

Summary:

For the July 22nd issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt Index posted a modest 1.3% gain, while the U.S. and Asia Battery Indices were relatively flat. The S&P500 and Russell 2000 were also down modestly.

Executive Director James Greenberger responds to suggestions that there will be a large oversupply of manufacturing capacity for large format lithium-ion battery for vehicle applications through 2020. Read "**Oversupply of Lithium-Ion Batteries: A Rebuttal**" in the Executive Director's Notes section of this newsletter below.

Key Highlights:

- **Valence Technology's** lithium-ion (li-ion) batteries have earned favorable first phase reviews during a large electric vehicle (EV) assessment program being conducted by **Ford-Werke GmbH** in **Cologne, Germany**. As part of the **colognE-mobile** study, **Smith Electric Vehicles** delivered ten **Edison** EVs to Ford in February 2010.
- **Ener1** and **Wanxiang Electric Vehicle Company** announced that they have received approval from the Chinese government for their joint venture (JV). **Zhejiang Wanxiang Ener1 Power System Company** will initially focus on fulfilling existing contracts with **State Grid**.
- **Siemens** will begin selling a home charger ("**VersiCharge**") for EVs that costs less than \$1,000 before installation. The company has had inquiries about distributing the product through **Home Depot, Lowe's** as well as electronics chains.
- **GE Energy Industrial Solutions** and **Lowe's** announced a partnership to offer consumers the **GE WattStation Wall Mount Electric Vehicle Charging Station**. Lowe's will introduce the product at 5 stores in **California** in August with availability increasing to 60 stores in September.
- **Coulomb Technologies** announced it will partner with **TomTom** to extend **ChargePoint Network** driver services into EVs. The partnership should help reduce range anxiety by bringing charging station location, navigation and reservation services right to a driver's dashboard.
- **Tesla Motors** has signed a \$100 million deal to build the power train for **Toyota's electric RAV4**. The company will supply the battery, charging system, motor and gearbox.
- **Clean Diesel Technologies** announced it has been chosen as a catalyst supplier to **Fisker Automotive**. The company is supplying its patented mixed phase catalyst (MPC®) technology for the **Karma**.
- **Energy Conversion Devices** is planning to sell its **Ovonic Battery** subsidiary. Ovonic Battery invented the **nickel-metal-hydride** rechargeable battery technology that is used in most hybrid gasoline-electric vehicles.
- An electric bus (ebus) caught fire while carrying passengers in downtown **Shanghai**. The ebus was manufactured by **Shanghai Leibo**.
- **Daimler AG's Smart** division is planning to sell an electric bicycle (ebike) next year. The company is searching globally for a manufacturing partner, including in **China** and **Taiwan**.

- **AES Corporation** is working with the **West Virginia Public Service Commission** on the construction of a 32 megawatt (MW) li-ion battery that could provide more consistent output for a wind farm. The storage device will be located at **AES Laurel Mountain's Barbour County** location.

A Few More Details:

Valence Technology's lithium-ion (li-ion) batteries have earned favorable first phase reviews during a large electric vehicle (EV) assessment program being conducted by Ford-Werke GmbH in Cologne, Germany. As part of the *colognE-mobile* study, Smith Electric Vehicles (SEV) delivered 10 Smith Edisons to Ford in February 2010. The Edison EVs utilized in this program have a range of up to 165 kilometers (102 miles) with a top speed of 80 km/hour (50mph).

Source: Valence Technology

Ener1 and Wanxiang Electric Vehicle Company announced that they have received approval from the Chinese government for their joint venture (JV). Zhejiang Wanxiang Ener1 Power System Company will initially focus on fulfilling existing contracts with State Grid. The projects include an ebus for the city of Qingdao and an EV for the city of Hangzhou. The JV is projected to achieve annual cell manufacturing capacity of 300 million Ampere hours (approximately 40,000 electric vehicle battery packs) annually by 2014.

Source: Ener1

Siemens will begin selling a home charger for EVs that costs less than \$1,000 before installation. The VersiCharge station (as shown in **Exhibit 1**) can be plugged into an existing 240-volt outlet. The chargers that use a 240 volt circuit can recharge the battery in a few hours, while a 110-120 volts system will take overnight. The company has had inquiries about distributing the product through Home Depot, Lowe's as well as electronics chains.

Source: USA Today

Exhibit 1: The VersiCharge



Source: Siemens

GE Energy Industrial Solutions and Lowe's announced a partnership to offer consumers the GE WattStation Wall Mount Electric Vehicle Charging Station. Lowe's will introduce the product at five stores

in California in August with availability increasing to 60 total stores in September. The Level 2 charger can fully charge an EV in 4 to 8 hours.

