Peer Review and Update Meeting 2015 — U.S. Department of Energy

Energy Storage Systems Program (ESS)

Portland Hilton and Towers, Portland, OR 97204

September 22-24, 2015

www.sandia.gov/ess

Tuesday, September 22, 2015

7:00 am – 5:00 pm	Registration (all day)	
	Peer Review Welcome ***Grand Ballroom 2***	**Dr. Imre Gyuk, *U.S. Department of Energy, Energy Storage Program Manager***
1:15 pm- 2:30 pm	**Keynote**	**Gregory K. Delwiche, *Bonneville Power Authority, Deputy Administrator***
	DOE Energy Storage Program	**Dr. Imre Gyuk, *U.S. Department of Energy, Energy Storage Program Manager***
	SNL OE-ES Overview	Babu Chalamala, *Sandia National Laboratories*
	PNNL OE-ES Overview	Vincent Sprenkle, *Pacific Northwest National Laboratory*
	ORNL OE-ES Overview	Michael Starke, *Oak Ridge National Laboratory*
2:30 pm - 3:00pm	*Break Sponsored*	
3:00 pm - 4:30 pm	**Session PR-1** ***Grand Ballroom 2***	**Chair: Stan Atcitty, *Sandia National Laboratories***
	PE Reliability 2 (FY15)	David Hughart, *Sandia National Laboratories*
	60kW DC-AC Inverter with Internal Isolation using GaN Devices	Martin Becker, *Princeton Power Systems*
	Highly Efficient, High Power Density GaN-based DC-DC Converters for Grid-Tied Energy Storage Applications	Daniel Martin, *APEI*
	Innovative Nanocomposites Materials for Flywheels	Tim Boyle, *Sandia National Laboratories*
5:00 pm - 7:30 pm	*Joint Reception with Posters - Sponsored by ESA* *Grand Ballroom 1*	

Wednesday, September 23, 2015

7:00 am – 5:00 pm	Registration (all day)	
8:30 am - 9:45 am	**Session PR-2** ***Grand Ballroom 2***	**Chair: Kim Nuhfer, *U.S. Department of Energy, NETL***
	NETL-ARRA overview	Kim Nuhfer, *U.S. Department of Energy, NETL*
	Detroit Edison's Advanced Implementation of community Energy Storage Systems for Grid Support	Haukur Asgeirsson, *DTE Energy*
	Tehachapi Wind Energy Storage Project Using Li-Ion Batteries	Grant Davis, *Southern California Edison*
	Vionx Energy Corporation Distributed Energy Storage System Demonstration	Doug Alderton, *Vionx Energy Corporation*
	ARRA Energy Storage Study	Don Bender, *Sandia National Laboratories*
9:45 am - 10:15 am	*Break Sponsored*	
10:15 am - 12:00 pm	**Session PR-3** ***Grand Ballroom 2***	**Chair: Vince Sprenkle, *Pacific Northwest National Laboratory***
	Room Temperature Sodium Flow Battery	Leon Shaw, *Illinois Institute of Technology*
	Advances in PNNL's Mixed Acid Redox Flow Battery Stack	David Reed, *Pacific Northwest National Laboratory*
	Na-metal Halide Battery Development	Guosheng Li, *Pacific Northwest National Laboratory*
	Composite Electrolyte for Li-ion Batteries	Xingbo Liu, *West Virginia University*
	Room Temperature Na-ion Battery Development	Xioalin Li, *Pacific Northwest National Laboratory*
	Prussian Blue Materials for Na-ion Batteries	Hyun-Wook Lee, *Stanford University*
12:00 pm – 1:15 pm	*Lunch on own*	
1:15 pm - 3:15 pm	**Session PR-4** ***Grand Ballroom 2***	**Chair: Dan Borneo, *Sandia National Laboratories***
	Industry Acceptance Thrust - Overview	Dan Borneo, *Sandia National Laboratories*
	California Energy Commission (CEC): UC San Diego	Bill Torre, *University of California San Diego*
	Demo/Optimization: Texas Tech University	Ben Gully, *DNV GL*
	CESA: Vermont GMP	Chris Larsen, *Dynapower*
	CESA: Oregon	Diane Broad, *Oregon Department of Energy*
	Clean Energy States Alliance	Todd Olinsky-Paul, *CESA*
	Energy Storage in Alaska	Marc Mueller-Stoffels, *University of Alaska Fairbanks*
	Active Damping of Power System Oscillations Using Distributed Energy Storage	Dave Schoenwald, *Sandia National Laboratories*

