LG Chem

Global advanced materials company

LG Chem



WeConnectScience

Contents

Introduction of LG Chem



- Introduction of LG Group
- Introduction of LG Chem
- Business of LG Chem

LG Group

Introduction of LG Chem

History



LG Group

Introduction of LG Chem

Subsidiary

* Figures represent the number of affiliates
* Total of 68 including LG Corp.
* As of 2020

Chemicals

LG Chem

LG EnergySolution

LG Household & Healthcare

Farm Hannong

etc.

24

Electronics

LG Electronics

LG Display

LG Innotek

etc.

14

Telecommunications & services

LG U+

LG CNS

LG Sports

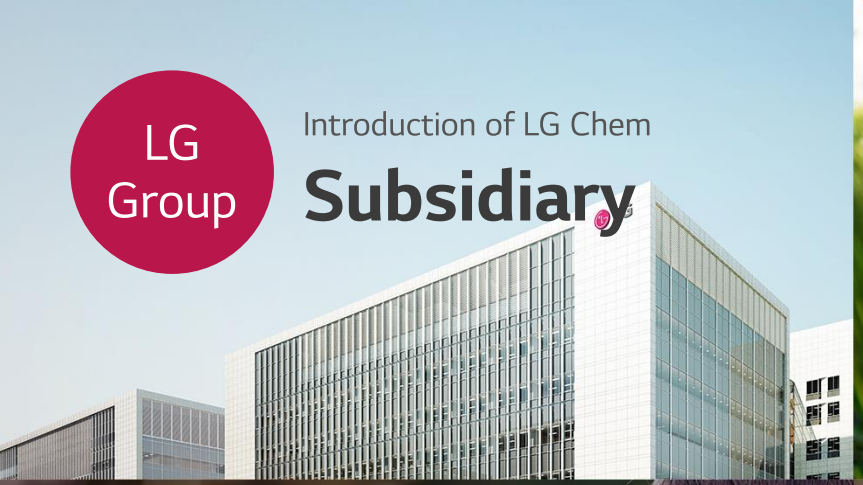
etc.

30

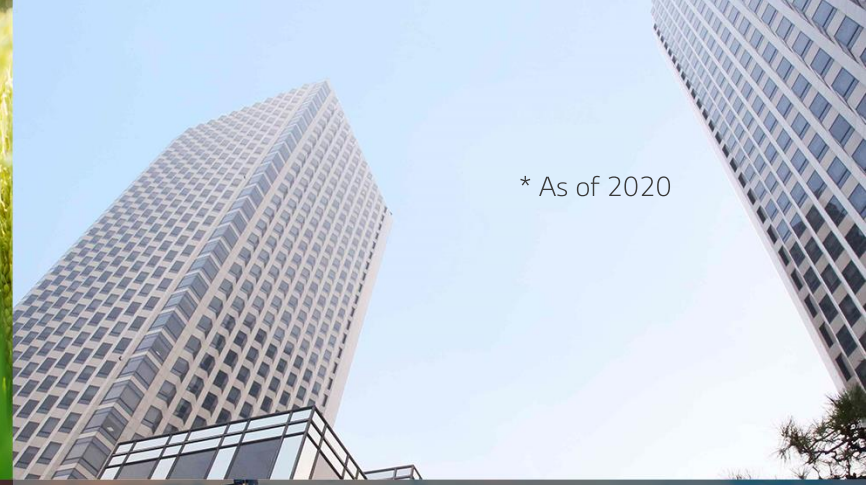
LG Group

Introduction of LG Chem

Subsidiary





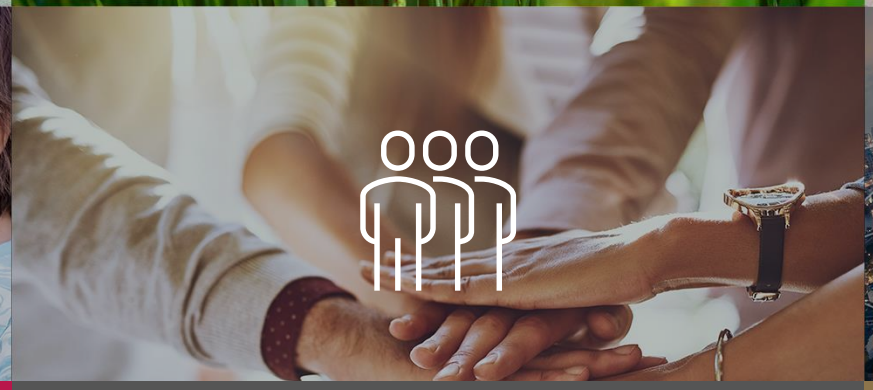


* As of 2020



Affiliates

Total of **68**



Workforce

258,000 (person)