Source: GE and Lowe's

Coulomb Technologies announced it will partner with TomTom to extend ChargePoint Network driver services into EVs. The partnership should help reduce range anxiety by bringing charging station location, navigation and reservation services right to a driver's dashboard. TomTom's navigation platforms will use the open ChargePoint Network Web Services API to assist drivers to:

- find the nearest available charging station;
- navigate to a destination and optimize the route for the nearest available stations;
- reserve a station in advance; and,
- access station information including power, connector type, availability, and pricing

Source: Coulomb Technologies

Tesla Motors has signed a \$100 million deal to build the power train for Toyota's electric RAV4 (as shown in **Exhibit 2**). The company will supply the battery, charging system, motor and gearbox. Production of the EV is expected to begin next year and continue through 2014.

Source: San Francisco Chronicle

Exhibit 2: The Electric RAV4



Source: Toyota Motor

Clean Diesel Technologies announced it has been chosen as a catalyst supplier to Fisker Automotive. The company is supplying its patented mixed phase catalyst (MPC®) technology for the Karma. The company had already begun catalyst shipments to Fisker in 1Q11.

Source: Clean Diesel Technologies

Energy Conversion Devices is planning to sell its Ovonic Battery subsidiary. The subsidiary licenses advanced battery technologies and works in joint development (JV) programs to support use of the technologies. Ovonic Battery invented the nickel-metal-hydride rechargeable battery technology that is used in most hybrid gasoline-electric vehicles.

Source: The Detroit News

An electric bus (ebus) caught fire (as shown in **Exhibit 3**) while carrying passengers in downtown Shanghai. This is the second incident to be publicized over the past 3 months. The ebus was manufactured by Shanghai Leibo. Over 10 cities in China have begun trials using ebus fleets.

Source: Reuters

Exhibit 3: A Charred Bus



Source: Green Car Reports and EastDay

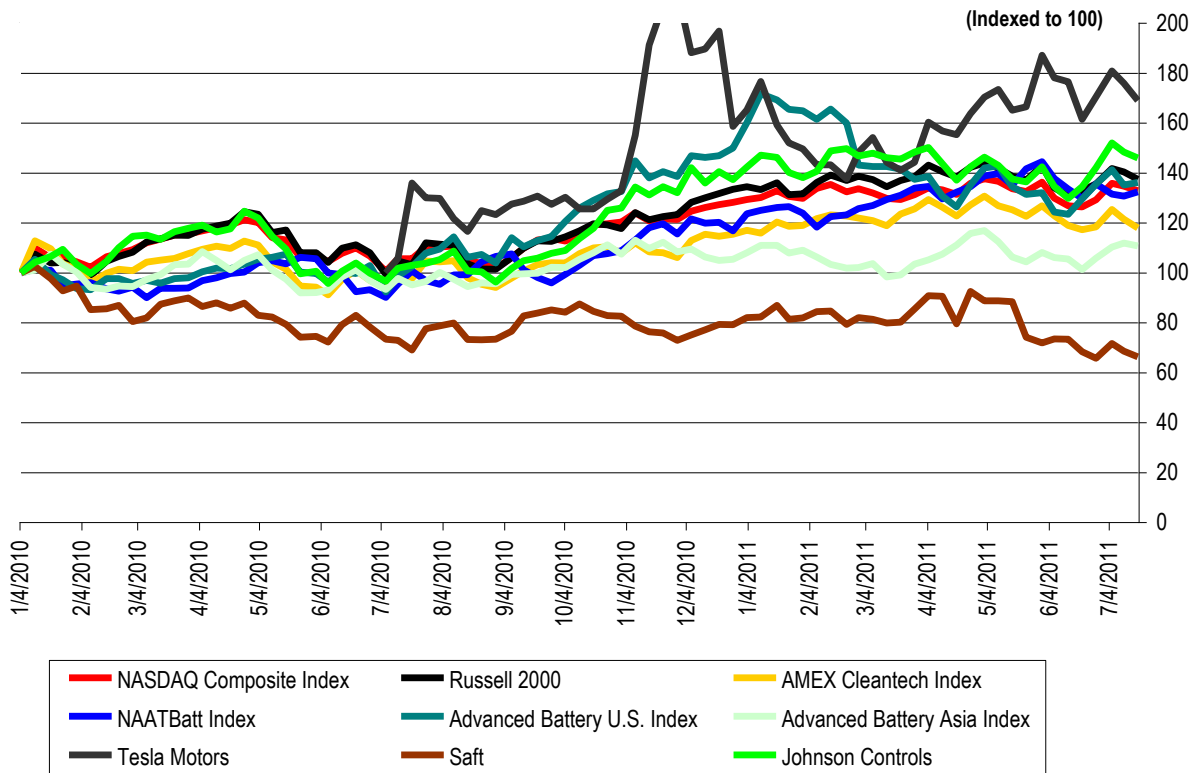
Daimler AG's Smart division is planning to sell an electric bicycle (ebike) next year. The company is searching globally for a manufacturing partner, including in China and Taiwan. The partner could help design and produce ebikes and scooters at a reasonable cost as the vehicles need to be priced competitively to gain mass-market appeal.

