ZBB

The Zinc/Bromine Advanced Battery Program

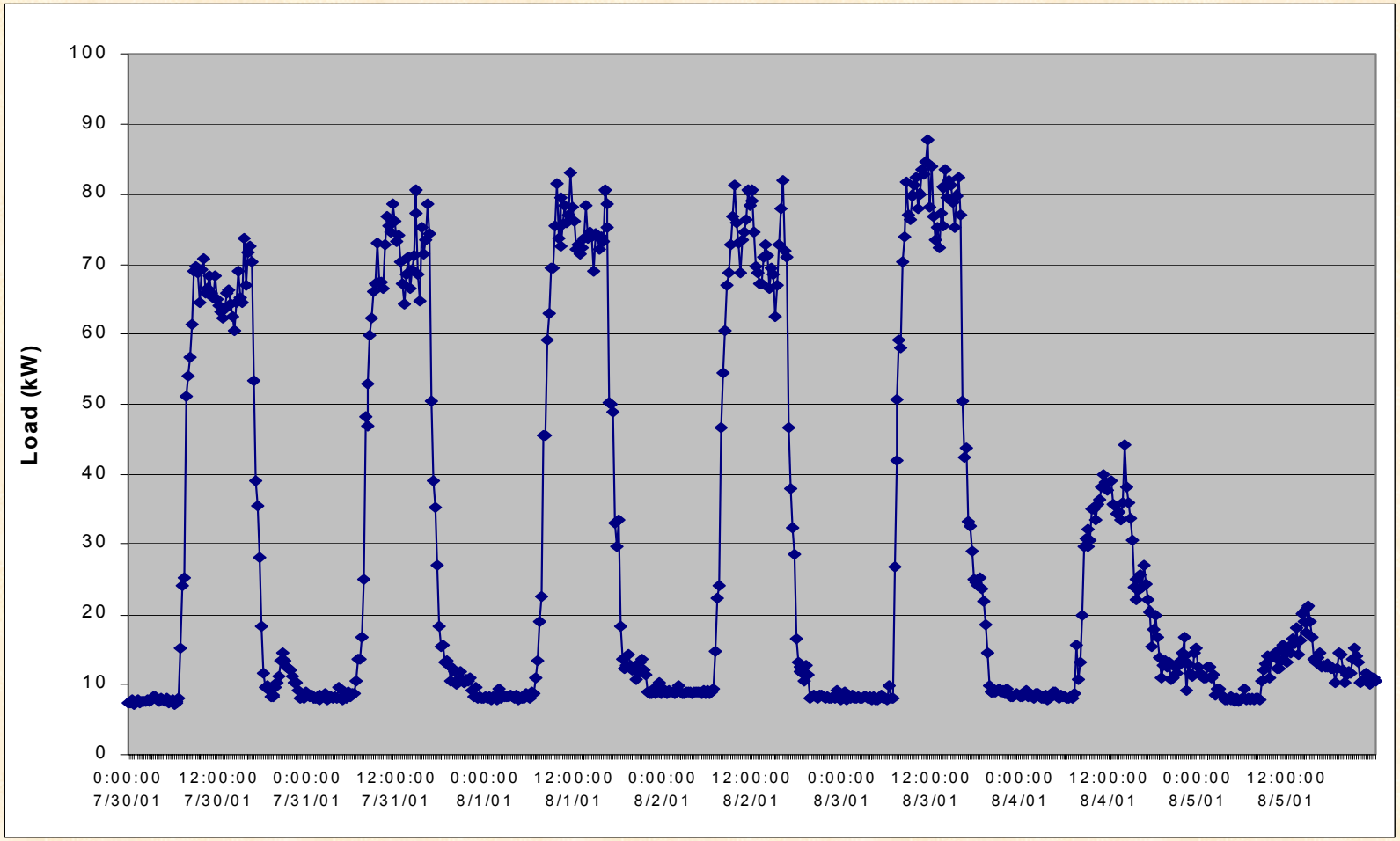
PV-Zinc/Bromine Battery
Greenpoint Facility - Bronx, NY

- US DOE Office of Power Technologies
  (Energy Storage Program Funding)
- Sandia National Laboratories (Cost shared contract)
- PowerLight Corporation (Test site, solar panels)
- SatCon Power Systems Canada, Ltd.
  (Power conversion system)
- ZBB Energy Corporation (Battery system)
- Gridwise Engineering (Data Collection and Analysis)