Sales

USD **144** Billion

LG Group

Introduction of LG Chem

LG Way

VISION

No. 1 LG

Behavioral Mode

Jeong-Do Management

Management Principles

Customer – Value Creation

People – Oriented Management

LG Chem | **Vision**

We connect science to life for a better future



Customer Focus | Agility | Collaboration | Passion | Sustainability

LG Chem | **Sustainability**

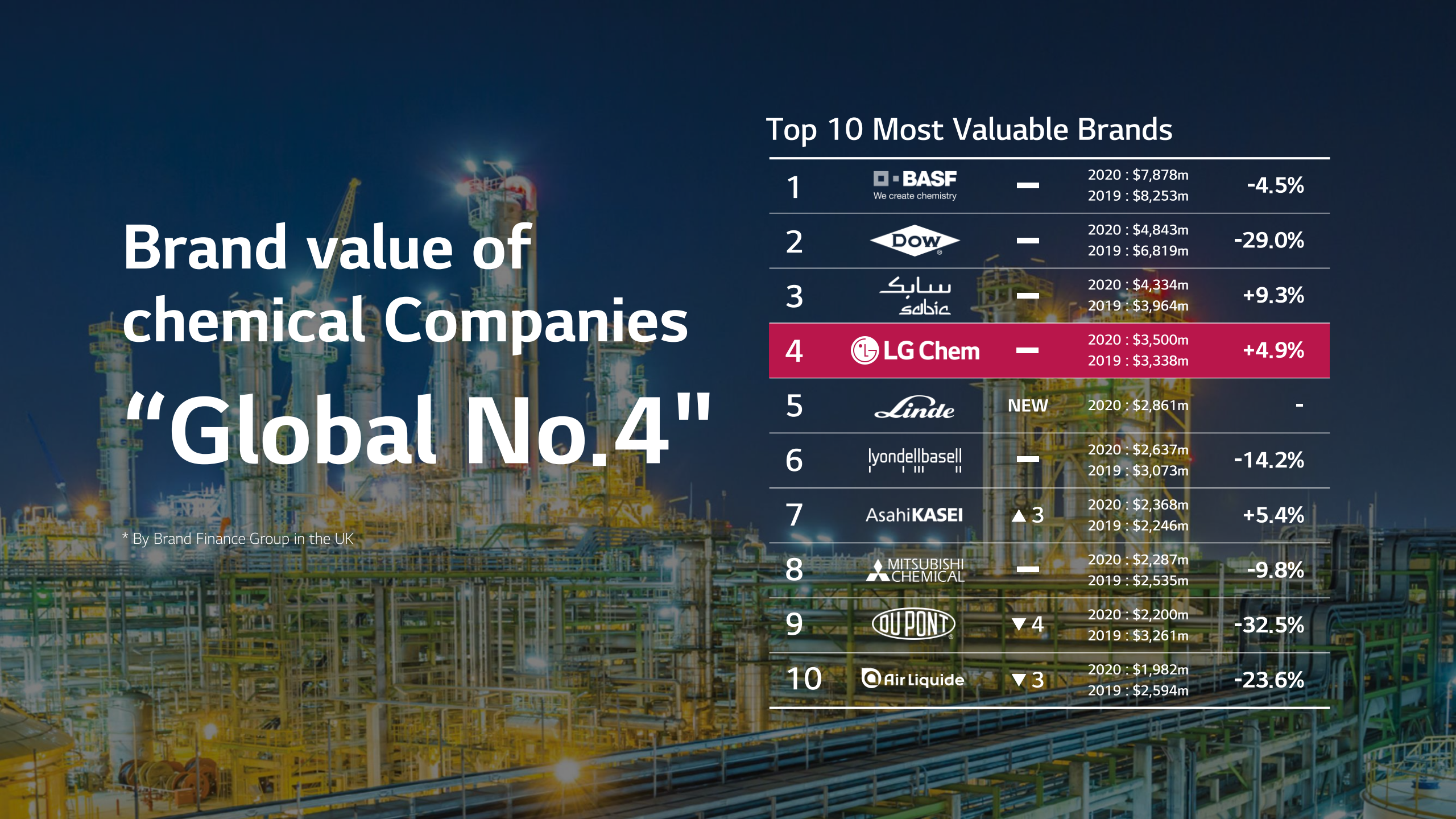




2019 : The First Korean Chemical Company To Enter

GLOBAL TOP 10

* By Chemical & Engineering News Published by ACS(American Chemical Society)



Brand value of chemical Companies "Global No.4"

* By Brand Finance Group in the UK

Top 10 Most Valuable Brands

1	BASF We create chemistry	—	2020 : $7,878m 2019 : $8,253m	-4.5%
2	DOW	—	2020 : $4,843m 2019 : $6,819m	-29.0%
3	سابك sabic	—	2020 : $4,334m 2019 : $3,964m	+9.3%
4	LG Chem	—	2020 : $3,500m 2019 : $3,338m	+4.9%
5	Linde	NEW	2020 : $2,861m	-
6	lyondellbasell	—	2020 : $2,637m 2019 : $3,073m	-14.2%
7	AsahiKASEI	▲3	2020 : $2,368m 2019 : $2,246m	+5.4%
8	MITSUBISHI CHEMICAL	—	2020 : $2,287m 2019 : $2,535m	-9.8%
9	DUPONT	▼4	2020 : $2,200m 2019 : $3,261m	-32.5%
10	Air Liquide	▼3	2020 : $1,982m 2019 : $2,594m	-23.6%

LG Chem | History



1980's Earlier

1947 Established as Lucky Chemical Industrial Corp

1969 Listed on Korea Stock Exchange

1974 Renamed company to Lucky Corporation

1976 Completed the Yeosu PVC Resin Plant

1979 Opened the Daedeok Central R&D Center



1990's

1991 Developed the world's first 4th-generation cephalosporin antibiotics

1995 Renamed to LG Chem, Ltd.

Completed construction of Tianjin PVC plant in China

2000's

2001 Spun-off the company (LGCI, LG Chem, LG Household & Healthcare)

2003 Acquired Hyundai Petrochemicals

Factive received the first US FDA approval in Korea

2004 Established LG Chem (China) Investment Co., Ltd

2005 Established a polarizer back-end subsidiary in Poland

2007 Merged with LG Petrochemicals Co., Ltd

2009 Spun-off Industrial Materials Business (LG Hausys)







2010's

2016 Acquired Dongbu Farm Hannong (Farm Hannong)

2017 Merged with LG Life Sciences Co., Ltd

2019 Launched Osan Tech Center in China

2020 Spun-off Energy Solution Business (LG Energy Solution)

Introduction of LG Chem

LG Chem | **Financial Results**

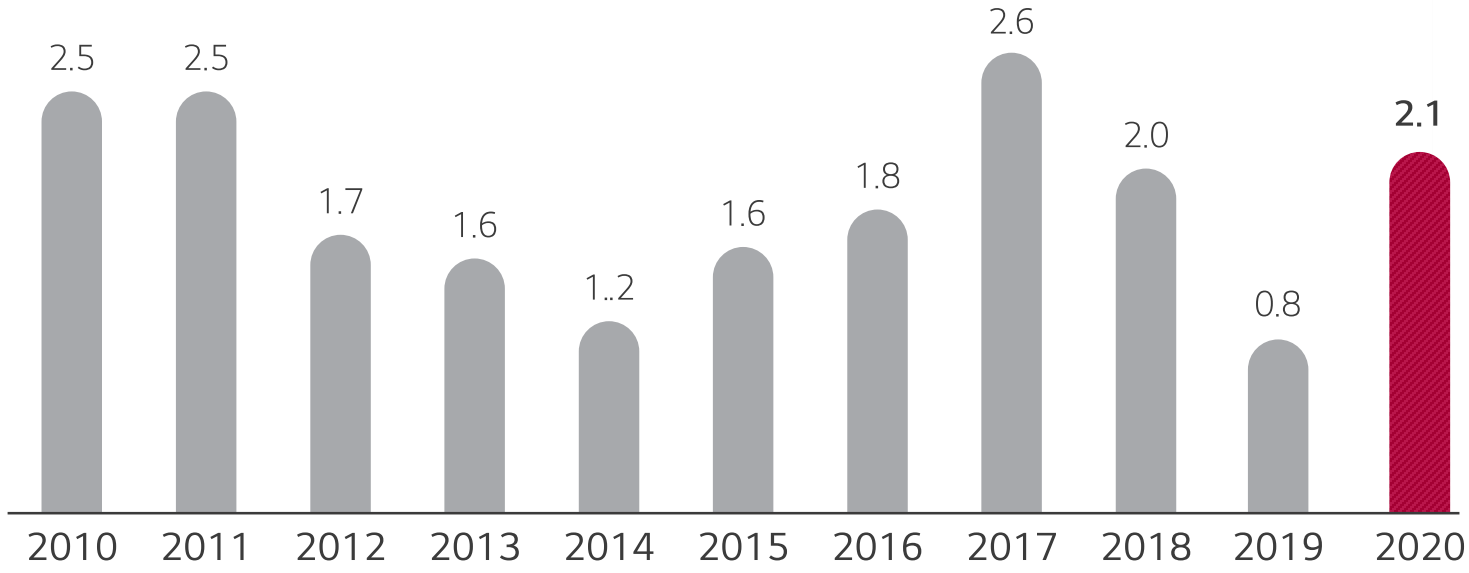


Sales in 2020

USD **26.4** Billion

Sales
(Unit : Billion USD)

Operating profit
(Unit : Billion USD)



