



# ESS

Product Catalogue



**E·SOLUTION**

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E-Solution Co., Ltd. | [e-solution.kr](http://e-solution.kr)

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# Our mission is to empower a sustainable future through smarter energy

E-Solution is a specialized manufacturer of high-safety lithium battery packs based on AI and ICT technologies. Aiming to advance the energy industry through lithium battery packs, supporting carbon neutrality, energy decentralization, and improved energy efficiency. the company directly develops and supplies battery packs for a wide range of sectors, including ESS, Mobility, and Industrial applications, firmly maintaining its leading position in the market. The lithium battery packs produced by E-Solution are built on advanced technologies and deliver top-tier quality and safety by obtaining KC 62619 (secondary battery safety certification) and NFPC 607 (fire extinguishing performance certification), reflecting internationally recognized technical standards.

## Total Sales Volume

**360** MWh

Proven expertise backed by accumulated performance Over 360 MWh of supply experience

## History

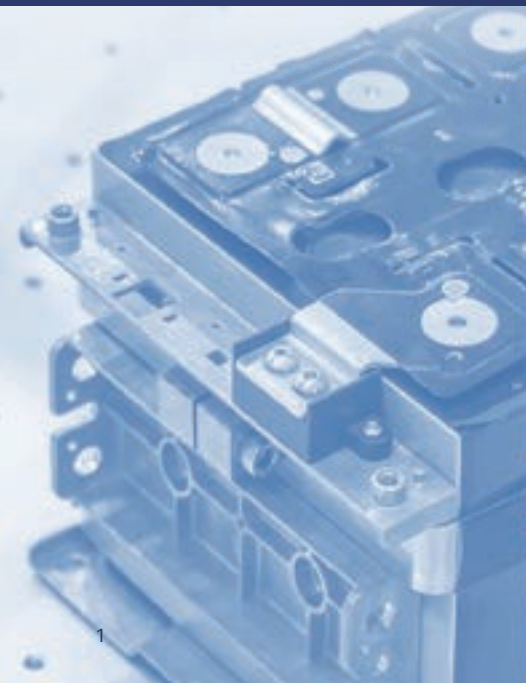
**12** Years

A journey built on one path  
Opening the future ahead

## R&D Investment

**10** Percent

Relentless innovation drives competitiveness Over 10% of revenue reinvested in R&D



# ESS

Beyond simple energy storage, it becomes a core infrastructure that powers future industries and cities.

Carbon Reduction



Efficiency & Cost Savings



Power Stability



## Leading Technology

1<sup>st</sup>

First in Korea to adopt industry leading ICT & AI technologies

## BMS Portfolio

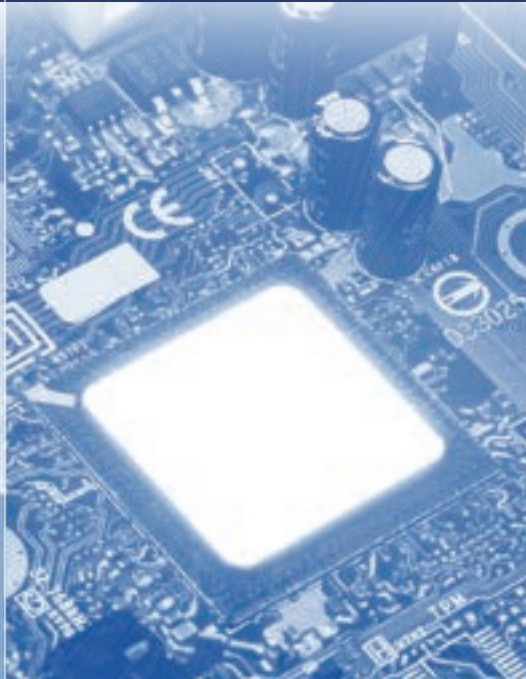
30<sub>EA~</sub>

In-house design and development capability for over 30 BMS models

## Competitiveness

1<sup>no.</sup>

Leading the industry with clear differentiation toward the future



# ESS, Mobility, and Industrial Applications Across Diverse Sectors



## ESS

#EV infra #Industrial  
#Renewable Energy #Energy

- Gyeonggi-do Future Energy Activation Project (4.816 MWh)
- LS Electric Shared ESS, etc. (2.064 MWh)
- LS Sauta ESS (0.459 MWh)
- Theham Energy ESS (0.344 MWh)
- Jeju Special Self-Governing Province Mobile ESS (0.23 MWh)
- Other PV ESS Projects (11.2 MWh)



