



Electricity Storage Systems

GridWeek 2007
Washington DC, April 25





Electricity storage technologies

- Recent battery developments
 - Flow
 - High-temperature
 - Lithium
- Non-battery technologies
 - Flywheels
 - Electric double-layer capacitors
 - Large-scale storage (PHS, CAES)
 - Superconducting magnetic (SMES)
- Power electronics developments



Application issues

- Power vs. energy
 - High-power, short-duration discharges
 - High-energy, long-duration discharges
- Scalability
 - kW → MW
 - kWh → MWh
- Cycling capability

Electricity storage systems in action



16 MVA, 30 sec.



27 MW, 15 min.



8 MW, 7 hr.

Rated Power : 8MW
Rated Capacity : 57.6MWh
Configuration : 160 50kW NAS modules
Four 2MW units
Operation : Daily Load Shifting
Site Dimensions : 51.2m(L)×22.6m(W)×5.2m(H)



“Hot button” issues for storage

- Integration of renewables
- Decentralization / microgrids
- Impact of plug-in hybrid vehicles
- Improved efficiency, reliability and security



Gathering momentum...

- Installation of electricity storage is accelerating
 - Demonstration systems
 - 'Low-hanging fruit'
- More installations help lower costs
 - Bringing more installations
- The technology is ready...





Overcoming barriers

- Barriers still exist
 - Government subsidies
 - Regulatory
 - Tariff-based
 - Cultural
- The storage industry must work with all parties to overcome these barriers
 - Governments
 - Regulators
 - Utilities
 - Operators



For further information...

- Any questions:
 - jim.mcdowall@saftbatteries.com
- Electricity Storage Association
www.electricitystorage.org
(includes links to ESA member companies)