

 **LG Energy Solution**

ESS Battery Division

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Company Websites

LG Energy Solution Website : www.lgensol.com
LG Energy Solution ESS Battery Website : www.lgessbattery.com

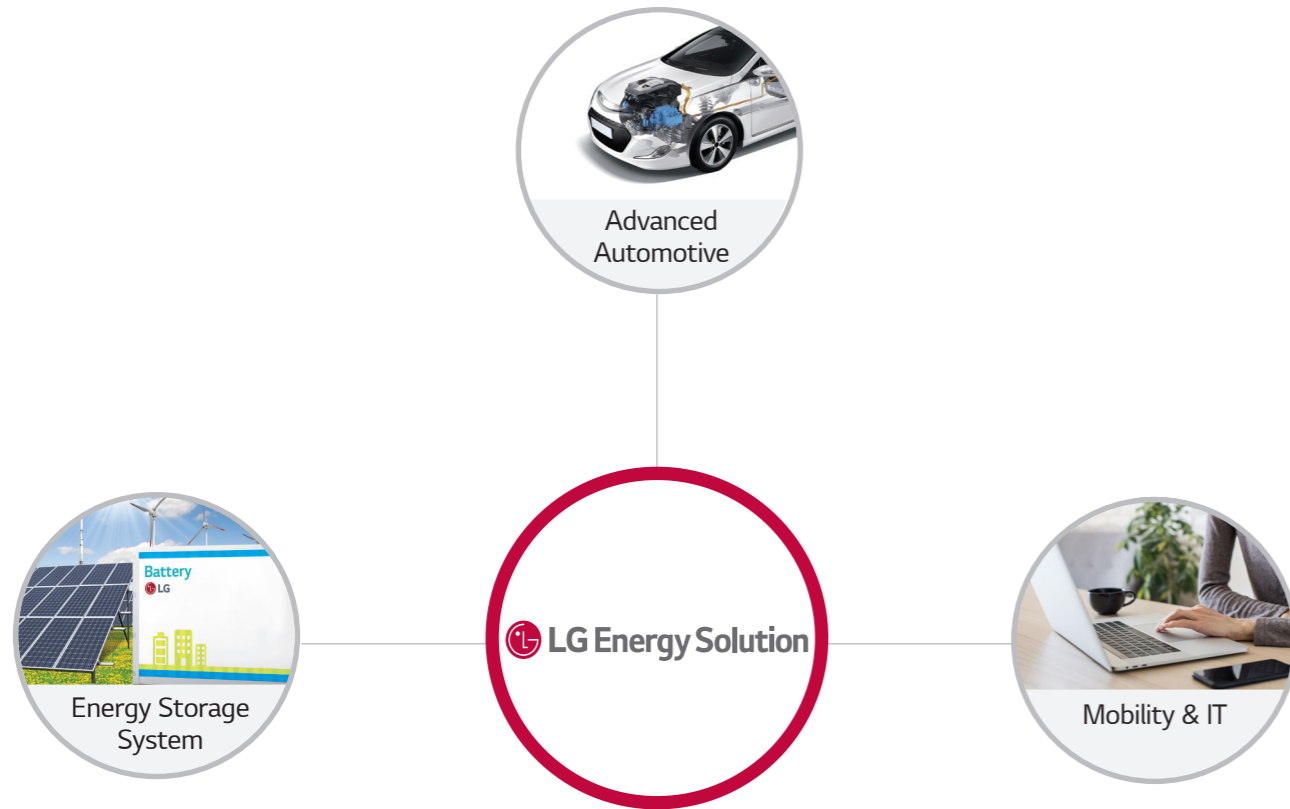


**CHANGE YOUR ENERGY
CHARGE YOUR LIFE**

**ADVANCED BATTERIES
FOR ENERGY STORAGE**

Introducing LG Energy Solution

LG Energy Solution at a Glance



Foundation	1947 *Dec, 20 LG Energy Solution spinoff	Employees	23,344
Headquarters	Seoul, Korea	Sales Revenue	USD 10.5B

