



2011 Update Conference — U.S. Department of Energy Energy Storage Systems Program (ESS)

San Diego Marriott Marquis & Marina, 333 W. Harbor Dr, San Diego, CA 92101 USA

SAND2011-6454P



AGENDA

Thursday, Oct. 20

www.sandia.gov/ess

TIME	PROJECT	SPEAKER
7:00 am	Registration (all day) & Complimentary Breakfast	
8:15	Welcome	Session Chair: Ron Staubly, NREL
8:30	Beacon Power 20MW Flywheel Frequency Regulation Plant	Dr. Imre Gyuk — US Department of Energy / Office of Electricity Delivery & Energy Reliability Jim Arseneaux — Beacon Power Corporation
8:45	Grid-Scale Energy Storage Demonstration for Ancillary Services Using the Ultrabattery Technology	John Wood — Ecoult Jeff Seasholtz — East Penn Manufacturing
9:00	PV Plus Storage for Simultaneous Voltage Smoothing and Peak Shifting	Steve Willard — Public Service Company of New Mexico
9:15	Notrees Wind Storage	Jeff Gates — Duke Energy Business Services
9:30	Detroit Edison's Advanced Implementation of A123's Community Energy Storage Systems for Grid Support	Nicholas Carlson — The Detroit Edison Company
9:45	Tehachapi Wind Energy Storage Project Using Li-Ion Batteries	Jeanne Boyce — Southern California Edison
10:00	BREAK	
		Session Chair: Kim Nuhfer, NREL
10:20	Premium Power Distributed Energy Storage System Demonstration	Dennis McKay — Premium Power
10:35	EnergyPod™: Smart Grid Storage	Rick Winter — Primus Power Corp.
10:50	Painesville Municipal Power Vanadium Redox Battery Demonstration Program	Jodi Startari — City of Painesville
11:05	Solid State Li Metal Batteries for Grid-Scale Energy Storage	Dr. Mohit Singh — Seeo
11:20	Amber Kinetics Flywheel Energy Storage Demonstration	Edward Chiao — Amber Kinetics
11:35	Demonstration of Isothermal Compressed Air Energy Storage to Support Renewable Energy Production	Dr. Dax Kepshire — SustainX
11:50	LUNCH (On Your Own)	
		Session Chair: Mark Johnson, ARPE-E
1:15 pm	(Main Marina Ballroom) One-minute Summaries of Poster Session Projects by All Presenters	
1:40	(Marina Ballroom) POSTER SESSION: SBIR, ARPA-E and New Proj [See page 3 - 5 for List of Projects and Presenters]	
3:30	BREAK	
		Session Chair: Ross Guttromson, SNL
3:50	Energy Storage at Sandia National Labs	Karen Waldrip — Sandia National Laboratories
4:00	Understanding the Function & Performance of Carbon Enhanced Lead Acid Batteries	David Enos — Sandia National Laboratories
4:15	Advanced Flywheel Materials	Tim Boyle — Sandia National Laboratories
4:30	Develop N2 – O2 Battery	David Ingersoll — Sandia National Laboratories
4:45	Life Cycle Testing of Energy Storage Devices	Summer Ferreira — Sandia National Laboratories
5:00	Tomorrow agenda and Close of today	Ross Guttromson — Sandia National Laboratories
5:05	END OF DAY	



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AGENDA

Friday, Oct. 21

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TIME	PROJECT	SPEAKER
7:15 am	Registration & Complimentary Breakfast	<u>Session Chair:</u> Terry Aselage?, <i>SNL</i>
8:15	Opening	Ross Guttromson — <i>Sandia National Laboratories</i>
8:20	Stationary Storage R&D at PNNL	Gary Yang — <i>Pacific Northwest National Laboratory</i>
8:30	Development of High Performance Redox Flow Batteries	Liu Li — <i>Pacific Northwest National Laboratory</i>
8:45	Low Cost, Long Cycle Life, Li-ion Batteries for Stationary Applications	Daiwon Choi — <i>Pacific Northwest National Laboratory</i>
9:00	Low Temperature Sodium Batteries	Jun Liu — <i>Pacific Northwest National Laboratory</i>
9:15	Energy Storage and Grid Analysis	Michael Kintner-Meyer — <i>Pacific Northwest National Laboratory</i>
9:30	BREAK	<u>Session Chair:</u> Landis Kannberg, <i>PNNL</i>
9:50	Intro	Georgianne Huff — <i>Sandia National Laboratories</i>
10:00	Energy Storage Test Facility	David Rose — <i>Sandia National Laboratories</i>
10:15	Superconducting Flywheel Development	Michael Strasik — <i>The Boeing Company</i>
10:30	Engineered Gate Oxides for Wide Band Gap Semiconductor MOSFETs	Stan Atcitty — <i>Sandia National Laboratories</i> Jon Ihlefeld — <i>Sandia National Laboratories</i>
10:45	CAES Modeling Parameters	Steve Bauer — <i>Sandia National Laboratories</i>
11:00	DOE/EPRI/NRECA Storage Handbook	Abbas Ahkil — <i>Sandia National Laboratories</i>
11:15	CLOSE and Next ES Peer Review 2012 Washington DC	Dr. Imre Gyuk — <i>US Department of Energy</i>
11:30	END OF PEER REVIEW 2011	



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POSTER SESSION (Marina Ballroom ?)

