## **Biennial International Conference**

## ELECTRICAL ENERGY STORAGE APPLICATIONS AND TECHNOLOGIES

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## Bonus Day - Technical Project Updates- DOE Energy Storage Program

2013

	Thursday Octo	ber 24, 2013 - Main Ballroom	
		Marriott Hall	
7:00 AM			
	Registrati	ion (All Day) and Continental Breakfast	
	8:00 am	– <u>Welcome</u> : Georgianne Huff, SNL	
8:00	Welcome and DOE / OE Program Overview	Dr. Imre Gyuk — US Department of Energy / Office of Electricity Delivery & Energy Reliability	
8:10	DOE / ARPA-E Program Overview	$\mbox{Dr. John Lemmon} - US$ Department of Energy / Advanced Research Projects Agency-ENERGY	
8:20	DOE / OE / SNL Program Overview	Sean J. Hearne — Sandia National Laboratories	
8:30	DOE / OE / PNNL Program Overview	Vincent Sprenkle — Pacific Northwest National Laboratory	
	Μα	orning Sessions	
	8:40 am -	- <u>Session BD2 Chair</u> : George Andrews	
TIME	PROJECT	SPEAKER	
8:40	ARRA Compressed Air Energy Storage	Mike Medeiros, Robert Booth – Pacific Gas and Electric Company	
8:55	ARRA Tehachapi Wind Energy Storage Project Using Li-Ion Batteries	Blake Chalson, Christopher Clarke— Southern California Edison	
9:10	ARRA Beacon Power 20MW Flywheel Frequency Regulation Plant (Hazle Spindle)	Jim Arseneaux – Beacon Power	
9:25	Nanofillers for Improved Flywheel Materials	Tim Boyle, Tim Lambert - Sandia National Laboratories	
9:40	High Performance Particle Composites for Magnetic Bearings in Energy Storage Flywheels	Jim Martin <sup>s</sup> - Sandia National Laboratories	
9:55	1	BREAK	
10:15		Poster Session	
	PROJECT	SPEAKER	
	ZBB	Tony Siebert — ZBB	
	Ruggedized Portable Storage for Microgrids	Jeff Hires — GS Battery	
5 AM - 12:15 PM	High Power Flywheel	Don Bender — Helix Power Corp.	
	Reading, MA: RMLD Feasibility Study	Jane Parenteau — Reading, MA Municipal District	
	NAATBatt DES Roadmap Methodology	Jim Greenberger — NAATBatt	
10:1	LiS batteries	Chengdu Liang – Oak Ridge National Laboratory	
	Lower Cost Carbon Fiber for Flywheels	James Gerald Hansen — Oak Ridge National Laboratory	
	BOE Internetional Energy Standard Batabase	Amenda Consina - Circland	

Thursday October 24, 2013 Marrie	3 - Parallel Session - Salons ott Hall
Morning	Sessions
8:40 am – <u>Session BC</u>	03 Chair: Vince Sprenkle
PROJECT	SPEAKER
Advanced Membranes for VRFB: A Collaboration with SNL, PNNL, and ORNL	Cy Fujimoto - Sandia National Laboratories
Next Generation Aqueous Redox Flow Battery	Wei Wang — Pacific Northwest National Laboratory
Redox Flow Batteries	Tom Zawodzinski — Oak Ridge National Laboratory
Nitrogen/Oxygen Battery – A Transformational Architecture for Large Scale Energy Storage	Frank Delnick <sup>1</sup> – Sandia National Laboratories
BR	EAK
Poster	Session
Session BD5 C	hair: Eva Gardow
PROJECT Novel Nitride Materials for Advanced Power Electronics Grown by "Bulk GaN" Method	SPEAKER Karen Waldrip <sup>2</sup> — Sandia National Laboratories
Active Power Damping of Inter-Area Oscillations	Dave Schoenwald — Sandia National Laboratories
SBIR PROJECTS	
A Single Substance Organic Redox Flow Battery	Paul Rasmussen — Vinazene, Inc.
Organic and Inorganic Solid Electrolytes for Li-ion Batteries	Runqing Ou — NEI Corporation
Superior Mg-ion Conducting Membranes Based on Textured MgZr4(PO4)6 (MZP) through Low-Temperature Liquid Phase Sintering Techniques	Thomas Kodenkandath — ITN Energy
2.5kW/10kWh Redox Flox Battery (RFB) with Low-cost Electrolyte and Membrane Technologies	Thomas Kodenkandath — ITN Energy Systems, Inc.
Acid Based Blend Membranes for Redox Flow Batteries	Alan Cisar - Lypptech Inc