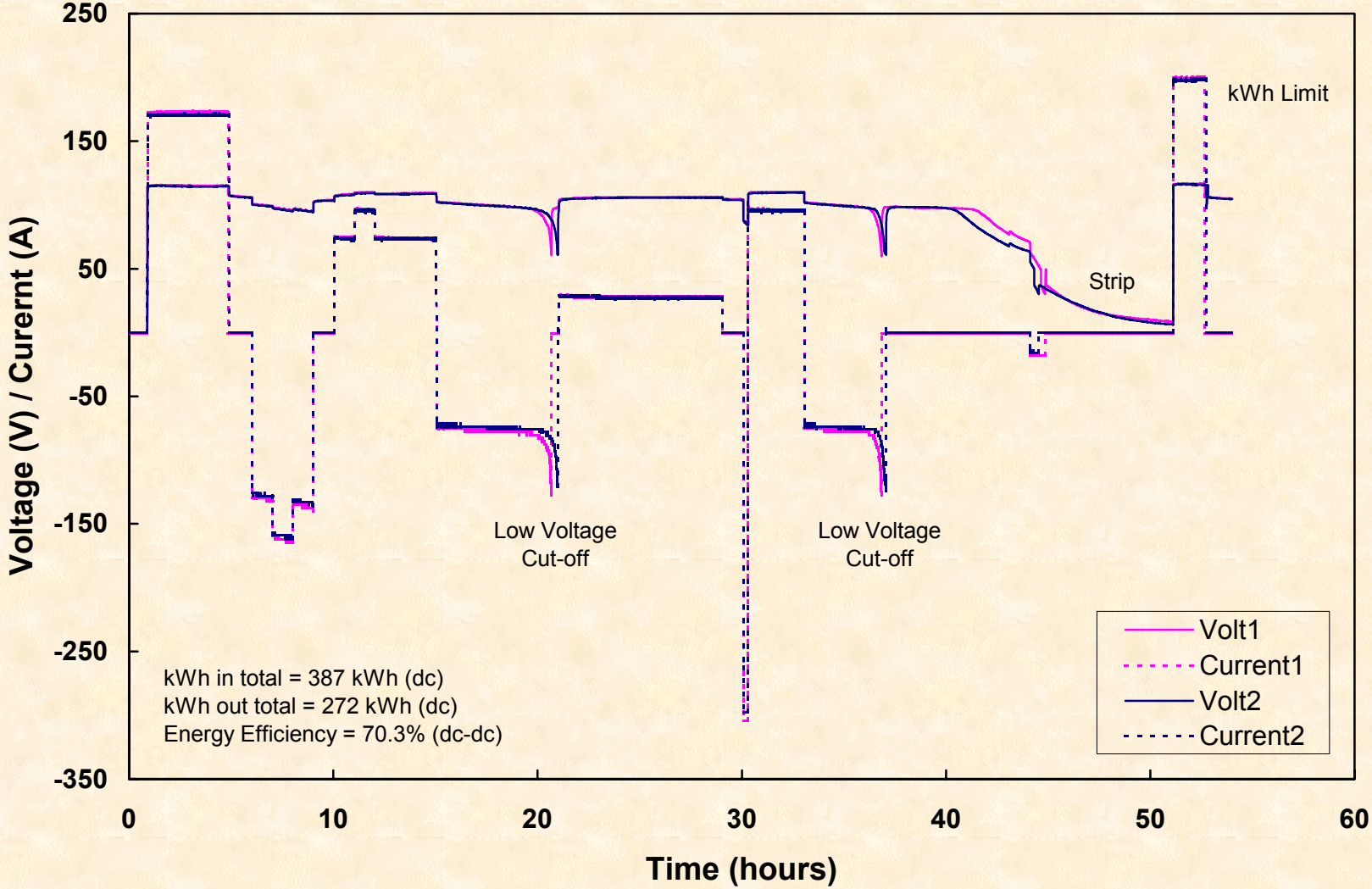
100 kWh Battery System

- Integrated PCS
- 100 kWh (dc)
- 50 kW (ac)/60 kVA
- 208 Vac/60 Hz
- Module Dimensions 48” x 48” x 84”