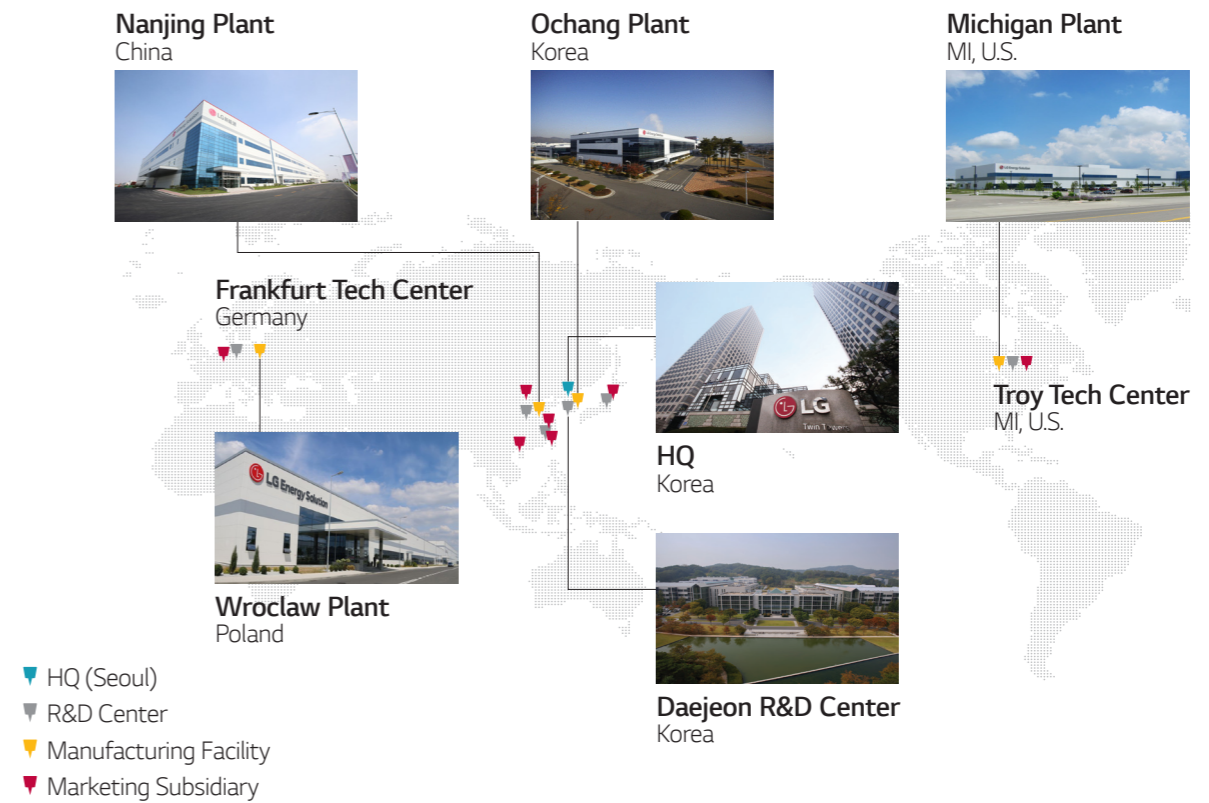
Energy Solutions

With 26 years of experience in successfully delivering products and solutions to customers in the global energy sector, LG Energy Solution is recognized as the industry leader in Lithium-ion batteries.

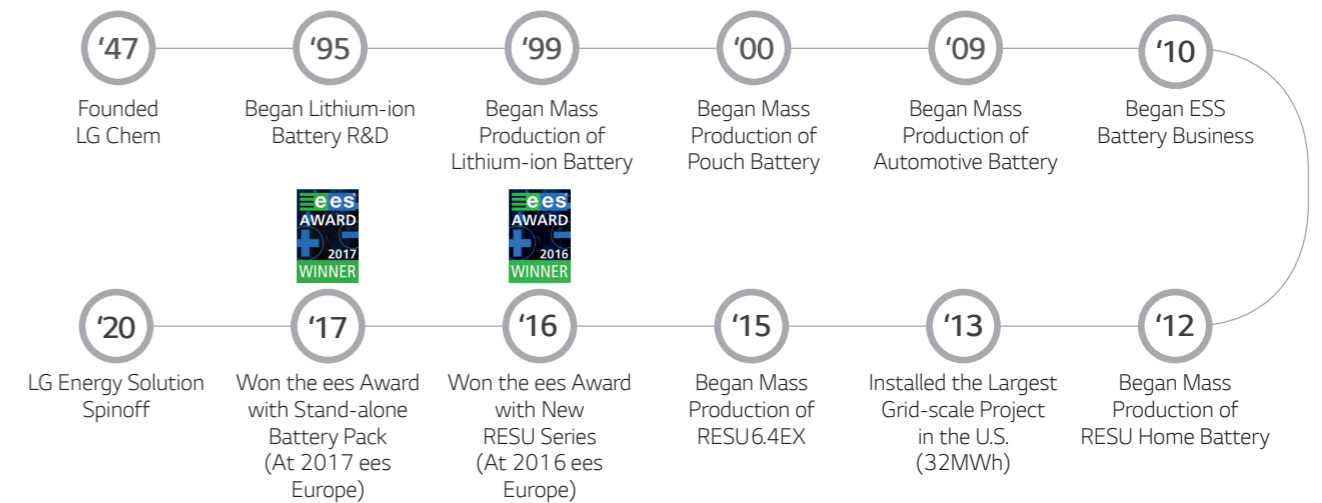


Global Operation of Energy Solutions

LG Energy Solution is successfully implementing rapid go-to-market strategies across its wide range of global networks. By locating manufacturing plants in four strategic locations of Korea, China, the U.S., and Poland, LG Energy Solution supplies batteries to meet the needs of local customers in the most efficient and timely manner.