Workforce

18,113 Employees

Domestic **12,498**
Overseas **5,615**

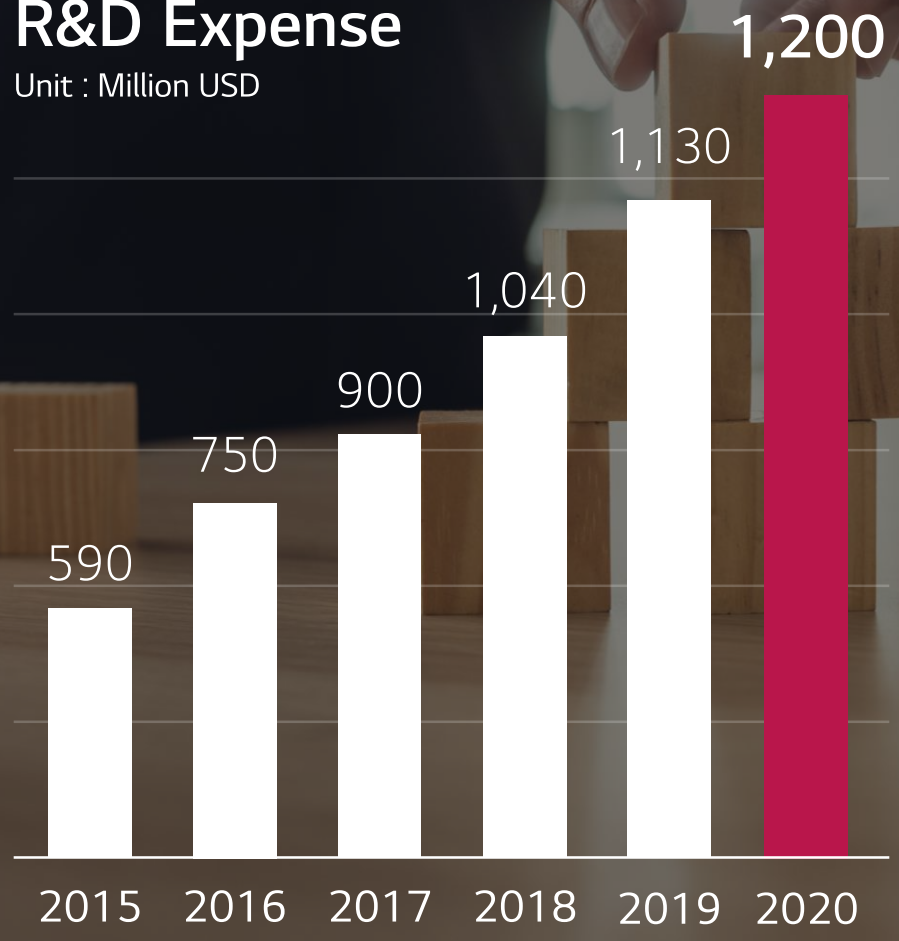
*Spun-off Energy Solution Business (LG Energy Solution) basis

LG Chem | **R&D Status**

*Subsidiaries included

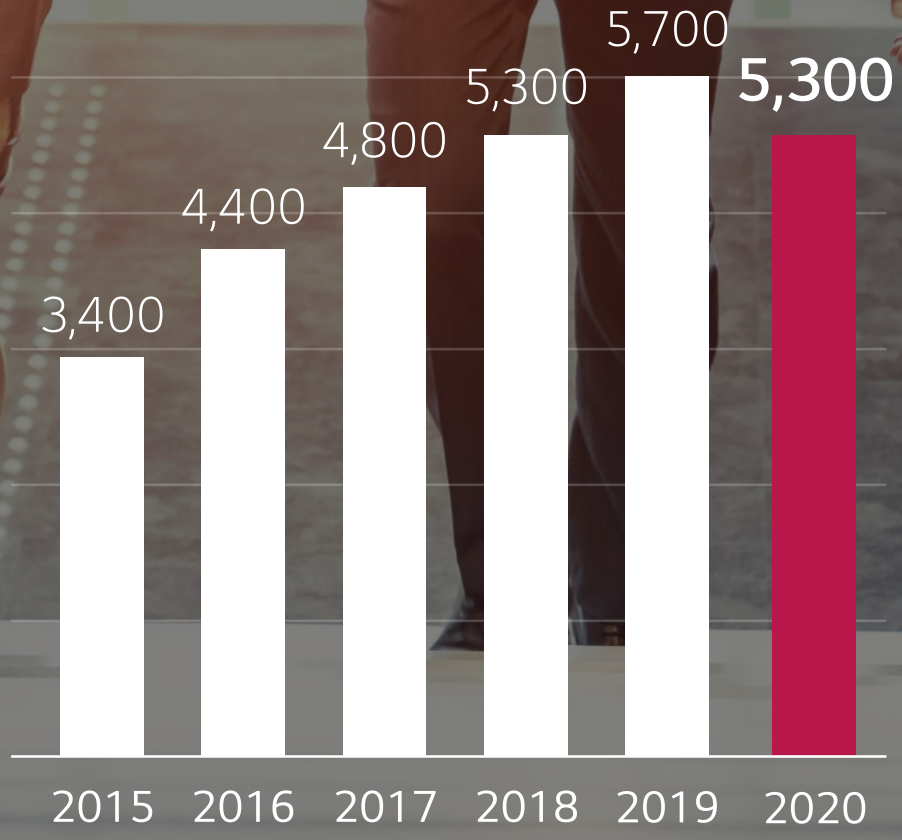
R&D Expense

Unit : Million USD



R&D Workforce

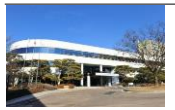
Unit : Person



LG Chem | Domestic Sites



Headquarter/R&D Campus Magok
(Est.1987/Est.2018)



Leadership Center / Tech Center
(Est.1991/Est.2019)



R&D Campus Daejeon
(Est.1979)



Osong Plant (Est.2009)
Bio Similar, Vaccine



Iksan Plant(3) (Est.1991/Est.1995/Est.2011)
EP, ABS / Pharmaceutical / Battery Materials



Naju Plant (Est.1984)
Octanol, Butanol, Plasticizers



Yeosu Complex (Est.1976)
NCC, PVC, ABS, SAP, PE, AA



Paju Plant (Est.2011)
LCD Glass



Daesan Complex (Est.2005)
NCC, SSBR, PVC



Ochang Plant (Est.2005)
Rechargeable Batteries, Polarizer, Stripper



Cheongju Complex (Est.1980)
OLED Material, Photoresist,
Cathode Material, RO membrane



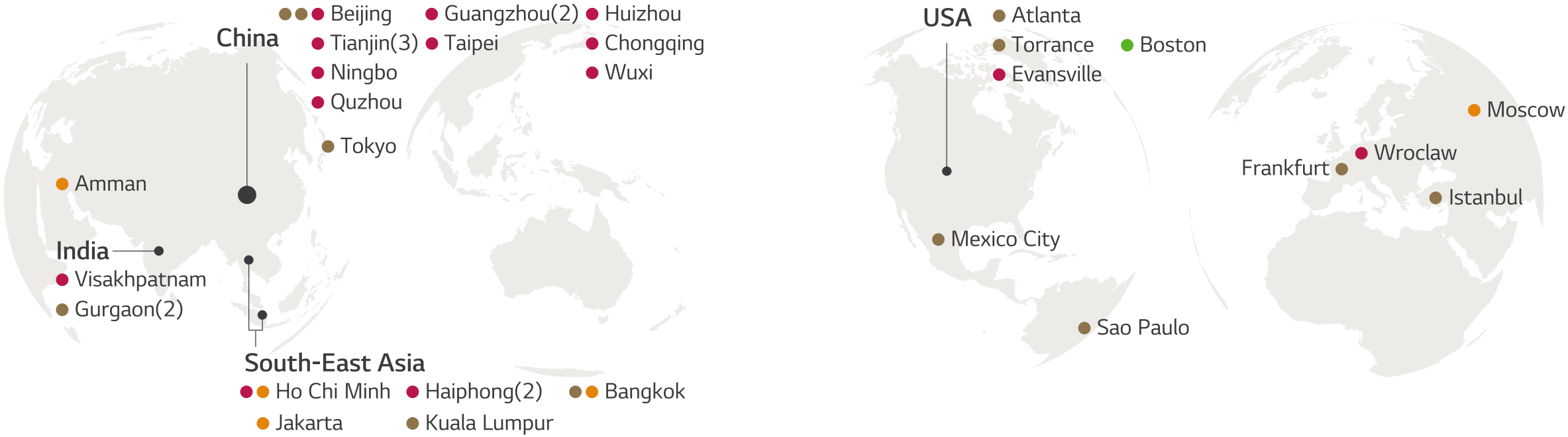
Gimcheon Plant (Est.2008)
SAP



Onsan Plant (Est.1979)
Fine Chemical

LG Chem | Overseas Sites

● Manufacturing Subsidiaries (18) ● Sales Subsidiaries (13) ● Regional Branch Offices (5) ● R&D Center (1)



