PANEL 3: Utilities' Perspective of Energy Storage

2011 Integrated Energy Policy Report Committee Workshop
on Energy Storage for Renewable Integration
Sacramento, California
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Energy storage is not a single application or technology. Potential Applications:

- **Behind the Meter:** manage loads, on site generation and costs at a specific location
- **Distribution:** manage reliability, power quality costs
- **Transmission:** manage power flows, maintain power quality
- **Generation:** Energy arbitrage, ancillary services

This wide range of potential applications shows that storage is not a homogeneous product and that a wide range of products and options may be needed. Utilities are a candidate for ownership of energy storage at all levels.

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Utility is responsible for operating the distribution grid. Customers expect the distribution system to be operated:

- Safely
- Efficiently
- Reliably
- With Power Quality

Potential Storage Deployment locations

- **Distribution Level**
  - To address increasing penetration of PV on distribution system
  - Voltage regulation, frequency regulation, power intermittency, voltage flicker, deferment of capacity upgrades
- **Substation Level**
  - To address centralized renewable variable generating sources
  - Voltage and Frequency regulation

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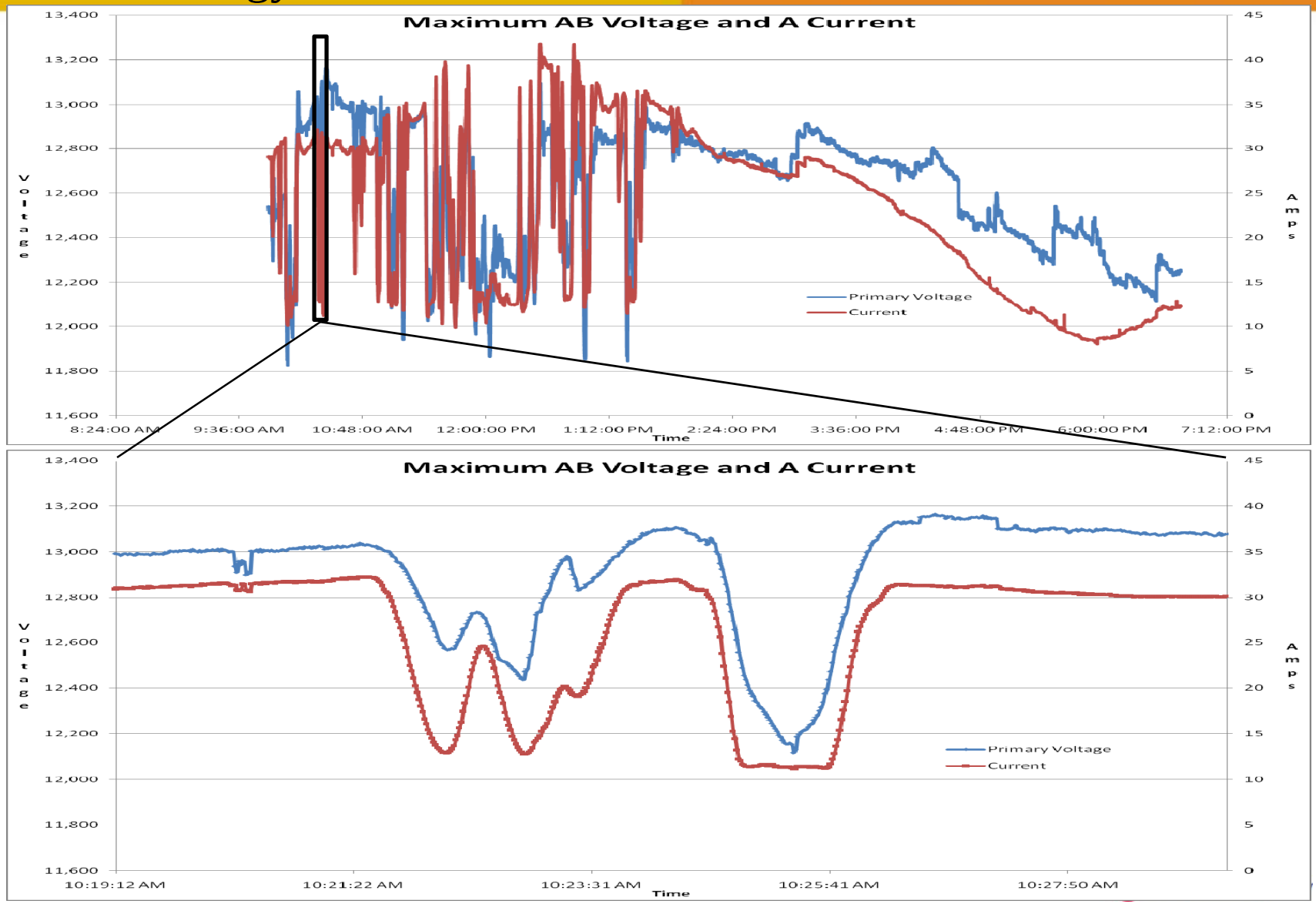
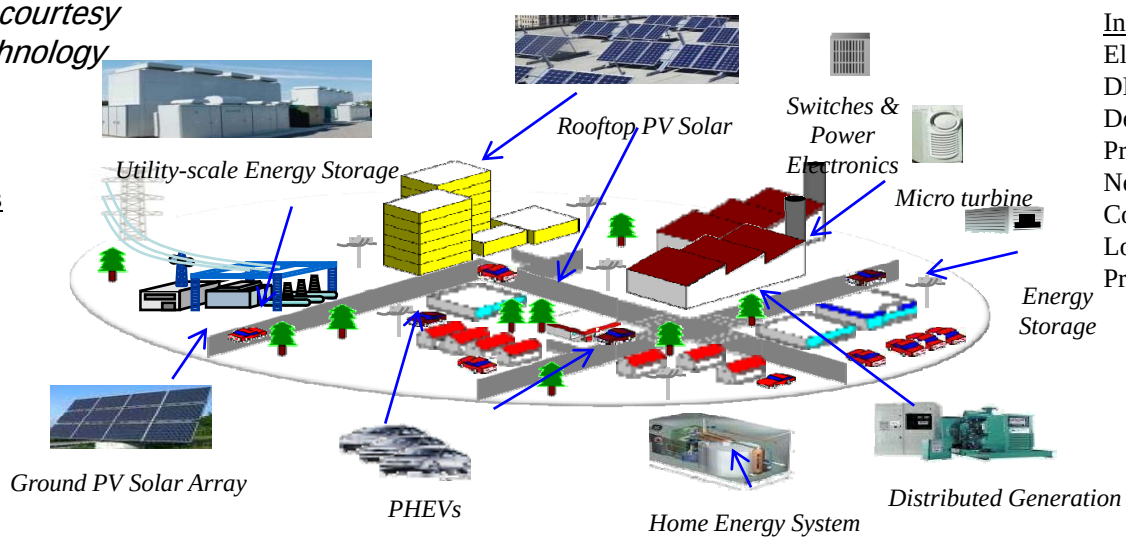
Intermittency caused by renewable energy sources