## Forklift

#Mobility #Industrial  
#Logistics #Smart Factory

- OE Lithium Pack Supplier to Hyundai Site Solutions
- Hyundai Site Solutions Lithium Pack Development (2020)
- Joint Development with Korea Pallet Pool (2017)
- Clark Forklift Lithium Pack Development (2018)



## Golfcart

#Mobility #Smart Mobility  
#Electrification

- Supplied 22,000 Sets to 160+ Golf Courses (154 MWh)
- No.1 Market Share (Replacement Market)
- Apro Golf Cart LFP Battery Official Registration (2025)
- KIOTI Golf Cart OE Supply (2016–2017)
- Hitachi Golf Cart OE Supply (2020)
- Exported Golf Cart Lithium Packs (Japan, Philippines)



## PM

#Mobility #Personal Mobility  
#Smart Mobility

- Joint Dev. of Universal PM Lithium Pack with G-Bike
- Cumulative Sales: 3,500 Sets
- G-Bike Gen1 PM Lithium Pack Dev. (2023–2024)
- G-Bike Gen2 PM Lithium Pack Dev. (2025)
- G-Bike B2C E-Bike Lithium Pack Dev. (2025)



## E-Scooter

#Mobility #Personal Mobility  
#Smart Mobility

- "D" E-Scooter Lithium Pack Dev. (2024–2025)
- Standard Swappable Battery Pack Dev.
- Traction Battery Safety Test Passed (2025)
- KSR 6100 Certified (2026)



## DAS

#SystemIntegration #Industrial  
#HighCapacity #SmartGrid  
#Energy

- First Developer of Distribution Automation Lithium Pack
- 50,000 Sets Supplied (Cumulative)
- No.1 Market Share (as of 2025)
- Supplied to KEPCO HQ
- Supplied to 130+ KEPCO Branches
- Supplied to Major KEPCO Switchgear Makers



## KEPCO DAS

#Industrial #Energy  
#PowerGrid

- Joint Dev. with KEPCO KDN
- No.1 Market Share
- Supplied to KEPCO KDN
- 7,000 Sets (2017)
- 10,000 Sets (2018)
- 5,000 Sets (2019)



## AGV

#Mobility #Smart Factory

- Samsung Semiconductor AGV Pack — 4 Intl. Certs
- 1,000 Sets Supplied
- Key Customers: Hyundai, Samsung, SK hynix
- Customers: Hyundai Mipo, GM Daewoo, CJ, Canon etc.

# Achieved 360 MWh Lithium Battery Pack Deliveries (as of 2025)



## Vacuum Truck

#Mobility #Industrial  
#Electrification

- No.1 Market Share
- 3,000 Sets Supplied
- Indoor Electric Sweeper Lithium Battery Dev. (2015)
- Supplying to No.1 Company "Cleantec"
- Joint Dev. with Dongwoo TS, Gyebaek Motor, YJ Industry



## KTX

#Mobility #Industrial  
#Infra

- Joint Dev. of KTX Lithium Battery
- Supplying to Hyundai Rotem (Motrex)
- For VOD & Auxiliary Power
- AEC-Q Certified for Railway
- Passed 51 Reliability Tests



## Yakult cart

#Mobility  
#LifeIntegrated

- Joint Dev. of Korea Yakult Cart Lithium Pack (2024-2025)
- Passed Certified Tests
- Mass Production in 2026 (600 Sets Contract)



## Road Vehicle

#Mobility  
#Commercial Vehicle  
#High-Efficiency

- Road Electric Sweeper Lithium Pack Dev. (2020)
- Korea TS Safety Certified
- Passed Major Safety Tests
- Supplying to Cleantec Road Sweepers



## UPS

#Industrial #Energy  
#DataCenter

- Supplied to Ministry of National Defense (1,000 Sets)
- Supplied to KEPCO Substations
- Supplied to Commercial Enterprises



## SPV

#Mobility #Industrial  
#Smart Mobility

- Suseong Heavy Ind. AWP Lithium Pack Dev.
- Life Env. Machinery AWP Lithium Pack Dev.
- Suseong Sebotonic AWP Lithium Pack Dev.
- Mobile DST & Engia Connector Smart Pole Pack Dev.



## BMS

#Industrial  
#IoT #Stability  
#Energy

- BMS Mass Supply for Global Shipbuilder "A" (2026)
- BMS Dev. for Aerospace Research Institute (Drone)
- KEPCO KDN BMS Dev.
- KEPCO Distribution Automation BMS Dev.
- HKT BMS Dev. & Multiple Projects



## ETC

#Industrial #Mobility  
#Electrification  
#Energy

- Emergency Rescue Vehicle Lithium Pack
- Incheon Airport Ticketing Lithium Pack
- Sacheon Cable Car & Monorail Lithium Pack
- Tunnel Lighting Lithium Pack
- Drilling Rig Lithium Pack
- Refrigerated Truck Lithium Pack
- ATV Lithium Pack



### Utility ESS

Enhances operational efficiency and economic performance by stabilizing the grid, standardizing loads, regulating frequency, and supplying emergency power during power generation and transmission/distribution stages, thereby improving overall grid reliability.



