

A Proven Provider of Energy Storage Solutions



Pioneers in
Energy Storage.
Leaders in
Innovation.



About LS Energy Solutions

LS Energy Solutions, an LS Group company, is a leading provider of grid-connected energy storage solutions. The company brings over a decade of experience innovating energy storage and related technologies, from the first grid-connected lithium-ion storage system and to now having more than 1.5 GW and 2.6 GWh deployed across 300 projects. The company offers a flexible range of all-in-one energy storage and power electronics systems for both front-of and behind-the-meter applications, supported by an advanced global manufacturing and testing infrastructure. LS Energy Solutions is a convenient and competitive one-stop supplier for energy storage, from advanced inverters and associated components to fully integrated all-in-one systems. For more information visit www.ls-es.com.

+
1.5 GW,
2.6 GWh
Storage systems

+
300
Successfully deployed
projects

+
>15
Number of integrated
storage technologies

+
2008
In business since

+
40
Successfully delivered
all-in-one systems

+
14
Use cases
implemented

Part of bankable \$25B LS group

LS Energy Solutions, formerly known as the Energy Grid Tie Division of Parker Hannifin, was acquired by LS ELECTRIC in 2018, and is now part of the \$25 billion-strong LS Group. Both LS Energy Solutions and LS ELECTRIC have extensive experience in energy storage and related technologies.



Our Experience. Your Confidence.

History of accomplishment

LS Energy Solutions has 15 years of experience in energy storage with over 300 deployed projects and 1.5GW and 2.6GWh of installed equipment globally. Our expertise covers a wide range of storage technologies such as advanced Li-ion and flow batteries, ultracapacitors, fuel cells, flywheels, and more. We can provide an optimized energy storage solution for any energy storage application you have, for front of meter applications up to 100s of megawatt-hours. We can also provide advanced inverters for behind the meter applications, scalable at 150-kVA increments.



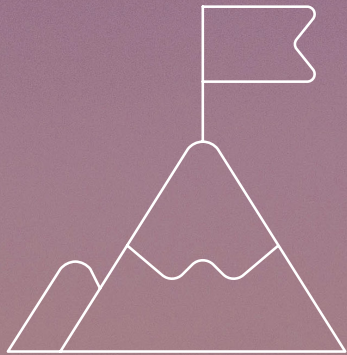
WV, 32MW/8MWh



Chile, 20MW/6.3MWh



OH, 6MW/2MWh



PA, 18MW/9MWh



CA, 37.5 MW/150MWh

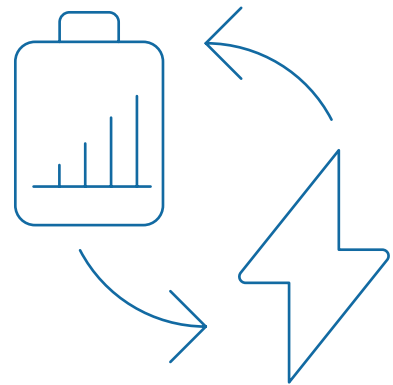


TX, 10MW/15MWh

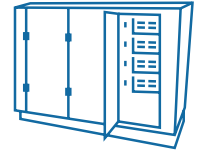
LS Energy Solutions is your ideal partner

Are you looking to partner with a systems integration expert that can provide you a complete and integrated energy storage solution? Or are you looking for advanced energy storage system components for your own integration? Either way, LS Energy Solutions is your ideal partner.

Combining LS Energy Solutions' advanced energy storage power-conversion systems (PCS), software, and integration capabilities with LS ELECTRIC balance of system (BOS) components like switchgear, circuit breakers, and contactors makes LS Energy Solutions a convenient and cost effective one-stop shop for your energy storage system needs. Our standard product and solutions offerings include fully integrated all-in-one AiON AC energy storage solutions and services, and AiON-SIS bidirectional string inverters.







AiON-SIS string inverters

AiON-SIS is our third generation bidirectional string inverter for energy storage and the fundamental building block of our integrated storage systems.

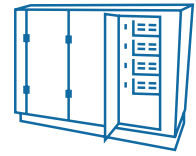
With industry-leading power density, the AiON-SIS inverter offers the patented ability to parallel the inverter on both AC and DC sides, making it easy to configure multiple inverters into larger units up to 3MVA. The AiON-SIS can operate from 620 VDC up to 1500 VDC, making it compatible with most current and future energy storage technologies.

