

## Summary:

For the May 13th issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt and U.S. Indices were relatively flat, while the Asia Index declined 3.8%. The S&P 500 and Russell 2000 declined 1.1% and 1.5%, respectively.

Executive Director James Greenberger writes about the recent EPRI white paper on energy storage on the grid and suggests that in order to reach the 14 gigawatt potential of that market, it will be necessary for the federal government to recognize and to share with local electricity ratepayers the national energy security benefits of grid-connected distributed storage. Read "***Recognizing the Energy Security Value of Storage on the Grid***" in the Executive Director's Notes section of this newsletter below.

## Key Highlights:

- **A123 Systems** announced a production agreement with **Smith Electric Vehicles** to supply battery modules for Smith's portfolio of electric trucks (etrucks). A123 expects to begin shipping its 5 kilowatt-hour (kWh) prismatic modules to Smith for integration into battery packs in 2H11.
- **Volkswagen (VW)** is planning to build electric vehicles (EVs) with **FAW Group** under the new brand "Kaili". VW would be the first foreign automaker to announce concrete plans to manufacture EVs in **China**.
- **Fort Collins Utilities, Schneider Electric** and **Spirae** have partnered and are building an **Electric Vehicle Service Equipment (EVSE)** system to support the community's EV market. The partnership will roll out the charging stations in phases.
- **Toyota** will be making plug-in technology a standard in its **Prius** hybrid car starting in 2014. The lithium-ion (li-ion) powered EV will be priced similar to the current model and should be able to travel more than 60 km per litre (or 141 miles per gallon) of gasoline, compared with 38 km (or 24 miles) for the current version.
- Researchers at **The University of Texas at Austin** have created a porous, three-dimensional carbon that could be used as an enhanced supercapacitor that could deliver significantly more charge. The potential application in energy storage could range from EVs to consumer electronics.
- **Trojan Battery Company** is expanding its **Absorbed Glass Mat (AGM)** product line of deep-cycle batteries for renewable energy storage. The batteries are designed for a range of applications including off-grid and grid-tied solar home systems and industrial backup power.
- The **Tower Companies** has installed five charging stations as part of Maryland's **Electric Vehicle Infrastructure Program (EVIP)**. They are among the first to be installed in **Montgomery County**.
- **Highpower International** announced that it has received an initial order for its li-ion battery systems through its subsidiary **Icon Energy System (Iconergy)**. The order has been placed by a French distributor for use in electric wheelchairs and in golf carts.
- The **U.K.** has installed 704 of the 4,700 car charging points expected by the end of the year. The **Department of Transport** has stated plans to install 9,000 points by 2013.

- The **National Grid** and engineering company **Ricardo** estimate that technology enabling the **U.K.** power grid to control the charging of EVs could correct only 6% of the additional imbalance in supply and demand by 2020 caused by rising use of the vehicles. The technology could also provide a vehicle owner with a modest annual financial return of 50 pounds (or \$81). EV owners with V2G technology could reap annual revenues of 600-8,000 pounds (\$975-\$12,995).
- **San Francisco** will install more than 80 free charging stations by year-end. The announcement came as the average price for a gallon of gas in San Francisco hit the \$4.32 mark - \$1.09 higher than a year ago (per the AAA auto club).

## A Few More Details:

A123 Systems announced a production agreement with Smith Electric Vehicles to supply battery modules for Smith's portfolio of electric trucks (etrucks). A123 expects to begin shipping its 5 kilowatt-hour (kWh) prismatic modules to Smith for integration into battery packs in 2H11. A123's battery technology will be first implemented in the Smith Newton etruck, which has been commercialized globally.

*Source: A123 Systems*

Volkswagen (VW) is planning to build EVs with FAW Group under the new brand Kaili. VW would be the first foreign automaker to announce concrete plans to manufacture EVs in China. The EV would be built by FAW Volkswagen. China's Ministry of Industry and Information Technology had certified the vehicle at the beginning of the month.

*Source: Reuters*

Fort Collins Utilities, Schneider Electric and Spirae have partnered and are building an Electric Vehicle Service Equipment (EVSE) system to support the community's EV market. The partnership will roll out the charging stations in phases. Initially, 13 stations will be installed. The stations will be installed in the city's fleet lot, private business parking lots and four in public parking lots across Fort Collins; specific locations are still to be determined.