DOE

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Poster	Sessions	Continued
Poster	Sessions	continueu

Energy Storage Module	Jim Arseneaux – Beacon Power
Transformative Renewable Energy Storage Devised Based on Neutral Water Input	Katherine Ayers — Proton OnSite
Small Organic Molecule Based Flow Battery for Grid Storage	Michael Aziz – Harvard University
Flow-assisted Zinc Anode Batteries for Grid- scale Electricity Storage	Valerio De Angelis, Nilesh Ingale, Sanjoy Banerjee — CUNY Energy Institute
Electroville: High-Amperage Energy Storage Device-Energy Storage for the Neighborhood	David Bradwell — Massachusetts Institute of Technology
Low-Cost Grid-Scale Electrical Storage Using a Flow-Assisted Rechargeable Zinc- Manganes Dioxide Battery	Tim Coyne - CUNY
Enhanced Metal-Air Energy Storage System with Advanced Grid-Interoperable Power Electronics Enabling Scalability and Ultra- Low Cost	Cody Friesen – Fluidic Energy
Soluble Lead Flow Battery Technology	David Keogh -
Advanced Sodium Batteries with Enhanced Safety and Low-Cost Processing	Joonho Koh — Materials & Systems Research, Inc.
Low-Cost Sodium-Ion Battery to Enable Grid Scale Energy Storage: Prussian Blue- Derived Cathode and Complete Battery Integration	Jong-Jan Lee – Sharp Laboratories
Hydrogen-Bromine Electrical Energy Storage System	Guangyu Lin – TVN Systems
A Robust and Inexpensive Iron-Air Battery for Grid-Scale Energy Storage	Sri Narayan — University of Southern California
An Inexpensive Metal-free Organic Redox Flow Battery for Grid-scale Storage	Sri Narayan — University of Southern California
Affordable Energy from Water and Sunlight	Daniel Nocera – Sun Catalytix
Superdonducting Magnet Energy Storage System with Direct Power Electronics Interface	V.R. Ramanan — ABB, Inc.
High Energy Storage Capacity Low-Cost Iron Flow Battery	Robert Savinell – Case Western University
10kW 80kWh Energy Storage System Based on All-Iron Hybrid Flow Battery	Julia Song – Energy Storage Systems
Demonstartion of 2.5kWh Vanadium Redox Glow Battery (VRFB) Through Rationally Designed High Energy Density Electrolytes and Membrane-Electrode Assembly (MEA)	Paul Thoen - ITNES
Quaternary Phosphonium Based Hydroxide Exchange Membranes	Yushan Yan — University of Delaware
High-Voltage and Low-Crossover Redox Flow Batteries for Economical and Efficient Renewable Electricity Storage	Yushan Yan — University of Delaware
ARRA Solid State Li Metal Batteries for Grid- Scale Energy Storage	Mohit Singh — Seeo Inc.

