Distributed Electricity Storage: A National Goal

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NAATBatt
National Alliance for Advanced Technology Batteries

Mission and Goals

- To Promote the Manufacture of Large Format Advanced Batteries in the United States
- To Accelerate the Market for Advanced Battery Systems in Automotive and Grid Supporting Applications in North America
- To Facilitate the Commercialization World-Leading Battery Technologies Developed by U.S. Universities and National Laboratories
- To Educate Government, Industry and the General Public About the Benefits of Electricity Storage Technology

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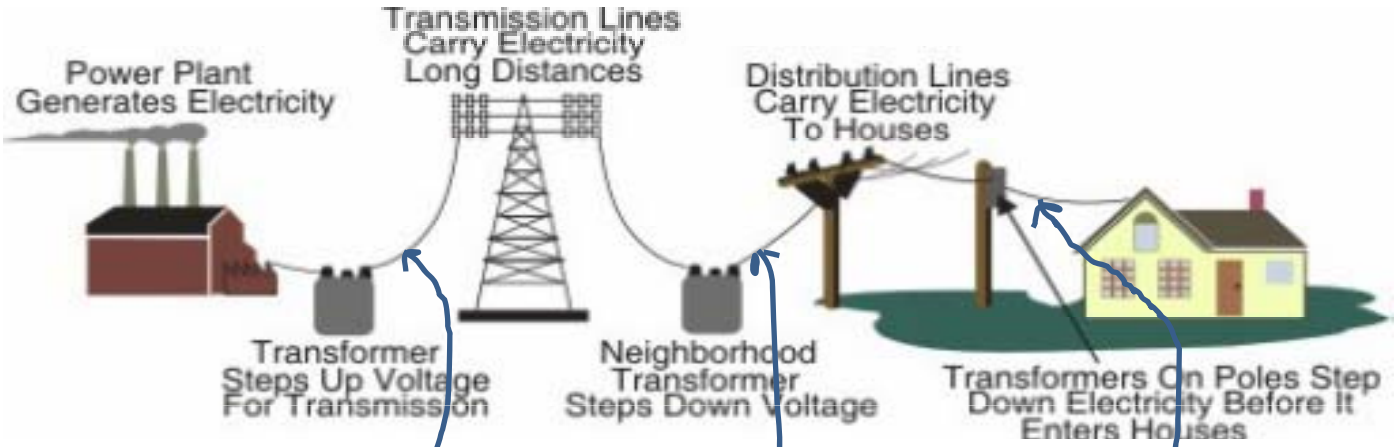
Recent Activities

- White Paper on National Benefits of Distributed Energy Storage (see www.naatbatt.org)
- Meeting with Secretary of Energy Steven Chu to Discuss the Importance of Distributed Energy Storage Technology, April 2012
- DES Demonstration Project Initiative
- Comments to FERC Concerning Third Party Provision of Ancillary Services, September 2012 (see www.naatbatt.org/publications)
- MOU with Maritime Clean Tech West of Norway
- MOU with Indian Energy Storage
- Member Site Visit Meetings at EaglePicher, S&C Electric, and General Motors

