



# URBAN ELECTRIC POWER

When evolution is revolution: safe, clean, low-cost energy storage

# ABOUT UEP

- Urban Electric Power (UEP) was spun out of the City University of New York (CUNY) in 2012 with an exclusive license to commercialize **zinc anode battery** technology
- \$45M in total funding includes public and private investment
- **Zinc-manganese dioxide battery** that is safe, cost-effective, and well-suited for solar + storage and resiliency applications



# NY-BASED MANUFACTURING

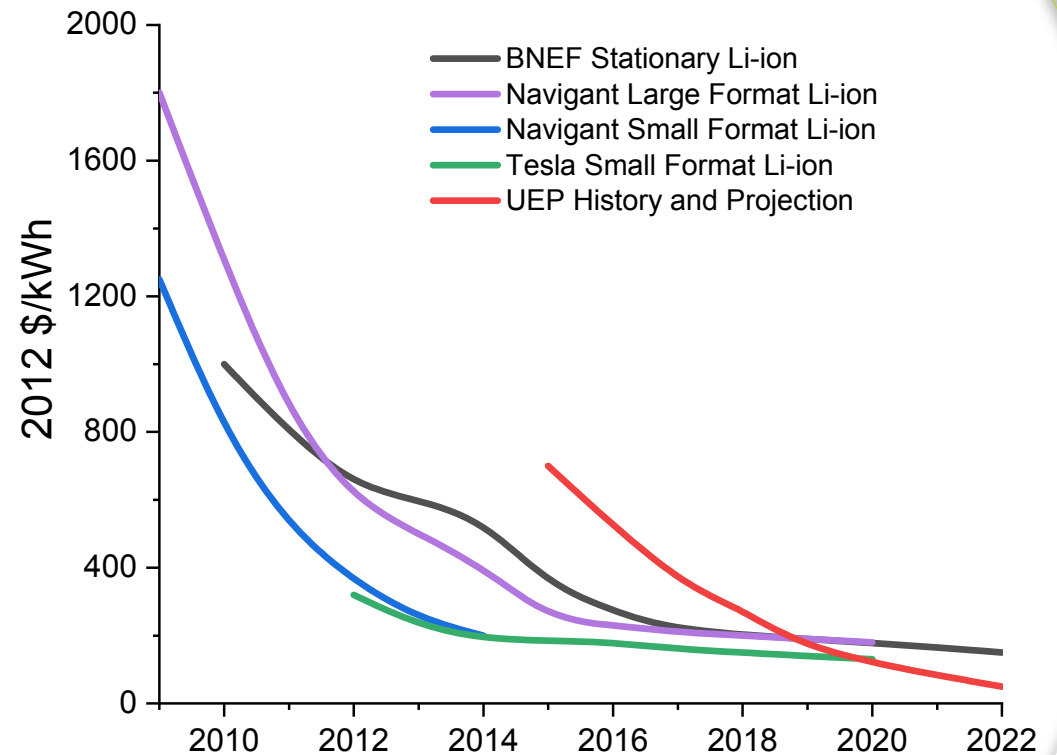
- Manufacturing line and testing facilities operated at the NY Center for Innovation in Pearl River, NY
- Fully operational plant equipped for scaled manufacturing and developmental activities



# THE ZINC ADVANTAGE

- Abundant and low-cost with robust existing supply chains and proven manufacturability
- More cost-effective than lead or lithium metals

Material	\$/kg	kWh/kg	\$/kWh
Lithium	\$78.00	12.63	\$6.18
Lead	\$2.04	0.54	\$3.75
Zinc	\$2.57	1.90	\$1.35



# SAEFTY

- Safe, non-hazardous materials similar to those in traditional primary alkaline cells
  - Aqueous, non-flammable product without risk of thermal runaway
  - Reduced system costs associated with fire mitigation and containment
- ✓ Appropriate for siting within buildings
- ✓ Finalizing compliance with UL/FDNY