Business History of Energy Solutions

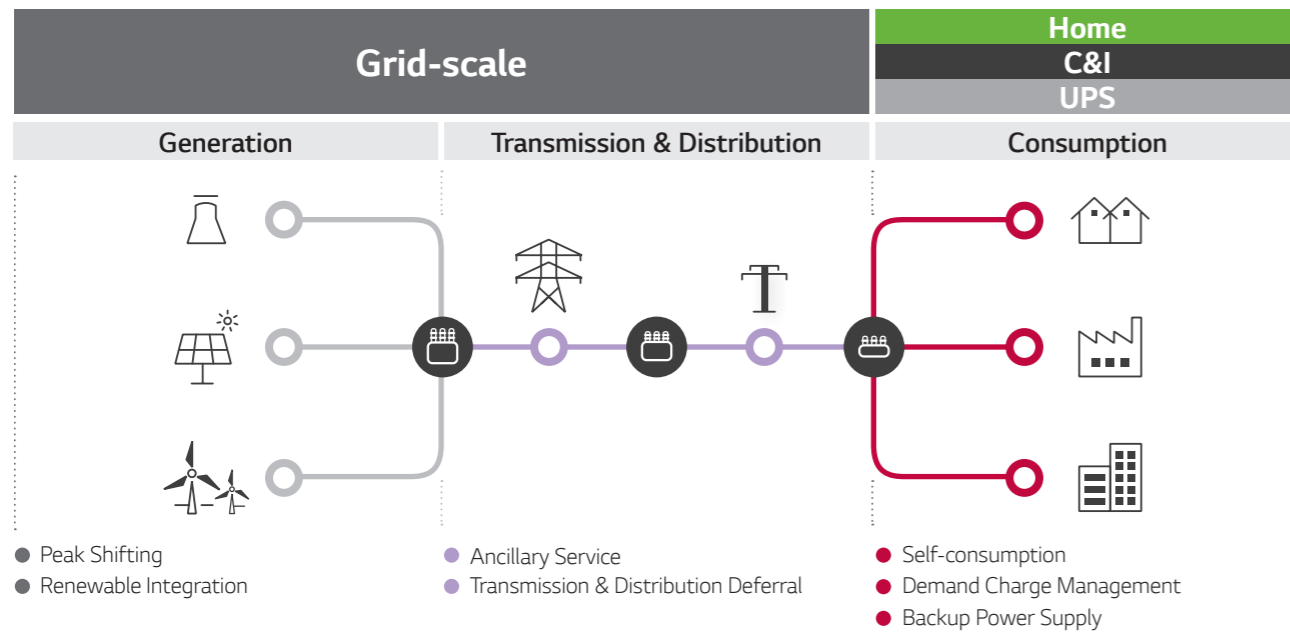


* The ees Award is one of the most prestigious awards presented annually at ees Europe, the largest exhibition for batteries and energy storage systems in Europe, with the purpose to pay tribute to pioneering products and solutions for energy storage system.

ESS Solutions Total Solutions for ESS (Energy Storage System)

