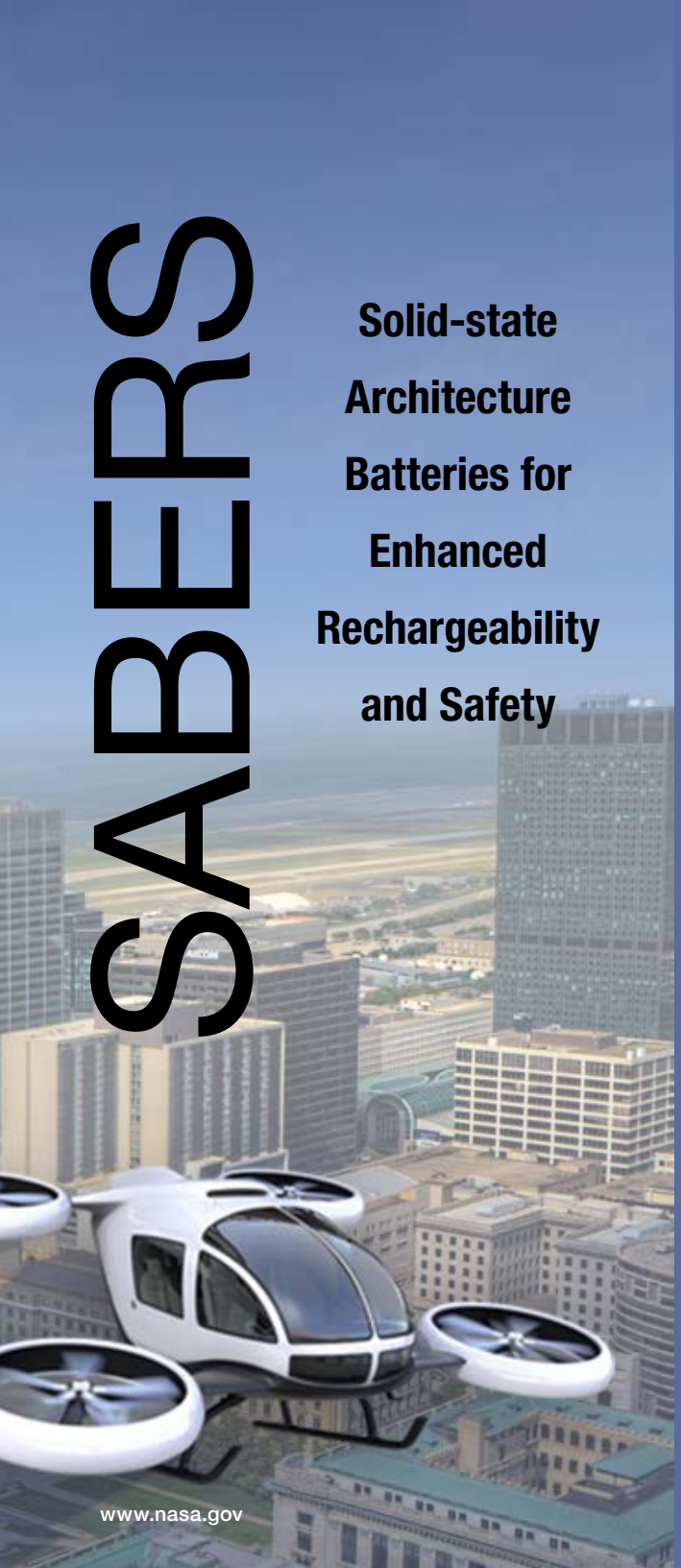
SABERS

Solid-state Architecture Batteries for Enhanced Rechargeability and Safety



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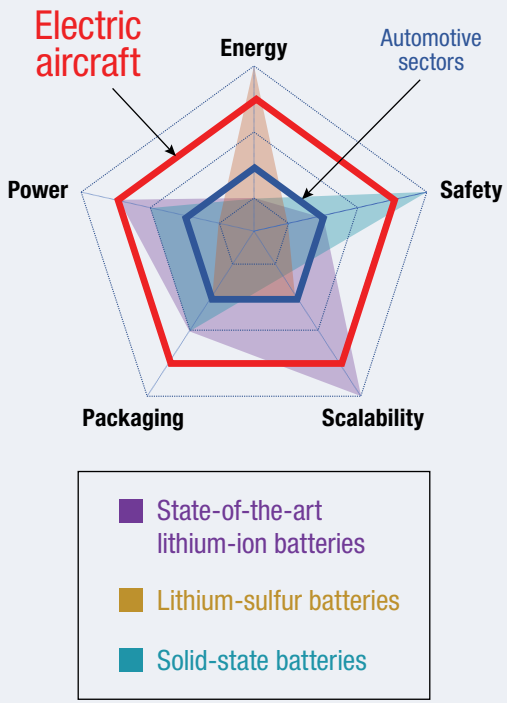
CHALLENGE

Current state-of-the-art batteries are not designed to meet the performance and safety requirements of electric aircraft.



SABERS uses new technology to achieve targeted properties for power, energy, safety, packaging, and scalability.

National Aeronautics and Space Administration

OBJECTIVES

1. Meet energy density requirements needed to enable electric aircraft.
2. Optimize recharge speed for efficient turnaround time.
3. Avoid parasitic weight from excess packaging and cooling.
4. Increase safety with fully solid design eliminating use of flammable liquids.
5. Combine materials technologies to achieve scalability.

NASA ADVANTAGES

Bipolar stack design
Reduces safety containment weight and improves specific energy and power.