Asia

- **Beijing** (Est.2004) - Polarizer
- **Tianjin** (Est.2004) - EP
  (Est.2005) - PVC,VCM,EDC
  (Est.2009) - SBS
- **Guangzhou** (Est.2002) – EP
  (Est. 2018) - Polarizer
- **Chongqing** (Est.2015) - EP
- **Ningbo** (Est.1996) - ABS, SBL, EP
- **Huizhou** (Est.2009) - ABS
- **Wuxi** (Est.2018) - Cathode Material
- **Quzhou** (Est.2018) - Precursor
- **Taipei** (Est.2004) - Polarizer
- **Tokyo**
- **India** (Est1996) - PS, EPS, Pharmaceuticals
- **Haiphong** (Est.2017) - Polarizer
  (Est.2018) - EP
- **Ho Chi Minh** (Est.1995) - Plasticizers
- **Bangkok**
- **Jakarta**
- **Kuala Lumpur**
- **Amman**

America

- **Atlanta**
- **Torrance**
- **Boston**
- **Evansville** (Est.2018) - Sealant
- **Sao Paulo**
- **Mexico City**

Europe

- **Wroclaw** (Est.2005) - EP
- **Moscow**
- **Frankfurt**
- **Istanbul**



Introduction of LG Chem

LG Chem | Business Area

Petrochemicals

- NCC
- Polyolefins
- PVC/Plasticizers
- ABS
- Acrylates/SAP
- HPM
- Catalyst
- CNT

Advanced Materials

- Engineering Material
- IT Materials
- Battery Materials
- RO Filter
- Semiconductor Materials

Life Sciences

- Primary Care
- Specialty Care
- Aesthetic

Subsidiaries

LG Energy Solution

- Automobile Battery / Mobility & IT Battery / ESS Battery

Farm Hannong

- Crop Protection Products / Seed / Fertilizer

01

Petrochemicals Company





Petrochemicals Company

Establishment (Year)
1976

Sales ($)
12.7 Billion * As of 2020

Workforce (Person)
Domestic 2,484 / Overseas 2,317

Business Area
Petrochemical Products

2019
Launched Osan Tech Center

2015
Launched Hwanam Tech Center in Nanjig, China

2010
Acquired Dow Polycarbonate business
Established Manufacturing Subsidiary in China
(Rubber / Special Polymers)

2007
Merged with LG Petrochemicals Co., Ltd.

2003
Acquired PVC Business of Hyundai Petrochemicals Co., Ltd.

1995 ~ 1998
Established Manufacturing Subsidiary in
China / India / Vietnam (PVC, ABS)

1976
Completed Yeocheon PVC resin factory
Entry into the petrochemical business

Production Capacity (As of 2020)

Unit : KTA

Ethylene	2,480	HDPE	550	Oxo- Alcohol	299
Propylene	1,460	LDPE/EVA	460	Acrylic Acid	715
BD	347	POE	300	SAP	495
BTX	831	PP	380	ABS	2,100
SM	702	PVC	1,239	PS	142
EG	180	VCM	1,363	EPS	136
Phenol	710	CA/EDC	1,176	Specialty Resin	504
BPA	496	Plasticizer	239	Synthetic Rubber	530

Naphtha Cracking Center (NCC)

LG Chem's naphtha cracking center (NCC) processes produce basic materials for the petrochemical industry, including ethylene and propylene. The raw materials produced from the BPA processes are used in polycarbonate(PC) resins and epoxy materials.

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

Naphtha Cracking Center













BPA



Applications





Polyolefins
(PO)

LG Chem's polyolefin(PO) processes produce synthetic resins, such as polyethylene (PE) and polypropylene (PP), used in containers and packaging materials, which are recognized in the global market for their outstanding quality.

LD / LLD/ HD / POE / EVA





Applications

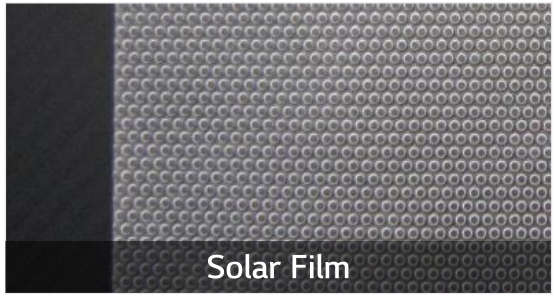

Medical Appliances

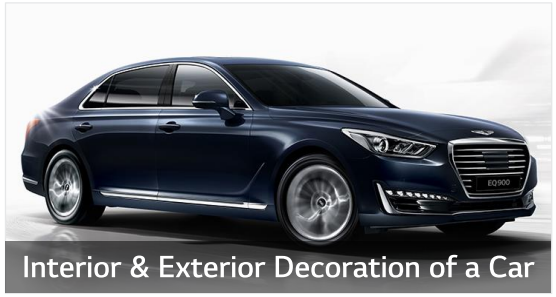

Korean Floor Heating System



Packing Materials


Cable Insulator


Solar Film


Interior & Exterior Decoration of a Car

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

PVC / Plasticizers

LG Chem's polyvinyl chloride(PVC) processes produce synthetic resins used for chassis and pipes, while plasticizers produce raw materials that add flexibility to the PVC.
LG Chem's CNT processes produce Carbon Nanotubes which have superior electrical, thermal, and mechanical properties

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

PVC / Caustic Soda / Plasticizers



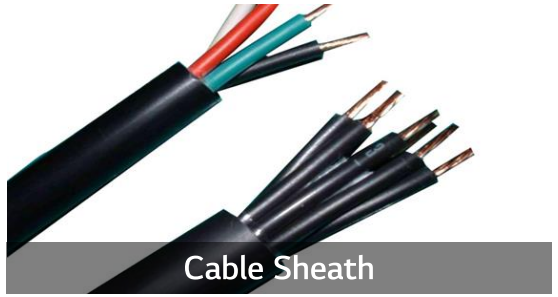
Applications

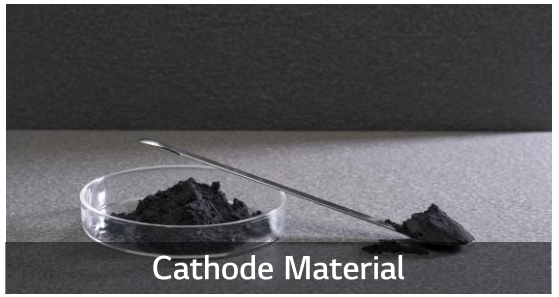












Acrylonitrile Butadiene Styrene (ABS)

LG Chem's acrylonitrile butadiene styrene(ABS) processes produce high-performance materials, used in automobiles, home appliances, and IT devices, that have excellent heat resistance, impact resistance, and processability.