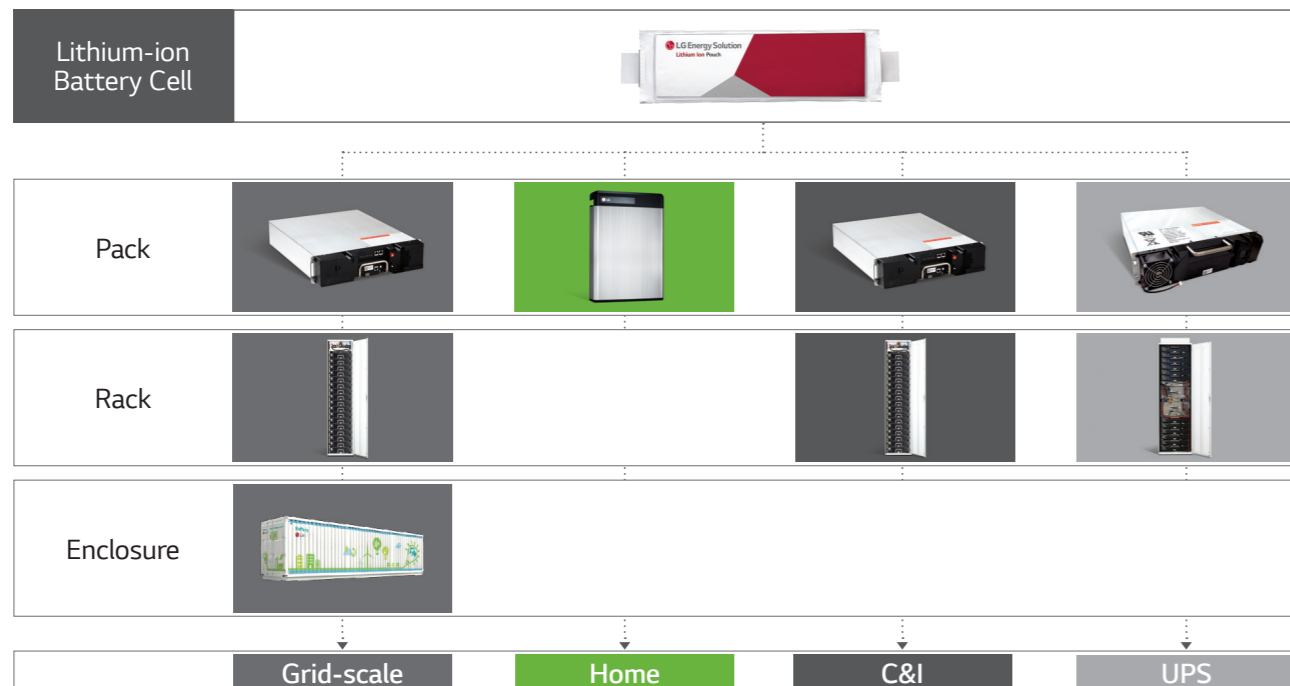
Applications of ESS

ESS (Energy Storage System) provides solutions for applications throughout power supply systems including Grid-scale, Home, C&I (Commercial and Industrial), and UPS (Uninterruptible Power Supply).



Product Portfolio

LG Energy Solution offers a wide variety of products, such as Battery Packs, Rack, and Enclosure that allow our customers to source total battery solutions.

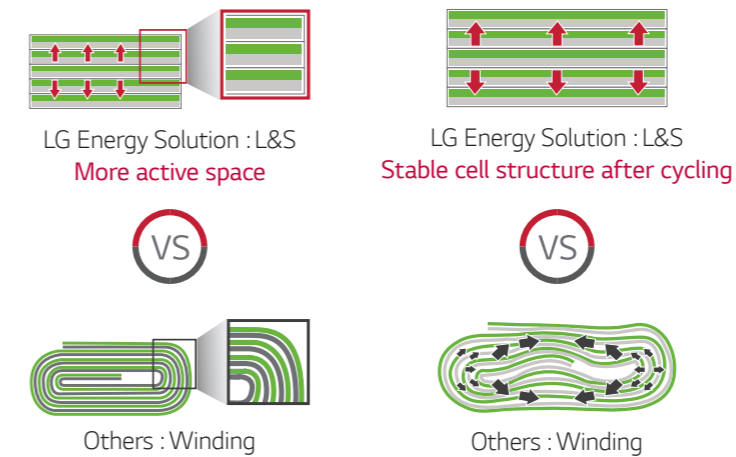


Key Strengths

Lithium-ion Battery Cell

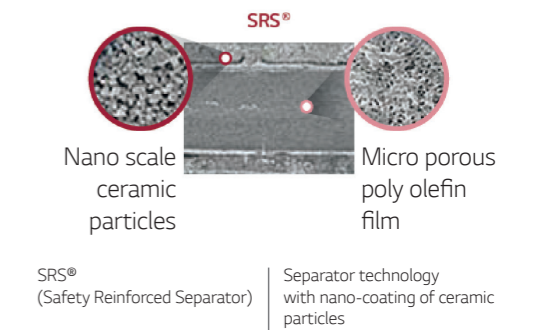
Compactness & Long Lifespan

LG Energy Solution's L&S (Lamination & Stacking) process minimizes dead space, enables higher energy density, and enhances the sustainability of cell structures.



Safety

LG Energy Solution's SRS[®] (Safety Reinforced Separator) increases the mechanical and thermal stability of battery cells.



Unsurpassed Experience and Expertise

LG Energy Solution is a reliable battery solution partner with extensive field experience and technical expertise.

Chemical Expertise

LG Energy Solution, which was LG Chem before spin-off, features world class battery technology. It made possible by 70 years of expertise in chemicals

Proven Technology

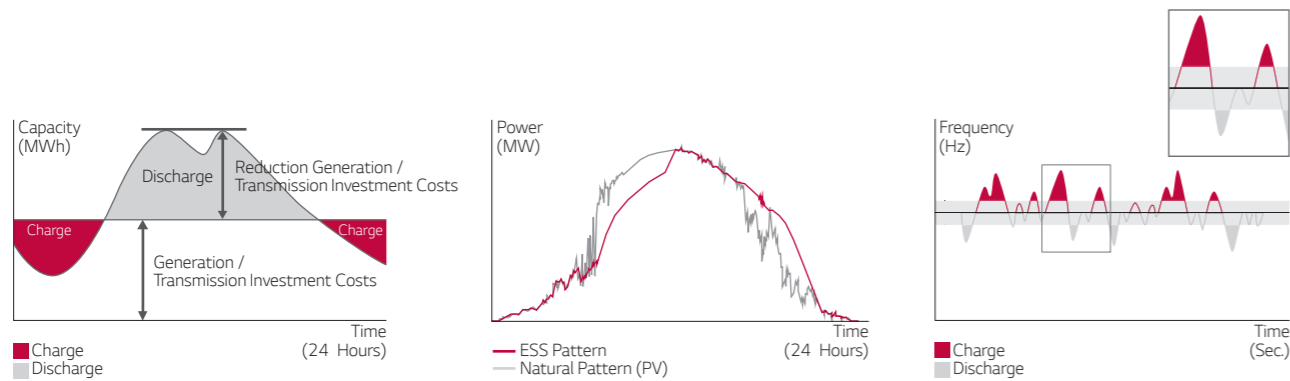
LG Energy Solution is the global leading supplier of Lithium-ion batteries for electric vehicles.

