Korea have established roadmaps to revitalize the hydrogen economy.

Market Prospect



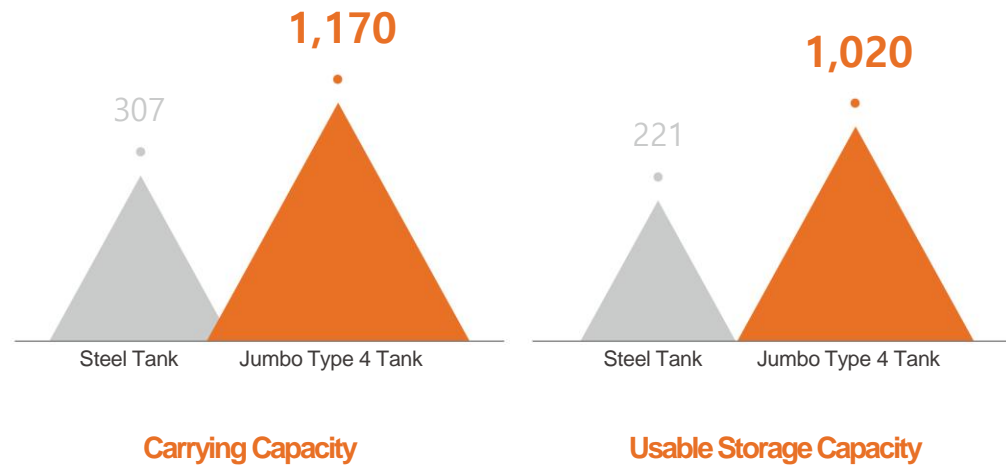
With an annual average growth of 6.7%, the green hydrogen market is estimated to grow to 540 million tons by 2050. We expect green hydrogen to lead the growth of the hydrogen market. Our Q CELLS Division plans to develop green hydrogen production complexes.

Advanced Materials Division Hydrogen Business

As the No.1 global company for high-performance and lightweight composite materials, the Advanced Materials Division provides green hydrogen energy storage and transportation solutions:

High-pressure Jumbo Tube Skid Container Capacity

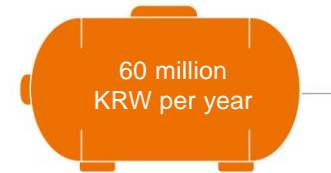
Hydrogen Transportation Capacity Comparison



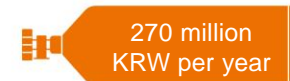
Annual Transportation Cost Comparison of Tube Skid Containers

Comparison of annual transportation costs when operating a charging station for 300 days per year, requiring 500kg hydrogen per day:

Jumbo Type 4 Tank



Steel Tank



Type 4 Hydrogen Tank

High-pressure container made of polyamide liner and carbon fiber composite materials:

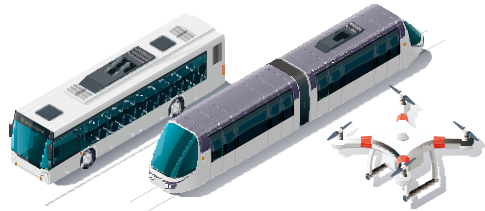
- Maximum working pressure: 990 bar / Maximum tank capacity: 3,000 liters
- High reliability and safety performance / High transportation efficiency due to lighter weight compared to steel

Advanced Materials Division Hydrogen Business

Advanced Materials Division develops high-pressure containers made of composite materials, which can be efficiently produced to be used across a variety of fields ranging from hydrogen production, transportation, and storage.

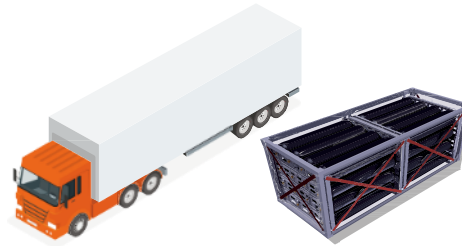
Applications

Hydrogen Fuel Storage Solution



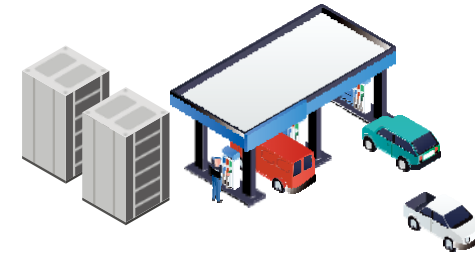
- High-pressure tank (Working pressure at 350~700 bar)
- Applications (Hydrogen fuel tanks for hydrogen fuel cell drones, passenger cars, commercial vehicles, trains, and ships)

Hydrogen Transportation Solution



- High-pressure tube skid (Maximum pressure up to 517 bar)
- More than 4 times the transportation efficiency Compared to steel products
- Lightweight and increased storage capacity
- 20FT, 40FT customized modules available

Hydrogen Storage Solution for Charging Stations



- Ultra-high-pressure tank (Maximum pressure up to 990 bar)
- Package-type design
- High-space efficiency



**Sustainability
Overview**

Sustainability Management System

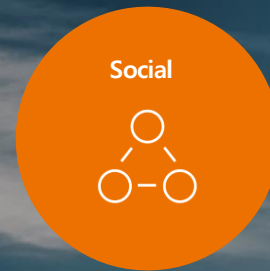
Hanwha Solutions is employing cutting-edge energy and materials technologies to create a better future for everyone.

Key Directions of Sustainability Management

We will create a better world through sustainable growth using our smart energy solutions and customized materials.



