



GRIDSTAR<sup>®</sup> FLOW  
ENERGY STORAGE

**LOCKHEED MARTIN**



# GRIDSTAR® FLOW ENERGY STORAGE SYSTEM

Lockheed Martin Energy is pioneering a new flow battery designed to provide **flexible, durable, long-duration (>6 hours) energy storage** for utility scale projects.

## Applications:

- Large-scale renewables integration
- Transmission and distribution asset deferral
- Large-scale industrial energy management
- Utility reserve capacity and peak power
- Microgrid support

## Advantages

Long discharge duration and deep charge-discharge cycles

Low total cost of ownership

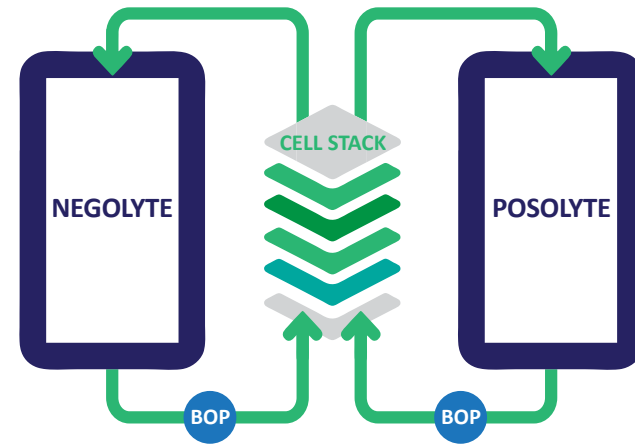
Long useful life

System-level safety and siteability – non-flammable battery chemistry

Full Lockheed Martin warranty

## Contact Information:

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www.lockheedmartin.com/energystorage



### CELL STACK:

- Membranes
- Electrodes
- Bipolar plates

### ACTIVE MATERIALS:

- Redox-active compounds (Posolyte, Negolyte)

### BALANCE OF PLANT (BOP):

- Pumps, tanks, piping
- Control & power conversion hardware

## Coordination Chemistry Flow Battery (CCFB)

Flow batteries differ from sealed batteries (e.g., lead acid, lithium-ion) in that they separate the power and energy portions of a battery system and allow each to be independently sized. Energy is stored in a liquid electrolyte which is flowed through a stack of electrodes.

Lockheed Martin's GridStar Flow system is based on our proprietary battery chemistry comprising metal ligand coordination compounds. The chemistry combines low-cost, earth abundant transition metals with commodity chemical ligands to optimize battery performance and affordability.

GridStar Flow systems are designed to exhibit lower system cost, higher efficiency, and longer useful life than currently available long-duration batteries.



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