*Source: Reporter-Herald*

Toyota will be making plug-in technology a standard in its Prius hybrid car starting in 2014. The plug-in Prius is scheduled to be launched in 2012. The li-ion powered EV will be priced similar to the current model and will feature high-performance lithium ion batteries, enabling it to travel more than 60 km per litre (or 141 miles per gallon) of gasoline, compared with 38 km (or 24 miles) for the current version.

*Source: Reuters and Nikkei*

Researchers at The University of Texas at Austin have created a porous, three-dimensional carbon (as shown in **Exhibit 1**) that could be used as an enhanced supercapacitor that could deliver significantly more charge. The potential application in energy storage could range from EVs to consumer electronics. The sponge-like carbon has a surface area of up to 3,100 square meters per gram (two grams has a surface area roughly equivalent to that of a football field).

**Exhibit 1: 3-D Model of New carbon Material**



*Source: The University of Texas at Austin*

Trojan Battery Company is expanding its AGM product line of deep-cycle batteries for renewable energy storage. The latest additions to the company's product lineup are the *U1-AGM* and *22-AGM* deep cycle AGM batteries. The batteries are designed for a range of applications including roadway and area lighting, traffic signs and security lighting, off-grid and grid-tied solar home systems and industrial backup power applications

*Source: Renewable Energy Focus*

The Tower Companies has installed five charging stations as part of Maryland's Electric Vehicle Infrastructure Program (EVIP). The stations are located in Silver Spring and Rockville. The company has two at the Blairs Shopping Center, one at Blair House, one at an LEED Platinum certified commercial office building at 2000 Tower Oaks Boulevard and one at the LEED Silver certified Tower Building in Rockville. They are among the first to be installed in Montgomery County.

*Source: Citybizlist Real Estate*

Highpower International announced that it has received an initial order for its li-ion battery systems through its subsidiary Icon Energy System (Iconergy). The order has been placed by a French distributor for 400 units to be used for electric wheelchairs and 100 units used to be used for golf carts. Iconergy was formed by Highpower in February 2011 with the purpose of targeting the emerging sectors of

transportation, wind and solar, and high-level energy storage equipment.

*Source: Highpower International*

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The U.K. has installed 704 of the 4,700 car charging points expected by the end of the year. The UK's Department of Transport has stated plans to install 9,000 points by 2013. Experts expect that 8,600 electric cars will be sold by the end of this year and set a target ratio of 1.8 cars for every publicly available charging point. There are about 30 million vehicles on British roads - 3,000 of which are electric vehicles.

*Source: BBC*

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The National Grid and engineering company Ricardo estimate that technology enabling the U.K. power grid to control the charging of EVs could correct only 6% of the additional imbalance in supply and demand by 2020 caused by rising use of the vehicles. The technology could also provide a vehicle owner with a modest annual financial return of 50 pounds (or \$81). EV owners with V2G technology could reap annual revenues of 600-8,000 pounds (\$975-\$12,995) depending on the vehicle's size.