ESS Track Record

Since 2010, LG Energy Solution has installed or been awarded ESS projects for a wide range of applications.

ESS Solutions Grid-scale Battery

For stabilizing the grid, a grid-scale battery provides capabilities such as peak shifting, renewable integration, and frequency regulation. With our world-leading Lithium-ion battery technology, LG Energy Solution offers advanced battery systems for grid-scale ESS applications.



Peak Shifting

- Charge during off-peak times
- Discharge during peak times

Renewable Integration

- Stabilize the intermittent renewable power by alternately charging and discharging

Frequency Regulation

- Charge when grid frequency increases
- Discharge when grid frequency decreases

Product Lineup

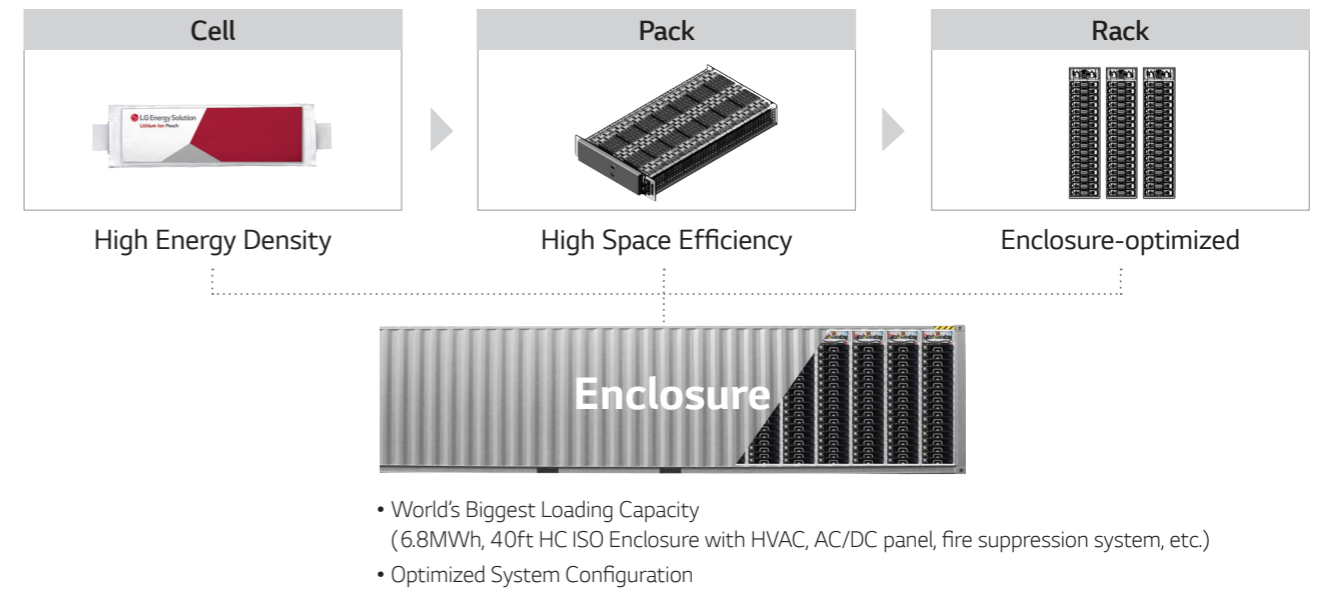
LG Energy Solution offers two product lineups highly optimized for grid-scale customers' requirements.