Addressing climate change
Environmental management
Health & safety management



Quality management
Talent management
Win-win management
Shared management



Corporate governance
Ethics & compliance management
Information security

Social Contribution

We believe in Hanwha's founding philosophy of "Contributing to the nation and society through business" and our spirit of "Trust and loyalty" above all else. Building on these, we have established a strong bond with the community. And now, this is most evident in our philosophy of "Going further together," through which we do our best to fulfill our social responsibilities as a corporate citizen.

Social Contribution Vision

Together, we are committed to discovering solutions for a better future for everyone.

Social Contribution Mission

We pursue sustainable solutions for environmental and social issues.

Social Contribution

As a leading company combating climate change through smart and economical green energy technologies, Hanwha Solutions operates a social contribution program to address climate change.

Agreement with the Korea National Park Service

Hanwha Solutions has signed an agreement to pursue carbon neutrality and ecological sustainability with the Korea National Park Service. In order to conserve national parks, South Korea's largest carbon reservoir, we support ecological monitoring to combat climate change and conserve biodiversity. We also supply renewable energy to key facilities to reduce carbon in national parks while improving energy efficiency for villages in national parks.



Environmental Solutions for the Green Earth

In an alliance with ChildFund Korea, Hanwha Solutions operates a program to combat climate change. The program runs campaigns to inform people of climate crisis in our daily lives and encourage their engagement in environmental practices. It also provides online education to inform climate crisis and energy-saving practices and supports energy efficiency initiatives for the vulnerable by climate crisis.



Social Contribution

Based on our philosophy of “Going further together,” Hanwha Solutions pursues a better future for everyone. We are committed to corporate social responsibility and growing together with the community, as we lead in continuous and authentic social contribution activities.

Community Program (Yeosu)

- Support for poor fire-fighting facilities, environmental improvement, and welfare for communities in the islands
- Installation of a communal refrigerator that allows community members to autonomously access various necessities



Community Program (Ulsan)

- Provide a program to help socially isolated young adults adapt to society
- Support customized programs for patriots and veterans, persons with disabilities, and victims of violent crimes



Community Program (Chungcheong)

- Operate a sports club for the disabled
- Support solar power plants for vulnerable homes
- Manage eco-friendly programs such as ecological forest restoration and alien species removal
- Facilitate eco-friendly bean bag chairs production



Right! Galleria

Implementing campaigns to establish sustainable consumption and upholding values, such as environmental protection, respect for life, and safety culture / Supporting the HAYAN project which strives to improve child welfare, such as helping children with incurable diseases and reducing the education gap for children from vulnerable families / Operating the PARAN (Protection of Animal Rights and Animal Needs) project to promote a harmonious lifestyle with pets



Social Contribution

As a global leader in renewable energy, we actively address climate change using the experience and expertise gained from developing world-class solar technology. Our efforts include supplying practical solutions and helping raise public awareness of the pressing need for sustainable development.

Happy Sunshine Campaign

Helping empower communities and social projects by providing solar-power systems to make them more energy self-sufficient.



Hanwha Solar Forest

Planting 500,000 trees across seven locations in Korea, Mongolia, and China.



Greener Davos

Donating a capacity of 340KW, which is enough to reduce 20 tons of CO₂ emissions per year.



Clean Up Mekong

Launching the campaign to help address one of the world's ongoing environmental issues: water waste.



Environment

In order to drive toward a sustainable future for all, Hanwha Solutions provides green solutions through the eco-friendly management philosophy of committing to the preservation of the global environment.

Climate Change Response Key Performance



Participation in climate change initiatives
Information disclosure for CDP and TCFD



Declaration of net zero by 2050

Environmental Management Key Performance



Final disposal rate of performance
management of resource circulation
exceeding the baseline target by 159%



Decreased waste generation
by 16% year-on-year

Safety and Health Management Key Performance



Zero cases of serious incident



Winner of the grand prize for evaluation of
safety management in workplaces

Social

Hanwha Solutions strives to become a top-tier global company that puts people and society first. As a global corporate citizen, we deeply consider economic and social values as we endeavor to pioneer sustainable growth and the future.

Quality Management Key Performance



Quality management system (ISO 9001) certification for all divisions



Q CELLS Division's Quality Controlled PV (QCPV) certification



Advanced Materials Division's International Automotive Task Force (IATF 16949) certification

Win-Win Management Key Performance



Satisfactory 2020 win-win growth index



KRW 58 billion for win-win fund



Support for business partners' ESG management

Talent Management Key Performance



Digital transformation education to empower employees



Systematic benefit system for a work-life balance



Reverse mentoring to communicate with millennials and Generation Z

Shared Management Key Performance



13,854 beneficiaries from social contributions in 2020



757 hours of volunteer activities by employees in 2020



KRW 5.5 billion of total donations in 2020

Governance

Hanwha Solutions is building a transparent and sound governance structure and a management environment capable of rational decision-making. As we establish trusted relationships with our stakeholders, we are laying a solid foundation for sustainable growth.

Governance Key Performance



Establishment of an ESG Committee
(May 2021)



Appointment of foreign outside directors
(March 2020)



Appointment of female outside directors
(March 2020)

Ethics & Compliance Management Key Performance



Compliance management system (ISO 19600) certification
(December 2020)



Anti-corruption management system (ISO 37001) certification
(December 2020)



Six internal ethics and compliance inspections in 2020

Information Security Key Performance



Zero personal information breaches for the past three years



1,815 employees participating in information security education



Information Protection Committee to ensure companywide security