### C&I ESS

Provides solutions that reduce electricity costs, improve operational stability, and relieve grid burden through peak shaving, load shifting, emergency power supply, and enhanced renewable energy utilization.



### Home ESS

Reduces electricity costs and strengthens energy independence and grid stability by utilizing self-generated power, load shifting, and securing backup power.



**Mobile ESS**

Provides reliable mobile power for disasters, emergency situations, outdoor events, EV charging, military, and special applications, improving operational efficiency while offering an alternative to diesel generators.



**Marine ESS**

Enhances eco-friendly vessel operation through hybrid propulsion and peak load support, reducing fuel consumption, noise, and vibration while improving overall operational stability.



**UPS ESS**

Ensures uninterrupted power supply and power quality management to secure data and operational stability, protect critical equipment, extend service life, and prevent economic losses from power interruptions.

# C&I ESS Configuration and Scalable Architecture

## 1. Battery Cluster

- NFPC607 Certification Obtained
- FSS (Fire Suppression System)
- 1,228V 280Ah 215kWh~344kWh
- Maximum Charge/Discharge Rate: 0.5P
- Liquid Cooling

## 2. Liquid Cooling/Heating System

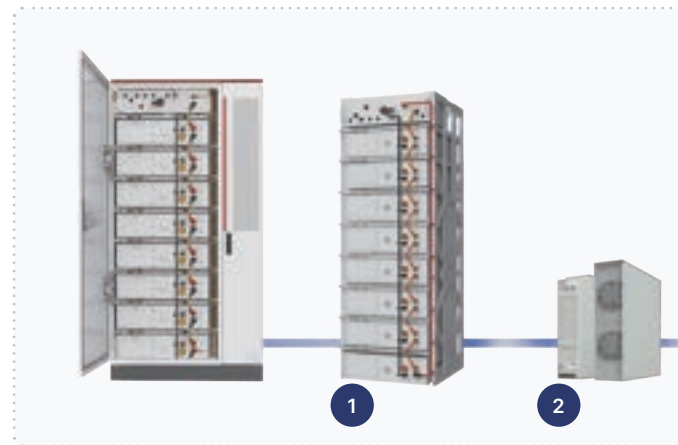
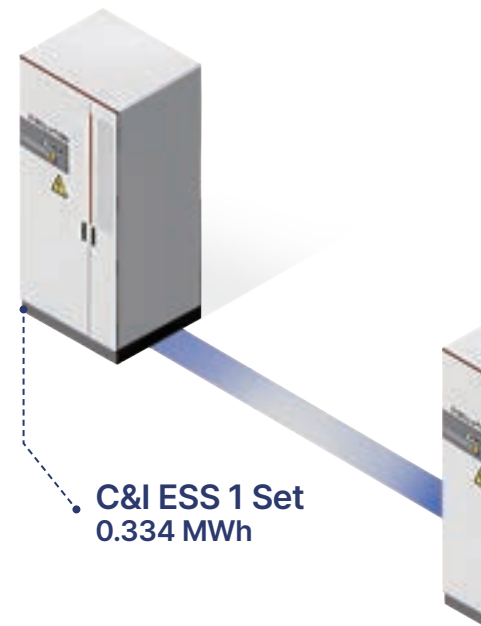
- 8kW Cooling Performance
- 2.5kW Heating Performance
- Stable Coolant
- Wide Operating Temperature Range (-30~60°C)
- Efficient Thermal Management
- Maximized System Lifespan, Performance, Safety
- Excellent Heat Dissipation & Uniform Temperature
- Improved Energy Efficiency & Cost Effectiveness