ABS / SAN / PS / EPS





Applications


Interior & Exterior Decoration of a Car


Toy


Home Application Housing


Kitchen Container


Products Container


Building Insulation Material

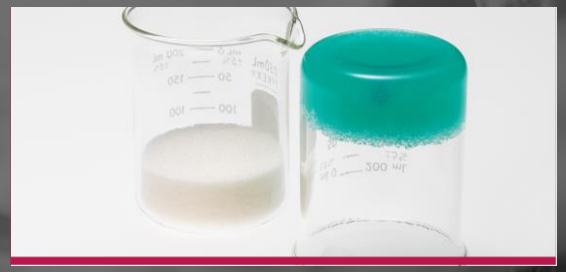
Acrylates / SAP

LG Chem's acrylate processes produce raw materials used for paint, adhesives, and SAP.
SAP effectively absorbs fluids in diapers and items for sanitary purposes.

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

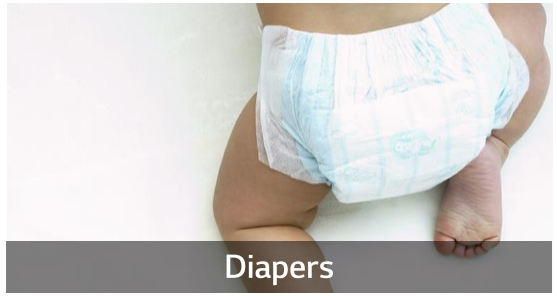
Acrylates / SAP





Applications


Plasticizer/ SAP Resin


Diapers


Paint


Adhesives


Cleaning agent for Semiconductors


Acrylic Fibers

High Performance Materials
(HPM)

Specialty Polymer acts as a special additive with various functions. Synthetic rubber meanwhile is used as a raw material for tires and golf balls.

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

Latex / SBS / MBS / SSBR






Applications


Medical Gloves


Impact Reinforcing Agent


Tire


Asphalt Modifying Agent


Golf Ball

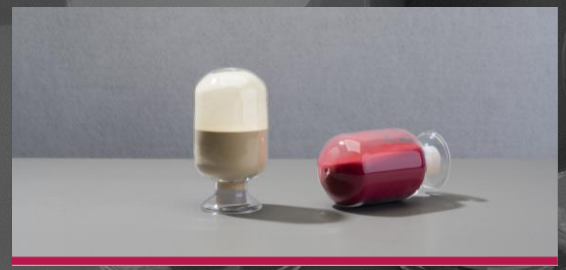

Shoe Insole

Catalyst

LG Chem has commercialized various catalysts for petrochemical processing, starting with the independent development of acrylic acid manufacturing catalysts for the first time in Korea and the fourth in the world. We performed this commercialization of crosslinking agents through developing high-efficiency production processing technology for organic synthesis, purification, and separation based on our proprietary metallocene catalyst technology that controls polymer structures.

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

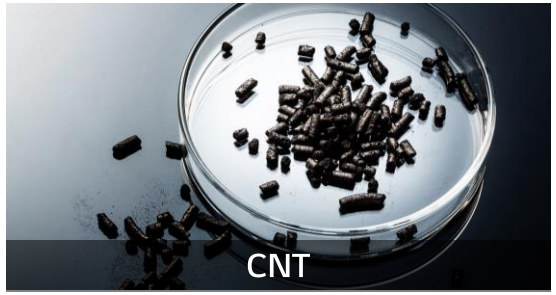
Polymer Catalyst / Process Catalyst





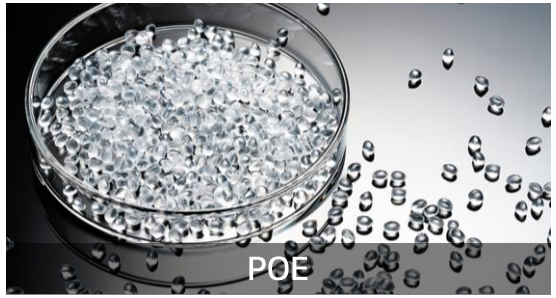
Applications













Carbon Nanotube (CNT)

Carbon Nanotube (CNT) is a tube-shaped carbon allotrope with a diameter in nanometers (nm). Because of its excellent electrical, thermal, and mechanical properties, it is used as a material for conductive products that require antistatic characteristics and the control of electromagnetic interference.
It is also used for lithium-ion battery cathodes.

