

LOCKHEED MARTIN



GRIDSTAR™

ENERGY STORAGE

Introduction

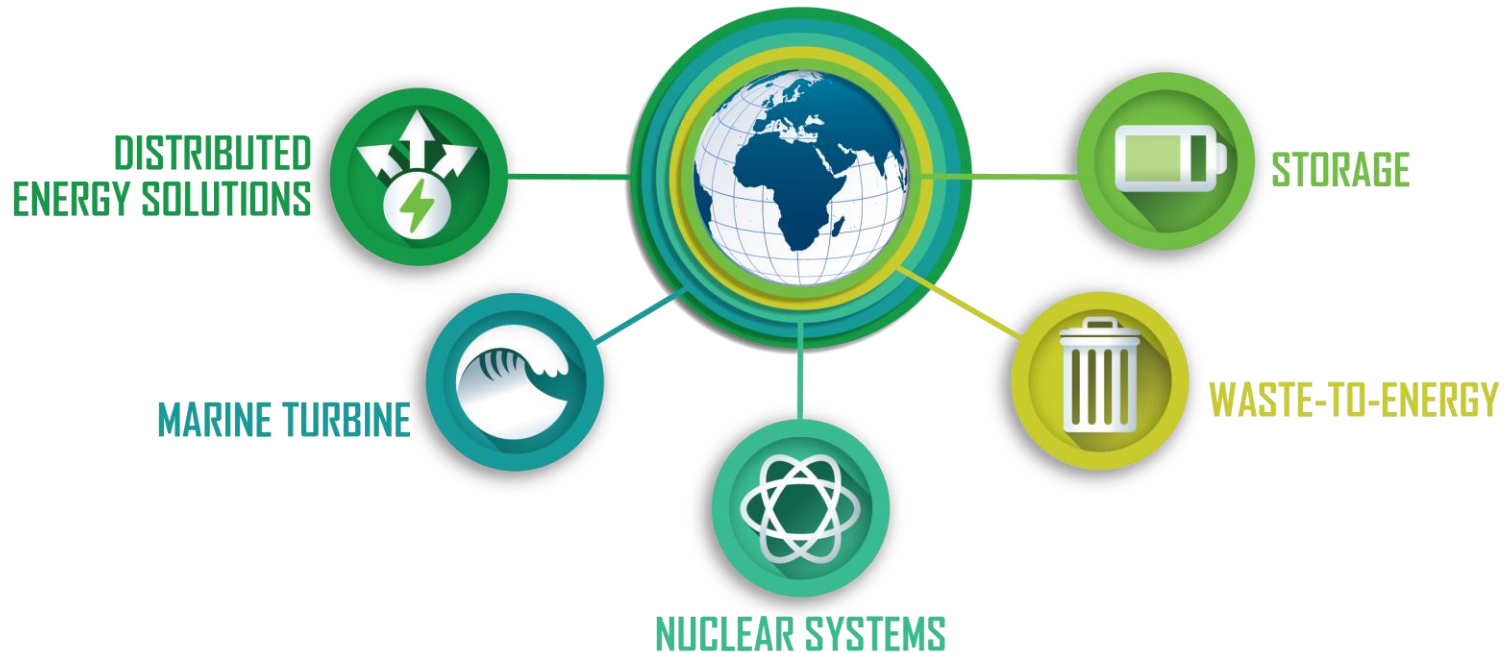
Energy Planning for Resilient Military Installations Workshop

