

Summary:

For the March 18th issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt Index increased 1.9% while the Asia Index fell 6.0%. The U.S. Index was flat. The S&P 500 and Russell 2000 decreased 1.1% and 2.1%, respectively.

Executive Director James Greenberger comments on lessons to be learned from the tragedy this week in Fukushima, including lessons about the value of electricity storage. Read "**Lessons from Fukushima**" in the Executive Director's Notes section of the newsletter below.

Key Highlights:

- **Polypore** announced a fourth capacity expansion (since 2009) of about \$65 million to expand its lithium-ion (li-ion) battery separator capacity for electric vehicles (EVs). The company is involved in over 50 EV development programs.
- **PowerGenix** announced an exclusive agreement with **PSI Acquisition** to supply battery cells for **UP-Stealth™** - an uninterruptible power supply (UPS) for the traffic industry. The PowerGenix-PSI solution is about 70% lighter than lead-acid equivalents with a much longer service life and requires no maintenance.
- **AeroVironment** has been awarded an \$820,000 contract from the **Hawaii EV Ready Grants Program** for charging stations. The charging docks will be strategically located throughout **Oahu, Hawaii Island, Maui and Kauai**.
- **Google** has rolled out a '**Google Maps**' feature that will enable EV drivers to find charging stations. The company has indicated that **NREL (National Renewable Energy Laboratory)** is working to make data on public charging stations available, and the company plans to mirror that database accordingly.
- **350Green** has announced plans to build 66 charging stations located mostly around **Philadelphia** and **Pittsburgh**. The \$2.6 million project is expected to be finished by 2H12 and is scaled to accommodate 33,000 EVs.
- **Milwaukee's** first charging station (from **Coulomb Technologies**) has been installed at the downtown campus of **Milwaukee Area Technical College, Madison** is the center of plans to add charging stations in the state.
- **Delta Electronics** has unveiled the first **Taiwan**-developed electric bus (ebus). The ebus has a maximum speed of 80km/h (~50 miles/hr) and to travel up to 25km (~16 miles) on a charge.
- Two model **K9** e buses produced by **BYD** will be deployed in passenger routes in and around **Copenhagen** in 2H12 in partnership with **Movia (Denmark's largest public transport agency)**. The ebus is expected to reduce carbon emissions by 55% compared to conventional buses.
- **Fallbrook Technologies** announced the formation of a joint venture **Ningbo Shentong Group (China-based)**. The two companies are in an agreement to develop and market its **continuously variable planetary (CVP)** transmissions to the EV market in China and abroad.

- **New York City's** first solar powered charging station was unveiled in **Brooklyn Bridge Park**. The **Beautiful Earth Group** built the station.
- Researchers from the **Fraunhofer Institute for Industrial Mathematics ITWM** in **Kaiserslautern** are developing software to simulate li-ion batteries in an effort to enhance performance of EVs. The new software **BEST (Battery and Electrochemistry Simulation Tool)** will be used to simulate the entire battery cell along with the transport and reaction processes of the li-ions.

A Few More Details:

Polypore announced a fourth capacity expansion (since 2009) of about \$65 million to expand its lithium-ion (li-ion) battery separator capacity for electric vehicles (EVs). The addition is scheduled to begin ramping up in 4Q12 and will be added to the facility currently under construction in Concord, North Carolina. The company is involved in over 50 EV development programs

Source: Polypore

PowerGenix announced an exclusive agreement with PSI Acquisition to supply battery cells for UP-Stealth™ - an uninterruptible power supply (UPS) for the traffic industry. Beginning in April, PowerGenix will supply Nickel-Zinc (NiZn) battery packs that will be deployed in traffic installations in metropolitan areas in the United States, Canada, and Mexico. The PowerGenix-PSI solution is about 70% lighter than lead-acid equivalents with a much longer service life and requires no maintenance.

