SolutionPartner

LG Chem

ADVANCED BATTERY
FOR ENERGY STORAGE SYSTEM

LG Chem ESS Sales

Energy Storage System
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ABOUT LG CHEM

You'll find it here

Whether you're searching for a competitive edge, new experiences, or a more comfortable, beautiful life, LG Chem has the solutions to make it happen. From quality petrochemicals to advanced information technology and electronic materials, we have innovative solutions you won't find anywhere else. If you're looking for a solution partner to help you succeed in the global marketplace, you've come to the right place.

Petrochemicals

- NCC / PE / PP
- SBR / SP
- PVC / ABS
- EP / Etc.

IT&Electronic Materials

- Optical Materials
- Electronic Materials
- IT Film
- LCD Glass
- OLED Lighting Panel

Energy Solution

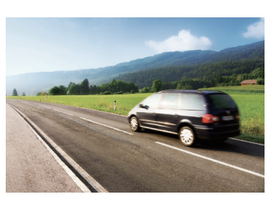
- Advanced BESS
- Mobile Battery
- Advanced Automotive Battery

LG Chem Energy Solution Company Domain

Compact & Efficient

Mobile Battery

- Mobile Phone
- Laptop Computer
- Power Tool



Safe & Green

Advanced Automotive Battery

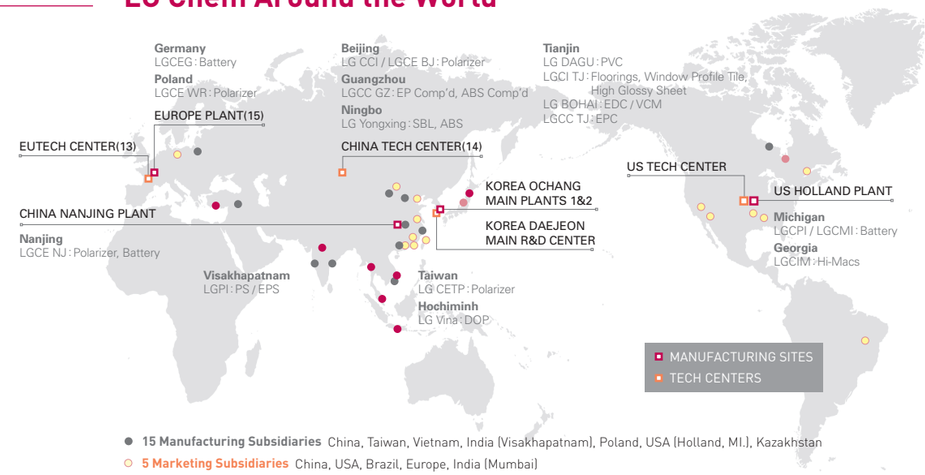
- Hybrid Vehicle
- Plug-in Hybrid Vehicle
- Electric Vehicle

Smart & Reliable

Advanced BESS

- UPS
- Photovoltaic ESS
- Grid ESS

LG Chem Around the World



- **15 Manufacturing Subsidiaries** China, Taiwan, Vietnam, India (Visakhapatnam), Poland, USA (Holland, MI.), Kazakhstan
- **5 Marketing Subsidiaries** China, USA, Brazil, Europe, India (Mumbai)
- **2 R&D Center** USA (Troy, MI.), Japan (Tokyo)
- **7 Representative Offices** Moscow, Istanbul, Ho Chi Minh City, Bangkok, Jakarta, Singapore, Tokyo

Tianjin	Ningbo	Beijing	Troy, MI.	Tokyo	Ho Chi Minh City
Poland	Guangzhou	Taiwan	Tokyo	Moscow	
Visakhapatnam	Holland, MI.	New Jersey		Istanbul	
Nanjing		Sao Paulo		Bangkok	