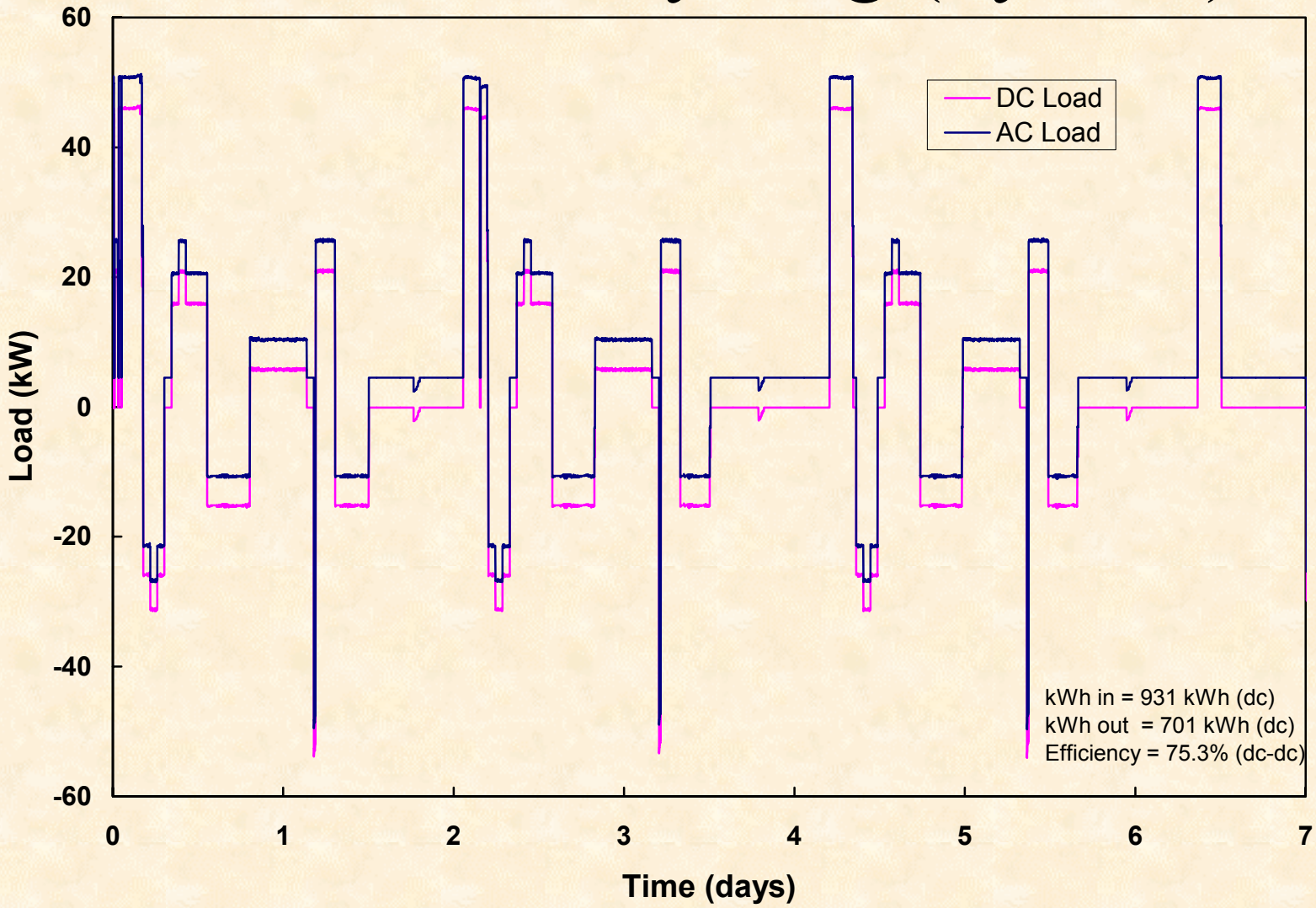
Greenpoint Facility Load



48-hour Pre-qualification Test



Unattended Cycling (System)



100 kWh Summary/Future Work

- Summary of results
  - Factory/witness testing completed
  - 108 kWh (dc) / 96 kWh (ac) at 25 kW (ac) rate.
  - 104 kWh (dc) / 92 kWh (ac) at 50 kW (ac) rate.
  - Achieved 75% energy efficiency (dc-dc)
  - Successfully completed unattended cycling
  - Delivered 4 MWh of energy over 3 months
- Future work
  - Installation November 2003

200 kWh ABESS Demonstration

- US DOE Office of Power Technologies
  (Energy Storage Program Funding)
- Sandia National Laboratories (Cost shared contract)
- The Detroit Edison Company (Test sites, transformer, data collection)
- SatCon Power Systems Canada, Ltd.
  (Power conversion system)
- ZBB Energy Corporation (Battery system)
- Gridwise Engineering (Data Collection and Analysis)