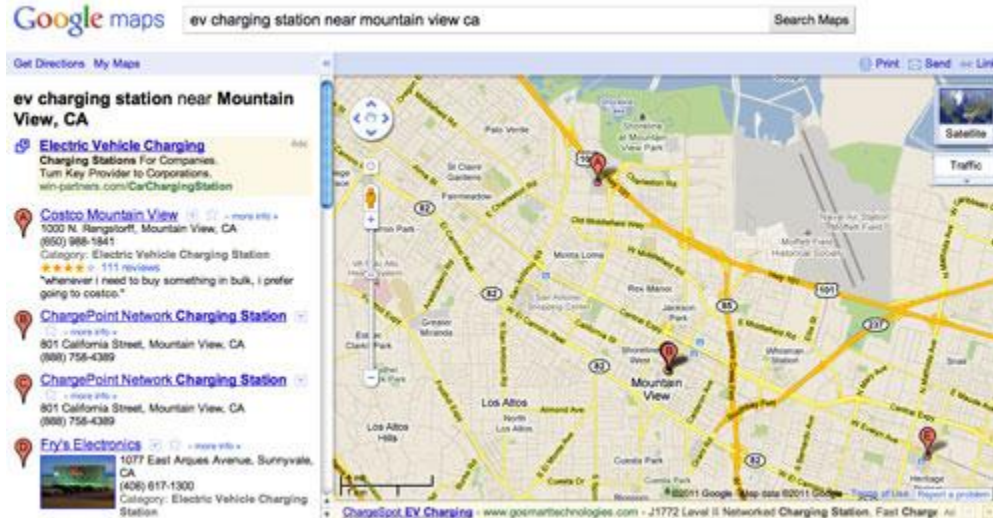
Source: PowerGenix

AeroVironment has been awarded an \$820,000 contract from the Hawaii EV Ready Grants Program. The contract will fund the deployment of up to 320 AeroVironment 240-volt charging docks throughout the islands. The charging docks will be strategically located throughout Oahu, Hawaii Island, Maui, and Kauai.

Source: AeroVironment

Google has rolled out a 'Google Maps' feature that will enable EV drivers to find charging stations (as shown in **Exhibit 1**). A charging station search would just begin with the preceding search term with "EV charging stations near...". The company has indicated that NREL (National Renewable Energy Laboratory) is working to make data on public charging stations available, and Google plans to mirror that database.

Exhibit 1: Google Maps Charging Station Locator



Source: [Geek.com](#)

350Green has announced plans to build 66 charging stations located mostly around Philadelphia and Pittsburgh. The \$2.6 million project is expected to be finished by 2H12 and is scaled to accommodate 33,000 EVs. The plan is to construct 22 fast-charging stations, which run at 480 volts and can charge a typical car in less than a half-hour, and 44 "level 2" stations that can recharge a vehicle in ~5 hours.

Source: [The Inquirer](#)

Milwaukee's first charging station (from Coulomb Technologies) has been installed at the downtown campus of Milwaukee Area Technical College. Madison is the center of plans to add charging stations in the state. Last fall, Madison Gas & Electric announced plans to install 24 stations at a dozen sites in Dane County. Five stations are currently in use.

Source: [Milwaukee Journal Sentinel](#)

Delta Electronics has unveiled the first Taiwan-developed electric bus (ebus). The ebus has a maximum speed of 80km/h (~50 miles/hr) and to travel up to 25km (~16 miles) on a charge and has a gas system to generate electricity. The company has plans to form a joint venture with a China-based auto maker is expecting to receive orders for several million units of electric propulsion systems.

Source: [DigiTimes](#)

Two model K9 e buses (a model shown in **Exhibit 2**) produced by BYD will be deployed in passenger routes in and around Copenhagen in 2H12 in partnership with Movia (Denmark's largest public transport agency). The ebus is expected to reduce carbon emissions by 55% compared to conventional buses. The K9 has already rolled-out in China and this is the first time the K9 is being tested abroad.

Source: [Car China Times](#)

Exhibit 2: A Model K9 ebus



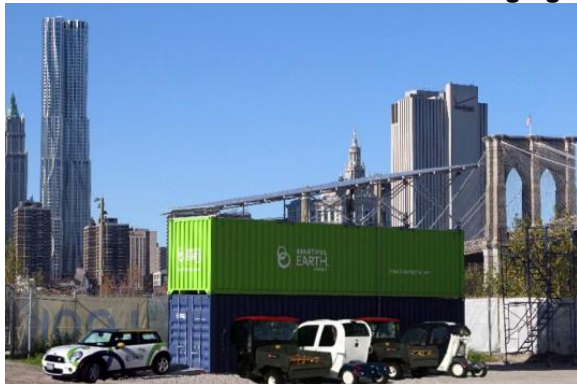
Source: BYD

Fallbrook Technologies the formation of a joint venture Ningbo Shentong Group (China-based). The two companies are in an agreement to develop and market its continuously variable planetary (CVP) transmissions to the EV market in China and abroad. The Shentong Fallbrook CVT JV will be based in the Zhejiang province of China.