CNT

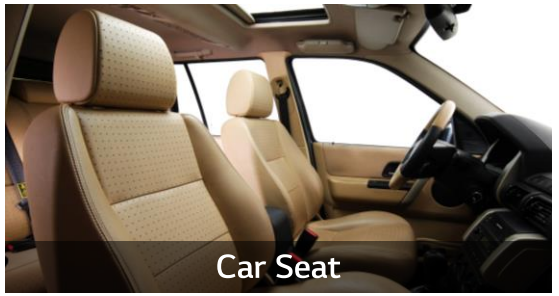




Applications









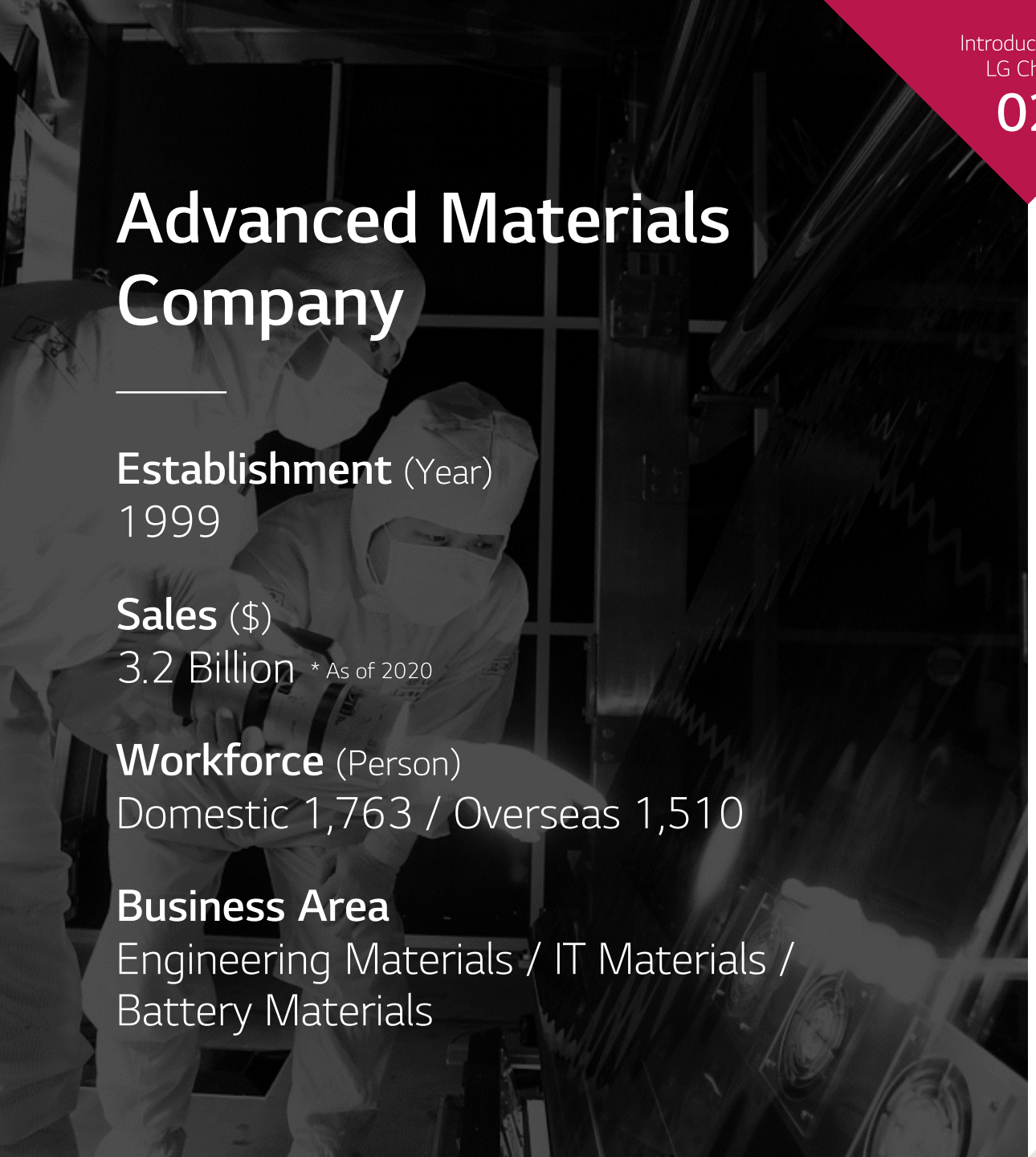




02

Advanced Materials Company





Advanced Materials Company

Establishment (Year)
1999

Sales ($)
3.2 Billion * As of 2020

Workforce (Person)
Domestic 1,763 / Overseas 1,510

Business Area
Engineering Materials / IT Materials / Battery Materials

2019
Reorganized the Advanced Materials Company

2018
Established Chinese joint venture for manufacturing Precursor and cathode material

2016
Acquired GS E&M, a renowned cathode manufacturer

2013
Commercialized OLED polarizer

2003
Established IT&E Manufacturing Subsidiary in Nanjing, China

2000 ~ 2004
Commercialized LCD, OLED, Process materials

Engineering Material

LG Chem is striving to provide the number one product in the automotive industry through stronger and lighter materials.

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

EPC / TPE / Specialty Compound / PC





Applications






Exterior & Interior Decoration of a Car/ Engine Parts

Major Customers

GM
HYUNDAI MOTOR GROUP
CHRYSLER
Mercedes-Benz
RENAULT NISSAN MITSUBISHI
Ford

IT Materials

LG Chem produces unique solutions
For IT devices with products such as OLED materials, display materials And various high-functional films and semiconductors.

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

OLED Materials / Display Materials / Advanced Functional Film





Applications



OLED Display Materials



Rollable TV

Major Customers

LG Display
BOE
INNOLUX
AUO
SAMSUNG DISPLAY
CSOT

Battery Materials

LG Chem produces one of the key materials for secondary batteries, namely the material for positive electrodes, and concentrates on the development of high-capacity cathode material for mobile battery, electric vehicle, and energy storage battery markets as well.



Cathode Material

Applications



Mobile Battery



Automotive Battery



ESS Battery

Major Customers

LG Energy Solution

HITACHI

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

RO Filter

LG Chem's seawater desalination and industrial RO filter is a water treatment filter that applies our proprietary nanotechnology called TFN (Thin-Film Nanocomposite). This product is leading the global market with an unrivaled removal efficiency of 99.89%.



SW R/ES/GR/SR

Applications







Major Customers

METITO

GS Inima

acciona

suez

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

Semiconductor Materials

LG Chem produces semiconductor substrate materials and films for post -processing, the core components for manufacturing semiconductors.