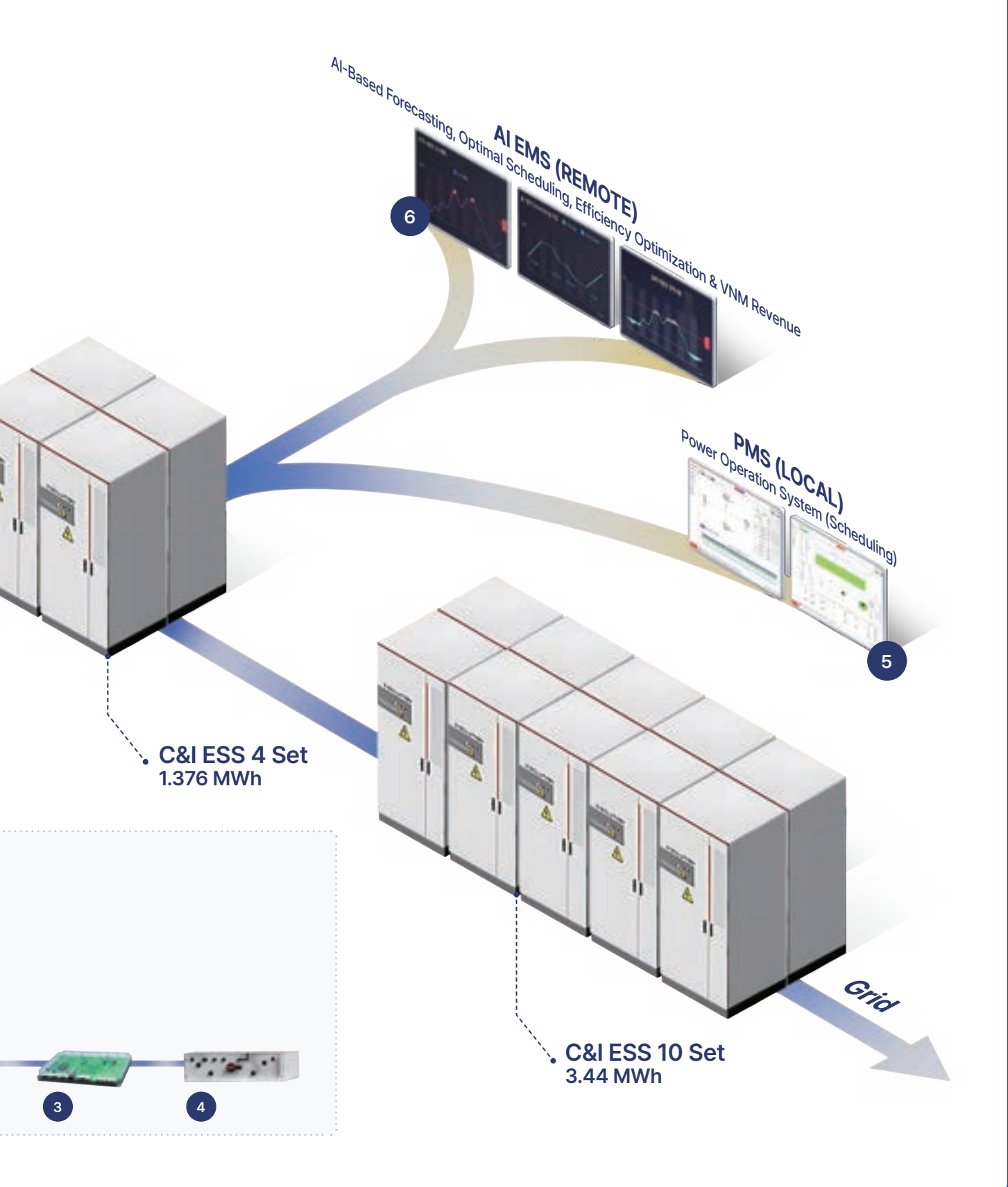
## 3. BMS HW & FW

- Dual Safety Control for ESS System
- KC62619 Functional Safety Design Applied
- Module & Rack BMS
- SoX Accuracy:  $\pm 1.5\%$
- Cell Balancing

## 4. High Voltage Box

- High Voltage Box
- System BMS
- Built-in MCCB & Fuse Safety Solution
- Abnormal Detection & Accident Prevention
- Efficient Operation via Data Communication





### 5. PMS Power Management System

- ESS & Site-Level Control
- Multi-Level Monitoring, Control & Configuration
- Independent & Distributed Operation via AMP
- Integrated ESS Site Management
- AI-Based Integrated Optimization

### 6. AI EMS AI Energy Management System

- AI-Based Charge/Discharge Optimization
- Maximized Economic Efficiency & Profitability
- Integrated ESS Demand Monitoring
- Peak Power Demand Reduction
- Revenue Generation via Virtual Power Plant (VPP)

# C&I ESS

Secured scalability and installation flexibility through a modular design architecture, and achieved long-term reliability and strengthened energy independence by enhancing environmental durability, safety, and maintainability to support diverse industrial environments.

## Powering industries with precision.

Reliable. Scalable. Always on.



