Massive Electricity Storage
A Utility Perspective

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Installed Batteries – AEP Experience

2006 - 1 MW, 7.2 MWh in Charleston WV

2008 – 6 MW, 50Mwh at three sites with “backup power”
- 2 MW, Bluffton, OH
- 2 MW, Balls Gap, WV
- 2 MW, E. Busco, IN

2009 - 4MW, 25MWh to be installed in Presidio Texas
**Major Short-Term Benefits of Energy Storage**

- **Service Benefits**
  - Dynamic VAR support
  - Improved Service Reliability (site dependent)
  - Firming & Shifting Renewables (source dependent)
  - Distribution Capital Deferral (site dependent)

- **Market Benefits**
  - Energy Arbitrage
    - Frequency Regulation and other Ancillary Values (large variability)
  - Generation Capacity

*values are based on studies made for an AEP site*

*Storage can Benefit both Customers and Utilities*
AEP Perspective on Energy Storage

- Energy Storage, as a buffer and shock absorber, can convert the renewable challenge into a new business opportunity.

- As a utility, we recognize the values of energy storage and have some practical experience with deploying them.

- As a user (utility), we have no financial interest in any particular storage technology.

- As a utility, we do have an interest in how storage is deployed as it impacts cost and performance.
AEP Perspective on MES

1. Massive electricity storage does not need to be amassed at a few geographical sites

2. **Widely Distributed** storage units, aggregated & operated as “multi-MW storage fleets”, offer additional benefits over concentrated large storage units in the following areas:
   - Security  
   - Safety  
   - Service Reliability  
   - Equipment Reliability  
   - Grid Constraints  
   - Competitive Pricing

   - (less concentrated energy)
   - (backup power for customers)
   - (diversity)
   - (closer to loads)
Community Energy Storage – A New Format

2. System-wide control of CES fleets is “Massive Electricity Storage” in a flexible format.
Community Energy Storage (CES)

*CES uses New or Used PHEV batteries*

- Leverages the evolving Electric Transportation Market
- Offers **Backup Power** to customers
- Buffers Customer Renewable Generation (DC input)
- Makes PHEV Charging time a less critical issue