

FLEXIBLE, SAFE AND LOW-COST UTILITY SCALE ENERGY STORAGE SOLUTION

Environmentally sustainable long-duration energy storage.



WHAT SETS THE ENERGY CENTER APART?

With the Energy Center, you're getting a proven, second-generation solution, field-tested and so dependable that it's guaranteed with insurance backed by Munich RE. The Energy Center supports a wide range of applications:

- Time-shifting renewable energy use
- Providing ancillary grid services
- Smoothing the intermittency of renewables
- Supporting capacity needs and more.

EASY DEPLOYMENT & OPERATION

Energy Center's simple all-iron electrochemistry is comprised of earth-abundant iron, salt, and water. The system's environmentally benign characteristics make it the greenest and easiest-to-permit storage technology in the world.

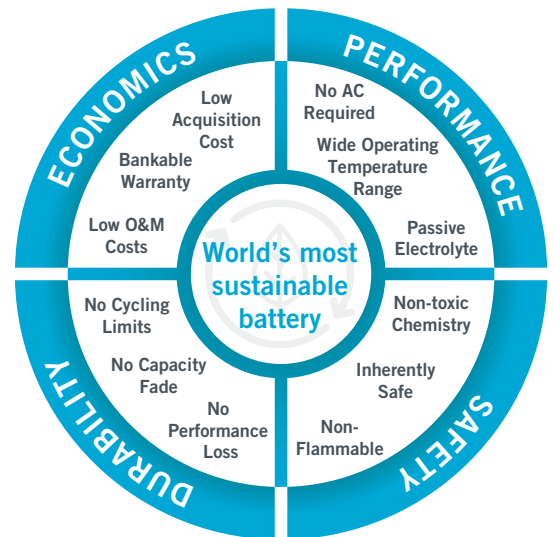
The iron flow battery has no fire, chemical, or explosive risk, eliminating the need for fire-suppression, secondary containment, and hazmat requirements. In addition, the system is fully recyclable at end-of-life.

- Clean, safe and sustainable
- pH similar to soda and wine, no toxic materials
- Benign chemistry enables standard, lower-cost components for construction

CUSTOMIZABLE AND UPGRADABLE

ESS has worked closely with leading engineering firms to deliver a design-build approach that enables systems to be tailored to meet any project size with a configurable range of power capacities starting at 3 MW and energy durations ranging from 6 to 12 hours. The Energy Center can also be upgraded by adding electrolyte to increase energy capacity and discharge duration, maximizing project flexibility and delivering the lowest operational cost to owners.

THE SAFEST AND GREENEST BATTERY ON THE PLANET



ESS delivers sustainable energy storage technology that is safe for both people and the planet.