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Session Chair: Mark Johnson, ARPA-E

PROJECT	PRESENTER
<u>ARPA-E</u>	
Fuel-Free, Ubiquitous, Compressed Air Energy Storage and Power Conditioning	David Marcus – <i>General Compression</i>
Transformative Renewable Energy Storage Devices Based on Neutral Water Input	Katherine Ayers – <i>Proton Energy</i>
Low Cost, High- Energy Density Flywheel Storage Grid Demonstration	Michael Strasik – <i>Boeing</i>
Battery: A Robust and Inexpensive Iron-Air Rechargeable Battery for Grid-Scale Energy Storage	Sri Narayan – <i>University of So. California</i>
Development of a 100 kWh/100 kW Flywheel Energy Storage Module	Richard Hockney – <i>Beacon Power</i>
Flow-assisted Zinc Anode Batteries for Grid-scale Electricity Storage	Sanjoy Banerjee – <i>CUNY</i>
Hydrogen-Bromine Flow Batteries for Grid-Scale Energy Storage	Venkat Srinivasan – <i>Lawrence Berkeley National Lab.</i>
Superconducting Magnet Energy Storage System with Direct Power Electronics Interface	V.R. Ramanan – <i>ABB, Inc.</i>
Soluble Lead Flow Battery Technology	David Keogh – <i>General Atomics</i>
Low Cost, High Performance 50 Year Electrodes	Rick Winter – <i>Primus Power</i>
Transformative Electrochemical Flow Storage System	Michael Perry – <i>UTRC</i>
Enhanced Metal-Air Energy Storage System with Advanced Grid-Interoperable Power Electronics Enabling Scalability and Ultra-Low Cost	Cody Friesen – <i>Fluidic</i>
Na-Metal Halide Batteries (in Combination with ARPA-E)	Vince Sprenkle — <i>Pacific Northwest National Laboratory</i>
High-Amperage Energy Storage Device-Energy Storage for the Neighborhood	David Bradwell — <i>MIT</i>
Semi-Solid Rechargeable Power Sources- Flexible, High Performance Storage for Vehicles at Ultra-Low Cost	James Cross — <i>24M</i>
Planar Na-beta Batteries for Renewable Integration and Grid Applications	Vince Sprenkle — <i>Eagle-Pitcher</i>
Affordable Energy from Water and Sunlight	Daniel Nocera — <i>Sun Catalytix</i>



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<u>SBIR</u>	
Development of a High-power Motor/Generator for the ARPA-E Hub-Less Flywheel	Jim Arseneaux – Beacon Power
Shaft-less, Hub-less High Strength Steel Flywheel	Patrick McMullen - Calnetix
Acid-Base Blend Membranes for Redox Flow Batteries	Christopher Rhodes – Lynntech, Inc.
Flow Battery Membrane	Jack Treger – Tiax, LLC
Modular Undersea Compressed Air Energy Storage (UCAES) System	James Kesseli – Brayton Energy, LLC
Highly Selective Proton-Conducting Composite Membranes for Redox Flow Batteries	Dr. Hongzhu Fu – Lynntech, Inc.
Low Cost and Highly Selective Composite Membrane for Redox Flow Batteries	Fei Wang - EIC Laboratories, Inc
Low-Cost, High-Performance Hybrid Membranes for Redox Flow Batteries	Hongxing Hu – Amsen Technologies, LLC
Novel, High Performance Li-ion Cell	Keith Kepler – Farasis Energy, Inc
<u>University Call</u>	
Investigation of High Performance Components of Novel Structure for Ambient Temperature High Energy Density Battery Systems	Austen Angell - Arizona State University S. W. Martin - Iowa State University
Iron Based Flow Batteries for Low Cost Grid Level Energy Storage	Jesse Wainwright – Case Western
Development of Electrode Architectures for High Energy Density Electrochemical Capacitors	Bruce Dunn - UCLA
The Architectural Diversity of Metal Oxide Nanostructures: An Opportunity for the Rational Optimization of Group II Cation Based Batteries	Esther Takeuchi – University of Buffalo
<u>Core Program New Starts</u>	
2nd Generation Emissions Study by KEMA	Rick Fioravanti — KEMA
Sodium-Based Batteries- Applied R&D	David Ingersoll — Sandia National Laboratories
Energy Storage Project Database	Janice Lin — StrateGen Consulting, LLC
Advanced Membranes for Flow Batteries	Cy Fujimoto — Sandia National Laboratories
High Temp Controller	Joe Henfling — Sandia National Laboratories
Novel High Energy Density Dielectrics for Scalable Capacitor Needs	Geoff Brennecke — Sandia National Laboratories



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Flow Battery Modeling	Mario Martinez — Sandia National Laboratories
Thermo electrochemical Energy Storage	Nick Hudak — Sandia National Laboratories
Magnetic Alignment of Nanoparticles	Jim Martin — Sandia National Laboratories
CAES Analyses	Steve Bauer — Sandia National Laboratories
Clean Energy States Alliance	Abbas Ahkil — Sandia National Laboratories
Testing Metrics Development- application dependant	Ben Schenkman — Sandia National Laboratories
Regulatory & Policy Considerations of Electricity Storage Technologies & Benefits	Verne Loose — Sandia National Laboratories
Economics – Energy Storage market structures	James Ellison — Sandia National Laboratories
Li-ion reuse	George P Andrews — Oak Ridge National Laboratories
<u>Other</u>	
Linear Single Phase Inverter Model for Battery Energy Storage System Evaluation	Luke Watson — Sandia National Laboratories Intern
Battery Impedance Modeling for Power Electronics Applications	Daniel Fregosi — Sandia National Laboratories Intern
NMSU Projects	Satish Rande — NMSU
California Big Box Stores PV with Energy Storage Demonstrations	Matt Galland — SunPower