

## Summary:

For the March 11<sup>th</sup> issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt, Advanced U.S. and Asia Indices were relatively flat. The S&P 500 and Russell 2000 decreased modestly 1.3% and 1.0%, respectively.

Executive Director James Greenberger talks about the disruptive nature of distributed energy storage technology and its ability fundamentally to restructure the grid. Read "**Utility Consumer: You're Fired!**" in the Executive Directors Notes section of this newsletter below.

## Key Highlights:

- The **Secretary of Energy Steven Chu** will be the keynote speaker at the **Technology & Rare Earth Metals (TREM)** 2011 Conference on March 22-23 in Arlington, Virginia. For more information, see the Announcements and Calendar section of the newsletter below.
- **Hitachi Vehicle Energy** will supply lithium ion (li-ion) batteries for the **Buick LaCrosse**. The compact 115-volt, 0.5 kilowatt-hour (kWh) battery will power the eAssist system that uses stop-start technology and an electric motor boost to help acceleration.
- Researchers at **Central Florida University** have engineered the world's lightest carbon material so that it could be used to store energy more efficiently. The new material belongs to the family of the lightest solid, also known by its technical name of **aerogel** or its common nickname of '**frozen smoke**'.
- Ten Japanese companies are planning to install electric vehicle (EV) chargers at the sites of beverage vending machines across Japan. The consortium includes **Panasonic Electric Works** and **Forking Company**, which has relationships with companies that own a combined 1.2 million vending machines across Japan, or about 50% of the national total.
- **Dow Kokam** announced the signing of supply contracts with **Motiv Power Systems** and **ZeroTruck**. The two companies will use **Kokam's** li-ion batteries in their medium-duty trucks.
- **Volkswagen** has redesigned the iconic 70s vehicle into an electric-powered van. The "**Bulli**" uses a 40 kWh li-ion battery and the electronics systems are controlled by a center-mounted iPad.
- **DesignLine Corporation** announced the results of a multi-year electric bus (ebus) evaluation. The ebuses showed increases in fuel economy of up to 41% and maintenance cost reductions up to 93% when compared to the **Charlotte International Airport's** fleet of traditional diesel buses.
- **Stealth Electric Bikes** has released two new all-terrain models into the American market. **The Fighter** and **The Bomber** are vehicles that are as similar to electric street bicycles as they are traditional dirt-bikes.
- Six **Fred Meyer** stores in the **Portland** area and six in the **Seattle** area will be installing charging stations this summer. The installations by **Ecotality** are part of a six-state program to support 8,300 cars. The \$230 million program is funded by federal stimulus money and private investments.

- **Yamaha** is considering launching an electric bike in the fast growing **Indian** two-wheeler market. The company is planning to focus more on India with a goal of having 10% of its total global sales from the country within the next 3-4 years.
- **PlugShare** (produced by **Xatori**) is a new, free app for the **iPhone** and **iPad** that provides a remedy for those suffering from 'range anxiety'. An app shows a map of all the public charging stations and taps into the device's GPS to locate the nearest one and provide directions.

## A Few More Details:

Hitachi Vehicle Energy will supply lithium ion batteries for the Buick LaCrosse this summer, the Japanese company's first lithium power pack for a passenger vehicle. The compact 115-volt, 0.5 kWh battery will power the eAssist system that General Motors believe will improve the 2012 LaCrosse fuel economy by 25%. The eAssist system uses stop-start technology and an electric motor boost to help acceleration.

*Source: Automotive News*

Reseachers at Central Florida University have engineered the world's lightest carbon material so that it could be used to store energy more efficiently, detect pollutants and toxic substances. The new material belongs to the family of the lightest solid, also known by its technical name of aerogel or its common nickname of "frozen smoke." The team has created multiwalled carbon nanotubes (MWCNT) aerogel so small that thousands fit on a single strand of human hair. By using the nanotubes instead of silica (major material in sand), the foundation for traditional aerogel, increases the materials' practical use.

