



Distributed Energy Storage White Paper

Smart Grid & Energy Storage
Subcommittee's Joint Effort

Update

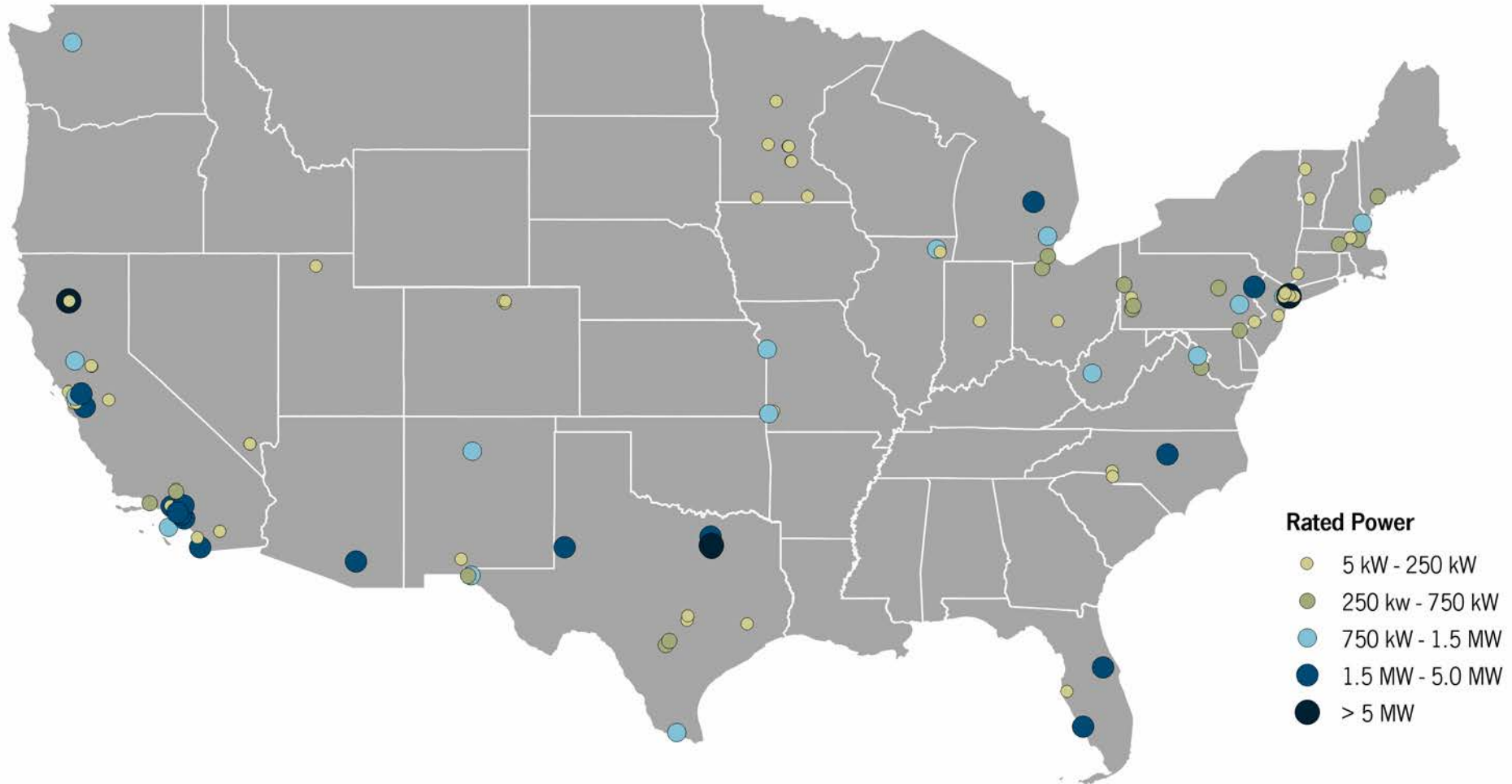


DES WP Update

- **Definition**
 - Energy Storage that is located at or down stream of Distribution Sub Stations
 - Includes Behind the Meter Applications
 - Thermal Energy Storage
 - Micro Grids
- **Scope**
 - Market
 - Regulatory & Interconnect
 - Technology & Applications
 - Benefits
 - Codes & Safety
 - DR Appendix
- **Purpose/Goal**
 - Characterize DES Status
 - Identify Gaps & Provide Recommendations to DOE



Distributed Energy Storage (DES) Projects Map (9/14) (to be updated)





Recent DES News

- **Oncor**
 - \$5B+ Proposal to ERCOT for DES
 - Balancing the Bulk System using DES
 - Addressing Majority of System Contingencies w/ DES
 - Providing Better Service to Customers w/ DES
- **Tesla**
 - DES Product Offering
 - Partnership w/ Solar City and Other Major Utilities
 - Majority of Giga Battery Factory Capacity to DES
 - Advanced Microgrid Solutions Signs 500 MWh Energy Storage Deal with Tesla



DES Expert Interviews

DES Expert Interviewee	Affiliation	Interview Completion Date
Willem Fadrhonc	STEM	10/20/2014
Tom Weaver	AEP	11/10/2014
Melicia Charles	CPUC	10/23/2014
Tom Bialek	SDG&E	12/15/2014
Fred Fletcher	Burbank Water and Power	10/30/2014
Dan Ton	DOE	10/9/2014
Imre Gyuk	DOE	10/9/2014
Paul De Martini	Newport Consulting Group	10/9/2014
Erich Gunther	Enernex	10/6/2014
Barry Mather	NREL	10/9/2014
Bob Rudd	Solar City	11/14/2014
Jeff Anderson	CalCEF	1/12/2015

Topics Not Covered in Interviews: Thermal Storage
OEM's Liability Concerns Regarding Using EV Batteries as DES



Draft Recommendations

- **Market Developing/Evolving Quickly**
 - **DOE's Ability to Track DES Projects**
- **DES Market Models & New Market Mechanics**
 - **Rate Base and/or Open Market**
- **DES Physical Models**
 - **Advanced Power Electronics & Controls**
- **DR & DES Control Models & Advanced Control Development**
 - **Local vs Central (DES vs Bulk)**
 - **Interface Control System Between Distribution & Bulk System**
- **DES Codes & Standards**
 - **Risk Based Codes & Standards**
 - **Accelerate Code Adoption by State & Local Governments**
- **DES Interconnect Standards/Open Access**
 - **Plug & Play for Behind the Meter**
 - **Simplify Interconnect Process for Other Interconnects thru Codes/Standard**
- **DES Technology Development**
 - **Materials, Products, Systems to Improve DES/Battery Safety**



DES WP Work Plan & Status

- WP Outline Draft
- DES Panel EAC June 2014 Meeting
- Expert Interviews (Complete)
- Draft White Paper September 2015
- Target Completion Date – March 2016