### Scalability

-

Standardized modular design enables easy cabinet parallelization and flexible capacity scaling based on operating conditions and load demand



### Longer Lifespan

-

Long-life LFP cells combined with optimized thermal management and BMS technology ensure extended lifespan and stable long-term performance



### Modularity

-

Manufactured in standardized module or cabinet units for easy installation and transportation, enabling adaptability to diverse project environments



### Flexibility

-

Wide voltage range support enables compatibility with various load types, including buildings and industrial facilities



### Reliability

Reliability

-

Operational stability ensured through multi-layer safety design, including overvoltage and overcurrent protection, fire suppression, and insulation monitoring



### Maintainability

Maintainability

-

Easy module-level access combined with real-time monitoring and remote control enables efficient condition diagnostics and inspection



### Efficiency

Efficiency

-

Contributes to corporate energy cost reduction and efficiency improvement through peak shaving, load balancing, and self-consumption optimization



### Versatility

Versatility

-

Suitable for medium- and large-scale facilities (commercial, industrial, logistics, healthcare) and for microgrid and renewable energy integration\*\*

## 1 | Next-Generation Li Cell Applied

High-capacity, high-density 280Ah cell applied to Cell/Module/Pack, delivering up to 344kWh of energy for extended runtime.

## 2 | Long Lifespan

Long-life system achieved through LFP cells, thermal management system, and optimized BMS integration.

## 3 | Outstanding Safety & Durability

High safety, durability ensured through multi-layer protection, including LFP chemistry, dust protection, safety valve, MSD interlock

## 4 | Flexible Configuration & Scalability

48S1P module configurable from 5S to 8S to support a wide voltage range. System scalability secured through parallel connection (up to max. 3.44MWh).

## 5 | Efficient Management & Maintenance

Effective battery temperature control via liquid cooling system and design optimized for easy maintenance.



## Modular & Scalable ESS System

항목	1 SET (BASIC)	4 SET	8 SET	10 SET
Expansion Schematic				
Configuration	1P384S x 1	1P384S x 4	1P384S x 8	1P384S x 10
Rated Energy [kWh]	344	1,376	2,752	3,440
Dimension [WDH, mm]	1,300 X 1,300 X 2,300	2600 X 2600 X 2300	5200 X 2600 X 2300	6500 X 2600 X 2300
Weight [kg]	3,400	13,600	27,200	34,000
Capacity [Ah]	280	1,120	2,240	2,800
Battery Cell [V]	LFP / 2.8~3.6V			
Battery Voltage Range [V]	1,075.2~1,382.4			
Thermal Management	Liquid Cooling			
Operation Temp [°C]	0~55			
IP LEVEL	IP66			

# Utility ESS

A utility-scale energy storage system deployed in large national power infrastructures—such as power plants, utilities, and transmission networks—to secure stable and efficient power supply and demand, while supporting grid-wide stabilization and renewable energy integration.

## Grid-Scale Power Stabilization



Maintains supply–demand balance through peak-time discharge and off-peak charging, providing frequency regulation and ancillary grid services.

## Renewable Energy Integration



Absorbs variability from solar and wind → output smoothing. Charges during surplus generation and discharges during shortages to ensure output stability.

## High-Capacity Storage Capability



Expandable from MWh to GWh at container scale, serving as an energy storage and supply hub for large power plants and national grids.

## Improved Economics



Enables peak-time power sales to capture price differentials, reducing operating costs and generating additional revenue for utilities and power producers.

## Power Quality Enhancement



Stabilizes voltage and frequency fluctuations and supports black start capability.

## Scalable & Modular Design



Modularized in 10ft and 20ft container units, enabling rapid deployment and easy maintenance through standardized package configuration.

## Enhanced Safety & Reliability



Liquid cooling ensures temperature uniformity even in large-scale operation. Applicable to global projects with international certifications. (UL9540/9540A, IEC62619)




## Sustainability & Policy Alignment



Aligned with RE100, Net Zero, and distributed energy policies, making it a critical infrastructure for utilities, governments, and large industrial complexes.

# Utility ESS



Product Image			
Capacity [MWh]	3.44	4.0	5.0
Battery Cell [Ah]	280	306	314
Configuration	10 * 1P 384S	10 * 1P 416S	12P * 416S
Battery Voltage Range [V]	1,075.2 ~ 1,382.4	1,164.8 ~ 1,497.6	1,164.8 ~ 1,497.6
Thermal Management	Liquid Cooling		
Dimension [WxDxH, mm]	20HC 6,058 × 2,438 × 2,896		
Weight [t]	약 35	약 37	약 45
Operation Temp [°C]	-30 ~ 55		
IP LEVEL	IP55		