*Source: Energy Harvesting Journal*

Ten Japanese companies are planning to install EV chargers at the sites of beverage vending machines across Japan (as shown in **Exhibit 1**). The consortium includes Panasonic Electric Works and Forking Company (a vending machine operator), which has relationships with companies that own a combined 1.2 million vending machines across Japan, or about 50% of the national total. The firms plan to install some 10,000 electric vehicle chargers at the sites of the vending machines in the first year of the project - which starts in April. SoftBank Telecom and SoftBank Mobile are due to provide telecom services to connect the charging systems, the group said in a press release.

### Exhibit 1: Leveraging Vending Machines Into Charging Stations



*Source: AFP*

Dow Kokam announced the signing of supply contracts with Motiv Power Systems and ZeroTruck. The lithium ion batteries to be supplied by Kokam will be used by the two in the medium-duty trucks. Dow Kokam, a joint venture (JV) between Dow Chemical Company, TK Advanced Battery and Groupe Industriel Marcel Dassault commenced operations in June 2010. The JV's Midland plant when fully operational will

produce 1.2 billion watt hours (Whs) of large-format lithium-ion batteries for 60,000 electric vehicles annually.

*Source: Auto Evolution*

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Volkswagen has redesigned the iconic 70s vehicle into an electric-powered van (as shown in **Exhibit 2**). The “Bulli” uses a 40 kilowatt-hour (kWh) li-ion battery that can be charged in less than an hour. The EV has a range of 186 miles with a top speed of 87 miles per-hour (MPH) and a 0-62mph acceleration in 11.5 seconds. The communications and electronics systems are controlled by a center-mounted iPad.

### Exhibit 2: The electric Bulli



*Source: Long Island Press*

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DesignLine Corporation announced the results of a multi-year ebus evaluation. The ebuses buses showed increases in fuel economy of up to 41% and maintenance cost reductions up to 93% when compared to the Charlotte International airport's fleet of traditional diesel buses. The ebus were first delivered to the Charlotte Airport in early 2007 and immediately placed into daily operations.

*Source: DesignLine Corporation*

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Stealth Electric Bikes has released two new all-terrain models. The Fighter and The Bomber (as shown in **Exhibit 3**) are vehicles that are as similar to electric street bicycles as they are traditional dirt-bikes. The Bomber is powered by a lithium iron phosphate battery with 1.5 kWh capacity and could be switched out in less than 90 seconds

*Source: Reuters*

### Exhibit 3: The Bomber Electric Dirt Bike



Source: *TG Daily*

Six Fred Meyer stores in the Portland area and six in the Seattle area will be installing charging stations this summer. The installations by Ecotality are part of a six-state program to support 8,300 cars. The \$230 million program is funded by federal stimulus money and private investments.

Source: *AP*

Yamaha is considering launching an electric bike in the fast growing Indian two-wheeler market. The company is already selling electric bikes in Japan and Europe. Yamaha is planning to focus more on India with more investments and aimed to have 10% of its total global sales from the country within the next 3-4 years.