FEATURES AND BENEFITS

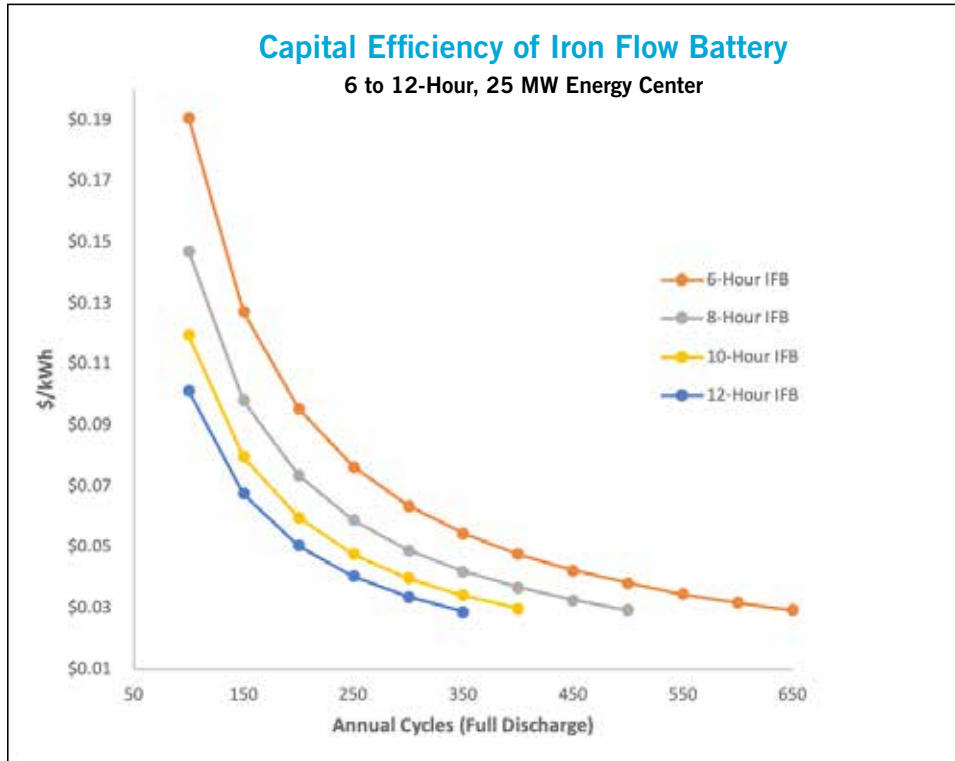
- Warranty backed by Munich RE
- Utility-class solution; can be optimized for power, energy, RTE, charge time, and duration
- No cooling/air conditioning requirement
- Footprint: 1 acre supports up to 6 MW / 74 MWh; Up to 12-hour discharge at rated power
- 96%+ plant availability over a 25-year operating life
- No power or energy degradation regardless of cycling duty
- Low O&M costs
- Fast and easy permitting– no hidden liabilities; no hazmat compliance plan requirement
- Non-flammable, non-explosive, no hazardous materials
- Environmentally friendly, 100% recyclable
- 25-year design life

UNPARALLELED FLEXIBILITY

The Energy Center 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.

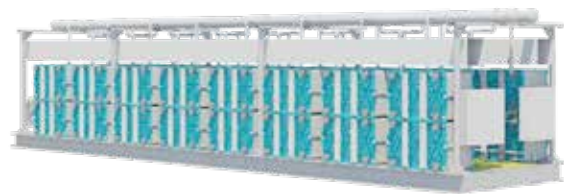
LOWEST COST PER kWh

Using earth-abundant materials in its chemistry – iron, water and salt – keeps the cost of manufacturing the Energy Center lower than comparable storage technologies with different chemistry. For applications that can use 6+ hours of discharge and frequent cycling, the iron-flow battery Energy Center delivers the lowest cost per kWh over its 25-year lifetime.



SPECIFICATIONS

FEATURE	DATA
Performance	
Rated Discharge Power:	Available over 80% of SOC
Energy Capacity:	Available over 100% of SOC, MWh up to 15X rated power
Voltage:	1,000Vdc
Response time:	<1 sec.
Module Cycle Life:	>20,000 cycles
Communications:	24/7 remote monitoring (MODBUS TCP/Ethernet interface to EMS/SCADA)
Environmental	
Battery	Recyclable components
Electrolyte	FeCl ₂ , KCl, H ₂ O; non-flammable, non-corrosive, re-usable, recyclable
Ambient Temperature	-40°C to +50°C (Building customized to the site's conditions)
Warranty	10 year battery module (underwritten by Munich Re) Extended warranty to 25 years available
Certification Pending	UL 9540A, IP54



Illustrative, sample Power Train system configuration. Depicted above is a 300kW 12-hour Power Train configuration with approximate dimensions: 3.5m W x 14m L x 3.5m H

Warranty Partner

ESS Inc. has partnered with Munich RE to launch industry-first insurance coverage of its flow batteries. The innovative policy means our long-duration storage solutions are now backed by a full 10-year performance guarantee, regardless of project size or location.



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