A Global Battery Company is Born

Spun-off from LG Chem’s battery division in Dec 2020, unfolding the new era of a global battery frontier.

LG Group

- Subsidiaries: 60+
- Overseas Offices: 300+
- Number of Employees: 250k+ (150k domestic/100k abroad)
- Revenue: $145B

as of Dec 2020

LG Energy Solution

Advanced Automotive Battery
Mobility & IT Battery
ESS Battery

December 2020
LG Energy Solution is building a unique corporate brand value, a specialized company that provides a variety of energy solutions for a better world.

LG Energy Solution pioneered South Korea’s untapped battery industry, overcoming a series of concerns and difficulties with a daring spirit, and has recently laid the foundation for the profitable business model before anyone else in the field.

Our journey is to become an enterprise: that provides value above expectations through the best technology and product quality, that improves life for mankind innovatively and leads environment-friendly progress; and that grows with its constituents and instills pride.
The Start of Korea’s Battery History

Beginning in 1992, lithium-ion battery research ushered in the start of Korea’s battery history.
2009
Supplied the World’s First Mass-Produced EV Batteries (GM Volt)

2013
Developed the World’s First Future Batteries (Stepped, Curved, Wire Battery)

2017
Completed Construction of EV Battery Plant in Poland

Dec 2020
LG Energy Solution Established

2012
Completed Construction of EV Battery Plant in the U.S.

2015
Began mass production of ESS battery cell

2018
Developed the World’s First Free-Form Battery
Achieving Explosive Growth

By leading in the fast-growing green energy sector and global EV market, LG Energy Solution continues to see steady growth.

Revenue (unit: $Billions)

Average Annual Growth

30%

2014 $2.7B
2015 $2.8B
2016 $3.1B
2017 $4.0B
2018 $5.9B
2019 $7.2B
2020 $10.5B
2024 (estimated) $27.2B

Estimated 2024 Revenue
Building a Strong Business Portfolio

Leading the future energy industry by developing Advanced Automotive Battery, Mobility & IT Battery, and ESS Battery enterprises, which are key for the green energy transition.

Advanced Automotive Battery
Contributing to the popularization of electric vehicles with the world’s best high-tech battery products
EV / PHEV / HEV / HEV / μ-HEV
Cell · Module · Pack · BMS

Mobility & IT Battery
Leading wireless innovation by actively targeting new markets, such as IT and LEV
IT Equipment / Power Tools / LEV
Cylindrical · Pouch · Free-Form

ESS Battery
Unlocking the smart grid era by providing various ESS battery products
Grids / Commercial / Residential
Cell · Pack · Rack
LG Energy Solution become the first supplier in the industry of electric vehicles, electric ships, drones, and battery-powered spacesuits.

**Electric Vehicles**
Supplier for 13 of the top 20 global automotive brands

**Ships**
Supplier for the world's first eco-friendly hybrid ship made by a Norwegian shipbuilding company

**Drones**
Developer of lightweight, high-powered drone batteries

**Space**
Supplier of battery-powered spacesuits for the National Aeronautics and Space Administration (NASA)
Global Network

Equipped with a Global Network
Expanding our R&D, manufacturing, and sales bases throughout key regions, including South Korea, China, and the United States.

Germany
- Sulzbach - Marketing Subsidiaries
- Wroclaw - Manufacturing Facility

Poland
- Wroclaw - Manufacturing Facility

South Korea
- Seoul - Headquarter
- Magok/Daejeon/Gwacheon - R&D
- Ochang Plant - Manufacturing Facility

China
- Nanjing (3) - Manufacturing Facility

Taiwan
- Taipei - Marketing Subsidiaries

USA
- Holland - Manufacturing Facility

Spring Hill (scheduled to be completed by 2023) - Manufacturing Facility

Australia
- Victoria - Marketing Subsidiaries
Global Production Capabilities
- Experienced in mass production
- Established a global production system (Korea/USA/Poland/China)
- Global R&D Network

Material Technology
- Leader in high-capacity cathode material technology
- Owner of source proprietary technology for ceramic coating on separators (safety-reinforced separator)
- Stable supply of battery materials (in-house)

Process Technology
- Stacking & Folding
- Lamination & Stacking
- CNT Pre-Dispersion
- Pre-lithiation

Ready to Compete in the Global Market
From raw material technology and manufacturing production technology to mass production systems, LG Energy Solution is at the forefront of technological advancements.
Securing Skills & Technology that Stand Out

Established substantial intellectual property rights, a key source of competitiveness, through active R&D investments and talent acquisitions

R&D

Investment (Units: KRW 100 mil) | Human Resources (Units: people)

<table>
<thead>
<tr>
<th>Year</th>
<th>Investment</th>
<th>Human Resources</th>
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<tbody>
<tr>
<td>2018</td>
<td>3,195</td>
<td>1,978</td>
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<tr>
<td>2019</td>
<td>3,873</td>
<td>2,457</td>
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<tr>
<td>2020</td>
<td>4,220</td>
<td>2,576</td>
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Established substantial intellectual property rights, a key source of competitiveness, through active R&D investments and talent acquisitions. As of May 2021, we have secured 24,731 total patents, with 11,445 domestic and 13,286 overseas.
A True Leader in Open Innovation

LG Energy Solution partners with universities, startups, and researchers to promote technological innovation for the global battery industry.