Source: *The Economic Times*

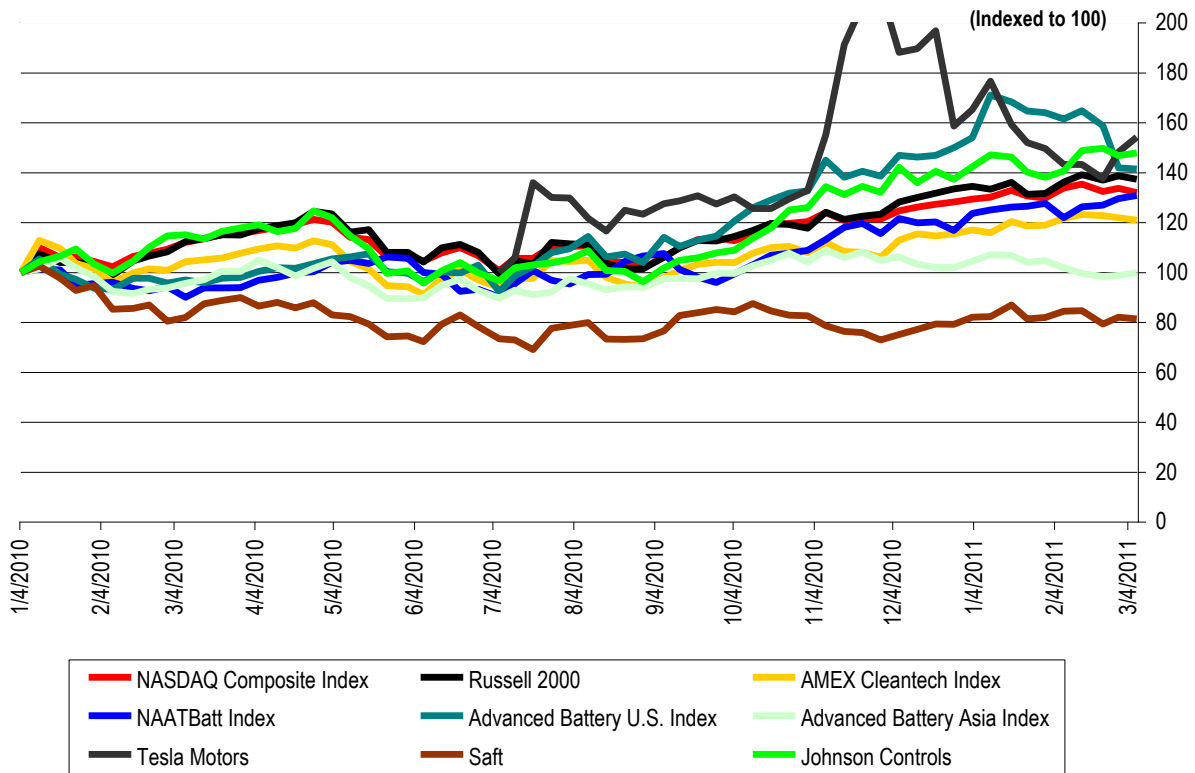
PlugShare (produced by Xatori) is a new, free app for the iPhone and iPad that provides a remedy for those suffering from 'range anxiety'. PlugShare labels itself as a community-powered vehicle charging network. An app shows a map (as shown in **Exhibit 4**) of all the public charging stations and taps into the device's GPS to locate the nearest one and provide directions.

