

Summary:

For the May 27th issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt Index increased 4.8%, while the U.S. and Asia Indices declined 2.3% and 1.8%, respectively. The S&P 500 and Russell 2000 declined modestly.

Executive Director James Greenberger writes about a recent Gallup Poll and USA Today article questioning whether consumers will buy electric vehicles. Read "**Sex, Lies and Gallup Polls**" in the Executive Director's Notes portion of this newsletter below.

Key Highlights:

- **Yuma** is the first city in the United States to receive delivery of a demonstration fleet of 140 plug-in hybrid electric **Chrysler Ram trucks**. **Electrovaya** is providing the lithium-ion (li-ion) battery packs.
- **Toyota Motor** and **Salesforce.com** have agreed to create a private social network for Toyota customers. The two companies are planning to start offering the service called "**Toyota Friend**" with Toyota's electric vehicles (EVs) due out next year.
- **Quantum Fuel Systems Technologies Worldwide** received a contract to deliver 100+ plug-in hybrid electric (PHEV) pickup truck fleet vehicles powered by **Dow Kokam** lithium ion (li-ion) battery technology to **The Dow Chemical Company**. The company has developed the new hybrid drive system "**Quantum F-Drive**" specifically for the **Ford F-150** pickup truck.
- **Evida Power** announced a strategic partnership with **HalIPT**. Evida designs and manufactures li-ion battery packs for EVs while HalIPT produces **Inductive Power Transfer (IPT)** systems for wireless charging. The agreement has an estimated value of 80 million Euros (or \$113 million).
- Researchers at **Case Western Reserve University** are building a flow battery out of **iron** that will be able to cheaply store solar and wind energy for the grid. Flow batteries usually use **Vanadium**, a rare metal mined in **Russia** and **South Africa** that sells for up to \$25 per pound in its raw form. **Iron** is plentiful in **North America** and sells for just \$0.25 per pound after processing.
- The **Obama** administration announced it is buying more than 100 EVs and will install charging stations in government buildings in five cities. The **General Services Administration (GSA)** oversees most of the federal government's fleet plans to purchase 101 **Chevrolet Volts**, 10 **Nissan Leafs** and 5 **Think City** vehicles.
- **Parkmobile** and **Liberty PlugIns (LPI)** have teamed to permit EV charging revenues to be collected by mobile phones. Parkmobile operates in the pay by phone parking services. LPI's Synchronous Codes algorithm is installed on Parkmobile's system server and creates unique authorization codes that are transmitted to drivers via their mobile app or text message.
- The city of **Boston** unveiled three charging stations near **City Hall Plaza**. EV owners will be able to charge their vehicles for the regular \$1.25-an-hour price of feeding the parking meter at three designated spots on **Cambridge Street**.
- **Leyden Energy** has launched a full suite of next-generation li-ion batteries. The company has commercialized an electrolyte technology, which it licensed from **DuPont**.

- A service station on the **M6** in **Cumbria, UK** has become the first in Cumbria to install a high-powered charging point for electric sports cars. The station opened at **Tebay Services** northbound between **junction 38** and **junction 39**.

A Few More Details:

Yuma is the first city in the United States to receive delivery of a demonstration fleet of 140 plug-in hybrid electric Chrysler Ram trucks (as shown in **Exhibit 1**). The company expects to have 7 million miles of real world testing on the 140 vehicles at the end of the 3-year project. The Chrysler Group also is developing a similar fleet of 25 Town & Country minivans with plug-in hybrid technology for demonstration and evaluation that will be allocated to select cities later this year. Electrovaya is providing the li-ion battery packs.

Exhibit 1: The Electric Ram Truck



Source: Yuma Sun

Toyota Motor and Salesforce.com have agreed to create a private social network for Toyota customers. The two companies are planning to start offering the service called "Toyota Friend" with Toyota's electric vehicles (EVs) due out next year. The new service will allow users to exchange real time updates, or "tweets," with other Toyota drivers, connect with local dealers and remotely obtain diagnostic information about EVs. It will debut in Japan before a global roll out later in 2012.