*Source: Reuters*

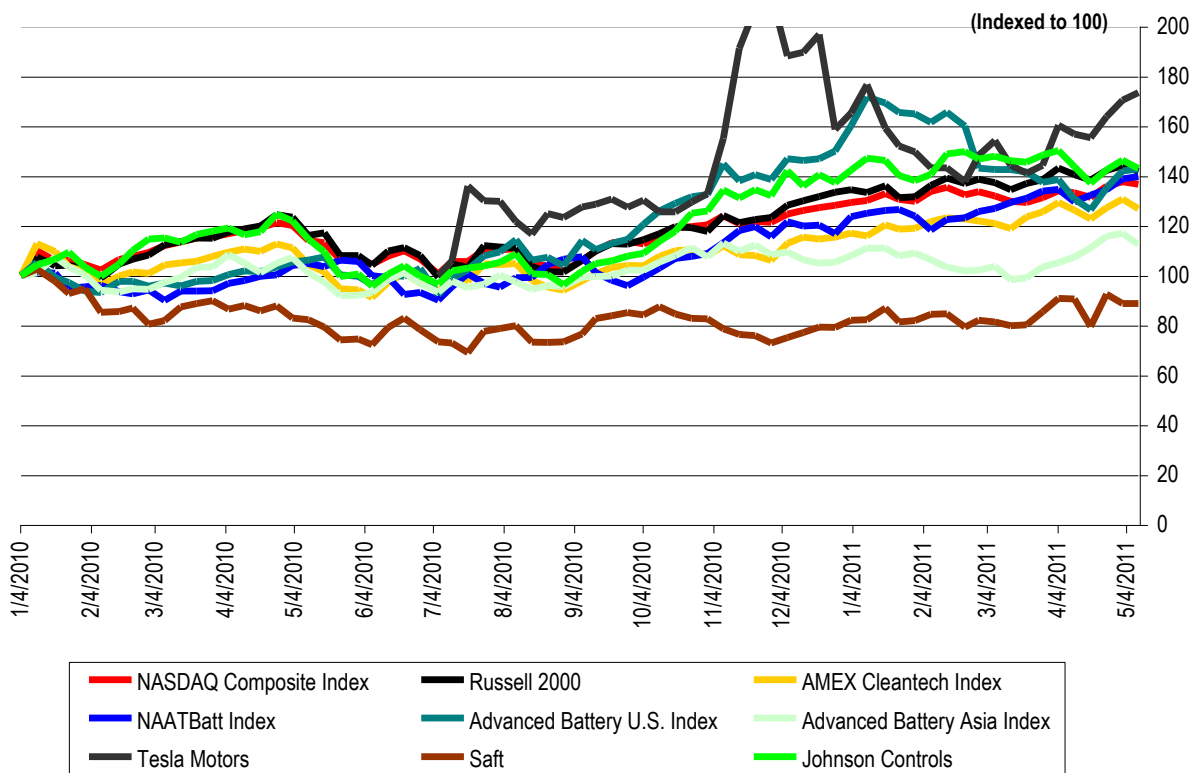
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San Francisco will install more than 80 free charging stations by year-end. The announcement came as the average price for a gallon of gas in San Francisco hit the \$4.32 mark - \$1.09 higher than a year ago (per the AAA auto club). Many of the stations will offer both 120-volt and 240-volt charging. It could take 6 to 8 hours to fully charge a car at 240-volts. The city may experiment with a handful of 480-volt chargers that could charge an EV to 80% capacity in less than 30 minutes.

*Source: San Francisco Chronicle*

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**Exhibit 2: Indices Performance**  
(From January 4, 2010)