#### Exhibit 4: The PlugShare App



Source: *PC World*

**Exhibit 5: Indices Performance  
(From January 4, 2010)**

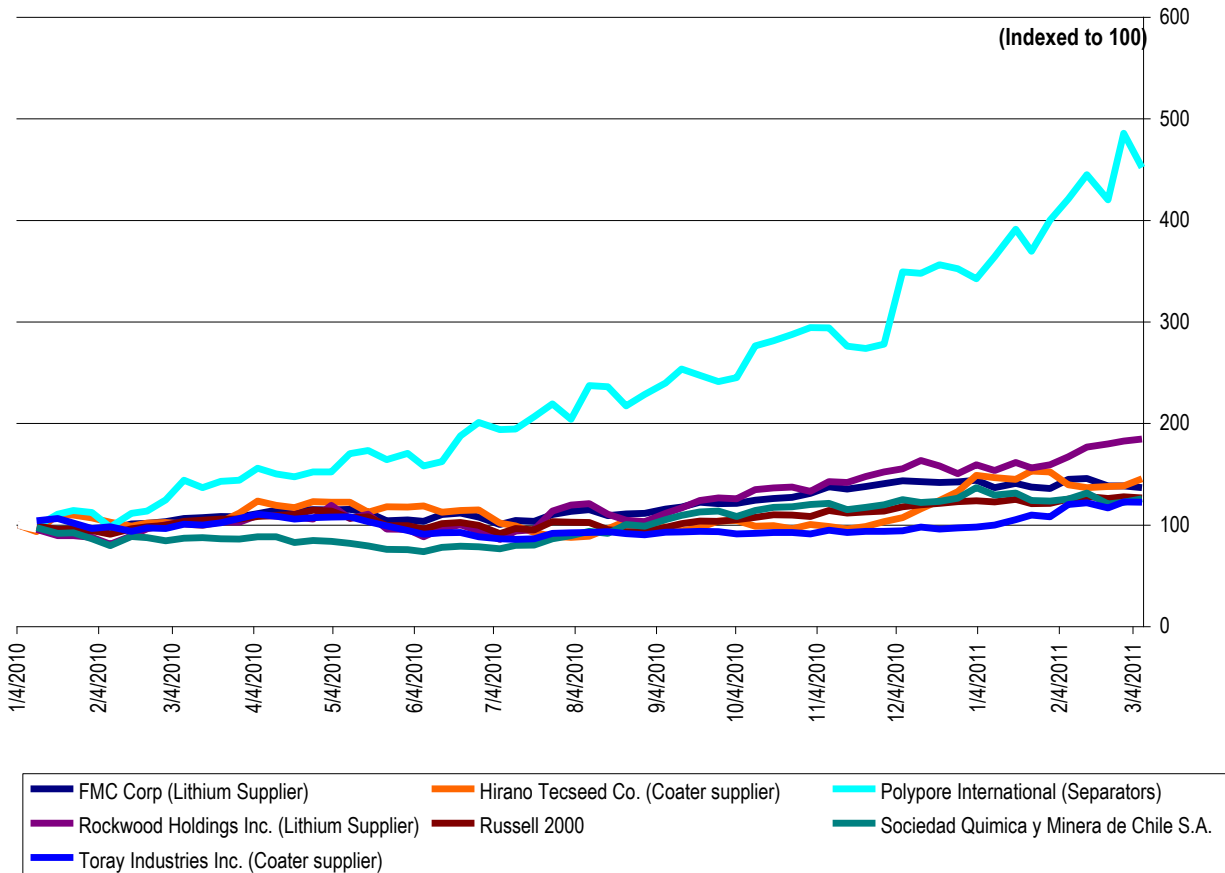


Index	Close on 3/7/2011	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	12,089.8	12,418.0	97.4%	14.4%	3.6%	(1.1%)
S&P 500	1,310.2	1,344.1	97.5%	15.1%	3.0%	(1.3%)
NASDAQ	2,745.6	2,840.5	96.7%	18.0%	2.0%	(1.3%)
Russell 2000	815.4	838.0	97.3%	22.4%	2.1%	(1.0%)
AMEX Cleantech Index	1,186.6	1,236.8	95.9%	16.3%	3.3%	(0.8%)

Source: Bloomberg and ThomsonOne

Note: The select NAATBatt Index is a market-value-weighted average and includes ALTI, BASF, COP, ENS and XIDE. The Advanced Battery U.S. Index is a market-value-weighted average and includes HEV, MGA, MXWL, UQM and VLNC. The Advanced Battery China Index is a market-value-weighted average and includes BYD, CBAK, GS Yuasa, LG Chem and Panasonic.