Source: WSJ

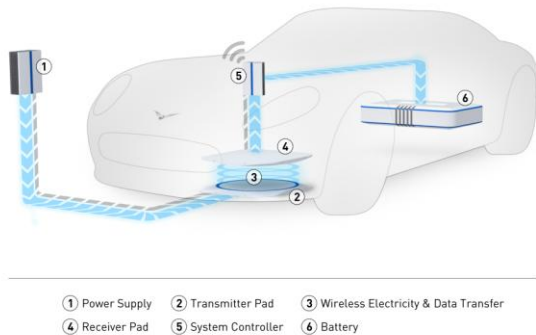
Quantum Fuel Systems Technologies Worldwide received a contract to deliver 100+ plug-in hybrid electric (PHEV) pickup truck fleet vehicles powered by Dow Kokam lithium ion (li-ion) battery technology to The Dow Chemical Company. The company has developed the new hybrid drive system "Quantum F-Drive" specifically for the Ford F-150 pickup truck. The F-150 has a 35 mile electric-only range before shifting to hybrid electric mode for a total range of over 400 miles. The 20 kWh Dow Kokam battery enables delivery of the required vehicle range in addition to speeds of up to 85 mph and 0-60 MPH acceleration in less than 12 seconds.

Source: Quantum Fuel Systems Technologies Worldwide

Evida Power announced a strategic partnership with HaloIPT. Evida designs and manufactures li-ion battery packs for EVs while HaloIPT produces Inductive Power Transfer (IPT) systems for wireless charging. The agreement has an estimated value of 80 million Euros (or \$113 million). Under the agreement, Evida and HaloIPT will jointly undertake a study designed to explore the feasibility of the manufacture of 40,000 Induction Power Transfer systems (as shown in **Exhibit 2**) over a five-year period. The systems are intended for supply as a specification option on a forthcoming electric car for which

sales are estimated to reach 70,000 units by 2015.

Exhibit 2: Inductive Wireless Charging Schematic



Source: *Evida Power*

Researchers at Case Western Reserve University are building a flow battery out of iron that will be able to cheaply store solar and wind energy for the grid. Flow batteries usually use Vanadium, a rare metal mined in Russia and South Africa that sells for up to \$25 per pound in its raw form. Iron is plentiful in North America and sells for just \$0.25 per pound after processing. The Department of Energy's Office of Electricity Delivery and Energy Reliability, through Sandia National Laboratory, is funding the research with a \$600,000 grant.

Source: *Clean Energy Authority*

The Obama administration announced it is buying more than 100 EVs and will install charging stations in government buildings in five cities. The General Services Administration (GSA) oversees most of the federal government's 600,000 vehicle fleet and plans to purchase 101 Chevrolet Volts, 10 Nissan Leafs and 5 Think Citys. The GSA purchases vehicles for 2/3rds of the federal fleet, acquiring about 65,000 new vehicles annually. The U.S. Post Office owns and buys the remaining vehicles.

Source: *The Detroit News*

Parkmobile and Liberty PlugIns (LPI) have teamed to permit EV charging revenues to be collected by mobile phones. Parkmobile operates in the pay by phone parking services. LPI's Synchronous Codes algorithm is installed on Parkmobile's system server and creates unique authorization codes that are transmitted to drivers via their mobile app or text message. Drivers can use their cell phones and native mobile apps for iPhone, BlackBerry and Android to pay for a charging session and the revenues are deposited directly into the parking lot owner's and operator's existing merchant banking accounts.

Source: *The Sacramento Bee*

The city of Boston unveiled three charging stations near City Hall Plaza. EV owners will be able to charge their vehicles for the regular \$1.25-an-hour price of feeding the parking meter at three designated spots on Cambridge Street. The charging station are manufactured by Coulomb Technologies – each costing about \$4,500. The stations offer two power levels (110/120 volt and 240 volt) with electricity expected to run \$15 a month for all three units