Battery Business History

1995	• Started Lithium-Ion Battery (LiB) R&D
1999	• Began to produce LiB for consumer applications
2001	• Started developing high power and capacity LiPB for HEV
2009	• Began to produce LiPB for Hybrid Electric Vehicles Selected to participate in Jeju Island Smart Grid Test Bed Program
2010	• Selected as Residential Energy Storage Unit (RESU) supplier to SCE Began to produce LiPB for Plug-in Hybrid Electric Vehicle
2011	• Selected as a LiPB supplier to SMA / ABB
2012	• Mass production for Residential PV ESS (Germany)

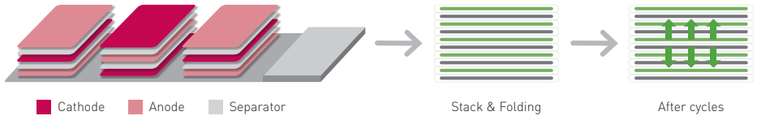
BUSINESS OVERVIEW

Why LG LiPB Energy Storage System

1 **The only chemical-based company among battery manufacturers.**

State-of-art technology with a full understanding of key materials

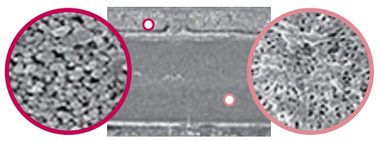
2 **Stack & Folding technology for high performance.**

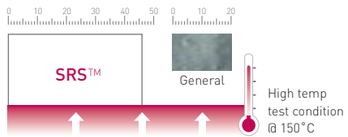


- Stable energy structure & discharge
- High capacity & long calendar life

3 **LG Chem's best solution for safety with Ceramic-coated separator.**

Effectively reduce the risk of internal short circuit by SRS (Safety Reinforced Separator)



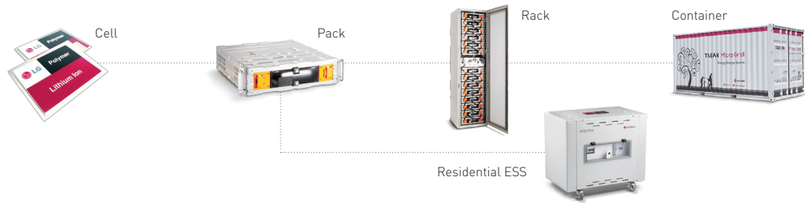


4 **BMS & BPU for protection and reliability of battery system.**

- Communication of SOC, SOH and operating condition
- Protection of over voltage & current, high temperature

Customizable, Scalable, and Reliable

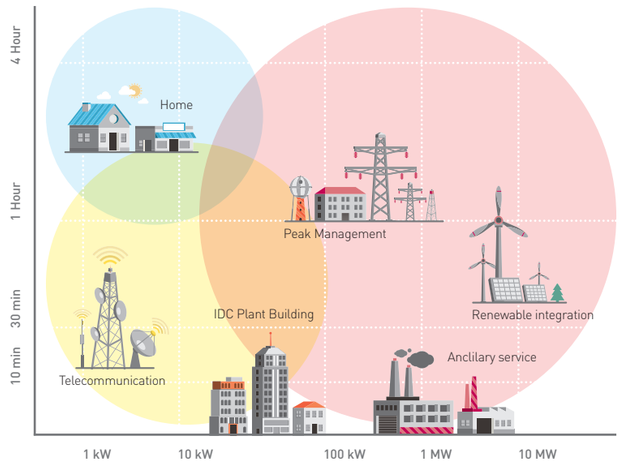
LG Chem's complete range of advanced batteries, from a single cell to the whole container system, provide an efficient and reliable energy storage solution.



Flexibility and Compatibility

LG Chem's ESS Line-up is capable of providing ESS solution from generation to end-user with multiple applications.

- RESIDENTIAL
- GRID SUPPORT
- UPS



RESU®5.0

RESU is a smart energy solution for homes. Peak management using RESU will make your electricity bill lower. Connecting photovoltaic systems to RESU can enhance self-consumption of self-generated electricity. Additionally, RESU is a reliable power source in emergency blackout.

