

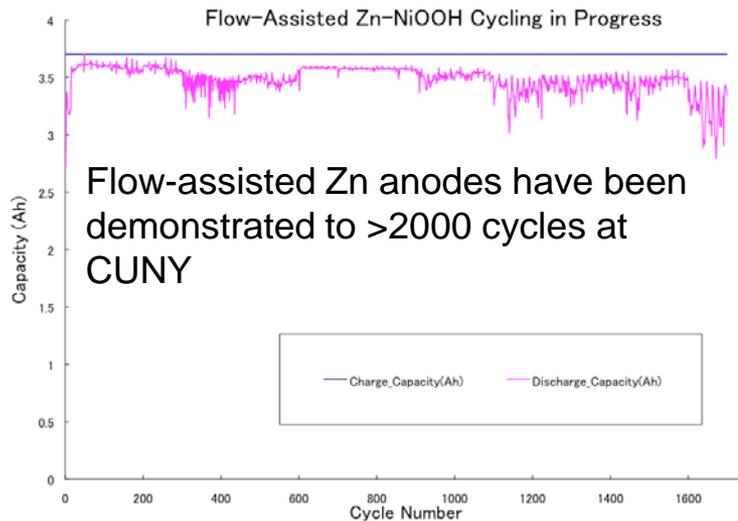
GRIDS Flow-Assisted Rechargeable Zn-MnO₂ Battery / CUNY Energy Institute

Technology Summary

The CUNY Energy Institute proposes to develop a novel flow-assisted rechargeable zinc-manganese dioxide (Zn-MnO₂) battery. Due to low cost basis materials, this battery has the potential to revolutionize the renewable energy industry, offering grid-scale energy storage for < \$100 / kWh.

- CUNY's innovation of flow-assist Zn electrodes
- RBC's innovation of Bi-doped MnO₂ materials

These overcome long-standing cycleability challenges: Zn dendrite formation and MnO₂ irreversibility. Cost targets, cycle life, and power needs are met with these materials when operating at low depth of discharge (DOD), appropriate for stationary grid-scale applications.



Key Personnel

CUNY EI: Sanjoy Banerjee, Dan Steingart, Steve O'Brien, Martin Klein
Rechargeable Battery Corporation: Lawrence Tinker, Ramesh Kainthla
The Ultralife Corporation: David Modeen

Program Summary

ARPA-E funds: \$3,623,614
Period of performance: Cost-share: \$1,654,016
36 months Total budget: \$5,277,630

	Key Milestones & Deliverables
Year 1	<ul style="list-style-type: none"> • 5 Ah lab-scale Zn-MnO₂ cell, max DOD study • Zn and MnO₂ individually, 1000 cycles
Year 2	<ul style="list-style-type: none"> • Gen 2 5 Ah cell >4000 cycles, >10% DOD • Gen 3 5 Ah cell >2000 cycles, <\$100/kWh
Year 3	Subscale battery 1kW for 1 hr >10% DOD

Technology Impact

This system is designed as safe and modular, intended to be scaled from home to utility size, appropriate for siting throughout urban areas as needed, to a broad customer base: from the individual consumer with home-scale solar power utilization to power providers. Easily dispatchable electrical storage at < \$100/kWh would revolutionize the U.S. grid. Zn and MnO₂ are considered primary battery materials, making the project high-risk. By using low DOD, this technology may leapfrog others due to cost.

Grid-scale battery from extremely low cost materials