Wednesday, September 23, 2015 – Poster Session PR-5

3:15 pm-3:45 pm	*Break Sponsored*	
3:45 pm - 5:45 pm	**Session PR-5 Posters** ***Grand Ballroom 2***	**Chair: Rusty Heffner, ARPA-E, U.S. Department of Energy**
	Mechanisms of Safety	Travis Anderson, *Sandia National Laboratories*
	Novel High Energy Density Dielectrics for Scalable Capacitor	Harlan Brown-Shaklee, *Sandia National Laboratories*
	HECO Energy Storage Study	Ray Byrne, *Sandia National Laboratories*
	Demo/Optimization: Los Alamos	Ray Byrne, *Sandia National Laboratories*
	Smart GaN-Based Inverters for Grid-tied Energy Storage Systems	Mehdi Ferdowsi, *Missouri University of Science & Technology*
	Eng Gate Oxide WBG	Jon Ihlefeld, *Sandia National Laboratories*
	Low-Cost Sodium-Ion Battery to Enable Grid Scale Energy Storage: Prussian Blue-Derived Cathode and Complete Battery Integration	Jong-Jan Lee, *Sharp Labs of America*
	Zn-I2 Flow Battery	Bin Li, Pacific *Northwest National Laboratory*
	Advanced Mg Batteries	Gousheng Li, *Pacific Northwest National Laboratory*
	Lithium Sulphur Batteries for Grid Applications	Chengdu Liang, *Oak Ridge National Laboratory*
	K-S Battery	Xiaochuan Lu, *Pacific Northwest National Laboratory*
	Na-ion Conducting Membranes for Non-Aqueous Redox Flow Batteries	Jagjit Nanda, *Oak Ridge National Laboratory*
	An Inexpensive Metal-free Organic Redox Flow Battery from Grid-scale Storage	Sri Narayan, *University of Southern California*
	Topic 10a: Power Dense Converter Electronics for Grid Tie Energy Storage Containers	Bruce Pilvelait, *Creare, Inc.*
	A Single Substance Organic Redox Flow Battery	Paul Rasmussen, *Vinazene, Inc.*
	Planar Na-beta Batteries for Renewable Integration and Grid Applications	Scott Reeves, *Eagle Pilcher*
	Optimal Control of Distributed Networked Energy Storage for Improved Small-Signal Stability	Dave Schoenwald, *Sandia National Laboratories*
	Iron Based Flow Batteries for Low Cost Grid Scale Energy Storage	Nicholas Sinclair, *Case Western Reserve University*
	All-Silicon Carbide power module based boost converter platform for grid-tied energy	Ranbir Singh, *GeneSiC Semiconductor, Inc.*
	Secondary Use of Vehicle Batteries on the Electric Grid	Michael Starke, *Oak Ridge National Laboratory*
	Flow Battery Stack Performance	Ed Thomsen, *Pacific Northwest National Laboratory*
	Low-Cost Grid-Scale Electrical Storage Using a Rechargeable Zinc-Manganese Dioxide Battery	Damon Turney, *CUNY Energy Institute*
	High Energy Storage Capacity Low-Cost Iron Flow Battery	Jesse Wainwright, *Case Western Reserve University*
	All Organic Flow Battery	Xiaoliang Wei, *Pacific Northwest National Laboratory*
	High Voltage Capacitors for DC-Link Applications	Angelo Yializis, *Sigma Technologies International, Inc.*

Thursday, September 24, 2015

7:00 am – 4:00 pm	Registration (all day)	
8:30 am - 9:45am	**Session PR-6** ***Grand Ballroom 2***	**Chair: Cy Fujimoto, *Sandia National Laboratories***
	Redox Flow Battery Optimization	Tom Zawodzinski, *Oak Ridge National Laboratory*
	Adv Membranes for Flow Batteries	Cy Fujimoto, *Sandia National Laboratories*
	Adv Materials for Ionic Liquid Flow Battery	Travis Anderson, *Sandia National Laboratories*
9:45 am - 10:15 am	*Break Sponsored*	
10:15 am - 12:00 pm	**Session PR-7** ***Grand Ballroom 2***	**Chair: Landis Kannberg, *Pacific Northwest National Laboratory***
	Sodium-Based Batteries	Dave Ingersoll, *Sandia National Laboratories*
	Update on ES Safety Working Group	Stan Atcitty, *Sandia National Laboratories*
	Energy Storage Hazard Analysis and Risk Management	David Rosewater, *Sandia National Laboratories*
	Testing: Cell Testing	Summer Ferreira, *Sandia National Laboratories*
	Energy Storage Systems Analysis	David Rosewater, *Sandia National Laboratories*
	Amber Kinetics Flywheel Energy Storage Demonstration	Seth Sanders, *Amber Kinetics*
12:00 pm – 1:15 pm	*Lunch on own*	
1:15 pm - 2:45 pm	**Session PR-8** ***Grand Ballroom 2***	**Chair: Babu Chalamala, *Sandia National Laboratories***
	DOE/EPRI Energy Storage Handbook in Collaboration with NRECA	Jacquelynne Hernández, *Sandia National Laboratories*
	Potential Revenue from electrical Energy Storage in ERCOT: The Impact of location and Recent Trends	Ray Byrne, *Sandia National Laboratories*
	International Energy Storage Working Group	Vish Viswanathan, *Pacific Northwest National Laboratory*
	DOE Global Energy Storage Database	Cedric O. Christensen, *Strategen Consulting*
3:00 pm - 4:00 pm	**Peer Review – EESAT Joint Closing Plenary** ***Grand Ballroom 1***	

The following DOE/OE Energy Storage Portfolio Projects are being presented during the EESAT 2015 Conference.