Source: *The Boston Globe*

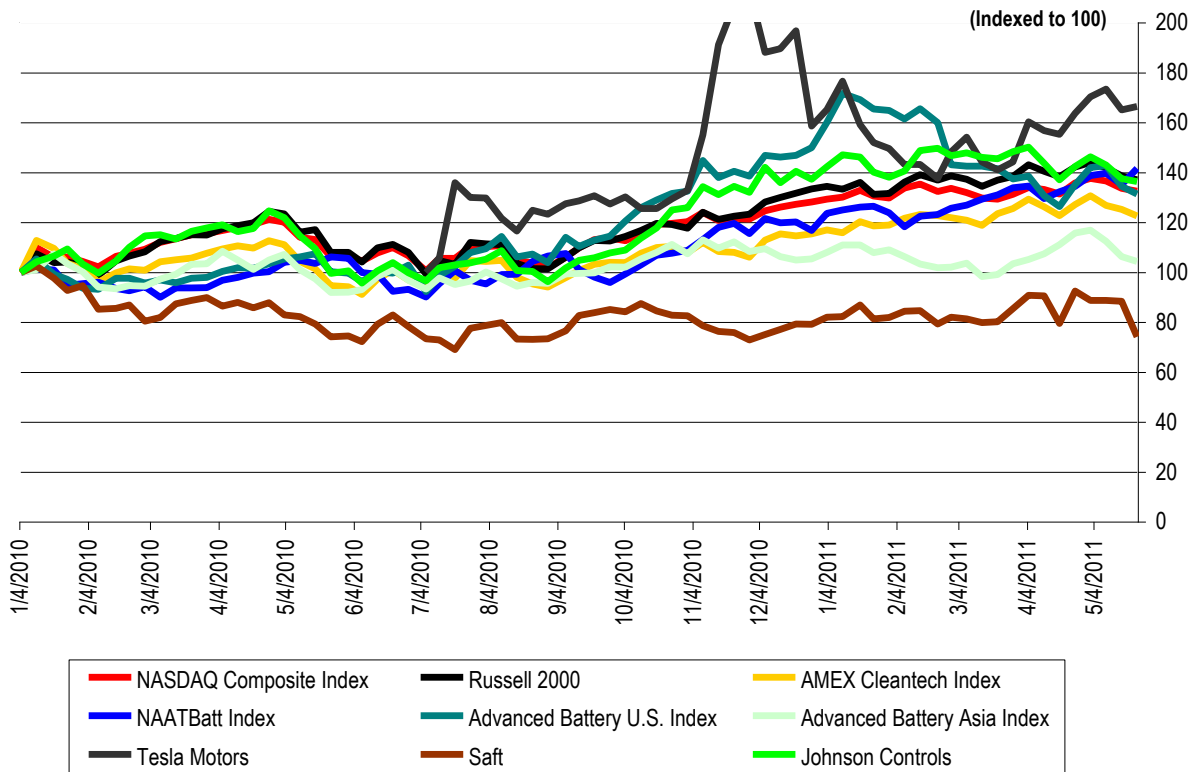
Leyden Energy has launched a full suite of next-generation lithium-ion batteries. The company has commercialized an electrolyte technology, which it licensed from DuPont. The electrolyte is made of a lithium ion salt that remains stable at high temperatures and causes less degradation over time to active components in the battery and leads to a longer cycle life. The company also has received the full \$2.96 million in grants from the California Energy Commission to produce ten electric vehicle (EV) batteries per month as part of a grant application submitted with an EV partner in 2010.

Source: Leyden Energy

A service station on the M6 in Cumbria, UK has become the first in Cumbria to install a high-powered charging point for electric sports cars. The station opened at Tebay Services northbound between junction 38 and junction 39. The charging point completes a network of eight charging points put in place at across Britain's road network.

Source: News & Star

Exhibit 3: Indices Performance
(From January 4, 2010)