**Exhibit 6: Supplier Performance**  
(From January 4, 2010)



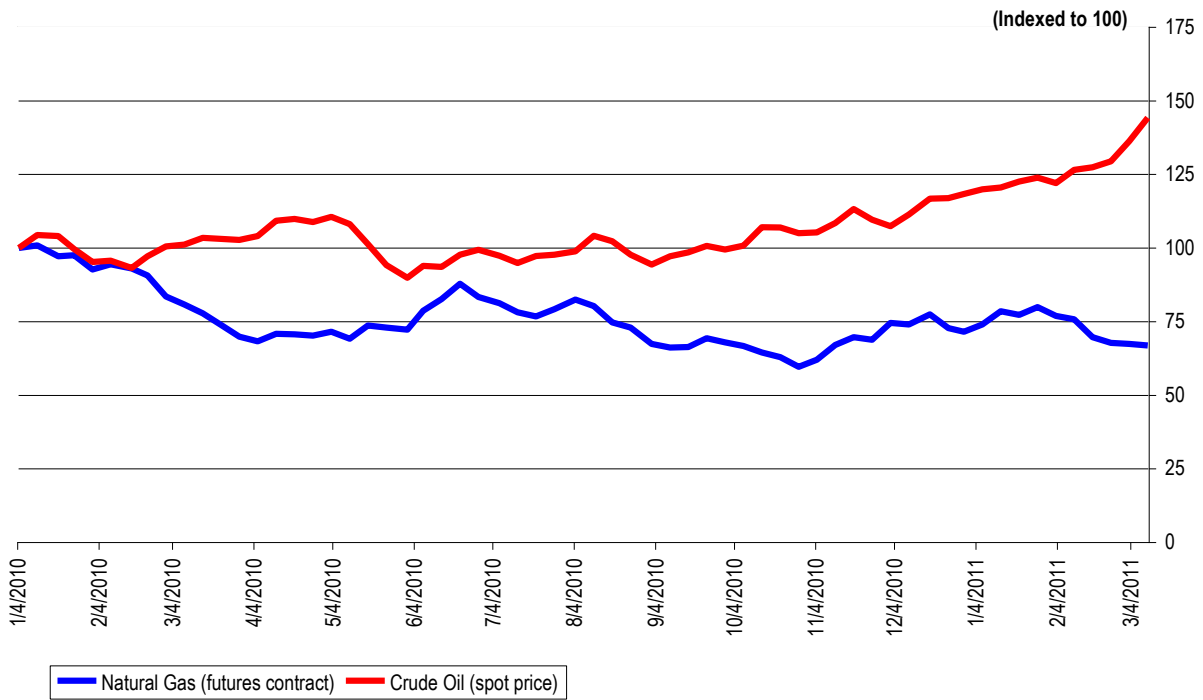
Source: Bloomberg

**Exhibit 7: Commodity Prices**

Commodity	Price on 3/7/2011	Price on 2/28/2011	Price on 2/7/2011	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	9,840	9,857	10,145	(0.2%)	(3.0%)
LME Lead (cash, \$ per tonne)	2,620	2,533	2,643	3.4%	(0.9%)
LME Nickel (cash, \$ per tonne)	28,525	28,830	28,700	(1.1%)	(0.6%)

Source: LME

**Exhibit 8: Natural Gas and Crude Oil  
(From January 4, 2010)**



Source: EIA

## Executive Director's Notes



### **ELECTRICITY CONSUMER: YOU'RE FIRED!**

Smart grid technology is all about demand side management. Leveling load on the grid and better matching load to electricity generation, particularly where that generation is variable, renewable generation, is the ultimate function of most smart grid systems. Load leveling on the grid today is an inefficient, antiquated, and complex process. Making the grid smarter is about finding a better way to do it.

The retail electricity consumer is the cause of the problem (yes, variable wind and sunlight may also have something to do with it, but blaming God for the problems of the grid is problematic on a number of different levels). Consumers don't use electricity when they should. They come home at 6:00 p.m., turn on the T.V. and the washer, cook dinner, take a bath and, perhaps, charge an electric car. And at night, when they should be using all that nearly free wind and base load generation, they go to sleep. Outrageous!

Earlier this week I attended a hearing of the Illinois Commerce Commission on integrating electric vehicles onto the grid. At the hearing several witnesses spoke about the consumer problem, albeit in a more courteous tone than mine. Many of the witnesses proposed solutions. All those solutions involved better measuring consumers' electric usage (generally through smart meters) and then training consumers, through a series of rewards and punishments (with an emphasis on the latter), to use electricity better or, more accurately, to use it when it is more convenient for the grid that consumers use it. Unfortunately, Dr. Pavlov could not make the hearing, but his spirit was fully in the room.

It is time that we recognize the retail electricity consumer for the public menace that he is. The retail electricity consumer is incorrigible. Electricity price elasticity appears negligible, and it is virtually certain that no one has ever lost a dime by overestimating the discount rate of the average American electricity consumer. Compact florescent light bulbs are a case in point. Despite a payback period of less than 10 months on bulbs that can last well in excess of 10 years, consumer adoption has been notoriously slow. The average consumer does not understand his electricity bill and has no desire to do so.

While it may be fair to blame the consumer, it is harder to fault him. Electricity is a dull subject for most and its relative costs have thankfully remained low. Modern life is complicated and time is limited. Consumers don't want to spend their free time learning the intricacies of a utility that has historically been cheap and plentiful. They are voting with their light bulbs and will not likely be changing their voting habits anytime soon.