Key Features

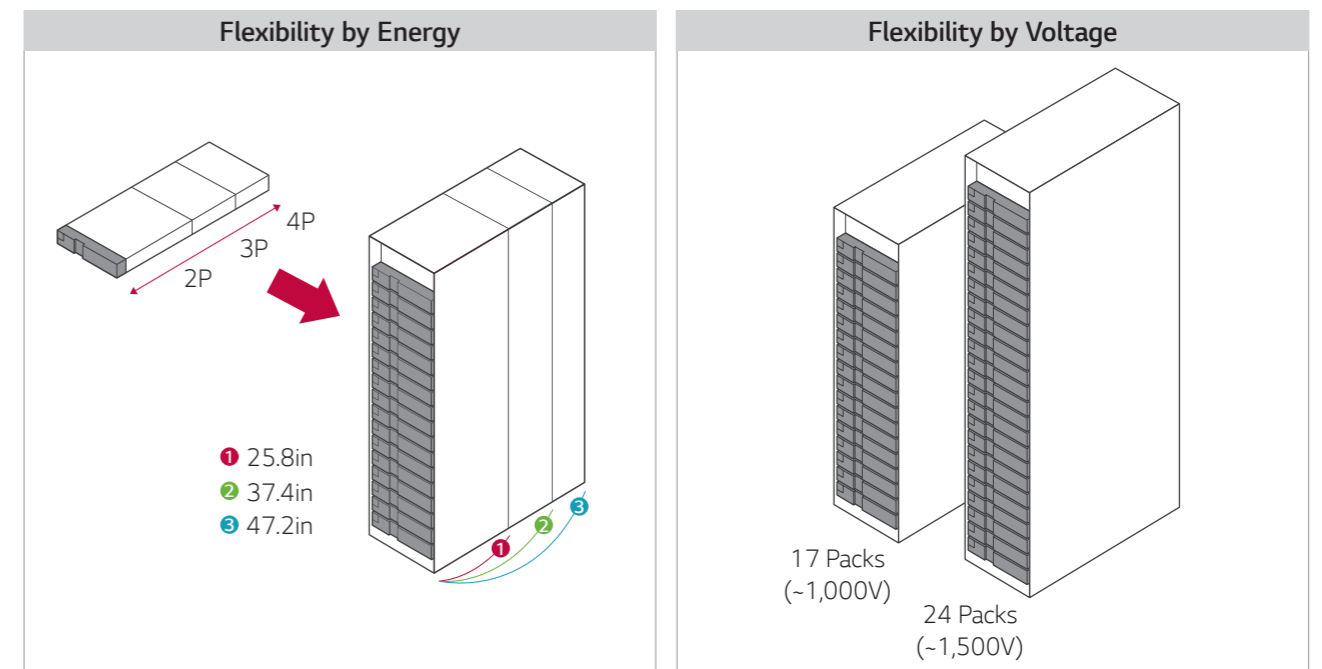
System Optimization

LG Energy Solution features a highly optimized battery system design which enables high energy density.



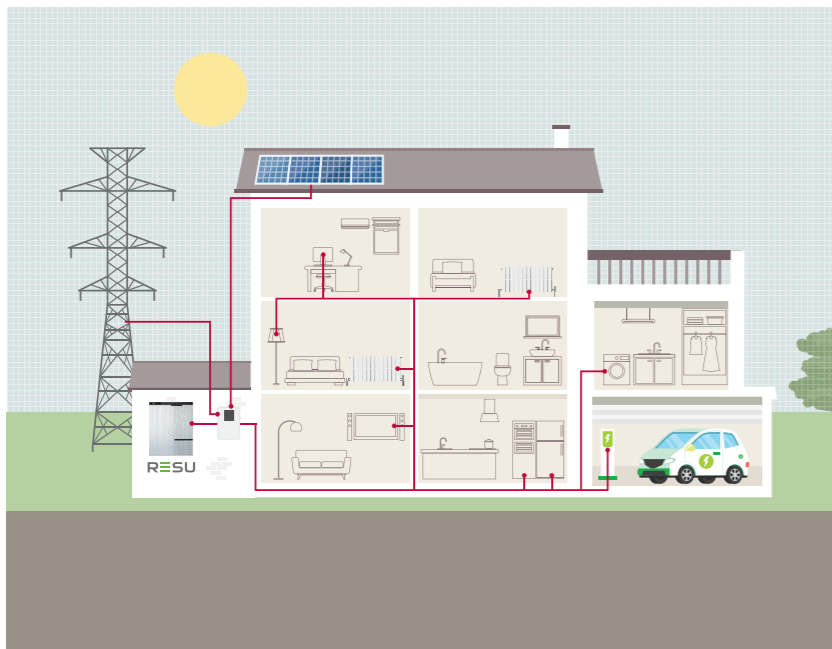
Diverse Product Options

LG Energy Solution offers a range of product options to optimally meet our customers' needs for energy, footprint and voltage.



ESS Solutions Home Battery

A home battery can store surplus energy generated from rooftop photovoltaic panels for use when needed. When the sun has set, energy demand is high, or there is a black-out, you can use the energy stored in your home battery to meet your energy needs at no extra cost. In addition, a home battery helps you pursue the goal of energy self-consumption and ultimately energy-independence.



Electricity Bill Saving

- Charge during off-peak times
- Discharge during peak times

Self-consumption

- Store solar energy generated from photovoltaic panels for the future use

Emergency Power Backup

- Discharge during a black-out, functioning as backup power

Key Features



Compact Size & Space Saving

The compact and sleek design of the RESU allows you to place it anywhere you want, both indoors and outdoors.



Reliable Performance

The RESU provides reliability for your home with its industry leading longevity.



Proven Safety

The safety of LG Energy Solution's lithium-ion battery is proven in the automotive and ESS markets.