Highly Selective Proton-conducting Composite Membranes for Redox Flow Batteries	Alan Cisar- Lynntech, Inc.
Sodium Intercalation Battery for Stationary Storage	David Ofer – Tiax, LLC
Flow Battery Structures to Improve Performance and Reduce Manufacturing Cost	E. Jennings Taylor – Faraday Technology
High Efficiency Cathode for Metal Air Batteries	Junquing Ma - Giner, Inc.
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Real-Time In-Situ Metrology for Lithium-Ion Battery R&D and Manufacturing	Jon Yoo - Applied Spectra Inc.
UNIVERSITY PROJECTS	
Iron Based Flow Batteries for Low Cost Grid Level Energy Storage	Jesse Wainright — Case Western Reserve University
The Architectural Diversity of Metal Oxide Nanostructures: An Opportunity for the Rational Optimization of Group II Cation Based Batteries	Esther Takeuchi — Stony Brook University
On the Structure and Properties of New Mixed Glass Former Solid Electrolytes for Low Temperature All Solid State Sodium Batteries	Steve Martin — Arizona State University
Development of Electrode Architectures for High Energy Density Electrochemical Capacitors	Bruce Dunn — UCLA
ARRA PROJECTS	
ARRA Amber Kinetics Flywheel Energy Storage Demonstration	Edward Chiao — Amber Kinetics, Inc.
ARRA Painesville Municipal Electric Power Vanadium Redox Battery Demonstration Project	Joseph Startari — Ashlawn Energy LLC
ARRA Ultrabattery Project Results	Jason Hoffman – East Penn
Not Present	
CAES Geo Performance	Mario Martinez – Sandia National Laboratories
Application of Redox Non-Innocent Ligands to Non-Aqueous Flow Battery Electrolytes	Mitchell Anstey - Sandia National Laboratories
Mesa del Sol Optimization	Jay Johnson — Sandia National Laboratories
Energy Storage Demonstration Journal	Jaci Hernandez — Sandia National Laboratories
NYSERDA Energy Storage Projects	Dhruv Bhatnagar — Sandia National Laboratories
Market Structure	Jim Ellison — Sandia National Laboratories
NV Energy	Jim Ellison — Sandia National Laboratories

12:15 pm – 1:30 pm

LUNCH (On Your Own)

Afternoon Sessions - Main Ballroom			
1:30 pm – <u>Session BD6 Chair</u> : Dan Borneo			
TIME	PROJECT	SPEAKER	
1:30	DOE/OE Demonstration Program	Dan Borneo — Sandia National Laboratories	
1:45	Cell Testing	Summer Ferreira — Sandia National Laboratories	
2:00	CESA ESTP, Connecticut DEEP	Todd Olinsky-Paul — Clean Energy Group	
2:15	ARRA PV Plus Storage for Simultaneous Voltage Smoothing and Peak Shifting	Steve Willard — PNM	
2:30	Updating the Electricity Storage Benefits and Market Potential Assessment Guide	Jim Eyer — Ali Nourai — DMV - KEMA	
2:45		BREAK	
	3:00 pm -	- Session BD7_Chair: Sean J. Hearne	
TIME	PROJECT	SPEAKER	
3:00	Reliable High-Performance Gate Oxides for Wide Band Gap Devices	Jon Ihlefeld — Sandia National Laboratories	
3:15	Room Temperature Na-ion Battery Development	Xiaolin Li <sup>4</sup> — Pacific Northwest National Laboratory	
3:30	Na-metal Halide Battery Development	Jin Yong Kim <sup>3</sup> — Pacific Northwest National Laboratory	
3:45	Sodium-based Battery Development	Dave Ingersoll <sup>6</sup> - Sandia National Laboratories	
4:00	DOE/EPRI Electricity Storage Handbook in Collaboration with NRECA	Georgianne Huff — Sandia National Laboratories	
4:15	c	losing Remarks - Dr. Imre Gyuk	
<sup>1</sup> Sean J. Hearne			
	<sup>2</sup> Stan Atcitty		
	<sup>3</sup> Vince Sprenkle		
<sup>4</sup> Wei Wang			
	"Tim Boyle		
	"Paul Clem		