Source: Fallbrook Technologies

New York City's first solar powered charging station (as shown in **Exhibit 3**) was unveiled in Brooklyn Bridge Park. The Beautiful Earth Group built the station. The park estimates the park says it will save over \$200,000 in gasoline costs, and tens of thousands of dollars in electricity costs over the 25-year lifetime of the project.

Exhibit 3: NYC's 1st Solar Powered Charging Station

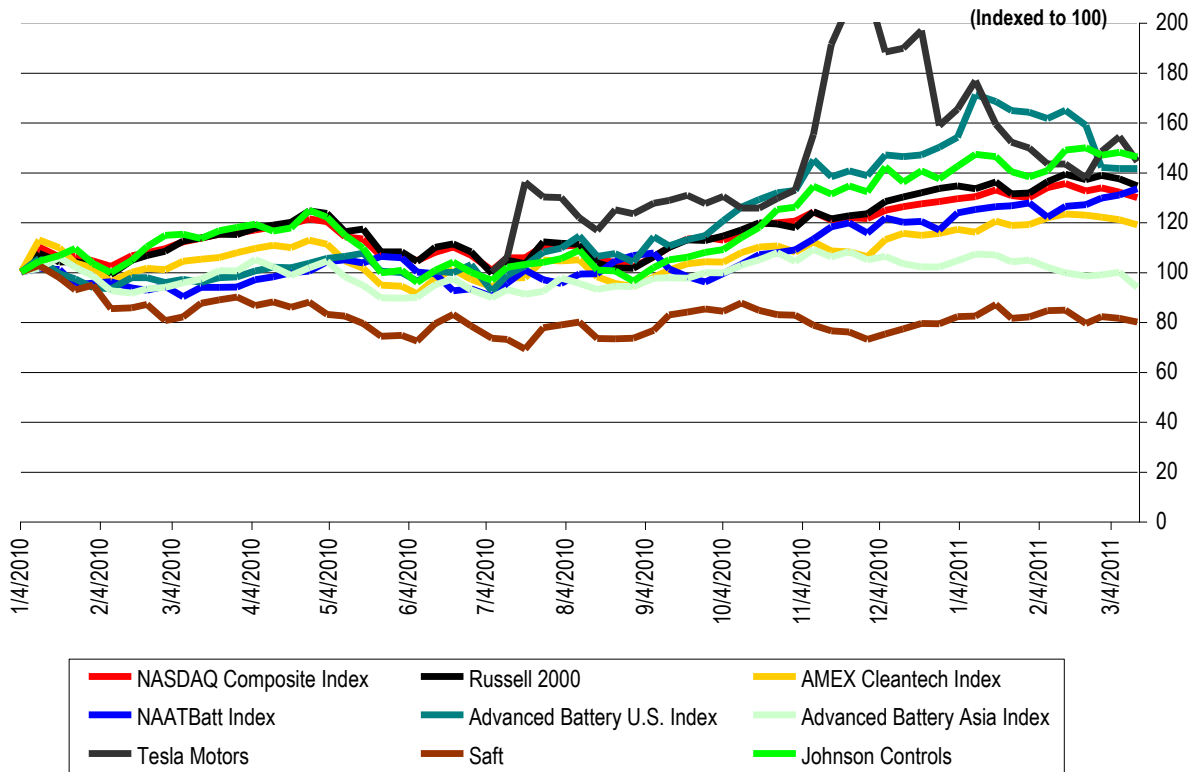


Source: Beautiful Earth Group

Researchers from the Fraunhofer Institute for Industrial Mathematics ITWM in Kaiserslautern are developing software to simulate li-ion batteries in an effort to enhance performnce of EVs. The new software BEST (Battery and Electrochemistry Simulation Tool) will be used to simulate the entire battery cell (on a macroscopic and microscopic level) along with the transport and reaction processes of the li-ions. The ability to view the structure of the electrodes in 3-D, parameters such as lithium ion concentrations and current density could be calculated.