Battery Innovation Contest (BIC)

University/Research Lab Financial Support Program

Ensure research autonomy for universities and research labs to conduct challenging research and match dedicated research teams from LG Energy Solution with institutes to jointly advance technological development in order to ensure the commercialization of research results.

The Battery Challenge

Battery Industry Startup Competition Program

A biennial event, hosted by LG Energy Solution and run by American startup accelerator New Energy Nexus, where selected startups cooperate to conduct joint R&D and venture projects, resulting in win-win growth.

Innovation Forum

International Battery Experts’ Open Forum

Experts from around the world discuss the latest research trends in the battery industry and analyze the possibilities and direction of future development of battery technology.
The Next-Generation Batteries

Leading the way in battery innovation with research on next-generation batteries based on new materials technology that satisfies high safety and capacity standards

Solid-State Battery
Solid-state batteries are rechargeable batteries with a solid-state electrolyte between a cathode and an anode, enabling high energy density and high capacity with a low risk of combustion.

Lithium-Ion Battery
(liquid electrolyte)

- Cathode
- Separator
- Liquid Electrolyte
- Solid-State Electrolyte
- Anode

E-mobility, Wearable Devices, Ships/Aircraft, Robots

Lithium-Sulfur Battery
Lithium-sulfur batteries are made from lightweight materials, such as sulfur-carbon composite in the cathode and lithium-metal in the anode, giving them an energy density 1.5 times higher than conventional lithium-ion batteries.

- Cathode (Sulfur-Carbon)
- Anode (Lithium-Metal)
- Liquid Electrolyte
- Separator

UAM, Drones

Solid-State Battery
(solid-state electrolyte)
Focusing on Renewable Energy to Take the Lead in Climate Change Response

As the first South Korean battery manufacturer to join RE100, LG Energy Solution is protecting the environment by advancing the goal of transitioning all businesses to 100% renewable energy 20 years ahead of the suggested schedule.

RE100: a global initiative with the goal of producing 100% of the electricity used by businesses from renewable energy sources, such as wind and solar, by 2050.

Poland Plant 2019
U.S. Plant 2020
China Plant 2025
South Korea Plant 2025

goals set for 2050
20 years early
2030
We are committed to fulfilling social responsibility for a better future

Selecting and promoting 8 critical areas related to the environment, human rights, safety, and society, as well as four key areas including climate action, closed-loop, human capital, and responsible supply chain management.

## ESG VISION

### We CHARGE toward a better future

<table>
<thead>
<tr>
<th>C</th>
<th>Climate Action &amp; Circular Economy</th>
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<tbody>
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<td>Achieving carbon neutrality by 2050</td>
</tr>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H</th>
<th>Human Value Management</th>
</tr>
</thead>
<tbody>
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<td>Human Capital Management</td>
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</tbody>
</table>

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<tr>
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</tr>
</thead>
<tbody>
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</tr>
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<tr>
<th>R</th>
<th>Responsible &amp; Impactful Business</th>
</tr>
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<tbody>
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</tr>
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</tr>
</tbody>
</table>

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<tr>
<th>G</th>
<th>Good Governance</th>
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</thead>
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<tr>
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<tr>
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</tbody>
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<thead>
<tr>
<th>E</th>
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</thead>
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<td>ESG initiative</td>
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## 8 Critical Areas

- **Climate Action**
  - Achieving carbon neutrality by 2050
  - Establishing a closed loop by 2025

- **Human Rights Management**
  - Creating risk-free business sites for human rights

- **Human Capital Management**
  - Fostering diverse talent

- **Product Stewardship**
  - 100% green products by 2023

- **EH&S**
  - Zero EH&S accidents

- **Responsible Supply Chain Management**
  - Securing over 90% of ESG low-risk group by 2030

- **Shared Growth and Greater Impact on Local Communities**
  - Reinforcing brand image for mutual growth and cooperation

## 4 Key Enablers

- **Compliance**
- **Governance**
- **Communication**
- **ESG initiative**
Increasing the Value of Batteries with the BaaS Business Model

To expand the EV market and increase the value of batteries to society, LG Energy Solution creates services to cover the entire battery life cycle.

- **Australia**
  - Envirostream
  - Battery Recycling
  - Employing used batteries from EVs for optimized ESS development

- **Korea**
  - 2019
  - RENAULT-SAMSUNG
  - Employing used batteries from EVs for optimized ESS development

- **Korea**
  - 2020
  - HYUNDAI GLOVIS
  - Employing used batteries from EVs for fast-charging ESS production

- **Korea**
  - 2021
  - GS 칼텍스
  - Utilizing big data to develop battery specialized services

- **Korea**
  - 2021
  - 롯데렌터카
  - Discovering new EV based mobility and battery service projects
  - Regular diagnostic and certification services for EVs

**Used Battery**: a battery that can be reused for other purposes, such as ESS, after being used in an EV

**BaaS**: Battery as a Service
LG Energy Solution strives for transparent and responsible mineral procurement by building a system that continuously monitors the ingredient information of the supplied materials from the purchase stage of minerals to the production of the final product.
THANK YOU