Session	EESAT Session Time	Project Name	PI / Task Manager	Affiliation
Tuesday, September 22				
E-0	Tue 8:30 am - 9:45 am	Safety Codes and Standards Effort	Dave Conover	PNNL
E-01	Tue 10:15 am - 12:00 pm	Secondary Use Energy Storage System Prototype Utilizing Varying Size and Chemistry Batteries	Michael Starke	ORNL
E-01	Tue 10:15 am - 12:00 pm	Compressed Air Energy Storage	Robert Booth	Pacific Gas and Electric
E-02	Tue 3:00 pm - 5:00 pm	Hawaii: Natural Energy Laboratory of Hawaii Authority (NELHA)	Laurence Sombardier	NELHA
E-02	Tue 3:00 pm - 5:00 pm	Testing: Stack Wave Form: Results of multiple simultaneous uses on life of a lithium ion cell	Summer Ferreira	SNL
E-02	Tue 3:00 pm - 5:00 pm	Performance Protocol	Vish Viswanathan	PNNL
E-02	Tue 3:00 pm - 5:00 pm	Valuation and Testing of Advanced Energy Storage for ARPA-E by UC San Diego	William V. Torre	UC San Diego
E-poster	Tue 5:00 pm - 7:30 pm	Grid-Scale Energy Storage Demonstration for Ancillary Services Using Ultrabattery	John Wood	Ecoult East Penn
E-poster	Tue 5:00 pm - 7:30 pm	Optimal Control of Distributed Networked Energy Storage for Improved Small-Signal Stability	Dave Schoenwald	SNL
E-poster	Tue 5:00 pm - 7:30 pm	10kW 80kWh Energy Storage System Based on All-Iron Hybrid Flow Battery	Julia Song	Energy Storage Systems, Inc.
E-poster	Tue 5:00 pm - 7:30 pm	10a: High Voltage and High Density SiC-based Topologies for Grid-tied Energy Storage Applications (GER-ES)	Chad Eckhardt	GridBridge, Inc.
Wednesday, September 23				
E-03	Wed 8:30 am - 9:45 am	WA State Clean Energy Fund – Use Case Analysis Assessing the Economic Benefits of Washington Clean Energy Fund Energy Storage Projects	Landis Kannberg	PNNL
E-04	Wed 10:15 am - 12:00 pm	Leading edge hybrid lead-acid: continuous partial-charge cycling, field reports, commercial	John Wood	Ecoult East Penn
E-04	Wed 10:15 am - 12:00 pm	Battery Storage Evaluation Tool: Assessing the Economic Benefits of Energy Storage and Microgrids	Patrick Balducci	PNNL
E-05	Wed 1:15 pm - 3:15 pm	Small Organic Molecule Based Flow Battery for Grid Storage	Michael Aziz	Harvard University
E-05	Wed 1:15 pm - 3:15 pm	*Redox Flow Battery Development for Stationary Energy Storage Applications*	Vince Sprenkle	PNNL
E-05	Wed 1:15 pm - 3:15 pm	Next Generation Aqueous Redox Flow Battery Development	Wei Wang	PNNL
E-05	Wed 1:15 pm - 3:15 pm	Developing MW-scale mixed-acid all vanadium redox flow battery system	Liyu Li	UniEnergy Technologies

The following DOE/OE Energy Storage Portfolio Projects are being presented during the EESAT 2015 Conference.

Session	EESAT Session Time	Project Name	PI / Task Manager	Affiliation
Thursday, September 24				
E-06	Thu 10:15 am - 12:00 pm	New Solid Electrolytes for Low Temperature All Solid State Sodium Batteries	Steve Martin	Iowa State
E-06	Thu 10:15 am - 12:00 pm	Li-ion electrolyte outgassing	Daiwon Choi	PNNL
E-06	Thu 10:15 am - 12:00 pm	The Architectural Diversity of Metal Oxide nanostructures: An opportunity for the Rational Optimization of Group II Cation Based Batteries	Esther Takeuchi	Stonybrook
E-07	Thu 1:15 pm - 3:00 pm	High Power Density GaN-Based Power Converters for Grid-Tied Energy Storage	Daniel Martin	Arkansas Power Electronics International, Inc.
E-07	Thu 1:15 pm - 3:00 pm	6.5 kV Silicon Carbide Half-Bridge Power Switch Module for Energy Storage System Applications	John Hostetler	United Silicon Carbide, Inc.
E-07	Thu 1:15 pm - 3:00 pm	Design and Development of a Low Cost, Manufacturable High Voltage Power Module for Energy Storage Systems	Chad O'Neal	Arkansas Power Electronics International
E-07	Thu 1:15 pm - 3:00 pm	Merged SiC Junction Transistors and Rectifiers as simplified Circ	Ranbir Singh	GeneSiC Semiconductor Inc
E-07	Thu 1:15 pm- 3:00 pm	Advanced Magnetics Project- High Frequency Link Converters Using Advanced Magnetics	Todd Monson	SNL

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