Source: The Economic Times

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

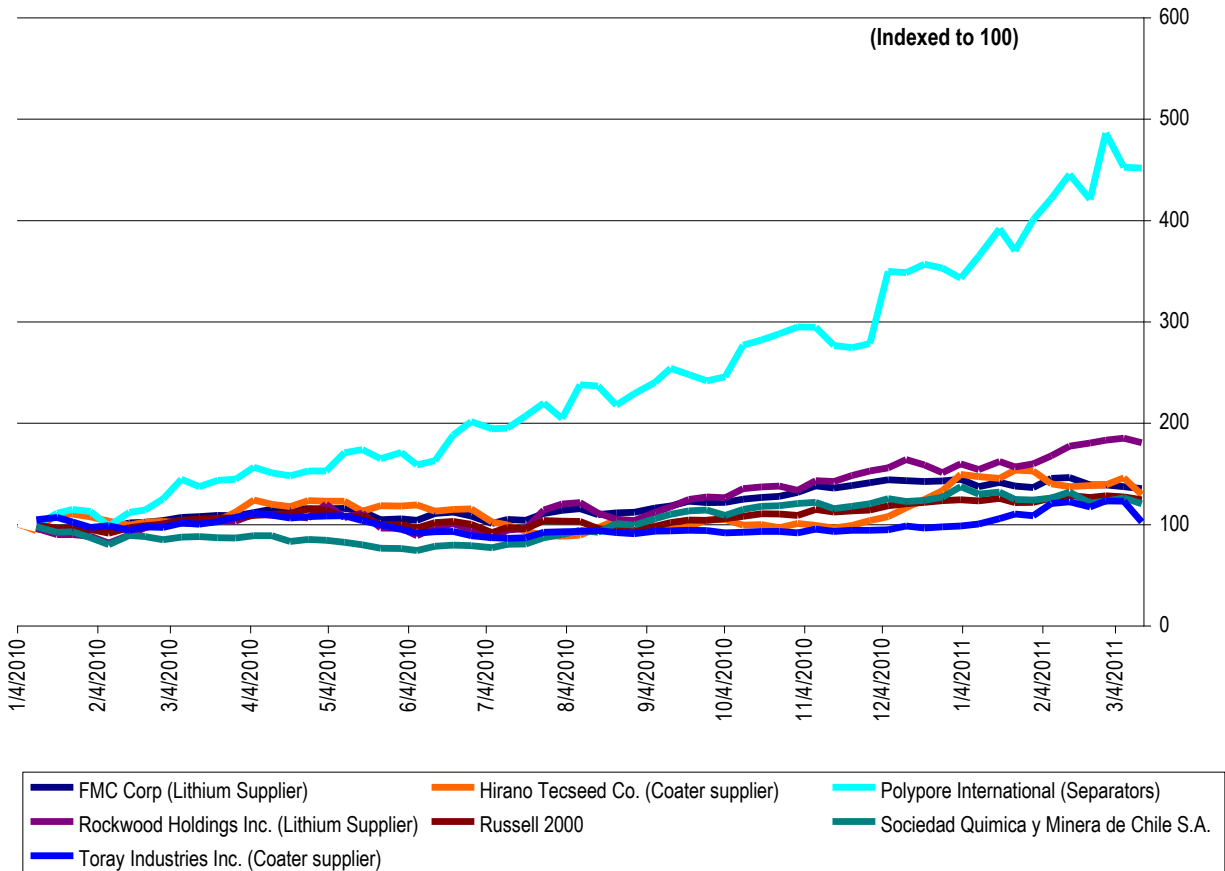


Index	Close on 3/14/2011	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	1,193.2	12,418.0	9.6%	(88.8%)	(89.8%)	(90.1%)
S&P 500	1,296.4	1,344.1	96.5%	12.9%	1.9%	(1.1%)
NASDAQ	2,701.0	2,840.5	95.1%	14.4%	0.4%	(1.6%)
Russell 2000	798.2	838.0	95.2%	18.2%	(0.0%)	(2.1%)
AMEX Cleantech Index	1,166.5	1,236.8	94.3%	12.3%	1.6%	(1.7%)

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 5: Supplier Performance
(From January 4, 2010)