Project Description	*In cooperation with the US Department of Energy and the California Energy Commission, SDG&E and 10 public and private sector partners will develop a "microgrid" project - a small version of its electric grid which takes advantage of local distributed energy resources and state-of-the-art controls to enhance grid operations – to achieve a >15% reduction in feeder peak load and improve system reliability.*
Current Status	*•Site Selection complete – Borrego Springs* *•Finalizing system requirements and high level design* *•Developing customer communication plan* *•Collaborating with environmental agencies to satisfy permitting requirements*

Conceptual illustration courtesy of National Energy Technology Laboratory



Distributed Energy Resources
Utility-scale Energy Storage
Rooftop PV Solar
Micro-turbines
Building Energy Storage
Community Energy Storage
Distributed Generation
Home Energy System
PHEVs
Ground PV Solar Array

Information
Electricity Pricing
DER status
Demand Response Programs
Network status
Community Objectives
Load and Resource Profiles

Grid Resources
Capacitor Banks
Voltage Regulators
Automated Switches
Power Electronics
Communications

- Continue to investigate and demonstrate individual energy storage projects in order to:
  - continue energy storage demonstration projects and technical studies
  - gain experience with storage devices and ancillary associated equipment
  - develop standard practices and work methods
  - work with manufacturers (RFP) and integrators to improve product cost and value
  - understand the need and drivers for different types/sizes of storage
- Adoption of mandatory energy storage procurement targets is inappropriate at this time:
  - Impact of renewable energy sources is not yet defined
  - Wide scale deployment of energy storage technologies are not yet mature
  - Energy storage systems are currently expensive

- Energy storage systems should be assessed on a case-by-case basis
  - The problem should be defined: Storage should be examined as one solution as with other technologies

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