Massive Electricity Storage

A Utility Perspective

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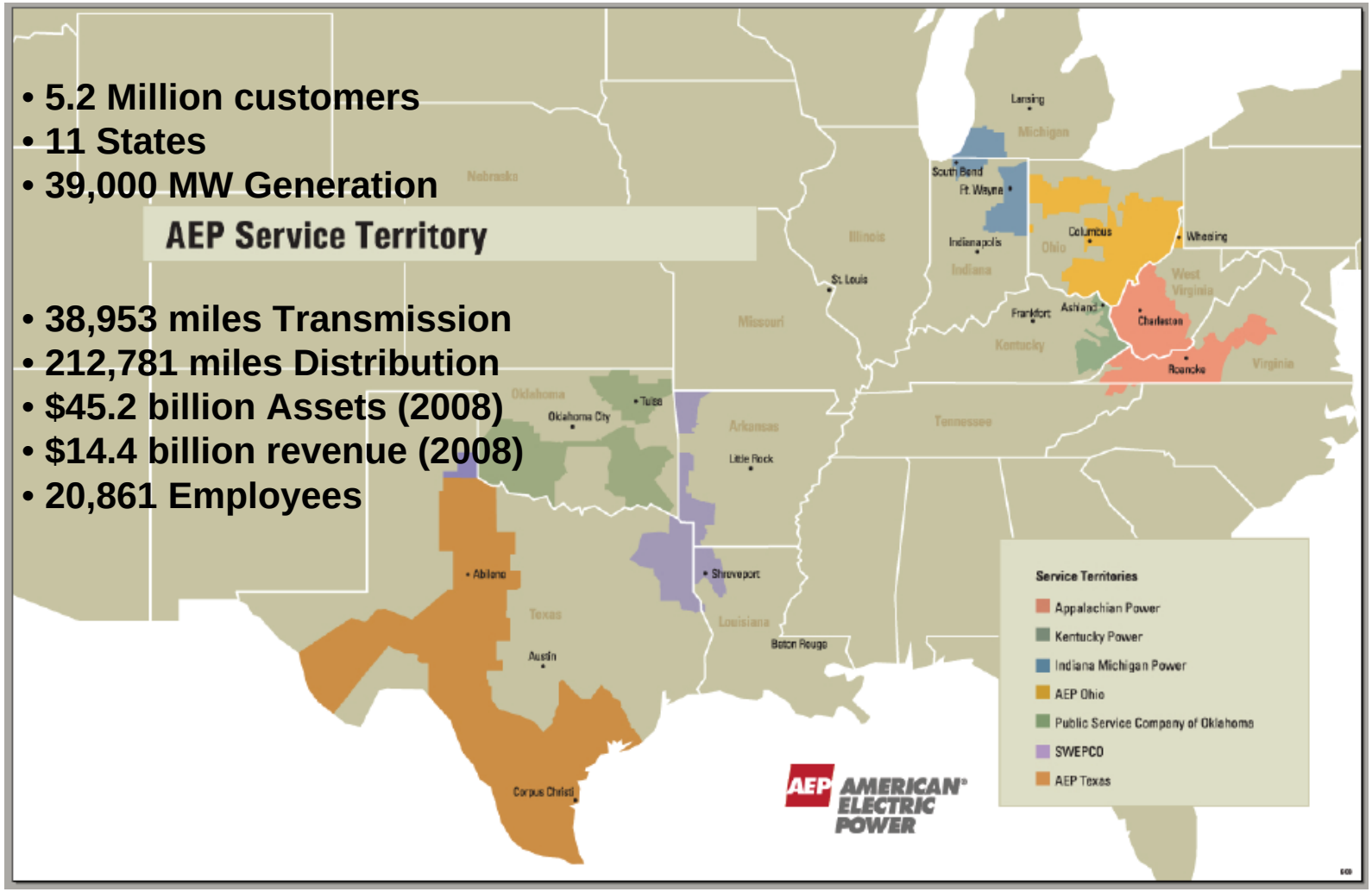
AEP Overview

- 5.2 Million customers
- 11 States
- 39,000 MW Generation



- 38,953 miles Transmission
- 212,781 miles Distribution
- $45.2 billion Assets (2008)
- $14.4 billion revenue (2008)
- 20,861 Employees