In dealing with demand side management of consumer electricity purchases, we need less Ivan Pavlov and more Donald Trump. It is time to fire the consumer.

An electricity grid structured to service the demands of the electricity consuming public is a grid that is designed for inefficiency and waste. The grid is not suited to respond to the vagaries and irrationalities of retail consumer demand. Creating a smart grid requires that we cut the link between the consumer and the grid. On a smart grid system, the consumer will still use power, but he will get that power from some place other than from the grid.

The place consumers will get power is a distributed energy storage system (DESS). DESS are basically just batteries, very much like the batteries that today power the first generation of plug-in electric vehicles. The DESS will be located in the consumer's home or somewhere proximate to it. A consumer will take electricity from the DESS whenever he wants it, and the power will be the same price anytime of the day—just like at a gas station. Electricity will be easy to use, easy to understand and a much more attractive fuel to put into a vehicle. The grid will still be there for the consumer, but only as a source of backup power. The primary electricity relationship of the consumer will be with his DESS.

The job of the smart grid will no longer be to serve the consumer. The job of the grid will be to serve the DESS. Because the DESS will be under the control of the grid operator, the operator can wheel power to the DESS when it is cheap and convenient for the grid operator to do so, not when the consumer wants to use electricity. Peak power caused by consumer demand will become a thing of the past, a curiosity of an earlier technological age. Building massive infrastructure to generate and transmit peak power will no longer be necessary. Maintenance expenses on lines and transformers will be significantly reduced. But peak power will be eliminated, not because we spend billions of dollars on smart meters and education programs for the Great Unwashed, but because we build a smart distribution system based on DESS technology that removes the consumer from the grid.

DESS is not some futuristic technology that needs another ten years in the laboratory. The technology is available today and several utilities are demonstrating its use in projects around the country. But DESS faces an uphill fight. Selling peak power is big business. Moreover, new smart grid technologies involving smart metering, consumer education, complex billing systems and (most importantly) the collection of consumer data have spawned whole cottage industries of companies hoping to become the next Google. Those companies understand that DESS is a threat, which could make them as outmoded as peak power and incandescent light bulbs.

The potential of energy storage, and most particularly of distributed energy storage, to transform the grid is only slowly becoming apparent to policy makers. DESS is a disruptive technology, not just for the old grid, but also for certain aspects of what many assume will be the new, smarter one. This will be an interesting fight. Stay tuned.



James J. Greenberger  
Executive Director

March 11, 2011



## NAATBatt Membership Applications for 2011

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### **2011 Membership Applications and Dues Structure**

NAATBatt is accepting applications for membership for the 2011 calendar year. Membership dues for 2011 are \$10,000 for Corporate Members, \$10,000 for OEM Members, \$10,000 for Utility Members, \$5,000 for Associate Members, \$1,000 for Individual Members, and \$500 for Non-Profit/Government Members. Please click on <http://naatbatt.org/membership-inquiry/> and indicate that you are interested in a 2011 membership.

### **Why Join NAATBatt?**

NAATBatt's mission is to grow the market for advanced electrochemical energy storage technology in North America. NAATBatt provides regular educational programming on topics of interest to the advanced battery community, a weekly newsletter chronicling developments in the North American advanced battery market, networking opportunities for industry participants and their customers, including our recently concluded conference on PEV's and the grid, and public policy initiatives, such as the recent NAATBatt-sponsored meeting with Chairman Jon Wellinghoff of FERC and production of written comments to FERC in support of distributed energy storage technology.

NAATBatt recently concluded the highly successful meeting and conference entitled "The Impact of PEV's on T&D Systems: Challenges and Solutions", in Louisville, Kentucky. The conference was the largest cross-industry event to date focused on the impact of plug-in electric vehicles on the grid. The conference outlined the improvements and upgrades that utilities must make to the grid in order for it to accommodate mass-market electric vehicles. The conference emphasized the critical role that grid-connected energy storage can play in promoting vehicle electrification in the United States. Emphasizing the necessary relationship between grid-connected storage and electric vehicles is one of NAATBatt's primary missions.