December 2017



WE'RE ENGINEERING A BETTER TOMORROW™

LOCKHEED MARTIN ENERGY



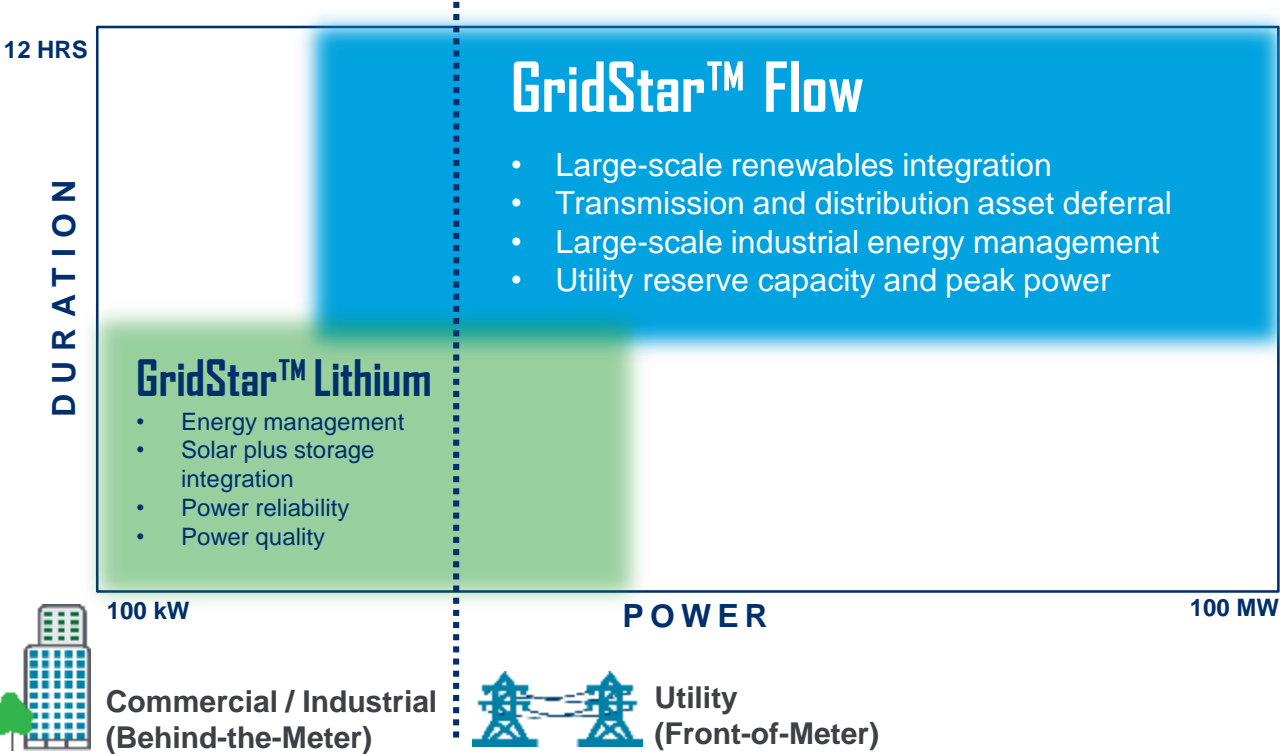


LOCKHEED MARTIN GRIDSTAR™ ENERGY STORAGE

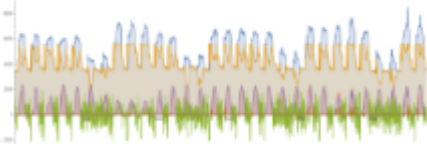
Turnkey energy storage systems
for commercial, industrial, and
utility applications.

Enabling a more efficient, secure
and sustainable electricity grid.

LOCKHEED MARTIN GRIDSTAR™ ENERGY STORAGE



TURNKEY ENERGY STORAGE SOLUTIONS



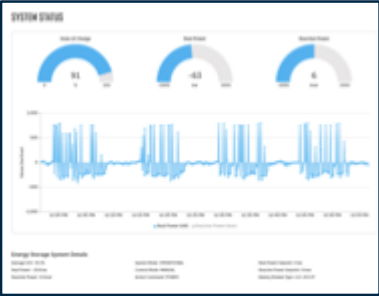
EVALUATION, ANALYTICS & DESIGN



CONFIGURATION & LAYOUT



GRIDSTAR™ ENERGY STORAGE



GRIDSTAR™ SITE CONTROLLER



MAINTENANCE



WARRANTY



IT'S ALL IN THE BOX.

- Batteries. Power conversion. AC/DC protection. Thermal Management. Controls.
- Up to 500 kW_{AC} and up to 950 kWh_{AC}.
- 30 power and energy combinations.
- Outdoor rated design. UL certified.
- Lockheed Martin warranty and long term maintenance options.



GRIDSTAR™ FLOW SYSTEMS

Pioneering long-duration flow battery for utility-scale projects.

Flexible. Durable. Affordable.

Proprietary battery with metal ligand coordination compound chemistry.

ADVANTAGES OF GRIDSTAR™ FLOW



Long Duration

- 6 to >12 hours duration

Durable

- Able to do multiple daily deep-discharge cycles
- Long useful life

Flexible

- Freedom to operate in future differently than originally planned
- Energy and power can be sized independently
- Can add additional energy in future, as required.