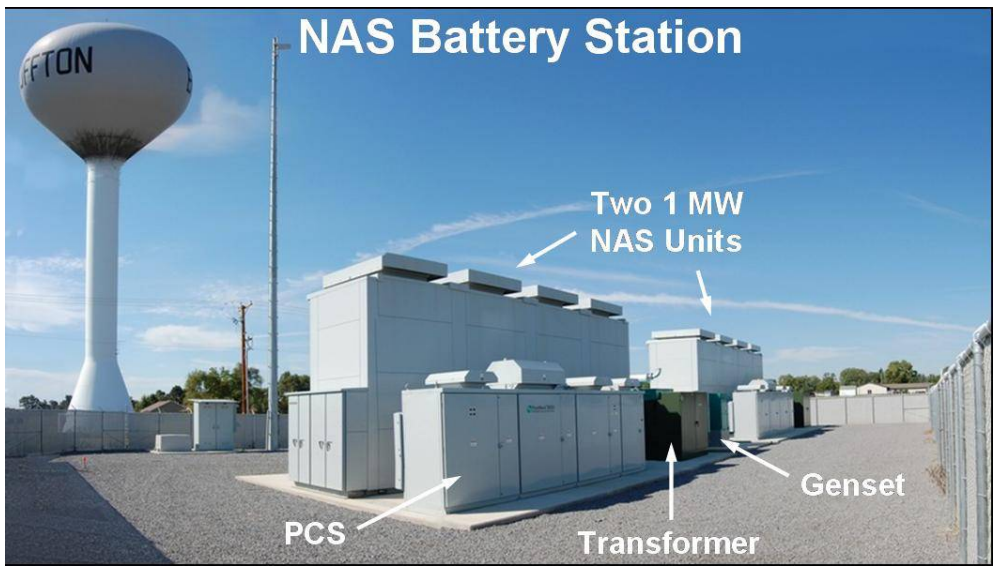
Installed Batteries – AEP Experience

2006 - 1 MW, 7.2 MWh in Charleston WV

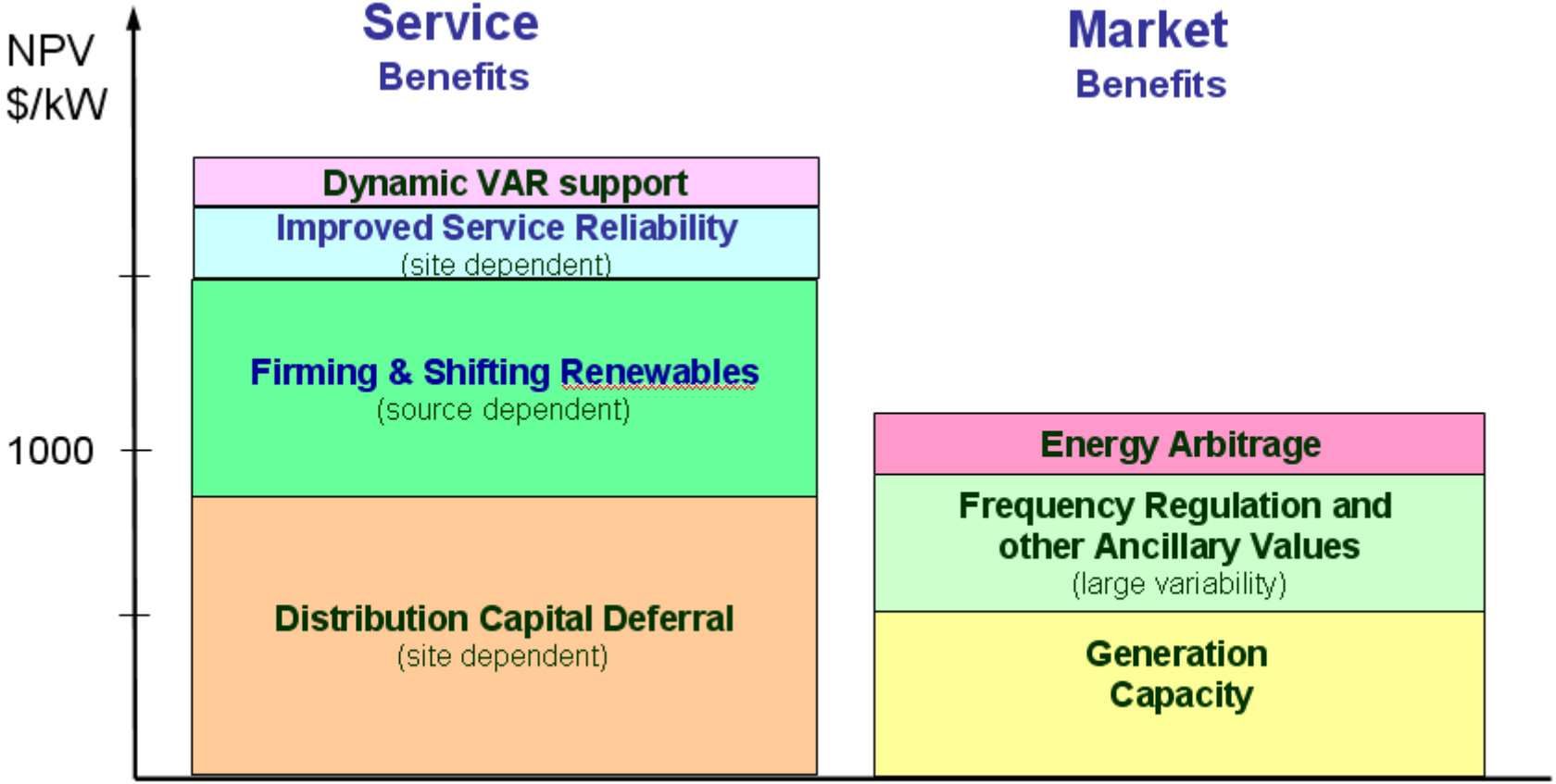
2008 – 6 MW, 50Mwh at three sites with “backup power”