200 kWh Demonstration

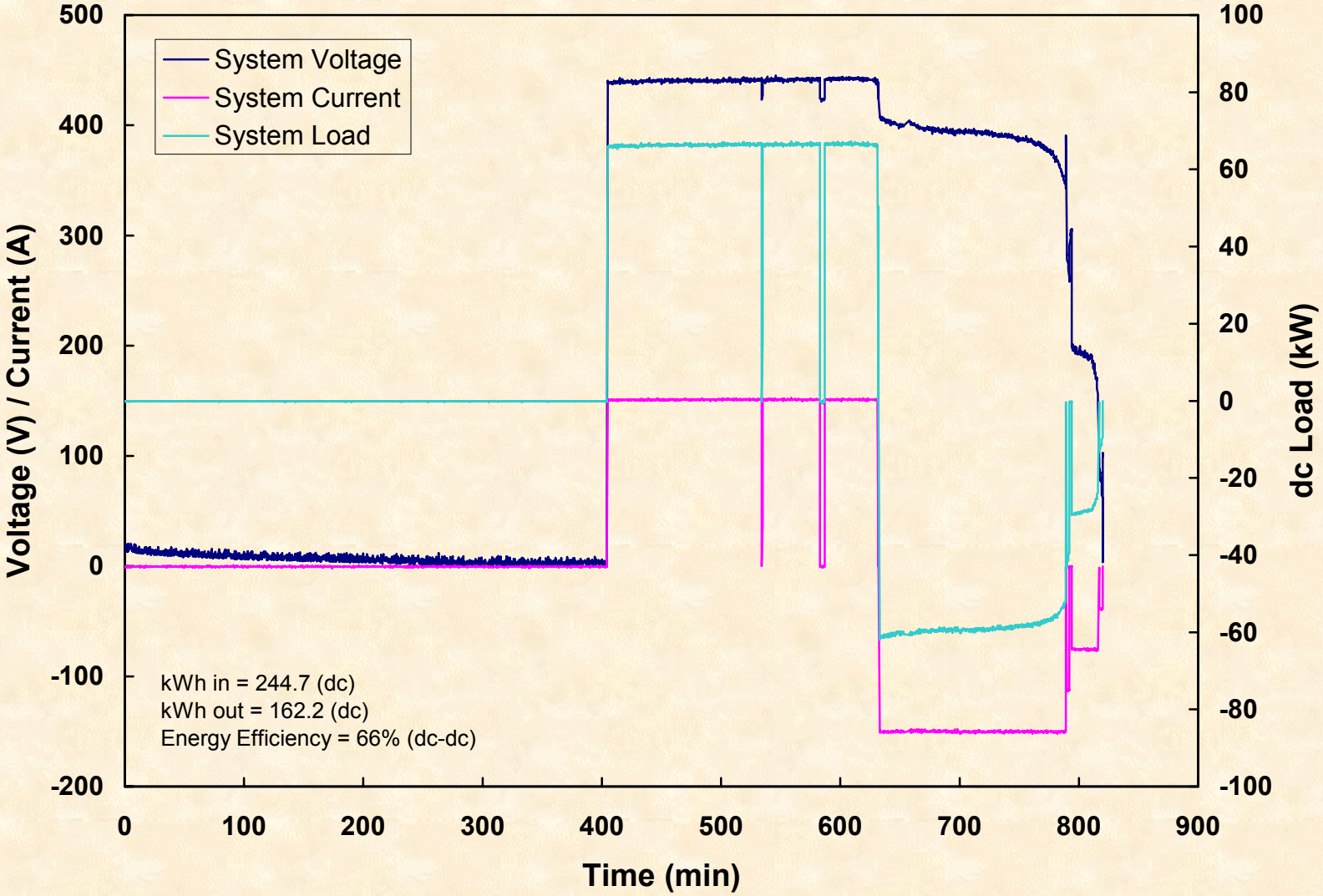
- Provide battery for Detroit Edison program.
  - Distributed Energy Resource (DER) integration
- Remotely charge/discharge system at pre-determined times.
- Provide real-time power information.
- Monitor effects of DER on current utility network.

200 kWh ABESS

- 200 kWh Capacity
- Single string of 4 modules
- 480 to 0 V DC
- 0 to 300 amp discharge
- 2 to 10 hour discharge
- 20’ x 8’ x 9’6”
- Approx. 40,000 lbs.

Lum Peak Shaving Site

String Voltage Profile



400 kWh Summary/Future Work

- Summary of results
  - Pre-qualified four battery modules for test program.
  - Installed four modules at site.
  - Operated battery from remote location.
- Future work
  - Integrate battery as Distribute Energy Resource (DER).
  - Provide real-time power information.
  - Monitor, dispatch and control DER on utility network.