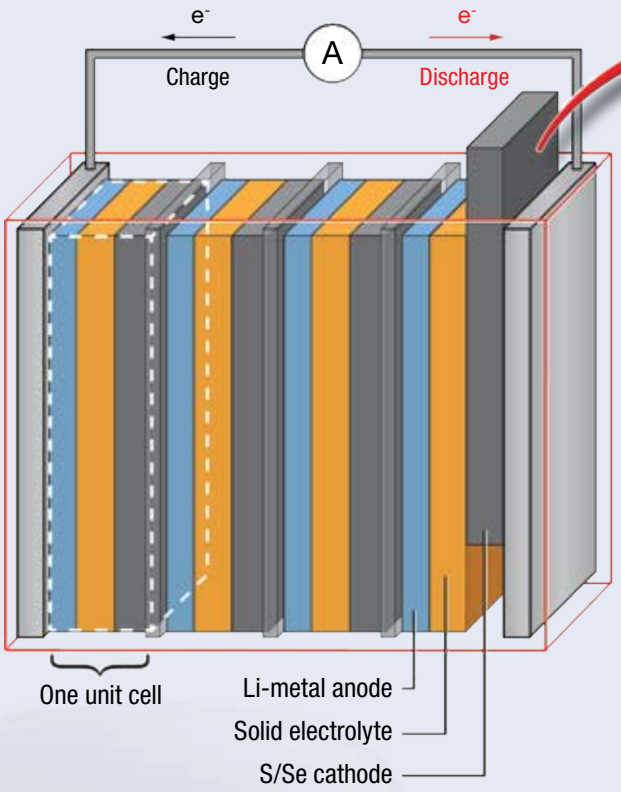
Patented holey graphene
Improves cathode conductive architecture and battery performance.

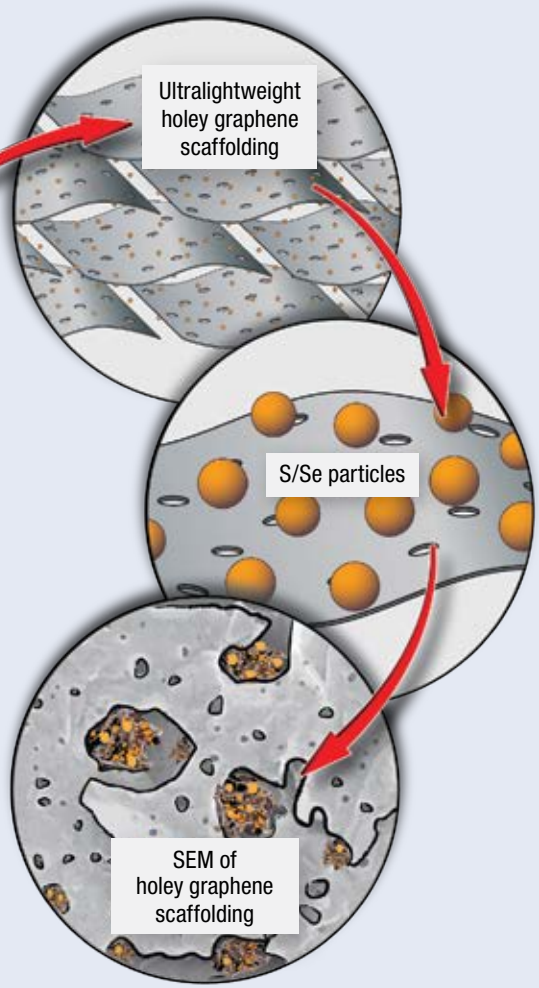
New sulfur-selenium combination
Optimizes performance by balancing energy versus power, reduces impedance, and creates a more stable discharge profile.

Computational modeling
Guides experiments to accelerate development time.

Collaboration
Engages expertise of mutliple NASA centers, Department of Energy (DOE) National Laboratories, and industry partners.

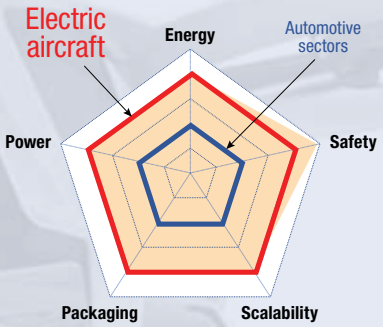
SOLID-STATE DESIGN



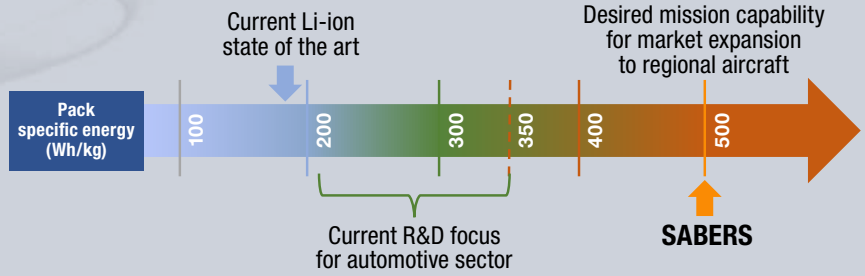


GOALS

Optimize composition ratio of solid-state electrolyte, active material, and conductive agent to significantly improve battery performance.



Performance Target: 500 Wh/kg battery



A feasibility study sponsored by NASA's Convergent Aeronautics Solutions Project

Fostering Innovation, Pushing Boundaries, and Overcoming Barriers

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AERO-027-0121