NAATBatt is a not-for-profit trade association qualified under Section 501(c)(6) of the Internal Revenue Code that is working for the benefit of the entire industry. **Every dollar spent on NAATBatt memberships and programs goes to recouping program costs and to supporting activities intended to benefit the entire advanced battery industry.** At a time when it seems that the only people making money on advanced lithium-ion technology are professional conference organizers, the advanced battery industry should take control of its own market and its own future. NAATBatt exists to market for the industry, not to the industry. But NAATBatt needs your support to do it. Please join us.

North American Industry  
Announcements and Calendar

**Get More Information!** **NAATBatt Workshop on Problems in Utility Deployment of Distributed Energy Storage Systems:** On **April 21, 2010**, NAATBatt and the U.S. Department of Energy will co-host in Chicago an interactive workshop examining the issues, problems and challenges that electric utilities face in deploying distributed energy storage systems on the grid. Although DES systems have many benefits, profitably deploying DES systems and adding them to rate base continues to be a major challenge for utilities. The NAATBatt/DOE workshop will encourage utility and battery executives to sit together and have a frank discussion about those challenges and how they might be addressed. The workshop is by invitation only. For more information about the workshop, please click [here](#).

**Save the Date!** **NAATBatt 2011 Annual Meeting and Conference:** NAATBatt has announced that its 2011 Annual Meeting and Conference will be held on **September 7-9, 2011** in Louisville, Kentucky. More information about the 2011 conference will be posted soon on the NAATBatt Web site at: [www.naatbatt.org](http://www.naatbatt.org). Visit the NAATBatt Web site for information about the 2010 conference. Please save the date for 2011!

**Speaker Presentations from the NAATBatt 2010 Annual Meeting and Conference are Now Available!** NAATBatt's 2010 Annual Meeting and Conference entitled "The Impact of PEV's on T&D Systems: Challenges and Solutions" was a great success. More than 40 industry experts presented and the conference on topics relating to how the grid was going to accommodate the new load that will be generated by plug-in electric vehicles. Copies of the speaker presentations are available on a secured portion of the conference Web site. Access to the Web site is free to NAATBatt members and conference attendees. Access to the presentations is now available to all other for the price of \$250. Please contact James Greenberger at [jgreenberger@naatbatt.org](mailto:jgreenberger@naatbatt.org) for more information about accessing the presentations.

**NAATBatt Membership Information.** NAATBatt is taking applications for membership from well qualified industry participants and supporters. Membership in NAATBatt is a great way to keep abreast of developments in advanced technology batteries and to support the growth of a market for products that could change the world. Your support for NAATBatt programs, newsletters, and committees is essential to the success of our organization and our industry. To inquire about membership, please complete the following inquiry form: <http://naatbatt.org/membership-inquiry/>. NAATBatt will respond with additional information about membership.

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- **Cleantech Forum San Francisco:** Cleantech Forum San Francisco will be held on **March 14-16, 2011** at the Hyatt Regency San Francisco. The latest in the Cleantech Network's ongoing series of cleantech conferences, the Forum will focus on the growing role of information technology in the cleantech sector. The Forum's web site can be found at: <http://events.cleantech.com/sanfrancisco/event-overview>.