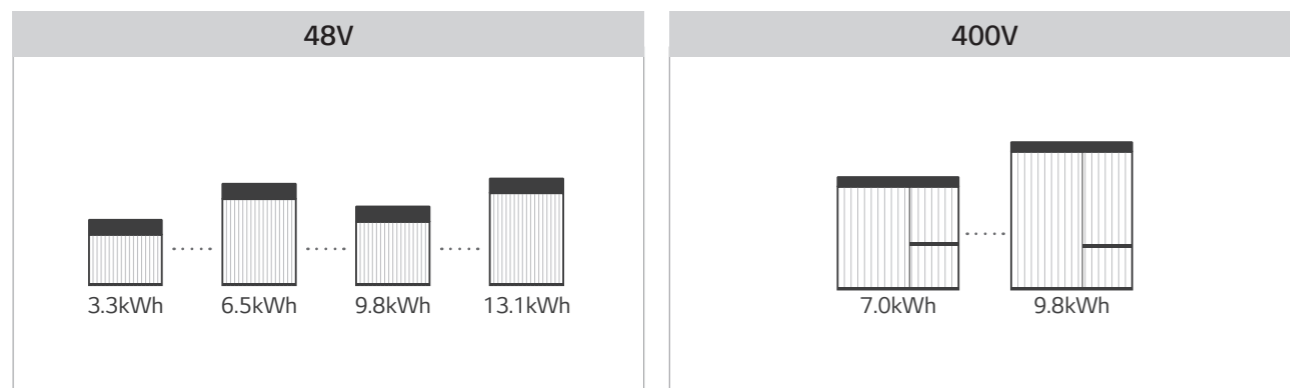
Expandable at Need


The RESU models can be combined up to 2 units to increase energy capacity.

Product Lineup

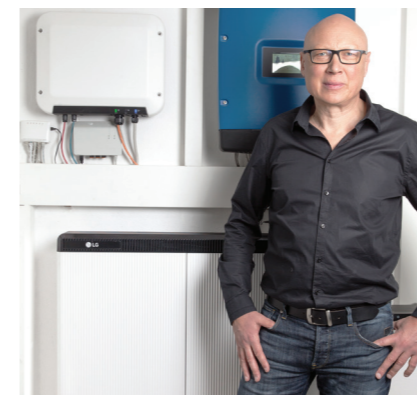
LG Energy Solution offers six home battery models in two product lineups to fulfill diverse capacity and voltage needs of homeowners.

RESU



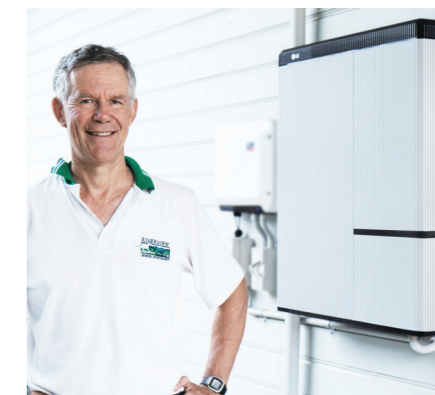
 RESU Plus is an expansion kit specially designed for 48V models of the RESU series. Number of expandable battery units : Up to 2EA

Customer Testimonials



Remarkable Self-sufficiency

"The remarkable result one year after completion and move-in : up to 90 percent self-sufficiency"
- Jörg Erstling, Germany



Simple Installation & Sleek Design

"The LG Energy Solution RESU10H was easy to install and looks good. It's not overly intrusive, and it is a real conversation starter"
- Stephen Young, Australia

Specifications

Grid-scale Battery



Long Duration & Energy

Long-duration application
with continuous power supply (≥ 7 hours)

Pack



Models	M48145P5B (2P)	M48218P5B (3P)
Energy [kWh]	7.4	11.2
Capacity [Ah]	145	218
Nominal Voltage [V]	51.4	
Voltage Range [V]	42.0-58.8	
Dimension [W x H x D, In]	17.5 x 4.3 x 24.4	17.5 x 4.3 x 36.0
Weight [lb]	101	150

Rack



Models	R1000 (17P)		
	M48145P5B	M48218P5B	M48290P5B
Energy [kWh]	126.6	189.9	253.2
Capacity [Ah]	145	218	290
Nominal Voltage [V]	873		
Voltage Range [V]	714-1,000		
Dimension [W x H x D, In]	20.5 x 86.6 x 25.8	20.5 x 86.6 x 37.4	20.5 x 86.6 x 47.2
Weight [lb]	1,995	2,877	3,704

Enclosure



Models	40ft HC ISO Enclosure	
	M48218P5B	Unmanned
Energy [MWh]	6.8	
System Voltage [V dc]	714-1,000	
Dimension [W x H x D, ft]	40.0 x 9.5 x 8.2	
Weight [ton] (incl. battery)	60	

(Enclosure system design can be changed according to customer requirements)

Pack



Models	M48290P5B (4P)
Energy [kWh]	14.9
Capacity [Ah]	290
Nominal voltage [V]	51.4
Voltage Range [V]	42.0-58.8
Dimension [W x H x D, In]	17.5 x 4.3 x 45.7
Weight [lb]	196

Rack



Models	R1400 (24P)	
	M48290P5B	
Energy [kWh]	357.5	
Capacity [Ah]	290	
Nominal voltage [V]	1,233	
Voltage Range [V]	1,008-1,411	
Dimension [W x H x D, In]	20.5 x 124 x 47.2	
Weight [lb]	5,307	



Models	TR1300 (22P)	
	M48290P5B	
Energy [kWh]	327.7	
Capacity [Ah]	290	
Nominal voltage [V]	1,130	
Voltage Range [V]	924-1,294	
Dimension [W x H x D, In]	41 x 48.7 x 47.2	
Weight [lb]	5,181	

