

CLEANEST, LOWEST COST LONG-DURATION STORAGE WITH NO CAPACITY DEGRADATION

ENERGY STORAGE FOR CRITICAL PROJECTS

Utilizing earth-abundant iron, salt and water for its electrolyte, and simple materials for battery components, the Energy Warehouse™ (EW) from ESS Inc. is a durable, environmentally safe, long-duration storage solution that is ideally suited for:

- Time-shifting renewable energy on a daily basis.
- Managing a facility's demand or TOU charges.
- Smoothing the intermittency of renewables on a constrained grid.
- Increasing resiliency and fuel efficiency for remote locations.

The EW has a lifespan that exceeds 20,000 cycles, low maintenance requirements, and an energy capacity of 4+ hours. It is complementary to the 25-year life span of solar and wind projects, and supports those applications' low levelized cost of energy requirements.

Concurrent with serving these applications, the EW's inherent quick-response power electronics can perform ancillary services such as voltage and frequency support on microgrids and utility-scale applications.

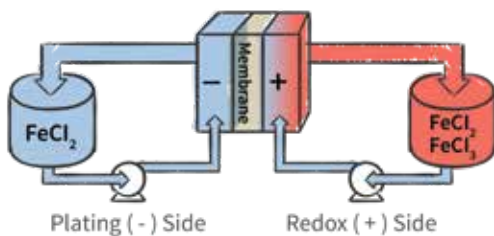
TECHNOLOGY

ESS Inc.'s all-iron redox (reduction-oxidation) flow battery technology is based on the simplicity of the electrochemical ferrous/iron plating reaction on the negative side and the ferrous/ferric redox reaction on the battery's positive side.

The EW is a flexible long-duration energy storage system that safely and effectively addresses the broadest range of energy and power applications at a lower Levelized Cost of Storage (LCOS) than other technologies on the market.

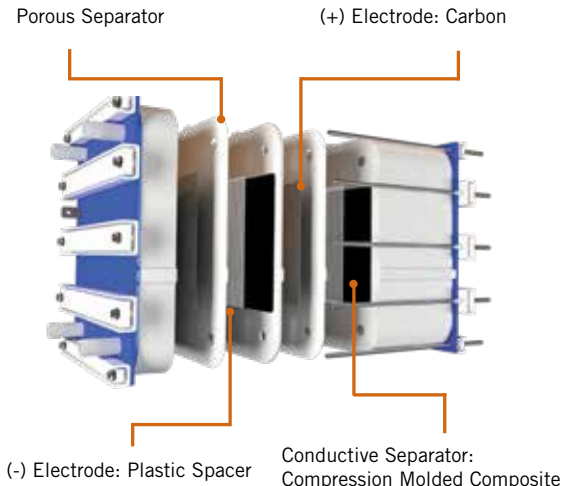
LIMITLESS CYCLING

The ESS team has cracked the code on this simple, yet elegant all-iron electrochemistry. The firm's patented electrode design and control system allow the battery to operate at high efficiency over literally an unlimited number of deep charge and discharge cycles, with no degradation or capacity fade over a 20+ year operating life with minimal annual operations & maintenance (O&M).



With the same electrolyte running on both the negative and positive sides, there is no cross contamination.

IDEAL FOR MULTIPLE USE CASES



Unlike typical batteries that are packaged as fixed cells or modules, a flow battery allows the power (the rate of electricity flow) to be decoupled from the capacity (the total amount of energy held). As a result, users have the flexibility to use the battery for a variety of use cases simultaneously on a project.

FEATURES AND BENEFITS

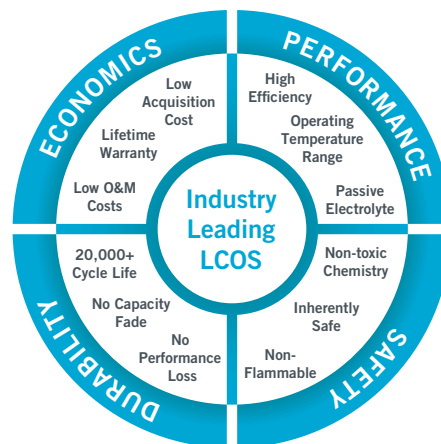
- Cost-effective, made of Earth's basic elements.
- Environmentally safe, non-toxic electrolyte – non-flammable – no corrosive acids – no hazardous materials – no noxious fumes.
- Long-duration storage (4+ hours) for renewable shifting and demand charge reduction.
- Provides flexibility for power and energy use cases.
- Long life, >20,000 cycles, low maintenance.
- Transports preassembled anywhere worldwide in a 40' long by 9'6" high customized shipping container.
- Separate containers can be stacked to conserve space.
- Can be shipped in dry state and hydrated onsite.

50kW/400kWh Energy Warehouse™

SPECIFICATIONS

FEATURE	DATA	NOTES
Electrical		
Power	50 kW (AC)	
Energy Capacity	400 kWh	100% available
AC Interface	480 VAC, 3-phase	
Communications	Remote Monitoring 3rd Party Data/control	Proprietary interface Modbus interface
Mechanical		
Enclosed ISO Container Dimensions	40'L x 8'W x 9' 6"H	Turnkey AC system
Weight (Dry)	12,700 kg	
Weight (Wet)	33,200 kg	
Environmental		
Battery	Recyclable components	
Electrolyte	FeCl ₂ , KCl, H ₂ O	Non-flammable, non-corrosive
Ambient Temperature	-5°C to +50°C	Can extend range with active temperature control
Warranty	Comprehensive 20-Year	With continuous extended Service Agreement
Certification	NRTL Field Certification UL	Meets AHJ requirements Pending
Performance		
Cycle Life	>20,000 cycles	
AC/AC Peak Roundtrip Efficiency	>70%	
Response Time	Full power in <1 sec.	From standby, inverter limited

LOWEST LEVELIZED COST OF STORAGE



Long-duration storage improves project economics, serving multiple energy and power use cases over project's long life span.



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