- **Advanced The 28<sup>th</sup> International Battery Seminar & Exhibit:** Power Source's annual International Battery Seminar & Exhibit will be held on **March 14-17, 2010**, at the Broward County Convention Center in Fort Lauderdale, Florida. A link to the conference Web site can be found at: <https://powersources.net/florida/28th.html>.
- **TREM11: Strategic Metals for National Security and Clean Energy:** The TREM11 conference on rare earth and strategic metals will be held on **March 22-23, 2010** at the Ritz-Carlton Pentagon City, in Arlington, Virginia. Secretary of Energy Steven Chu will be the keynote speaker. NAATBatt is a supporting organization of the conference. Information about the conference can be found at: <http://www.tremcenter.org/>.
- **4th Annual Energy Storage Summit:** The 4<sup>th</sup> Annual Energy Storage Summit will be on **March 28-30, 2011** in San Francisco, California. The Summit will focus on grid-connected energy storage technologies. The Summit's Web site can be found at: <http://www.energystoragesummit.com/Event.aspx?id=434682>.
- **Plug-In Electric Vehicle Infrastructure USA 2011:** The Plug-In Electric Vehicle Infrastructure USA 2011 conference will examine five key areas of interest to those working with PEV's and their supporting infrastructure. The conference will be held **March 31-April 1, 2011**, at the Hilton Mission Bay in San Diego California. The conference Web site is: <http://www.evupdate.com/electricvehicleusa/index.shtml>.
- **2011 Battery Conference:** The 2011 Battery Congress will be held at the University of Michigan – Michigan League in Ann Arbor, Michigan on **April 11-12, 2011**. Information about the Congress can be found at: <http://batterycongress.org/about-2/>
- **Electric Drive Vehicle Association 2011 Meeting and Annual Conference:** The EDVA 2011 Meeting and Annual Conference will be held on **April 19-21, 2011** in Washington, D.C. The Web site for the meeting can be viewed at: <http://www.edtaconference.org/ht/d/sp/i/18736/pid/18736>.
- **Workshop on Problems in Utility Deployment of Distributed Energy Storage Systems:** NAATBatt will sponsor a special workshop and roundtable discussion among utility and battery executives in Chicago on **April 21, 2011**. The purpose of the workshop is to identify the specific challenges that utilities face in evaluating, procuring, deploying and adding to their rate base advanced battery systems for storing electrical energy in the distribution portion of the grid. Attendance at the workshop is by invitation only. Please direct inquiries to: [jgreenberger@naatbatt.org](mailto:jgreenberger@naatbatt.org)
- **The Council for Chemical Research Annual Meeting:** The Council for Chemical Research will hold its annual meeting on **May 1-3, 2011** in Dearborn, Michigan. The title of the meeting is "Advanced Materials: Driving Transformative Research in Transportation and Automobiles". The conference Web site may be viewed at: <http://www.ccrhq.org/2011-annual-meeting>.
- **The Battcon™ International Stationary Battery Conference:** The Battcon™ International Stationary Battery Conference is a three day, noncommercial, technical event for storage battery users from a broad range of industries. The conference will be held from **May 16 to 18, 2011** at the Swan and Dolphin Resort, Orlando, Florida. The conference Web site is: <http://www.battcon.com/>
- **21<sup>st</sup> Annual ESA Meeting:** The 21<sup>st</sup> annual meeting of the Electricity Storage Association will be held on **June 6-8, 2011** at the Fairmont Hotel in San Jose, California. Information about the

meeting can be found on the meeting Web site at:  
[http://www.electricitystorage.org/ESA/calendar/21st\\_esa\\_annual\\_meeting\\_-\\_save\\_the\\_date/](http://www.electricitystorage.org/ESA/calendar/21st_esa_annual_meeting_-_save_the_date/).

- **Plug-In 2011 Conference and Exhibition:** The Plug-In 2011 Conference and Exhibition will be held on **July 18-21, 2011** in Raleigh, North Carolina. The Conference Web site can be viewed at: <http://www.plugin2011.com/>.
- **NAATBatt 2011 Annual Meeting and Conference: September 7-9, 2011** in Louisville, Kentucky (see note above).
- **2<sup>nd</sup> Battery Safety Conference:** Knowledge Foundation will host the 2<sup>nd</sup> Battery Safety Conference on **November 7-8, 2011** in Boston, Massachusetts. The conference will discuss safety incidents and product recalls regarding lithium-ion batteries. The conference Web site can be accessed at: [http://www.knowledgefoundation.com/viewevents.php?event\\_id=253&act=evt](http://www.knowledgefoundation.com/viewevents.php?event_id=253&act=evt)

**7<sup>th</sup> Lithium Mobile Power Conference:** Knowledge Foundation will host the 7<sup>th</sup> Lithium Mobile Power Conference on November 9-10, 2011 in Boston, Massachusetts immediately following the battery safety conference. The conference will provide a general survey of the lithium-ion battery industry. The conference Web site can be accessed at:  
[http://www.knowledgefoundation.com/viewevents.php?event\\_id=254&act=evt](http://www.knowledgefoundation.com/viewevents.php?event_id=254&act=evt).



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