Locations for Storage on the Grid



Large Bulk Storage
100's of MW

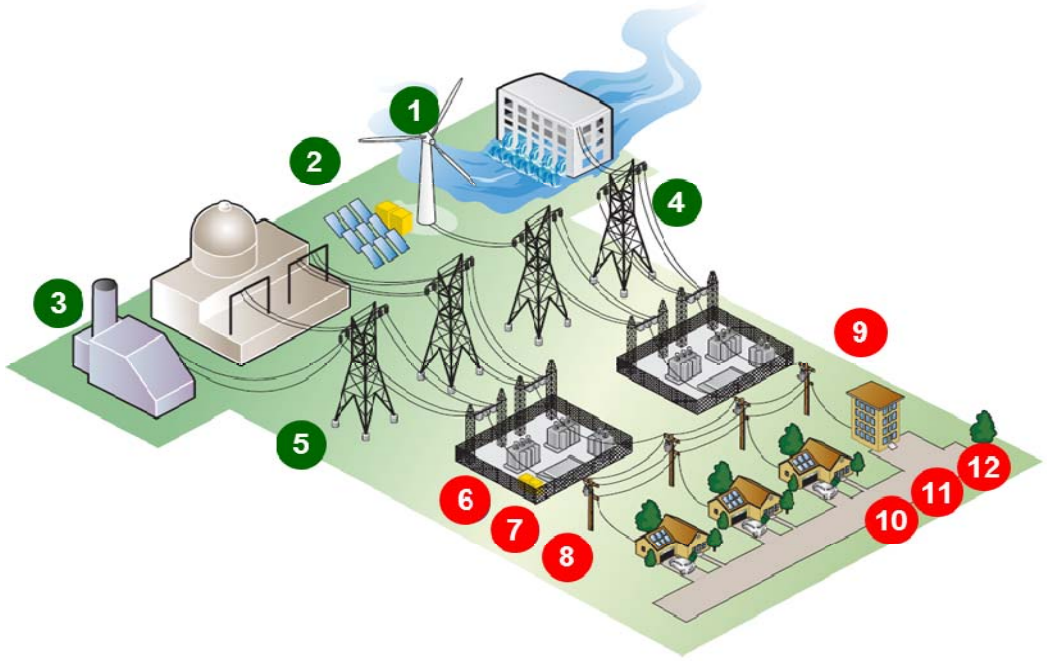
Distributed storage at substations
10's of MW

Storage at the "Tip" of the Grid
10's of kW

Source: S&C Electric Company

Applications of Energy Storage On The Grid

All of the operational uses (or value streams) a storage device may provide when sited at a specific place & managed in a particular way.



Application Examples

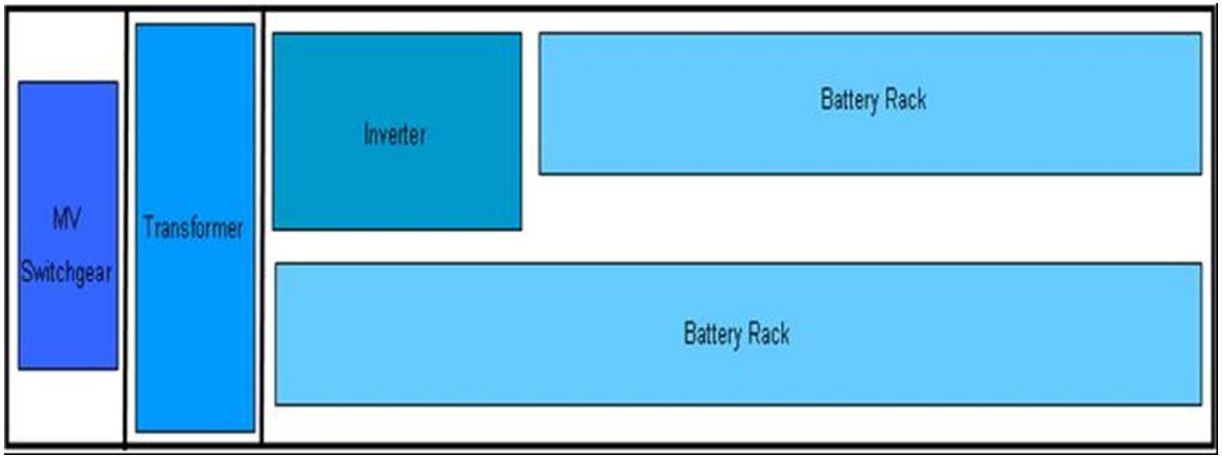
1. Off-to-on peak intermittent energy shifting & firming
2. On-peak intermittent energy smoothing & shaping
3. Ancillary service provision
8. Peak load shifting downstream of the distribution system
10. End user retail rate optimization