Cost Competitive

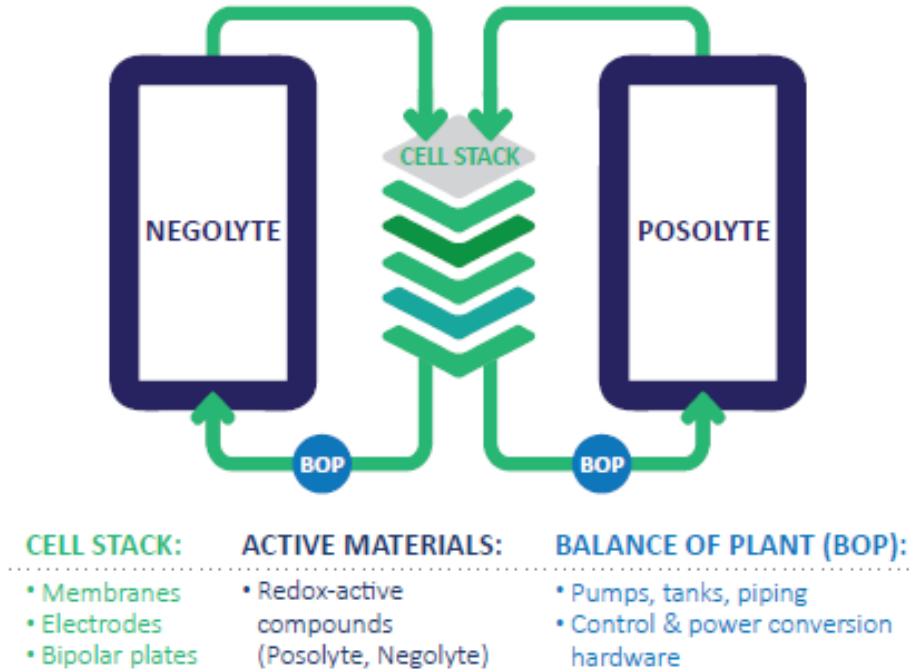
- Low total cost of ownership

Safe

- Designed for system-level safety and siteability
- Non-flammable battery chemistry

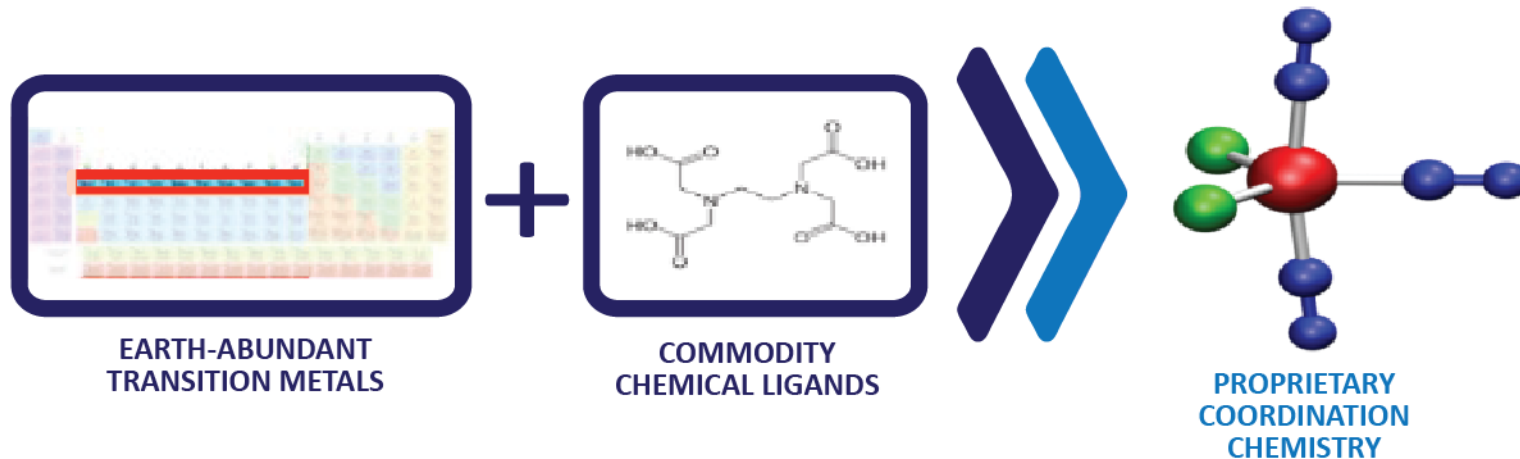
Lockheed Martin Warranty

ANATOMY OF A FLOW BATTERY



Flow batteries decouple power and energy, lowering marginal cost of multi-hour storage.

NEW FLOW BATTERY PLATFORM TECHNOLOGY



We have developed our proprietary GridStar™ Flow technology to optimize battery performance and affordability.