With RESU, You get

- Electricity bill saving : peak management
- Use of clean energy with PV
- Reliable power source
- Environmentally-friendly materials
- Low maintenance

Item		RESU 5.0
Energy (kWh)		5.0
Voltage (V)		48
Capacity (Ah)		120
BMS		Integrated
Weight (kg)		130
Dimension (mm)	Width	664
	Height	614
	Depth	440

UPB 2715 / UPB 4810

LG Chem's battery is a perfect solution for telecom sites with high performance in floating and compact design.

For off-grid hybrid sites, where the equipment power comes from intermittent energy sources (photovoltaic panels or wind turbines), LGC battery's excellent cycling capabilities will provide you the most efficient energy storage.

With UPB 2715 / UPB 4810, You get

- Compact, low-weight package
- Low TCO
- High performance and long life
- Environmentally-friendly materials
- Low maintenance

Item		UPB 2715	UPB 4810
Energy (kWh)		0.4	0.5
Voltage(V)		27	48
Capacity(Ah)		15	10
BMS		Integrated	
Weight (kg)		6.5	11.5
Dimension (mm)	Width	200	200
	Height	125	125
	Depth	274	274

UPB 15135

Soaring growth in internet traffic and cloud computing has propelled its secure power input to the top of agenda in building of datacenters. Under this scenario, the batteries are the state-of-art technology which contributes to ensure the backup power for servers in any kind of emergency.

LG Chem's carefully engineered and tested batteries assure you high and safe performance with less maintenance.

With UPB 15135, You get

- Environmentally-friendly materials
- Low TCO
- High performance and long life
- Compact and space saving design
- Low maintenance

Item		UPB 15135
Energy (kWh)		2.0
Voltage (V)		15
Capacity (Ah)		135
BMS		Integrated
Weight (kg)		24.8
Dimension (mm)	Width	440
	Height	89
	Depth	699

UPB 4850

According to the growth of telecommunication industry, it is essential to build a wider coverage of telecommunication infrastructure such as base-station and repeater with secure power supply. LG Chem's battery, as an indispensable device to protect the telecommunication system, will provide you high reliability and efficiency with small space and low cost.

With UPB 4850, You get

- High performance and long life
- Compact and space saving design
- Low TCO
- Environmentally-friendly materials

Item		UPB 4850
Energy (kWh)		2.4
Voltage (V)		48
Capacity (Ah)		50
BMS		Integrated
Weight (kg)		25
Dimension (mm)	Width	440
	Height	82.6
	Depth	540

UPB 4860

For the electricity grid, large scale of ESS, such as rack and container, is used. ESS reduces congestion on T&D lines caused by heavy power load, and stabilizes the fluctuation caused by intermittent renewable energy.

With proven technology through many ESS projects participation, UPB 4860 provides you energy storage solution, that is the ideal combination of high performance, maximum reliability, long life and efficient operation over a wide range of temperature.

With UPB 4860, You get

- Grid support
- Renewable energy capacity firming
- Ancillary service
- High reliability and safety with long life

Item		UPB 4860
Energy (kWh)		3.2
Voltage (V)		48
Capacity (Ah)		60
BMS		Integrated
Weight (kg)		35
Dimension (mm)	Width	445
	Height	122
	Depth	554

RACK SYSTEM R800 / R1000

LG Chem has designed a rack system that can cover wider range of capacity from kWh to MWh. LG Chem's specialized system designs maximize space savings with high performance. Proven BMS and BPU technology provides you easy and smart supervision of the system without routine site visits.

With RACK SYSTEM R800 / R1000, You get

- Flexible capacity expansion & position of BPU
- Reliable power source & compatibility for PCS
- Seismic stability

Item			R800	R1000
Energy (kWh)			44.9	54.6
Voltage (V)			725	880
Capacity (Ah)			60	60
BMS			Rack BMS	
Weight (kg)			750	870
Dimension (mm)	Width		600	600
	Height		2,200	2,700
	Depth	Without Fan	600	600
		With Fan	650	650