Product Features	
<b>High-Capacity Storage</b>	3MWh~5MWh ESS / 20ft
<b>High-Voltage Platform</b>	Voltage range 1,075~1,498V, improved transmission efficiency, enhanced PCS conversion efficiency
<b>Liquid Cooling System</b>	Extended lifespan and enhanced stability in both high- and low-temperature environments
<b>International Certification</b>	Compliant with UL9540/9540A, IEC62619, UL1973 & applicable to domestic and global projects
<b>Modular Design</b>	20ft ISO container design for easy transport, installation; modular for easy maintenance, expansion
<b>Safety Mechanism</b>	Integrated BMS, thermal, fire control with real-time cell monitoring, automatic fault shutdown

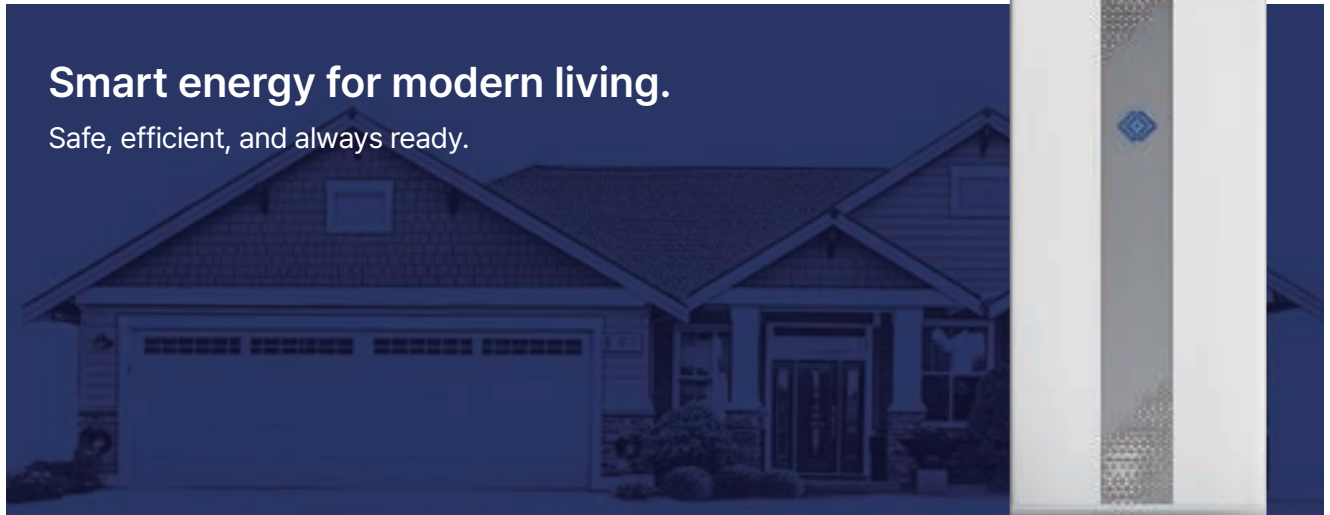


# HOME ESS

A residential energy storage system that stores eco-friendly renewable energy such as solar and wind power, or low-cost off-peak electricity, and uses it when needed to improve power utilization efficiency and ensure stable power supply.

## Smart energy for modern living.

Safe, efficient, and always ready.



### Design

Simple, compact design with a Lightning logo for real-time battery status monitoring.

### Safety

15 kWh KC 62619-certified product featuring multi-channel sensing with dual safety cutoff and full-cell temperature monitoring.

### Scalability

Selectable capacity from 5–15 kWh with support for multiple communication protocols including CAN, TCP/IP, and RS-232/485.

### Maintainability

Real-time data logging to SD memory with battery status monitoring and real-time diagnostics via dedicated GUI and LCD.

## Product Specialty

- KC 62619 certification obtained (2024)
- Residential ESS product launched (2022)
- Li-Battery + EMS + PV integrated system development (2022)
- 1Stable output via 10 kWh (2P) / 15 kWh (3P) design
- Secured fire safety through three-stage safety design
- Battery data monitoring and measurement functions
- Eco-friendly product(reduced greenhouse gas emissions)
- Long lifespan (2,000–3,000 cycles)
- Excellent fire safety with LFP battery
- Wide-range temperature performance
- Real-time monitoring via HMI





### Applications & Use Cases

<b>Renewable Energy Integration</b>	Improves efficiency and supply stability with solar/wind
<b>Home Power Optimization</b>	Higher self-consumption and electricity cost savings
<b>Self-Sufficient Power Grid</b>	Stable power in remote or weak-grid areas
<b>Backup Power (UPS)</b>	Reliable emergency power during outages