- 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



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

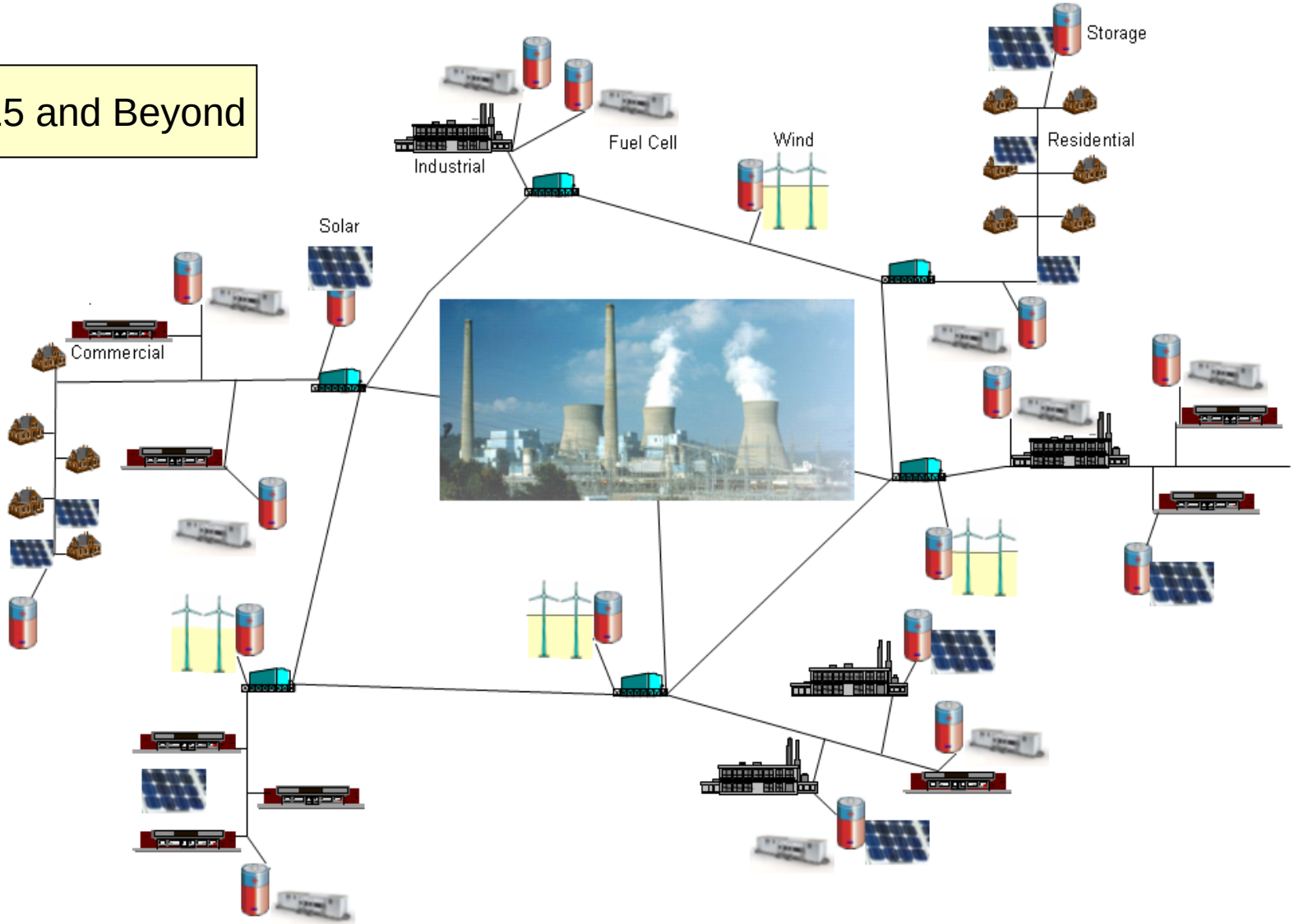
AEP Perspective on MES

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 *(less concentrated energy)*
   - Service Reliability *(backup power for customers)*
   - Equipment Reliability *(diversity)*