## UEP Cell Flammability Testing



Before



After

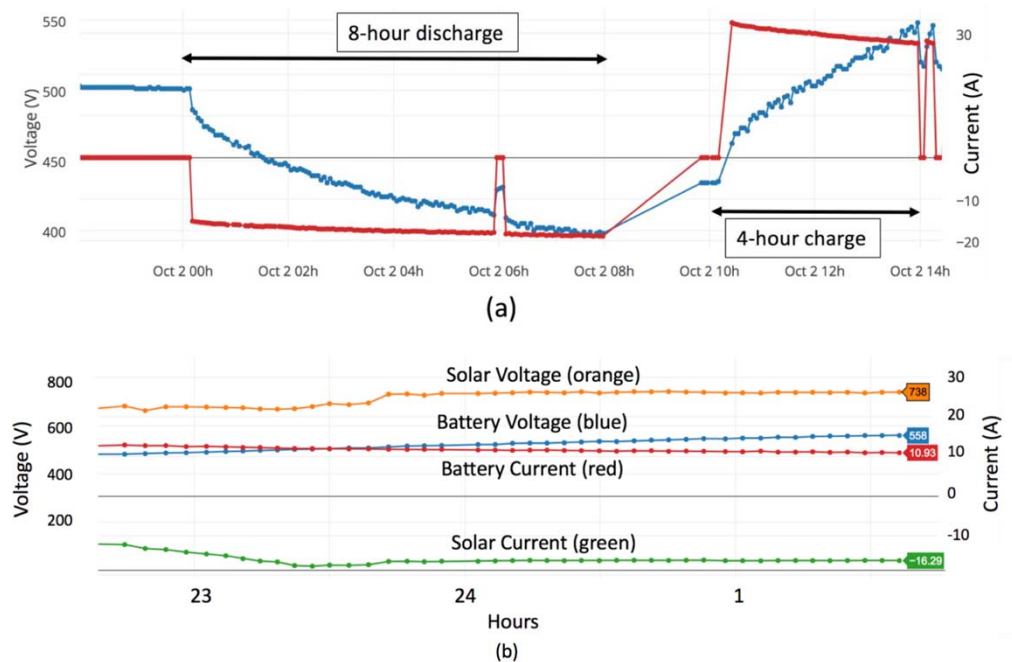


# PERFORMANCE

- Charge/discharge profile well-suited for stationary applications
- No self-discharge, high temperature tolerance, low maintenance costs
- Able to function at partial state of charge

## Use Cases:

- ✓ Solar + storage
- ✓ Peak demand management
- ✓ Power backup



# MARKET OPPORTUNITIES

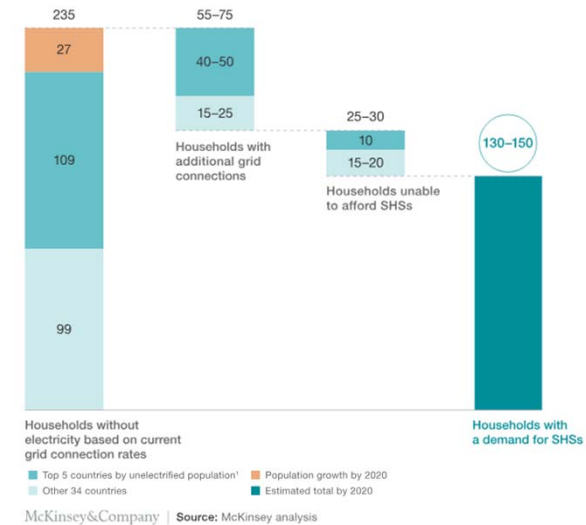
- Energy storage market expected to reach \$3B in U.S. by 2022
- Requirements and subsidies expanding in major US markets
- Rural electrification expanding market for solar + storage in developing countries

U.S. Annual Energy Storage Market Size, 2012-2022E (Million \$)