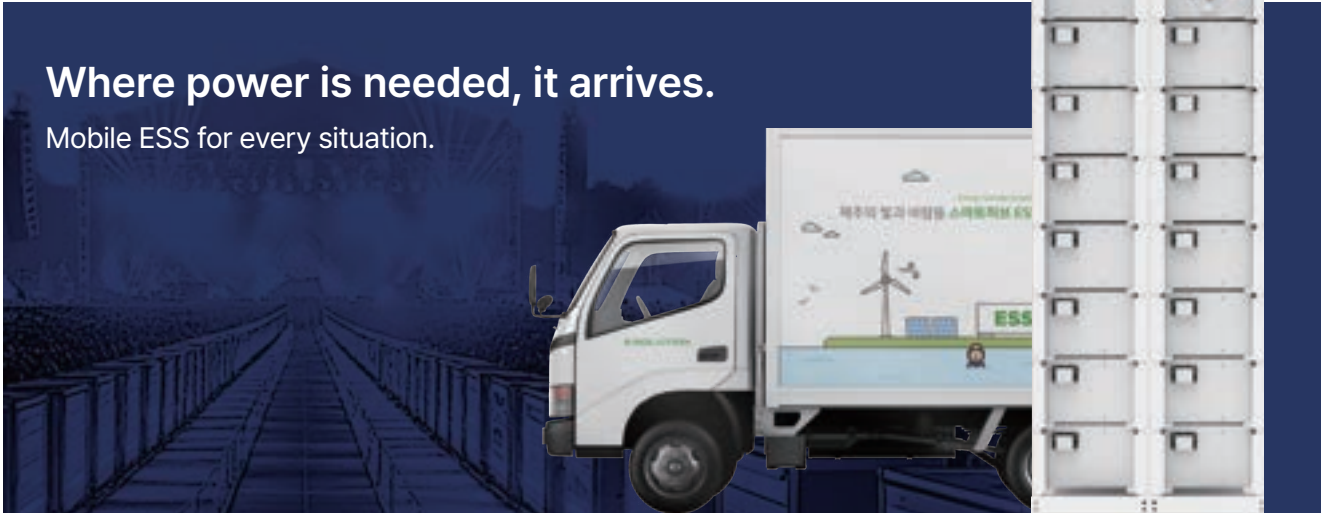
Model		HESS051A	HESS102A	HESS154A
ESS	Capacity [Ah]	100Ah	200Ah	300Ah
	Battery Cell	LFP / 3.2V	LFP / 3.2V	LFP / 3.2V
	Configuration	1P16S	2P16S	3P16S
	Rated Energy [kWh]	5.12	10.24	15.36
	Voltage Range [V]	44.96~55.36	44.96~55.36	44.96~55.36
	Thermal Management	Air cooling	Air cooling	Air cooling
	Dimension [WDH, mm]	680×425×1430	680×425×1430	680×425×1430
	Weight [kg]	About 100	About 135	About 165
Features	OV / OC / OT / Short-Circuit Protection, Circuit Breaker, Power Switch, Status LED, CAN 2.0A, TCP/IP, GUI LCD			

# Mobile ESS

A mobile power supply system that delivers electricity directly where needed, supporting EV emergency charging, outdoor event power, backup power during outages, temporary construction site supply, and disaster response operations.

## Where power is needed, it arrives.

Mobile ESS for every situation.



### Reliability

-

Structural safety based on compliance with domestic safety standards and KC 62619 certification, with fire-suppression and vibration-free design applied.

### Scalability

-

Standard ESS module platform applicable across various fields, supporting low- to high-power solutions and multi-channel communication protocols.

### Convenience

-

User-friendly system with real-time monitoring and remote power management via dedicated GUI and LCD.

### Maintainability

-

Real-time data logging (SD memory storage) with easy battery status diagnostics and management.



## Product Specialty

- Mobile ESS core technology developed (2021)
- Enhanced output stability with 2P structure design
- High safety ensured with three-stage protection system
- IP55 protection rating applied
- Battery data monitoring and measurement functions
- Eco-friendly product(reduced greenhouse gas emissions)
- CAN 2.0 communication supported
- Long lifespan (2,000–3,000 cycles)



## Applications & Use Cases

<b>Eco-Friendly</b>	Equipment replacement for carbon regulation compliance, utilization of clean power.
<b>Emergency Power Supply</b>	Power support in disaster areas, EV emergency charging, backup power supply.
<b>Temporary Power</b>	Stable event power and generator replacement
<b>Smart Grid</b>	Cost savings via peak shaving and microgrid deployment