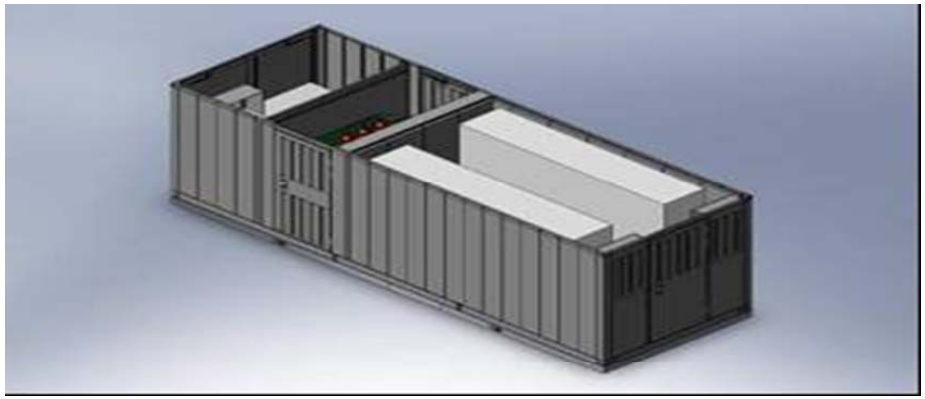
● Distributed Storage Application

Source: Southern California Edison

Distributed Energy Storage

Typical Sketch- Predesigned Unit / Distributed Energy Storage Module for 1000 kW / 3000 kW-hr



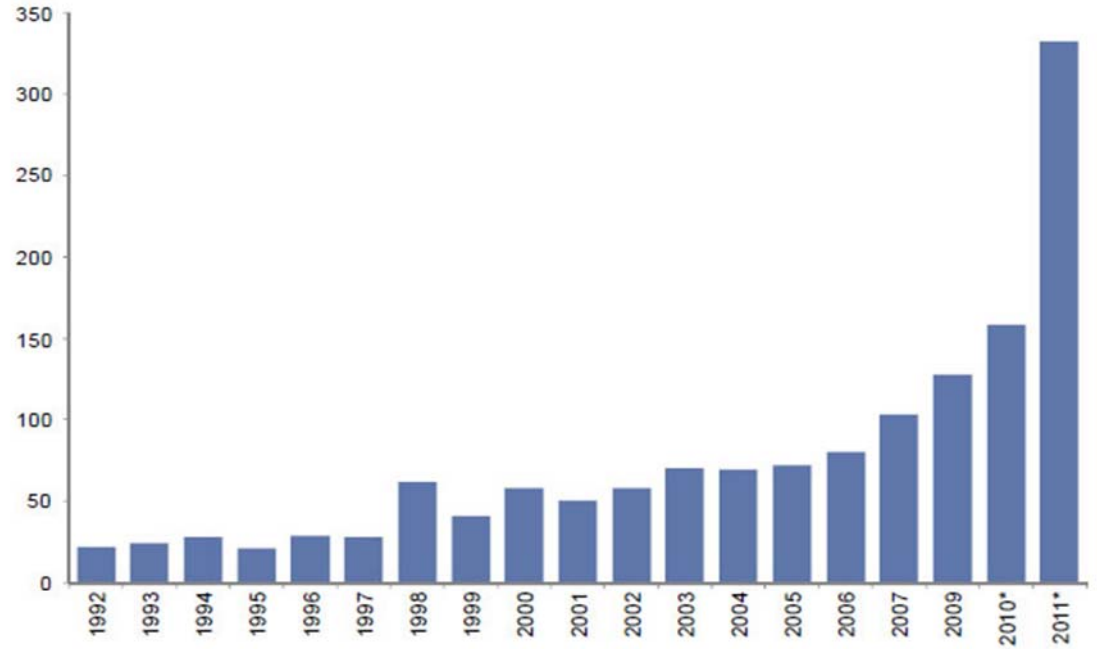


Source: ABB, Inc.