01 Petrochemicals Company
02 Advanced Materials Company
03 Life Sciences Company

CCL / PPG / BGT / DAF

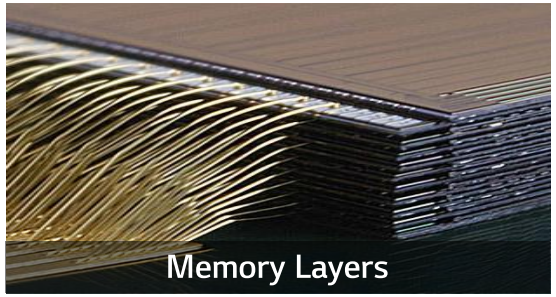


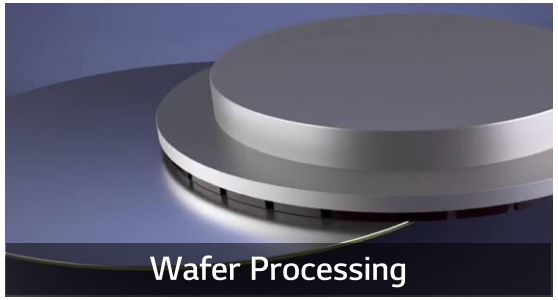




Applications







Major Customers

LG Innotek

SAMSUNG ELECTRONICS

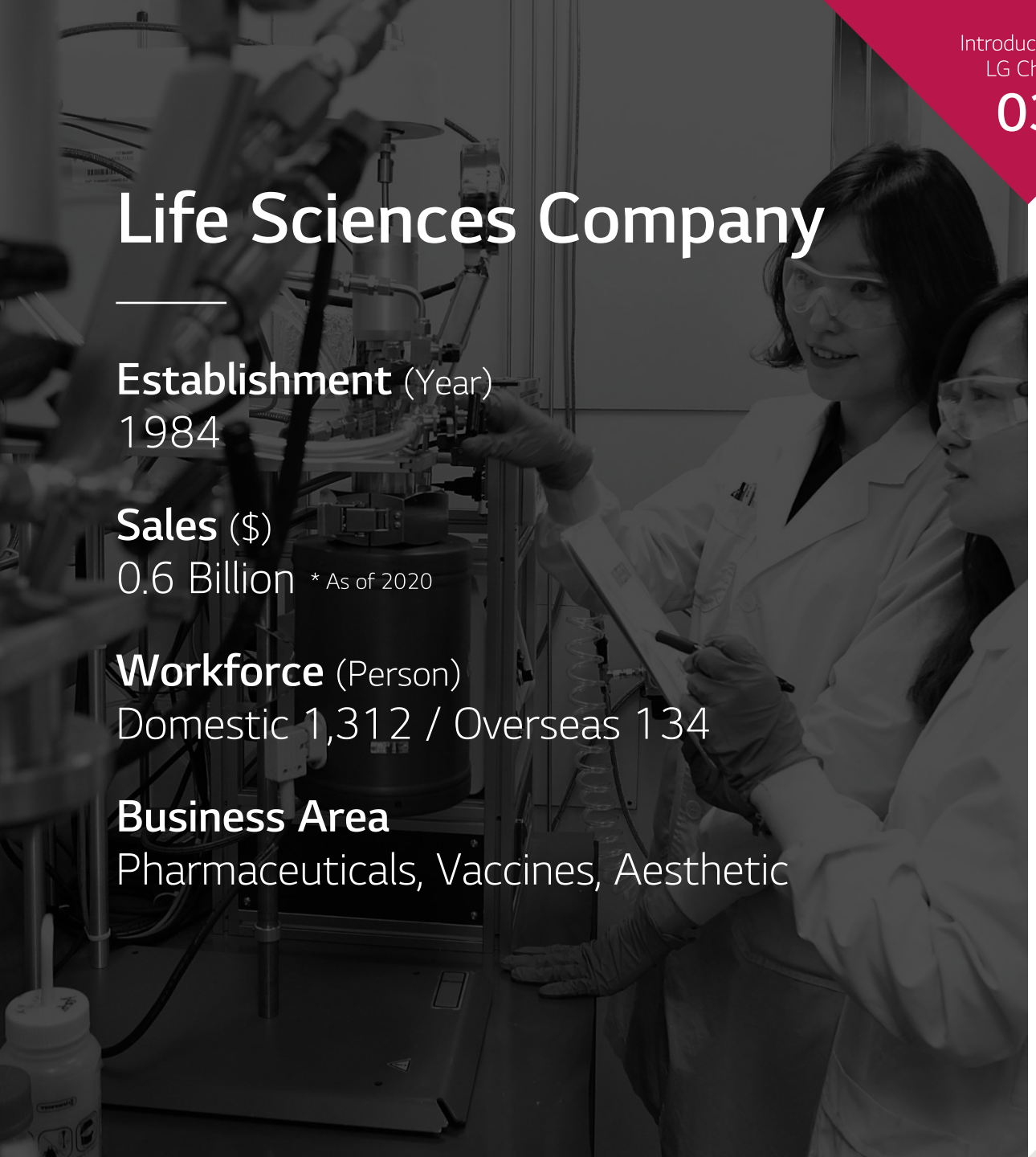
SAMSUNG ELECTRO-MECHANICS

SK hynix

03

Life Sciences Company





Life Sciences Company

Establishment (Year)
1984

Sales ($)
0.6 Billion * As of 2020

Workforce (Person)
Domestic 1,312 / Overseas 134

Business Area
Pharmaceuticals, Vaccines, Aesthetic

2019
Established Life Sciences Innovation Center in Boston, USA

2012
Developed 1st Korean diabetes medicine, ‘Zemiglo’

2003
1st Korean NCE approved by US FDA(Factive)

1996
1st Korean hepatitis B vaccine ‘Euvox’ approved by WHO PQ

1991
Developed World’s first 4th generation Cephalosporin

1984
Start of pharmaceutical business
(Established Pharmaceuticals business division)

1961
Acquire of manufacturing license pharmaceuticals products

Primary Care

LG Chem has developed Korea's first diabetes medicine, Zemiglo, and arthritis medicine, Synovian, increasing its competitiveness in Korea as well as overseas, and has expanded its efforts to develop new drugs and to cooperate with other companies through partnership in the fields of diabetes and cardiovascular, musculoskeletal, and autoimmune diseases.



Representative Products



Diabetes
(Zemiglo, Zemimet SR)



Cardiovascular Disease
(Rovatitan)



Musculoskeletal Disease
(Hyruan One)



Autoimmune Disease
(Eucept)

01 Petrochemicals Company
02 Energy Solution Company
03 Advanced Materials Company
04 Life Sciences Company

Specialty Care

LG Chem is the first company in Korea that has successfully developed a drug for growth hormones and is also concentrating on the R&D of drugs for special diseases.

Throughout the hepatitis B and pentavalent combination(5-in-1) vaccine that has been approved by the World Health Organization(WHO), LG Chem has been strengthening competitiveness in the global market.



Representative Products



Grow Hormone (Eutropin)



Ovulation Induction (Follitrope)



Hepatitis B (Euvax)

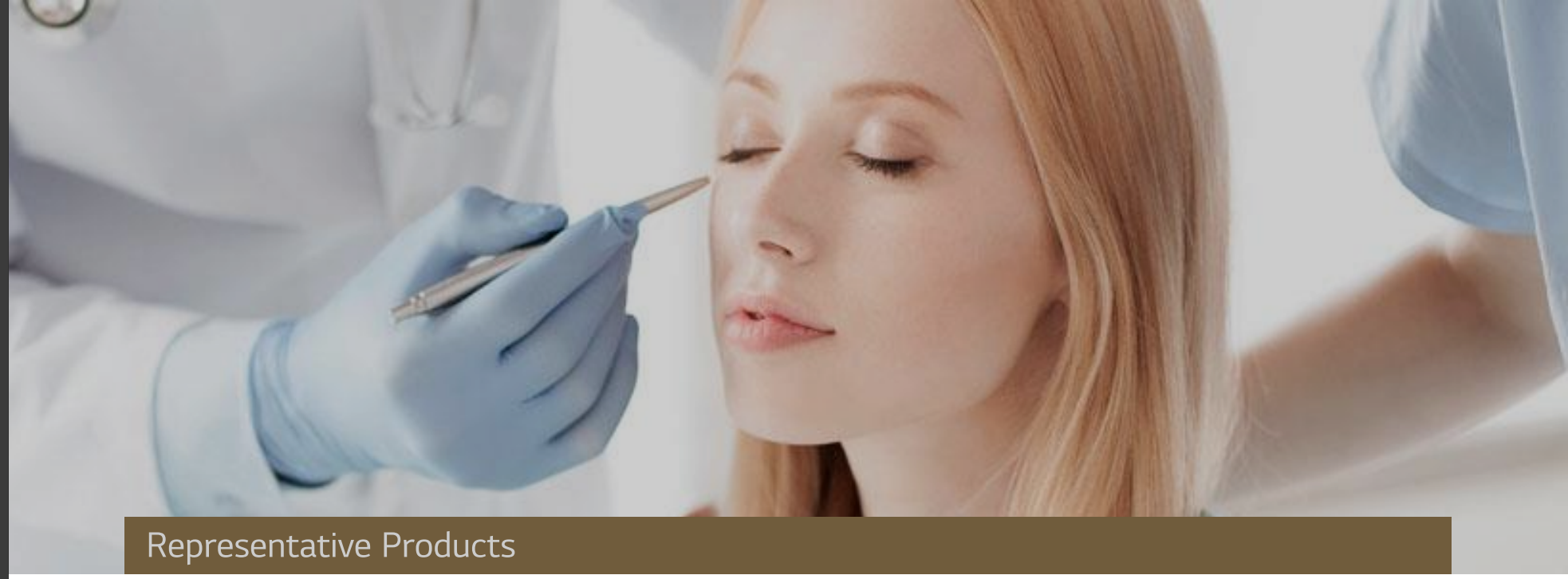


Pentavalent Combination (Eupenta)

01 Petrochemicals Company
02 Energy Solution Company
03 Advanced Materials Company
04 Life Sciences Company

Aesthetic

YVOIRE, the first hyaluronic acid filler developed by LG Chem with authentic in-house technology in Korea, is expanding its market shares with the recognition of superior product quality.



Representative Products



Hyaluronic Filler
(Y-SOLUTION)



Hyaluronic Filler
(YVOIRE)



Hyaluronic Filler
(伊婉 in China)