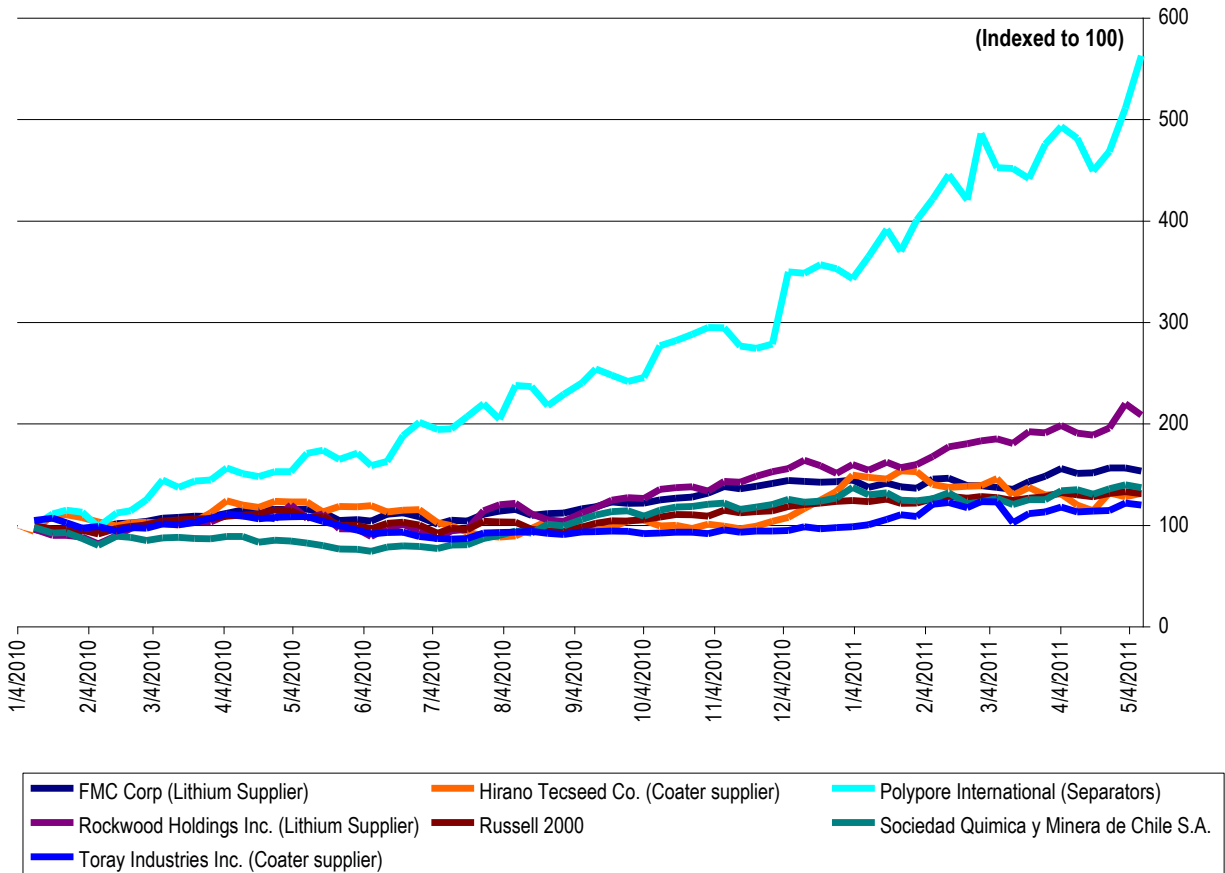


Index	Close on 5/9/2011	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	12,684.7	12,885.9	98.4%	15.2%	8.7%	(1.0%)
S&P 500	1,346.3	1,370.6	98.2%	13.3%	5.8%	(1.1%)
NASDAQ	2,843.3	2,887.8	98.5%	15.0%	5.6%	(0.7%)
Russell 2000	842.3	868.6	97.0%	17.1%	5.5%	(1.5%)
AMEX Cleantech Index	1,244.6	1,292.4	96.3%	15.4%	8.4%	(2.9%)

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 3: Supplier Performance  
(From January 4, 2010)**