DES Demand Driver: Reliability

Power outages have risen sharply over the last decade

Major power disturbances in North America



*Note: * NERC equivalent data estimated based on the trends seen in the Eaton Blackout tracker for number of outages affecting over 50,000 people.*

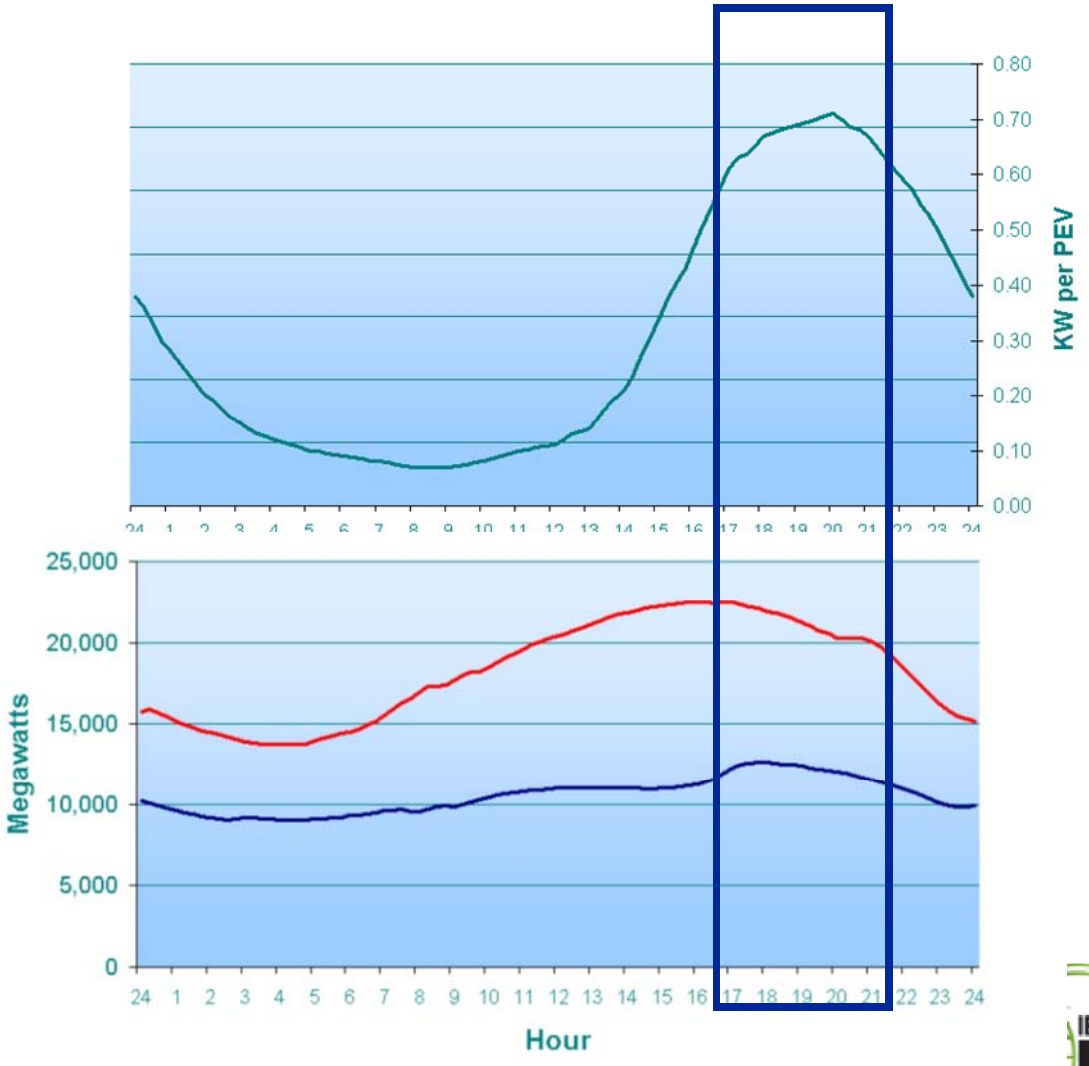
Source: NERC, Eaton Blackout Tracker, Goldman Sachs Research estimates.