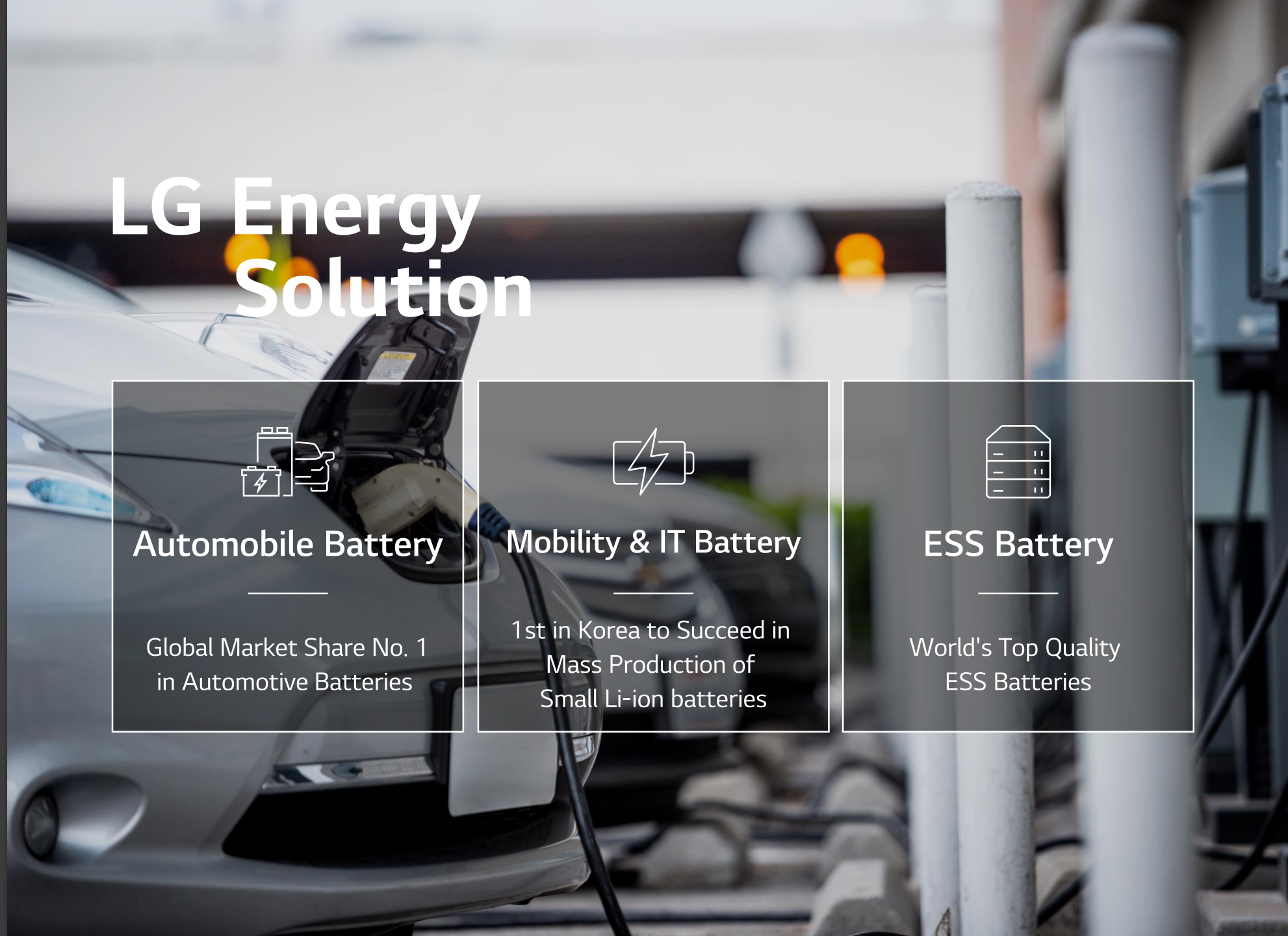
01 Petrochemicals Company
02 Energy Solution Company
03 Advanced Materials Company
04 Life Sciences Company

Subsidiaries



LG Energy Solution

LG Energy Solution was the 1st in Korea to mass-produce Li-ion batteries and provides a wide-ranging portfolio of all products related to automotive batteries, from batteries, modules, BMS, pack development to technical support.
We also supply battery systems for ESS batteries in various fields, such as power grids, residential and commercial areas, and UPS (Uninterruptible Power Supply).



LG Energy Solution

Automobile Battery

Global Market Share No. 1 in Automotive Batteries

Mobility & IT Battery

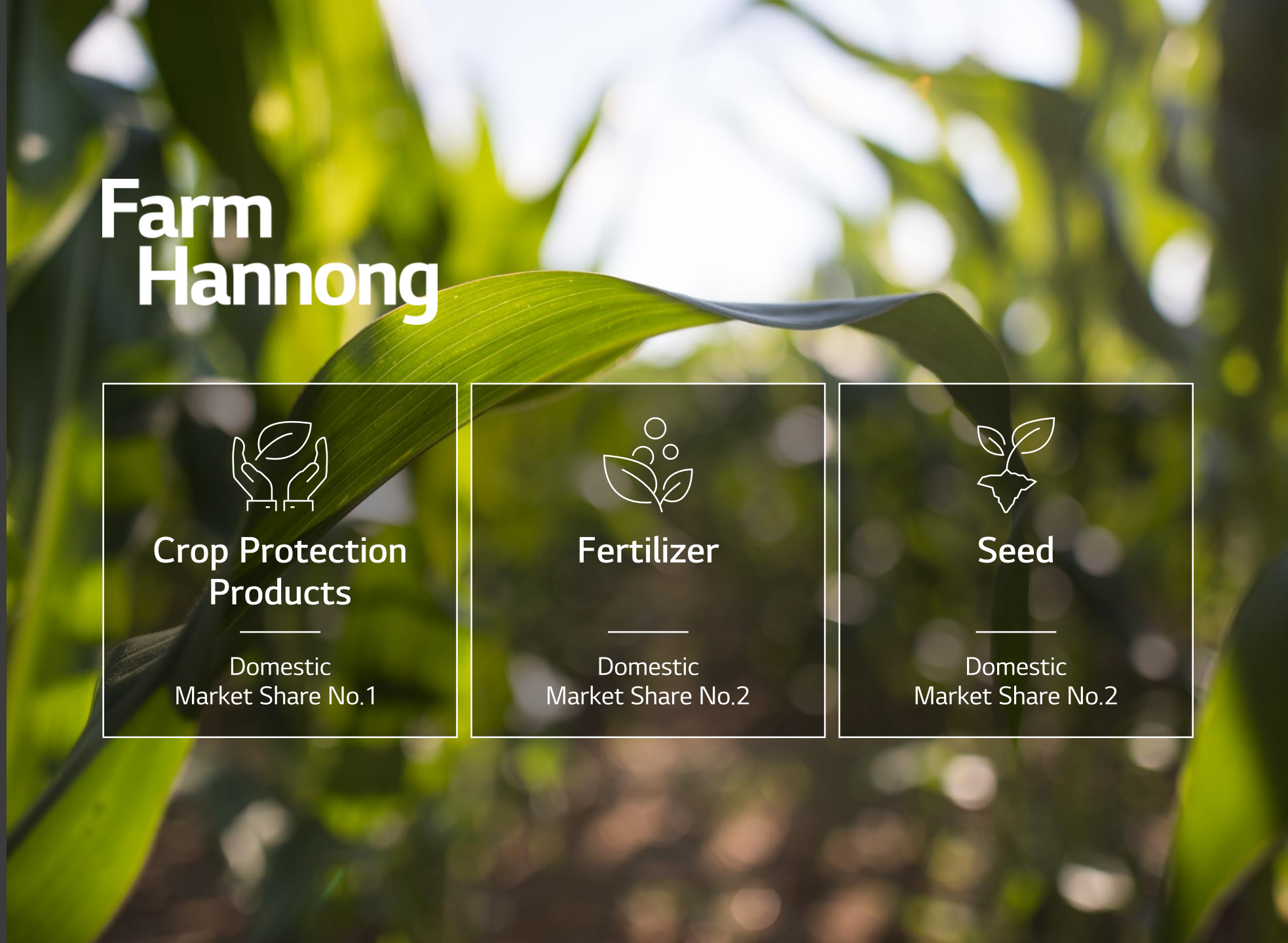
1st in Korea to Succeed in Mass Production of Small Li-ion batteries

ESS Battery

World's Top Quality ESS Batteries

Farm Hannong

Farm Hannong, LG Chem's affiliate company, is the top domestic agricultural company holding the first place in the agricultural chemicals and the second place in the fertilizer & seed in market shares, and aims to be the leading green company in the international market through agriculture and ICT industry technologies.




A Company
That Enriches
Human Life

LG Chem

Thank you



LG Twin Towers, 128 Yeoui-daero, Yeongdeungpo-gu
Seoul 07336, Korea

Tel. 02-3773-1114 / www.lgchem.com

Copyright © 2020 LG Chem. All Rights Reserved.

WeConnectScience