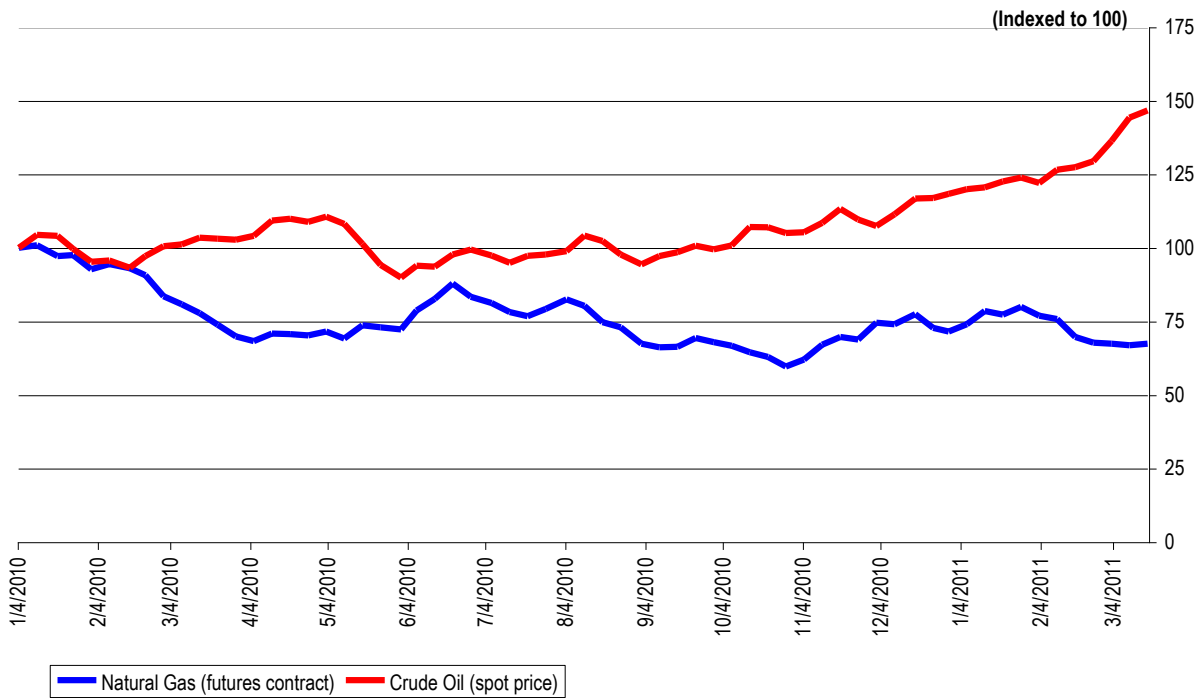
Source: Bloomberg

Exhibit 6: Commodity Prices

Commodity	Price on 3/14/2011	Price on 3/7/2011	Price on 2/14/2011	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	9,205	9,840	10,148	(6.5%)	(9.3%)
LME Lead (cash, \$ per tonne)	2,506	2,620	2,630	(4.3%)	(4.7%)
LME Nickel (cash, \$ per tonne)	25,995	28,525	28,670	(8.9%)	(9.3%)

Source: LME

Exhibit 7: Natural Gas and Crude Oil
(From January 4, 2010)



Source: EIA

Executive Director's Notes



LESSONS FROM FUKUSHIMA

This past week all serious discussions about energy policy have been overshadowed by the disasters in Japan. For almost everyone working in the advanced battery industry, the disasters have a personal aspect. Among those coping and suffering are friends, colleagues and families. Our thoughts, hearts and prayers go out to all of them.

There are, of course, lessons to be learned from the incidents at Fukushima, which go well beyond the subject of nuclear plant design. The first and most important lesson is one about character. The discipline, stoicism and courage with which the Japanese people have borne their trials have been truly inspirational. I suspect that all things Japanese will soon become quite fashionable in the United States and will remain so for some time.

But there is also a lesson about the importance of energy storage. One of the most economically devastating effects of the Fukushima incidents has been the sudden loss of a significant portion of the Japanese grid's generating capacity. The Japanese grid, which relies on much of the same early 20th century technology as the U.S. grid, has had little choice but to cope with lost generation capacity by imposing rolling blackouts and other mandatory curtailments on commercial, industrial and residential consumers. The economic impact of these curtailments cannot yet be measured, but is likely to be in the trillions of yen.

Storage, of course, cannot create electrical energy. But what storage can do is to allocate limited electricity supply to the places and times where it can be used most productively. Not all electrons are created equal. As the Japanese economy struggles to cope with intermittent electricity supplies, those electrons that are more equal than others will increasingly become clear. Electricity storage could ensure that those electrons can get where they need to be, when they need to be there in order to create their exceptional value.

It is sobering to note that the economic losses the Japanese economy will likely suffer from intermittent electricity supply over the foreseeable future would likely have been able to pay for a nationwide system of distributed energy storage many times over. There is a lesson in this for U.S. energy policy makers. Let's hope they are learning.





James J. Greenberger
Executive Director

March 18, 2011



NAATBatt Membership Applications for 2011

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. 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 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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- **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. 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 4th 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
- **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/>
- **21st Annual ESA Meeting:** The 21st 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/.
- **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).
- **2nd Battery Safety Conference:** Knowledge Foundation will host the 2nd 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
- **7th Lithium Mobile Power Conference:** Knowledge Foundation will host the 7th 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.



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