   - Grid Constraints *(closer to loads)*
   - Competitive Pricing

Massive Electricity Storage – AEP's Vision

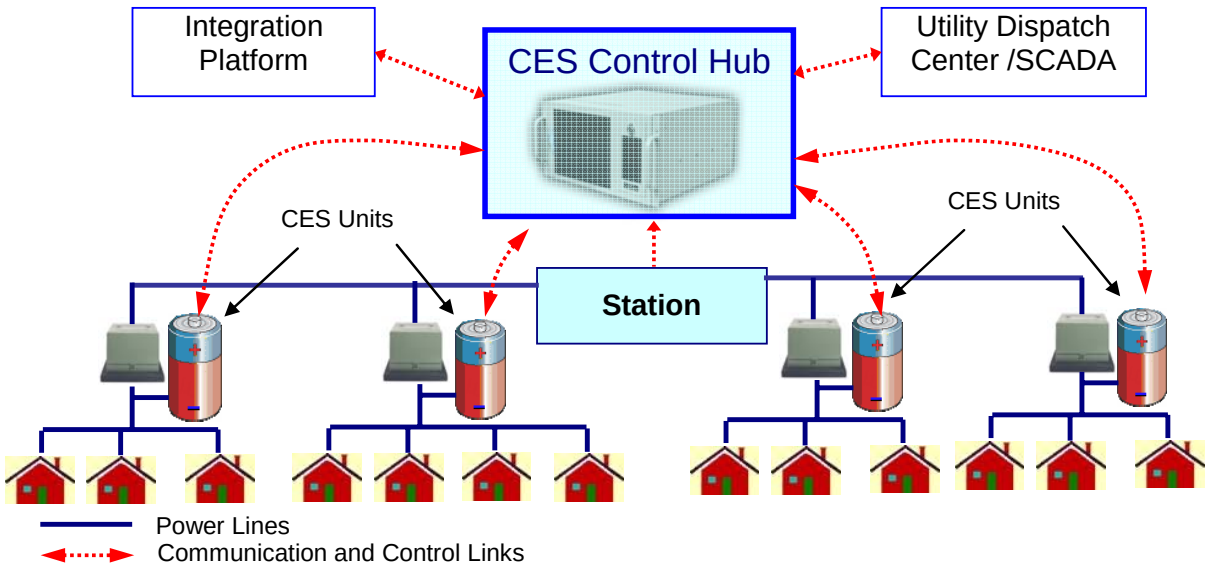
2015 and Beyond



ELECTRICITY STORAGE ASSOCIATION

Community Energy Storage – *A New Format*

1. Collectively, Community Energy Storage functions as a multi-MW, multi-hour unit.
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