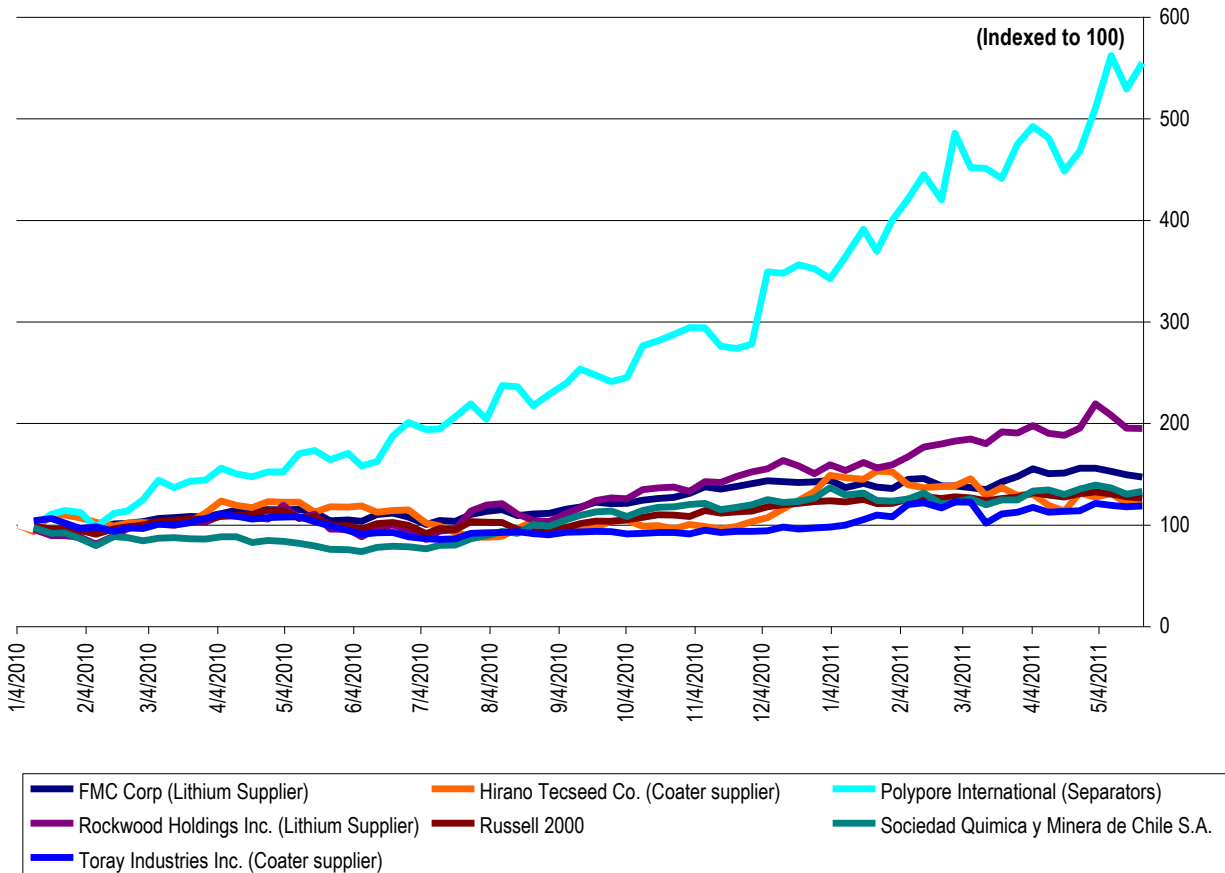


Index	Close on 5/23/2011	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	12,381.3	12,928.5	95.8%	21.5%	6.1%	(1.3%)
S&P 500	1,317.4	1,370.6	96.1%	21.4%	3.6%	(0.9%)
NASDAQ	2,758.9	2,887.8	95.5%	24.2%	2.5%	(0.8%)
Russell 2000	814.0	868.6	93.7%	25.6%	1.9%	(1.1%)
AMEX Cleantech Index	1,203.2	1,292.4	93.1%	32.0%	4.8%	(2.1%)

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 4: Supplier Performance
(From January 4, 2010)