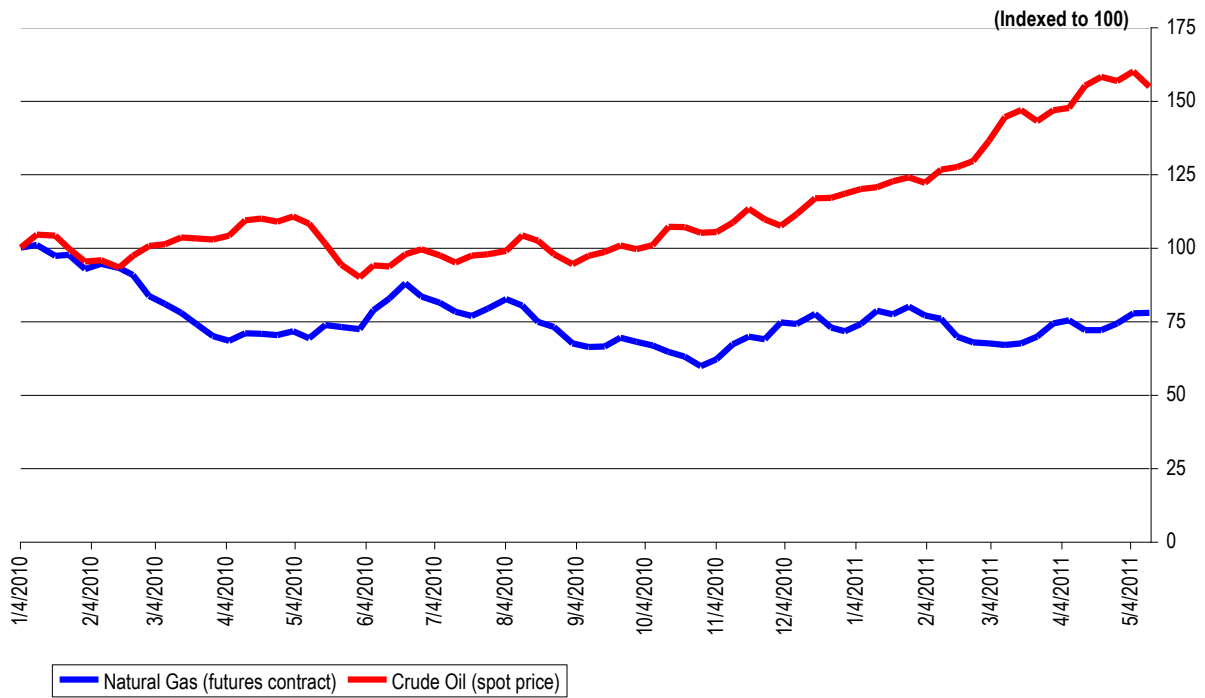
Source: Bloomberg

**Exhibit 4: Commodity Prices**

Commodity	Price on 5/9/2011	Price on 5/2/2011	Price on 4/8/2011	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	8,906	9,240	9,822	(3.6%)	(9.3%)
LME Lead (cash, \$ per tonne)	2,379	2,540	2,900	(6.3%)	(18.0%)
LME Nickel (cash, \$ per tonne)	24,770	26,405	27,400	(6.2%)	(9.6%)

Source: LME

**Exhibit 5: Natural Gas and Crude Oil**  
**(From January 4, 2010)**



Source: EIA

## Executive Director's Notes



### **RECOGNIZING THE ENERGY SECURITY VALUE OF STORAGE ON THE GRID**

Last week, EPRI released a white paper on energy storage, which generated a lot of excitement. Many read the white paper as concluding that the market for grid-connected storage was 14 gigawatts and that the market would open once the price of electricity storage falls to \$700-750 per kilowatt hour.

The reality, as always, is a bit more complicated. EPRI's white paper on storage was one of three major white papers released within the last year (the other two published by Sandia National Laboratory and Southern California Edison; all three can be read at: <http://naatbatt.org/publications/articles/>). All concluded that the market for grid-connected energy storage was potentially large but that the costs of building new energy storage facilities did not yet in most circumstances justify the benefits that electricity ratepayers would receive from them.

The focus of the white papers on the benefits of storage was proper. It is important when talking about energy storage not to fixate on the costs of storage itself, but rather on the value of the benefits that energy storage can bring. This is, by and large, what EPRI, Sandia and SCE did. The \$700-750 per kilowatt hour figure EPRI cited is not so much a price target as it is EPRI's estimate of the value that storage can bring to the grid in certain situations. The EPRI white paper noted (as did Sandia and SCE), however, that the value of the storage benefits vary wildly depending upon where the storage is located and for what purpose it is used.

One consistent theme of all three white papers was the possibility of maximizing the theoretical value of storage by having a single storage facility perform, or "bundle", a number of different functions. For example, one stationary battery might during certain hours of the day be deployed to provide frequency regulation, during other hours to arbitrage peak power prices, and at other times of low electricity demand to wheel power into areas where peak power demands with otherwise accelerate the depreciation of transmission and distribution infrastructure.

The EPRI, Sandia and SCE white papers all provide a detailed analysis of the dollar value of storage to electricity ratepayers. What the white papers did not do, however, is value the energy security benefits that energy storage can provide to the nation as a whole.

The energy security benefit of grid-scale storage largely arises from two attributes of certain types of storage applications. The first is the ability of energy storage, when deployed on the distribution portion of the grid, to permit the formation of local micro-grids, which can protect the grid from disruption cause by

malicious attacks and natural disasters. The second is the ability of distributed energy storage systems that use vehicle-compatible batteries to help bring down the cost of electric vehicles and reduce petroleum imports.

The energy security benefits of storage are problematic because they are hard to value in economic terms and impossible for individual utilities or storage developers to monetize. It is one thing to ask a regulator for permission to invest in a storage facility in Ohio that will save Ohio ratepayers \$1 million in maintenance expenses. But it is quite another to ask permission to invest in that same facility because it will reduce the cost of electric vehicles and save Florida consumers \$1 million in gasoline purchases.