GRIDSTAR™ FLOW: 1MW|6MWh



LOCKHEED MARTIN ENERGY STORAGE DEVELOPMENT NETWORK



Located in Massachusetts, Texas, and California



PROJECT EXAMPLE: COMMERCIAL/INDUSTRIAL



LOCATION

Syracuse, New York

Manufacturing facility
with 5MW of peak load

APPLICATION

Demand charge reduction
& ancillary services

SYSTEM SIZE

1MW, 1.4MWh

CUSTOMER BENEFITS

- Reduced electricity costs from capacity charges
- Revenue from services to the New York Independent System Operator (NY ISO) to maintain grid reliability



Project provides both behind-the-meter demand charge reduction and ancillary services.

SYRACUSE, NY: VALUE STREAMS STACKING DEMAND MANAGEMENT+ANCILLARY SERVICES

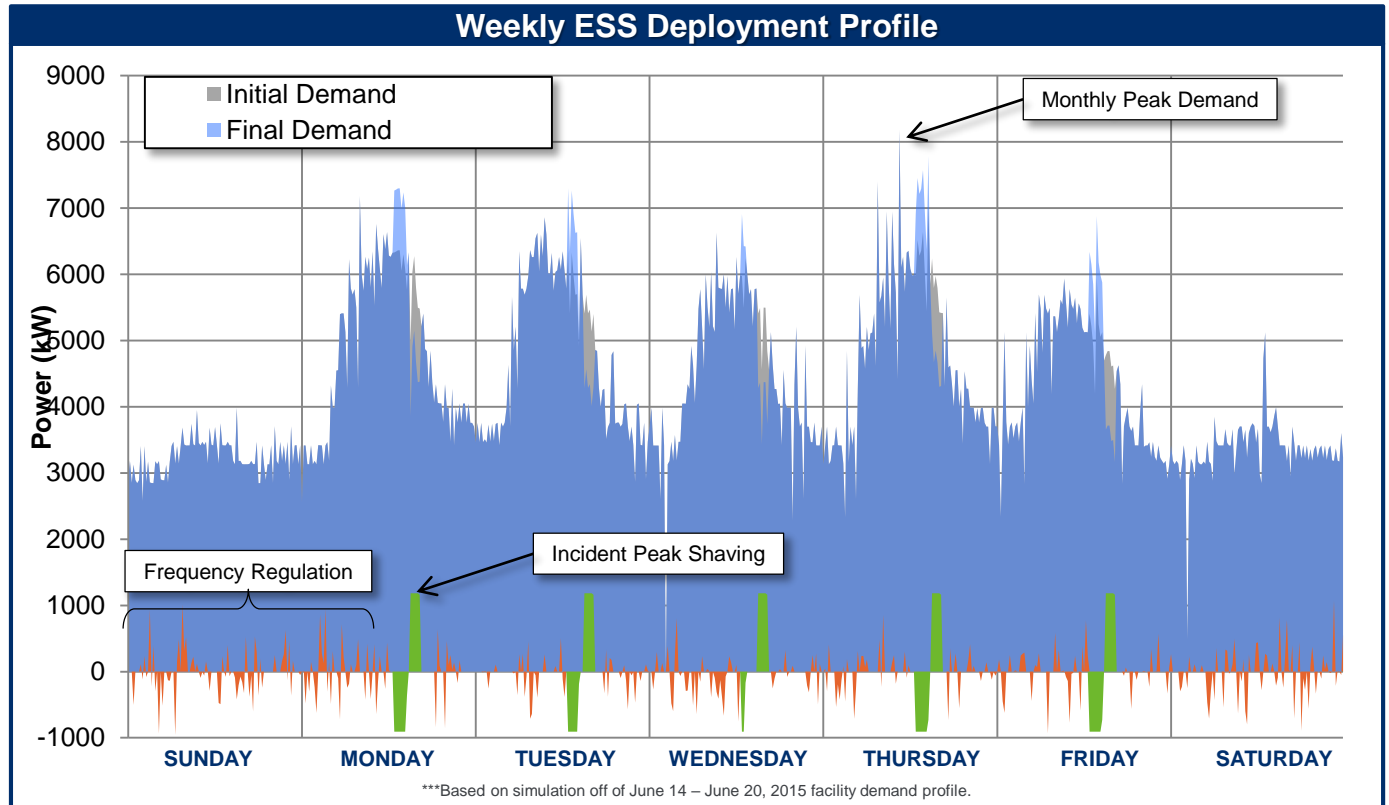


VALUE STREAMS

- Unforced Capacity Charge Reduction
- NYISO Frequency Regulation

DEPLOYMENT STRATEGY

- Reduce facility demand during historic incident peak window (~3-5pm, weekdays, June–Sept.)
- Participate in NYISO frequency regulation market when the system is not needed for incident peak shaving





CONTACT US

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WARNING
HIGH VOLTAGE
KEEP OUT