Air-cooled, the AiON-SIS can operate in environments up to 55°C/131°F (with derating), making it suitable for most applications. The AiON-SIS also features optional grid-forming capability making it suitable for use in microgrid, backup power, and resiliency applications.

The modular AiON-SIS architecture comes with multiple advantages:

- + Enables right-sizing of inverter systems to optimally match power requirements by paralleling multiple, independent 140kVA string inverters
- + Enhances safety and reduces cost with reduced short-circuit currents due to dividing the DC bus into multiple manageable DC busses
- + Enables energy and power augmentation options – AiON-SIS-based systems can be configured into multiple DC busses, which opens opportunities for flexibility and expansion
- + Improves system availability through smaller inverter sizing and through ability to create smaller, independent strings of batteries and inverters on separate DC busses
- + Optional grid-forming capability makes the AiON-SIS suitable for multiple applications including microgrid





AiON-ESS

The AiON-ESS all-in-one integrated system is a flexible, modular AC energy storage solution for 1-hour and 2- to 6-hour applications. Both models incorporate our third-generation string inverters, together with Tier-1 energy focused batteries in a single, scalable enclosure, enabling configurations of any size for almost any application. AiON integrated solution is available with NMC and LFP chemistries. The fully integrated, containerized system reduces upfront capital outlay and saves on site installation work.

- + **Modular Architecture** – The enclosure design houses battery racks, power conversion systems, and controls in separate compartments, each with its own protection system for maximum safety and reliability.
- + **Thermal Management** – Each system includes superior thermal management, including properly sized HVAC and liquid-cooled systems and sufficient ducting.
- + **Designed for Safety** – The equipment environment includes features to ensure the safety of technicians, first responders, and other on-site personnel.
- + **Fleet Controller** – Each system includes an energy management system (EMS) for intelligent control of energy storage and renewable energy assets.
- + **AC Augmentation** – Our all-in-one systems can be simply augmented by adding new enclosures over time. This reduces augmentation time and maintains project power capacity.

AiON-ESS Power Series

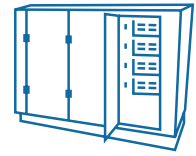
The AiON-ESS Power Series all-in-one integrated system is a flexible, modular AC energy storage solution for 1-hour applications.

AiON-ESS Energy Series

The AiON-ESS Energy Series all-in-one integrated system is a flexible, modular AC energy storage solution for 2- to 6-hour applications.

AiON modular design can be leveraged to provide all-in-one integrated AC energy storage in different container dimensions, including standard container sizes.





AiON-ESS on site

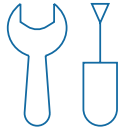


Top and left:
4.99 MW / 10 MWh project in Vermont.

Bottom left:
AiON-ESS following final assembly in North Carolina.

Bottom right:
14 MW/14 MWh site in New Jersey.





Service

Backed by decades of industry experience, LS Energy Solutions aftermarket and service teams support projects for all your aftermarket and service-related needs. Whether the need is training, commissioning assistance, preventative maintenance service, spare part and warranty support, or remote diagnostics and troubleshooting, our experienced personnel are ready to lend a qualified hand. LS Energy Solutions is always available to support our customers and offer easy-to-reach global technical support.



Safety by design

Product and system safety is always first at LS Energy Solutions. Our products are tested and certified to stringent conditions, including IEEE1547, UL1741-SA, and UL9540. Confidence in the safety of your energy storage system is our most basic commitment to you. Our focus on system safety begins in the design phase of your project. The design plan includes electrical safety measures, review of interior and exterior environment conditions, site readiness, monitoring and controls, as well as active countermeasures for fire suppression.

Our designs follow the most current standards of the National Fire Protection Association and the best practices of the American Clean Power Association. During integration activities, all system elements are confirmed for proper certification and tested to meet the applicable project requirements.

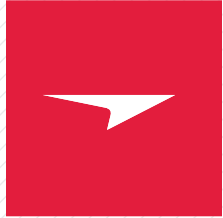
LS Energy Solutions delivers equipment designed to detect unsafe conditions and stop a fire if it should occur.

Applications

Our AiON based solutions are suitable for front of the meter grid scale applications:

- + Microgrid and Back up power
- + Black Start
- + Ability to transfer from Grid Following to Forming and back
- + Frequency regulation and ancillary services
- + Peak shaving
- + Solar + storage
- + ... and more





Contact LS Energy
Solutions today.

LS Energy Solutions
PIONEERING THE FUTURE OF ENERGY STORAGE

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