Grid-scale Battery



Short Duration & Power

short -duration applications with fast response
high power supply (< 1 hours)

Pack



Models	M4864P6B (1P)	M48128P6B (2P)
Energy [kWh]	3.3	6.6
Capacity [Ah]	64	128
Nominal Voltage [V]	51.5	
Voltage Range [V]	42.0-58.8	
Dimension [W x H x D, In]	17.5 x 4.3 x 13.5	17.5 x 4.3 x 24.4
Weight [lb]	62	104

Rack



Models	R1000 (17P)	
	M4864P6B	M48128P6B
Energy [kWh]	56.0	112.1
Capacity [Ah]	64	128
Nominal Voltage [V]	876	
Voltage Range [V]	714-1,000	
Dimension [W x H x D, In]	20.5 x 86.6 x 16.7	20.5 x 86.6 x 25.8
Weight [lb]	1,287	2,037

Enclosure



Models	40ft HC ISO Container	
	M48128P6B	
Energy [MWh]	4.0	
System Voltage [V dc]	714-1,000	
Dimension [W x H x D, ft]	40.0 x 9.5 x 8.2	
Weight [ton] (incl. battery)	50	
Ambient Temperature [°F]	-4-122	
Communication	CAN2.0B, Modbus TCP/IP	

(Enclosure system design can be changed according to customer requirements)

Home Battery



48V

Models	RESU3.3	RESU6.5	RESU10	RESU13
Total Energy [kWh] ¹⁾	3.3	6.5	9.8	13.1
Usable Energy [kWh] ²⁾	2.9	5.9	8.8	12.4
Capacity [Ah]	63	126	189	252
Nominal Voltage [V]	51.8			
Voltage Range [V]	42.0-58.8			
Dimension [W x H x D, In]	17.8 x 15.9 x 4.7	17.8 x 25.8 x 4.7	17.8 x 19.1 x 8.9	17.8 x 24.6 x 8.9
Weight [lb]	68	115	165	218
Enclosure Protection Rating	IP55			
Communication	CAN2.0B			
Certificates	Cell	UL1642		
	Product	UL1973 / TUV (IEC 62619) / CE / FCC / RCM		TUV(EC 62619)/CE/FCC/RCM

1) Total Energy is measured at the initial stage of battery life under the condition as follows : Temperature 77°F

2) Usable Energy is based on battery cell only

Compatible Inverter Brands : Goodwe, Ingeteam, SMA, Selectronic, Solaredge, SolarX, Solis, Sungrow, Victron, Viessmann, Western co - More brands to be added



400V

Models	RESU7H		RESU10H	
	Type-R	Type-C	Type-R	Type-C
Total Energy [kWh] ¹⁾	7.0		9.8	
Usable Energy [kWh] ²⁾	6.6		9.3	
Capacity [Ah]	63		63	
Voltage Range [V]	350-450	430-550	350-450	430-550
Dimension [W x H x D, In]	29.3 x 27.3 x 8.1	29.3 x 35.7 x 8.1	29.3 x 35.7 x 8.1	29.3 x 35.7 x 8.1
Weight [lb]	165	192	214	220
Enclosure Protection Rating	IP55			
Communication	RS485	CAN2.0B	RS485	CAN2.0B
Certificates	Cell	UL1642		
	Product	TUV (IEC 62619) / CE / FCC / RCM	TUV (IEC 62619) / CE / RCM	UL1973 / TUV (IEC 62619) / CE / FCC / RCM

1) Total Energy is measured at the initial stage of battery life under the condition as follows : Temperature 77°F

2) Usable Energy is based on battery cell only

• Noise Level : < 40dBA

Compatible Inverter Brands : Fronius, Huawei, SMA, Solaredge, Solis, Sungrow - More brands to be added

Telecom Backup Solution / Residential Pack



Models	M4863P3S	M48126P3S
Energy [kWh]	3.3	6.5
Capacity [Ah]	63	126
Nominal Voltage [V]	51.8	51.8
Voltage Range [V]	42.0-58.8	42.0-58.8
Dimension [W x H x D, In]	17.5 x 4.3 x 13.3	17.5 x 4.3 x 23.1
Weight [lb]	53	97



UPS Backup Solution

Models	UPS Rack		
	12P (6S2P)	10P	10P
	M7830P7B	M4864P6B	M48128P6B
Energy [kWh]	28.0	33.0	65.9
Continuous Power [kW]	250	115	132
Nominal Voltage [V]	466	515	515
Voltage Range [V]	397-523	420-588	420-588
Dimension [W x H x D, In]	20.5 x 90.2 x 19.7	23.6 x 78.7 x 25.6	23.6 x 78.7 x 31.5
Weight [lb]	1,058	860	1,378



Global Reference (Grid-scale)

LG Energy Solution has installed or been awarded over 14GWh of grid-scale projects since the launch of our ESS business.

> 14.8 GWh
(As of December 2020)

World-leading Grid-scale battery supplier with extensive experience and proven reference projects

* Cumulative amount of installed / awarded projects