Model		M768M	Model		B768M
Module	Product Image		BPU	Product Image	
	Capacity [Ah]	150		Dimension [WDH, mm]	1570×450×242
	Battery Cell	LFP / 3.2V		Weight [kg]	About 25
	Configuration	1P16S		Features	OV / OC / OT / Short-Circuit Protection, Main Circuit Breaker, Power Switch, Status LED, CAN 2.0A, TCP/IP
	Rated Energy [kWh]	7.68			
	Voltage Range [V]	44.96~55.36			
	Dimension [WDH, mm]	570×450×242			
	Weight [kg]	About 72			

Model		ESS1152M	ESS2304M
ESS	Product Image		
	Capacity [Ah]	150	300
	Battery Cell	LFP / 3.2V	LFP / 3.2V
	Configuration	M768M 15S + B768M	ESS1152M 2P
	Rated Energy [kWh]	115.2	230.4
	Voltage Range [V]	674.4~830.4	674.4~830.4
	Thermal Management	Air Cooling	Air Cooling
	Dimension [WDH, mm]	1390×606.4×1668.4	2780×606.4×1668.4
	Weight [kg]	About 1,255	About 2,510

# Marine ESS

A system that provides stable and eco-friendly power across various maritime operating environments, including zero-emission shore power during port berthing, auxiliary propulsion support, improved fuel efficiency, emergency backup during outages, and compliance with environmental regulations.

## Engineered for the Demanding Seas.

Delivering Safety, Stability, and Endurance.



### Eco-friendliness

-

Based on non-toxic materials, offering excellent eco-friendliness and recyclability (LFP, Lithium Iron Phosphate).

### Stability

-

Minimized output fluctuations and stable power supply under diverse operating conditions.

### Safety

-

Stable chemical properties and long lifespan ensure long-term reliability, while low thermal runaway risk minimizes explosion and fire hazards.

### Low Noise

-

Reduces engine dependency to enable quieter operation and delivers stable performance even in low-temperature conditions.

## Product Specialty

- KR classification design applied certification obtained (2025)
- Power supply during vessel operation
- Superior CO<sub>2</sub> reduction effect compared to diesel engines
- Protection functions through BMS
- Application of international-standard insulation system





### Applications & Use Cases

<b>Eco-Friendly Operation</b>	IMO environmental compliance enabling emission and carbon reduction.
<b>Fuel Efficiency Optimization</b>	Reduces fuel use and operating costs via parallel generator operation.
<b>Zero-Emission Power Supply</b>	Supplies onboard power during berthing, minimizing noise and emissions.
<b>Emergency Power</b>	Provides stable power for critical loads during outages or generator failure.
<b>Electric Propulsion Support</b>	Supports propulsion motors and enables expansion to fully electric vessels.

Model		SV614230G	VS358210D
ESS	Capacity [Ah]	230Ah	210Ah
	Battery Cell	LFP / 3.2V	LFP / 3.2V
	Configuration	1P192S	2P112S
	Rated Energy [kWh]	141.3	75.3
	Voltage Range [V]	539.52~664.32	314.72~387.52
	Thermal Management	Air Cooling	Air Cooling
	Dimension [WDH, mm]	1450×732×1360	1432×1170×517
	Weight [kg]	About 1290	About 820
	Operation Temp [°C]	-30 ~ 65	-20 ~ 60
	IP LEVEL	IP55	IP55

An aerial photograph of a green field. In the upper left, there is a small solar panel array. In the center, there is a larger, rectangular solar panel array. To the right of the solar panels, there is a road with several cars. The background is a dark blue sky.

**E·SOLUTION**

**Distant green,  
with carbon neutrality  
realized up close**

**The Carbon-Neutral Blue Tomorrow Powered by E-Solution**

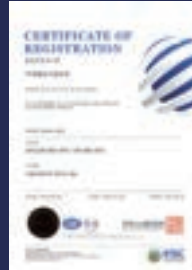
## Certifications and Listing Status



Venture Business Certificate



ISO 14001 Certification



ISO 9001 Certification



Corporate R&D Center



Inno-Biz Technology Innovation SME Certification



Main-Biz Management Innovation SME Certification



Materials & Components Equipment Specialist Confirmation



NFT(P)C 607 Fire Certification



KC62619 Safety Certification



Talent-Fostering SME Designation



KEPCO Expert Committee Appointment



Daejeon Distribution SME Certification

## Total Solution Partnership

Through Korea's top-tier ESS specialist, we deliver a total solution from purchase to O&M.

<b>E·SOLUTION</b>	<b>LS ELECTRIC</b>
<b>CHUNGWOO ELECTRIC MANAGER</b>	<b>dots energy</b>





**2026 E-SOLUTION ESS Vol.2**

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