

GENERAL ATOMICS

SOLUBLE LEAD FLOW BATTERY

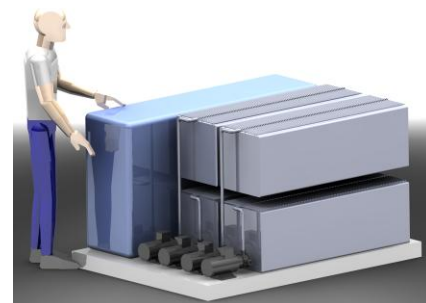
PROJECT TITLE:	Soluble Lead Flow Battery Technology		
ORGANIZATION:	General Atomics	LOCATION:	San Diego, CA
PROGRAM:	GRIDS	ARPA-E AWARD:	\$1,986,308
TECH TOPIC:	Energy Storage: Stationary	PROJECT TERM:	9/1/10 – 2/28/13
WEBSITE:	www.ga.com		

CRITICAL NEED

Our national electric grid has limited ability to store excess energy, so electricity must constantly be generated to perfectly match demand. Though wind and solar power are promising clean alternatives to fossil fuels, their natural unpredictability and intermittency present major challenges to delivery of the consistent power that is necessary to operate today's grid. The U.S. needs technologies that can store renewable energy for future grid-use at any location. Flexible, large-scale storage would create a stronger and more robust electric grid by enabling renewables to contribute to reliable power generation.

PROJECT INNOVATION + ADVANTAGES

General Atomics is developing a flow battery technology based on chemistry similar to that used in the traditional lead-acid battery found in nearly every car on the road today. Flow batteries store energy in chemicals that are held in tanks outside the battery. When the energy is needed, the chemicals are pumped through the battery. Using the same basic chemistry as a traditional battery but storing its energy outside of the cell allows for the use of very low cost materials. The goal is to develop a system that is far more durable than today's lead-acid batteries, can be scaled to deliver megawatts of power, and which lowers the cost of energy storage below \$100 per kilowatt hour.



IMPACT

If successful, General Atomics' project would create a cost-competitive grid-scale energy storage battery, accelerating the adoption and integration of renewable energy sources into the grid.

- **SECURITY:** A more efficient and reliable grid would be more resilient to potential disruptions.
- **ENVIRONMENT:** Electricity generation accounts for over 40% of U.S. carbon dioxide (CO₂) emissions. Enabling large-scale contributions of wind and solar power for our electricity generation would result in a substantial decrease in CO₂ emissions.
- **ECONOMY:** Increases in the availability of wind and solar power would reduce fossil fuel demand, resulting in reduced fuel prices and more stable electricity rates.
- **JOB:** Advances in energy storage could result in new high-paying jobs in supporting sectors such as manufacturing, engineering, construction, transportation, and finance.

CONTACTS

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