DES Demand Driver: EV Charging

PEV Charging Load

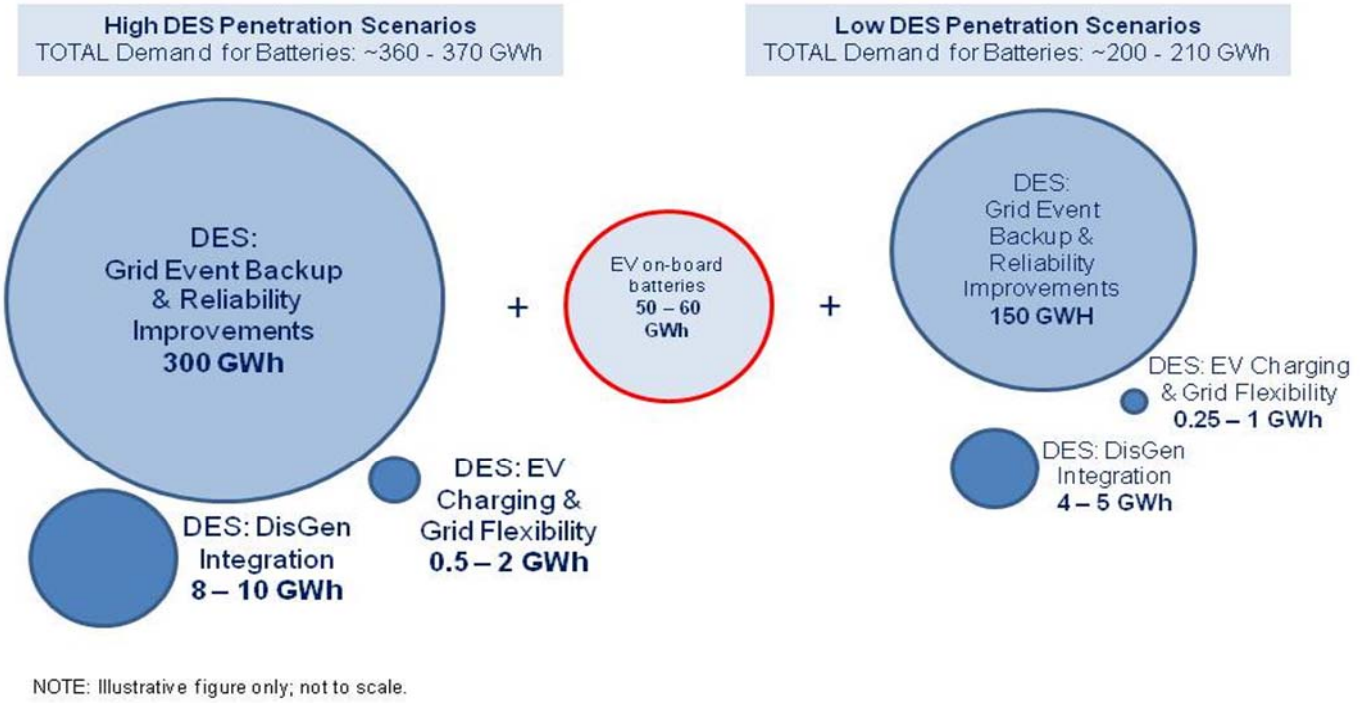
Peak Load Day

Minimum Load Day



Source – PG&E

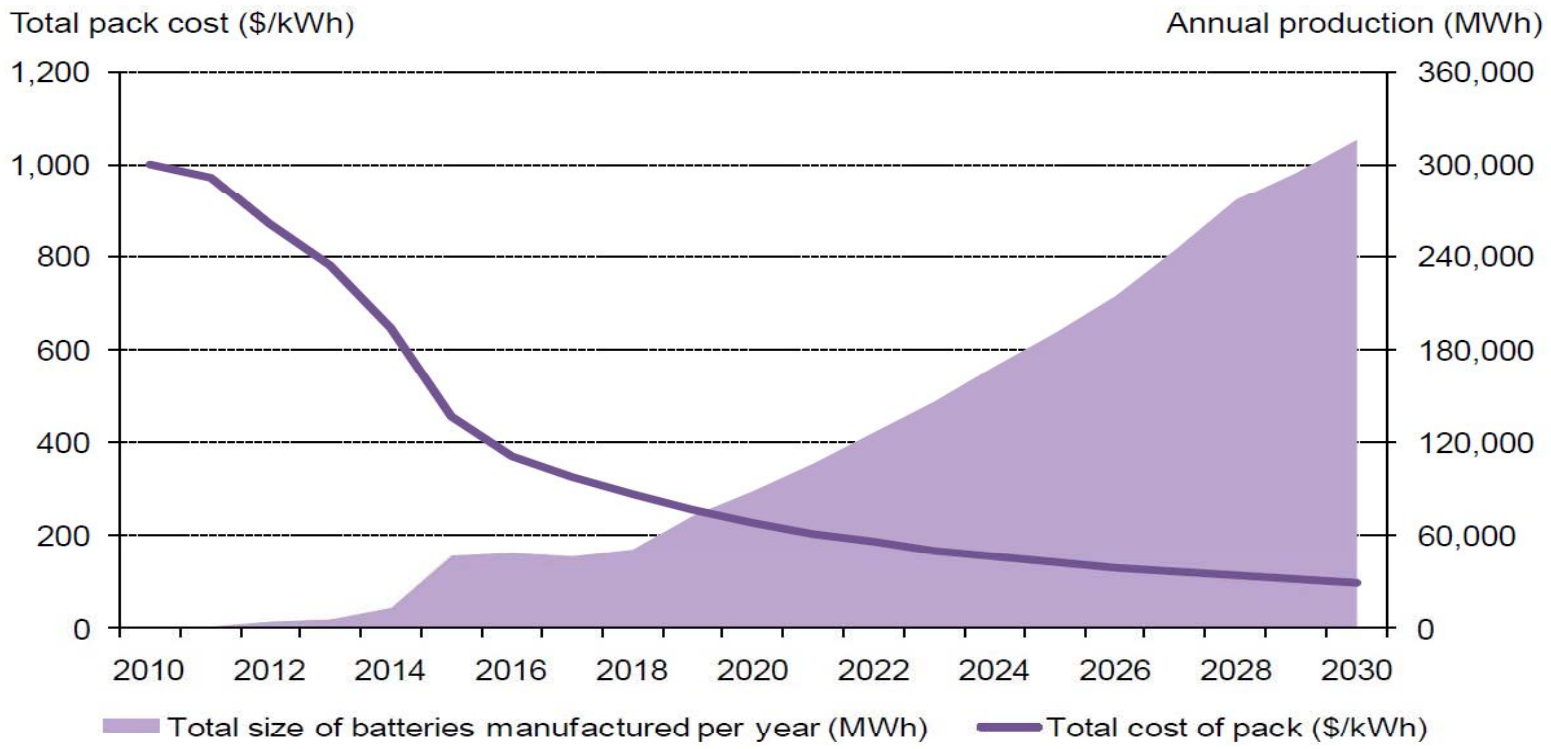
Economies of Scale Possible by Aggregating DES and Automotive Markets



NOTE: Illustrative figure only; not to scale.

Data source: KEMA

Battery Cost Reduction Will Increase Demand for Electric and Electrified Vehicles



Note: Total pack cost includes the battery management system

Source: Bloomberg New Energy Finance

Thank You!

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