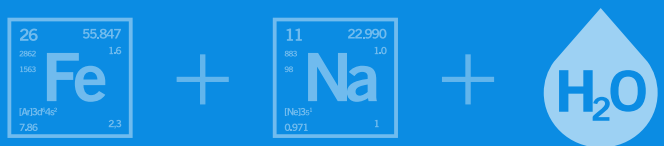
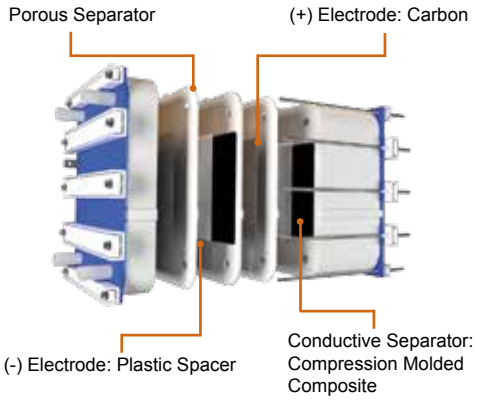
ESS INC
ENERGY STORAGE SYSTEMS

JUST ADD **WATER...**

...For the most reliable, flexible, and safe long-duration energy storage



OUR NON-CORROSIVE ELECTROLYTE ENABLES THE USE OF PLENTIFUL AND EXTREMELY COST-EFFECTIVE MATERIALS, COMBINED WITH AN INNOVATIVE CELL DESIGN THAT DRAMATICALLY INCREASES POWER DENSITY, RESULTING IN A SIGNIFICANTLY LOWER COST POWER STACK AND GREATLY REDUCED ANNUAL O&M OVER THE 20+ YEAR LIFE OF THE SYSTEM.



Energy Storage Systems (ESS, Inc.) was launched in 2011 by a team with deep experience in fuel cells, electrochemistry, advanced material science and renewable energy. After five years of intensive innovation, engineering development and rigorous validation, backed by ARPA-E and others, the company began shipping turn-key battery solutions in 2016. Most recently, ESS has announced the integration of its proprietary and patented all-iron electrolyte into the breakthrough 50kW/400kWh Iron Flow Battery (IFB) system.

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.

IDEAL FOR ADVANCED MICROGRID APPLICATIONS

An ESS IFB is operating as part of an advanced micro-grid at Stone Edge Farm, Sonoma, CA. The system was easily sited in an environmentally sensitive area, given its small footprint and non-toxic, non-flammable chemistry.

THE MOST SUSTAINABLE LONG-DURATION ENERGY STORAGE CAPACITY AT THE LOWEST LCOS

- Safe and non-toxic
- Operationally flexible long-duration storage solution enables the broadest range of power and energy applications
- Robust 20+ year operating life
- Capable of simultaneously delivering high-power and long-duration energy services
- Lowest levelized cost of storage (LCOS) delivers superior financial returns
- Highest performance with no degradation in output (capacity, power or efficiency)
- Made in the USA

LONG DURATION COMMERCIAL & UTILITY SCALE ENERGY STORAGE APPLICATIONS

	FLYWHEELS	LEAD ACID BATTERIES	LIION BATTERIES	TRAD. FLOW BATTERIES	ESS IRON FLOW BATTERY
COST	●	●	◒	◒	●
ENERGY DENSITY	●	○	●	○	○
ENERGY CAPACITY	○	○	◒	◒	●
INSTALLATION	○	○	◒	◒	●
CYCLE LIFE	●	○	○	●	●
DEPTH OF DISCHARGE	◒	○	●	●	●
O&M	◒	○	◒	◒	◒
RESPONSE	●	◒	◒	●	●
ENVIRONMENT	●	○	○	◒	●

The ESS IFB provides 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.

Customers and applications ideally suited for the ESS long-duration IFB solution:

UTILITY

Integrating higher concentrations of renewable energy and resilient microgrids (off-grid or grid connected)

The ESS long-duration IFB solution allows utilities and microgrids to deploy a single battery system capable of handling short-duration high-power applications or high-capacity, long- duration applications with access to the full capacity of the battery (100% depth of discharge) multiple times per day over a greater than 20-year operating life.

USE CASES

- Renewables integration
- Demand response
- Ancillary services
- Capacity reserve
- Transmission and distribution deferral

COMMERCIAL & INDUSTRIAL

Minimize operating expense and improve the bottom line.

Whether it's managing the self-supply of intermittent solar or wind, maximizing savings from existing utility tariffs for demand charges and TOU rates, or ensuring a facility's energy security from grid outages, an economical, long-duration energy storage solution puts the power to control your energy cost back in your hands. What's good for your electric bill and the planet is also good business.

USE CASES

- Behind-the-meter renewable energy time shifting
- Demand charge management
- TOU tariff arbitrage
- Energy security
- Utility ancillary services (where allowed)

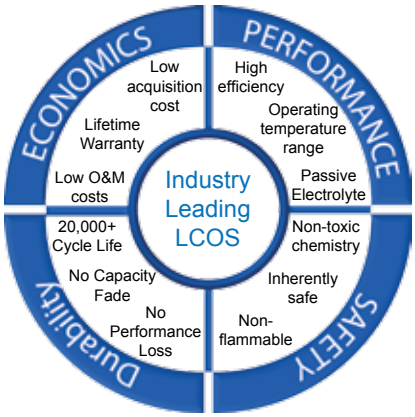
MILITARY

Light-weight, resilient, flexible power for forward operating bases

Reducing the amount of fuel required in remote deployments, and the resulting logistics trail, is critical to the military mission. The ESS IFB is microgrid-ready for syncing with existing generators and enabling the use of solar and wind for baseload power. The IFB can be forward deployed in a dry state, making it 70% lighter than other flow and traditional batteries.

USE CASES

- Silent watch with power
- Baseload power, when coupled with RE
- Load following remote grid
- Operate generators at peak efficiency

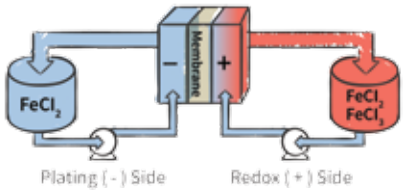


WHY YOU NEED LONG-DURATION STORAGE

The value of long-duration (> 6 hours) energy storage is increasingly recognized by regulators, utilities, and industry experts for its flexibility in addressing multiple energy use cases with a single energy storage asset.

Long-duration storage improves project economics (LCOS) by enabling the ability to serve multiple energy and power use cases.

LIMITLESS CYCLING



The same electrolyte on both sides eliminates cross contamination.

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

ABOUT ESS

ESS Inc. was founded in 2011 to manufacture a cost-effective, reliable, and environmentally friendly All-Iron Flow Battery (IFB) that expands the use of renewables. Incorporating abundant, low cost and non-toxic materials into our system design, enables us to offer one of the lowest installed cost/kWh storage systems on the market.

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