Source: GTM Research

Estimated number of households by 2020, million



McKinsey & Company | Source: McKinsey analysis

# SCALEABLE PRODUCT

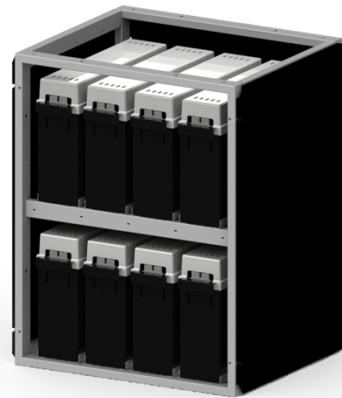
- UEP battery cells are housed in monoblocks, and scale easily to meet capacity and voltage needs



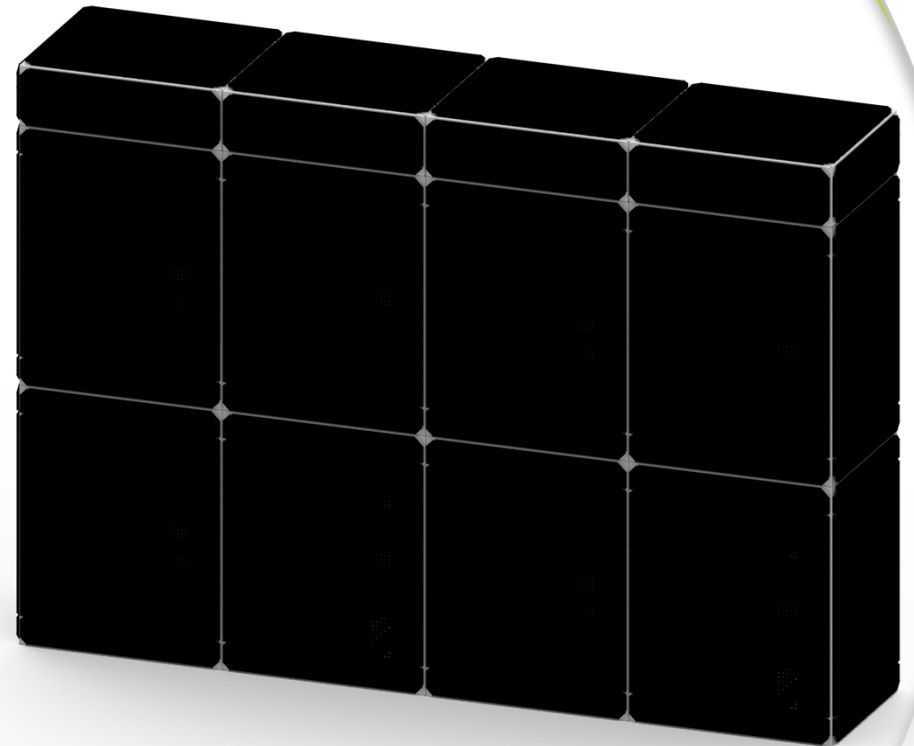
Cell



Monobloc



Cube



System



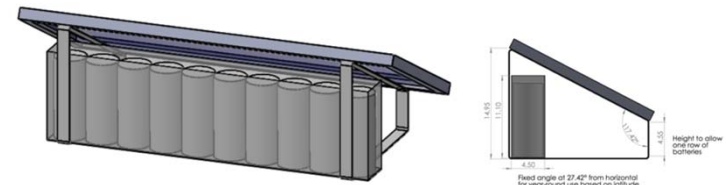
# PROJECT PROFILE: CITY COLLEGE

- 200kW/800 kWh grid-tied
- Installed in the Steinman Hall basement
- Supports peak load management and demand response activities
- Large demonstration project to support UEP's commercial scale product
- Support from NYSERDA



# PROJECT PROFILE: NM STATE

- Distributed storage research in extreme conditions
- Provides off-grid power for remote homes without grid access
- Replicable model with use cases across the globe
- Prototype under development at New Mexico State University, supported by Sandia National Labs



# QUESTIONS?