Many of the benefits of storage are national in scope and do not, and never will, enter into the cost/benefit analysis that utilities and state regulators make in deciding on energy storage investments. The energy security benefits of storage are, however, very real. Federal energy policy must find a way to recognize those benefits and to share them with the utilities and local electricity ratepayers that are being asked to invest in energy storage systems. If the energy security benefits of storage could be recognized and shared, the \$700-750 per kilowatt hour value attributed to storage by EPRI could turn out to be much higher, and the 14 gigawatt market much closer, than assumed.



James J. Greenberger  
Executive Director

May 13, 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

**NEW  
EVENT!!**

***NAATBatt Quarterly Members' Meeting, Facility Tour and "Thank You" Dinner:*** On **June 16, 2011**, NAATBatt will kick off a series of quarterly meetings at facilities of our members around the county. The meetings are intended to deepen relationships among NAATBatt member firms and to promote business opportunities. This quarter's meeting will be held at the offices of **Cabot Corporation** in **Albuquerque, New Mexico**. Members will tour Cabot's micro-powder manufacturing facility and receive a briefing from NAATBatt and the Electrification Coalition on developments in Washington that could impact the U.S. advanced battery market this year. The meeting includes a group dinner at one of the top New Mexican restaurants in Albuquerque and is open to all NAATBatt members at no cost. NAATBatt members should click [here](#) for more information about the meeting. Non-NAATBatt members should click [here](#) for information on how to join.

**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. The annual meeting will feature a Battery Industry-Academic Summit, featuring presentations by the top university battery programs in the United States and a 5-Year Market and Technology Forecast for Advanced Batteries in North America. More information about the 2011 conference will be posted soon on the NAATBatt Web site at: [www.naatbatt.org](http://www.naatbatt.org). Please save the date!

**NEW  
MATERIALS  
POSTED**

***Presentations and Materials from the Workshop on Distributed Energy Storage Posted:*** Presentation materials, handbooks, attendee lists and working group discussion summaries from the recently concluded April 21 DOE/NAATBatt Workshop on Issues in Distributed Energy Storage have been posted on the NAATBatt Web site at: [www.naatbatt.org](http://www.naatbatt.org). The materials are available for review to all Workshop registrants and to all NAATBatt members. If you have lost or never received your password to access these materials, please contact Jim Greenberger at [jgreenberger@naatbatt.org](mailto:jgreenberger@naatbatt.org).

***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 Jim 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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- **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/).
- **4<sup>th</sup> Symposium on Beyond Lithium-Ion:** Beyond Lithium-Ion IV will be held **June 7-9, 2011**, at Pacific Northwest National Laboratory in Richland, Washington. The goal of the Symposium is to advance understanding on the directions and challenges in present-day vehicle batteries and the future of storage technologies. The meeting is one of a series of Symposia organized by a consortium of IBM Research and U.S. National Laboratories. The meeting website is <http://beyonddi-ioniv.labworks.org/>.
- **Storage Week 2011:** Infocast will host Storage Week 2011 in San Diego on **July 11-14, 2011**. The program, now in its third year, will cover a range of storage policies, markets, project applications and technologies involved in the integration of storage onto the grid. NAATBatt is a Supporting Organization of the program and NAATBatt members will be entitled to a 15% discount on admission.
- **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).
- **Battery Power 2011:** Battery Power 2011 will be held on **September 20-21, 2011** in Nashville, Tennessee. The show will highlight the latest capabilities, design issues, trends and market forecasts in batteries and battery-powered products and systems. The conference Web site can be viewed at: [http://www.batterypoweronline.com/bppt-conf11/bp11\\_index.php](http://www.batterypoweronline.com/bppt-conf11/bp11_index.php).
- **EV Battery Tech USA:** EV Battery Tech USA will be held on **September 21-22, 2011**, in Detroit, Michigan. The program will focus on reducing the cost and improving the performance of EV batteries and will feature representatives from the leading automotive OEM's. The conference Web site may be viewed at: <http://www.ev-battery-tech.com/>.
- **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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