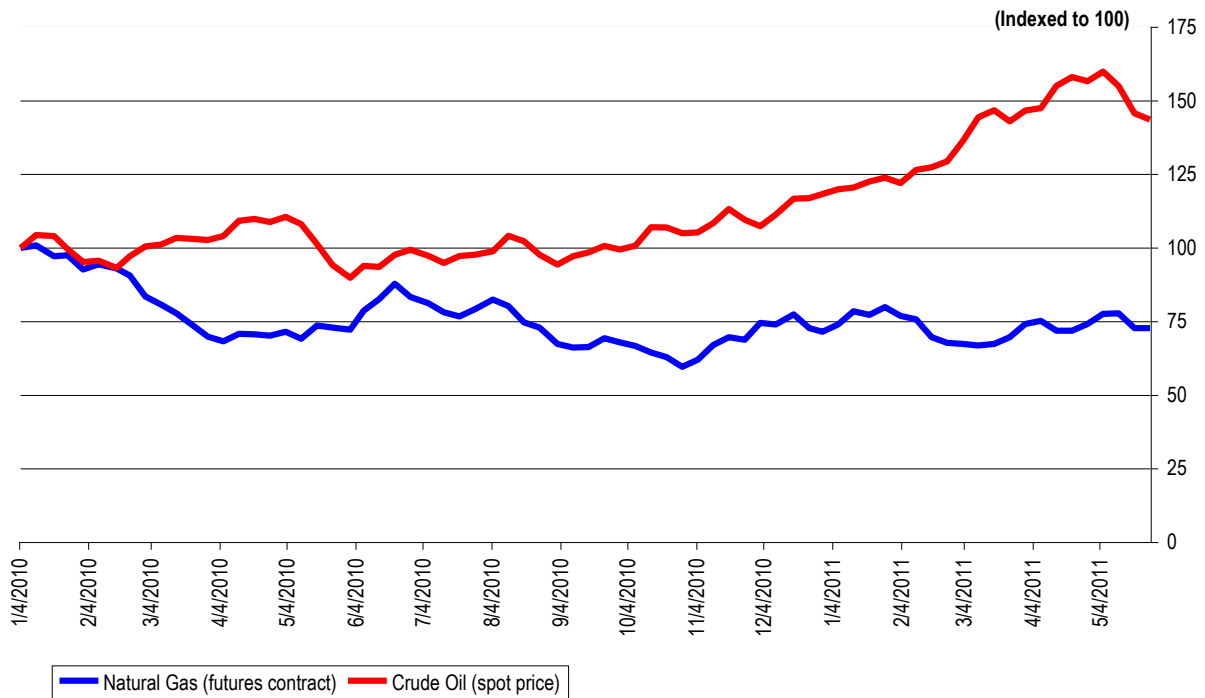
Source: Bloomberg

Exhibit 5: Commodity Prices

Commodity	Price on 5/23/2011	Price on 5/16/2011	Price on 4/26/2011	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	8,830	8,709	9,455	1.4%	(6.6%)
LME Lead (cash, \$ per tonne)	2,420	2,276	2,582	6.3%	(6.3%)
LME Nickel (cash, \$ per tonne)	22,605	24,075	26,230	(6.1%)	(13.8%)

Source: LME

Exhibit 6: Natural Gas and Crude Oil
(From January 4, 2010)



Source: EIA

Executive Director's Notes



SEX, LIES AND GALLUP POLLS

Last Wednesday, [USA Today](#) ran an [article](#) entitled “*Americans Say No to Electric Vehicles Despite Gas Prices*”. The article claimed that, based on a recent [Gallup Poll](#), 57% of American drivers would be unwilling to purchase an electric vehicle no matter how high gas prices rise.

The poll results were, of course, more nuanced than [USA Today](#) suggests. The conclusion cited by the article was based on a single question “*How high would gas prices have to rise before you would buy an electric car that you could only drive a limited number of miles at one time, or is that something you would not do no matter how high gas prices get?*”—not a form of question likely to produce an objective answer. What the poll, which consisted of multiple questions, really concluded was that higher gas prices will affect consumer behavior in a number of ways, though the impact may not be immediate. This was neither an original nor a particularly newsworthy result.

Geoffrey Moore’s insight into consumer acceptance of new technologies in his seminal book [Crossing the Chasm](#) continues to define the principal challenge for electric vehicles in the United States. To paraphrase Professor Moore, mass market consumers will adopt new technology when that technology lets them do something that they are doing already, but lets them do it better.

For a small segment of possible PEV consumers, better means more environmentally friendly. For another small segment, better means improved torque and performance. But for the large majority of potential consumers, better is going to mean a lower price.

Meaningful electrification of vehicles in the United States requires that the price of those vehicles be brought sharply lower. That can only be done by reducing the price of the vehicle batteries, which account entirely for the higher cost of PEV’s relative to petroleum-fueled vehicles.

Reducing PEV battery costs requires increasing three things: the energy density of battery cells, the market volume of advanced batteries, and the reuse of vehicle batteries (the E-M-R Challenge). Debate about the meaning of poorly worded opinion polls questions must not distract from that challenge.



James J. Greenberger
Executive Director



May 27, 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

**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 title of the program is "**New Markets, New Innovations: The Next 5 Years in Advanced Batteries**." The program will take a hard look at near-term market opportunities for U.S. advanced battery manufacturers and let them hear from potential customers what those customers want now. The annual meeting will also feature a Battery Industry-Academic Summit with presentations by the top university battery programs in the United States. Attendees will learn who is working on what in the academic world. There is more going on than you think. Information about the 2011 conference will be posted soon on the NAATBatt Web site at: www.naatbatt.org. Please save the date!

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. 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.

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 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.

- **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/.
- **4th 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://beyondli-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.
- **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/>.
- **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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