Source: WSJ

AES Corporation is working with the West Virginia Public Service Commission on the construction of a 32 megawatt (MW) li-ion battery that could provide more consistent output for a wind farm. The storage device will be located at AES Laurel Mountain's Barbour County location. It will consist of eight 4 megawatt modules consisting of li-ion, inverters, transformers and cooling systems. Installation is expected to take four months and the project is expected to be online later this year.

Source: The State Journal

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

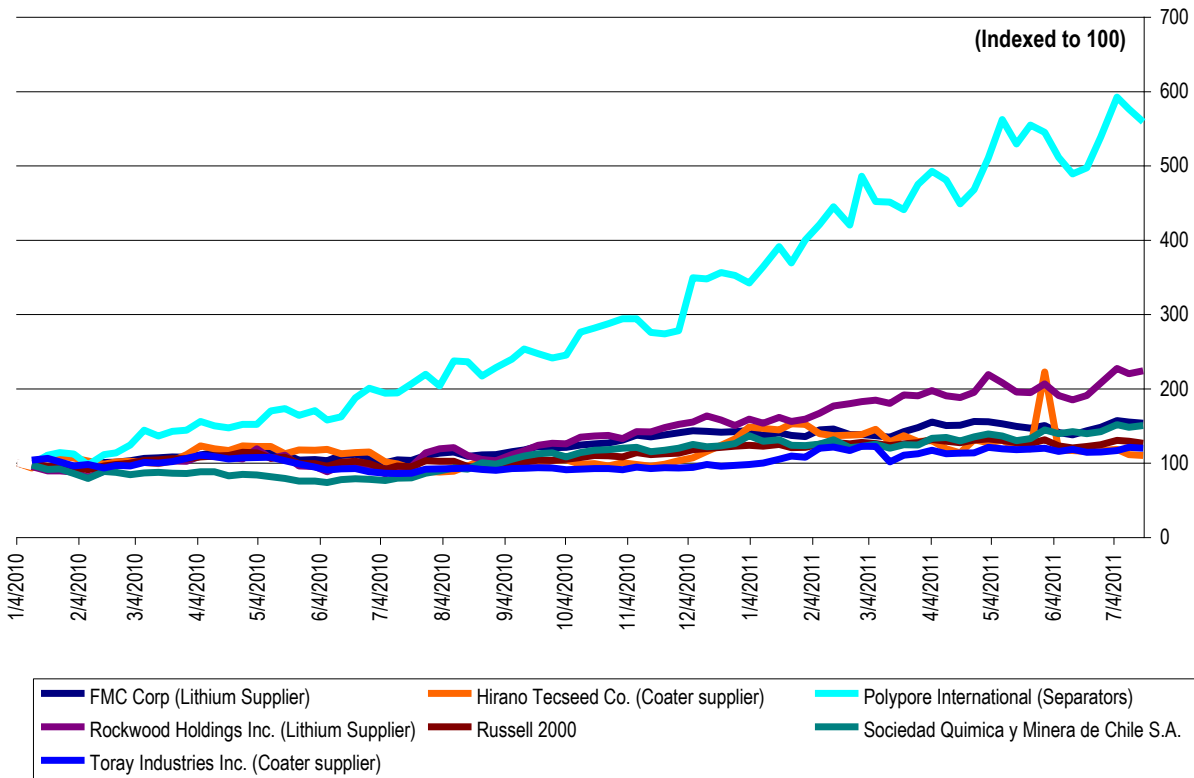


Index	Close on 7/18/2011	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	12,385.2	12,928.5	95.8%	22.6%	6.1%	(1.0%)
S&P 500	1,305.4	1,370.6	95.2%	22.4%	2.6%	(1.1%)
NASDAQ	2,765.1	2,887.8	95.8%	26.5%	2.7%	(1.3%)
Russell 2000	816.1	868.6	94.0%	33.3%	2.2%	(2.1%)
AMEX Cleantech Index	1,157.5	1,292.4	89.6%	21.1%	0.8%	(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 5: Supplier Performance
(From January 4, 2010)**



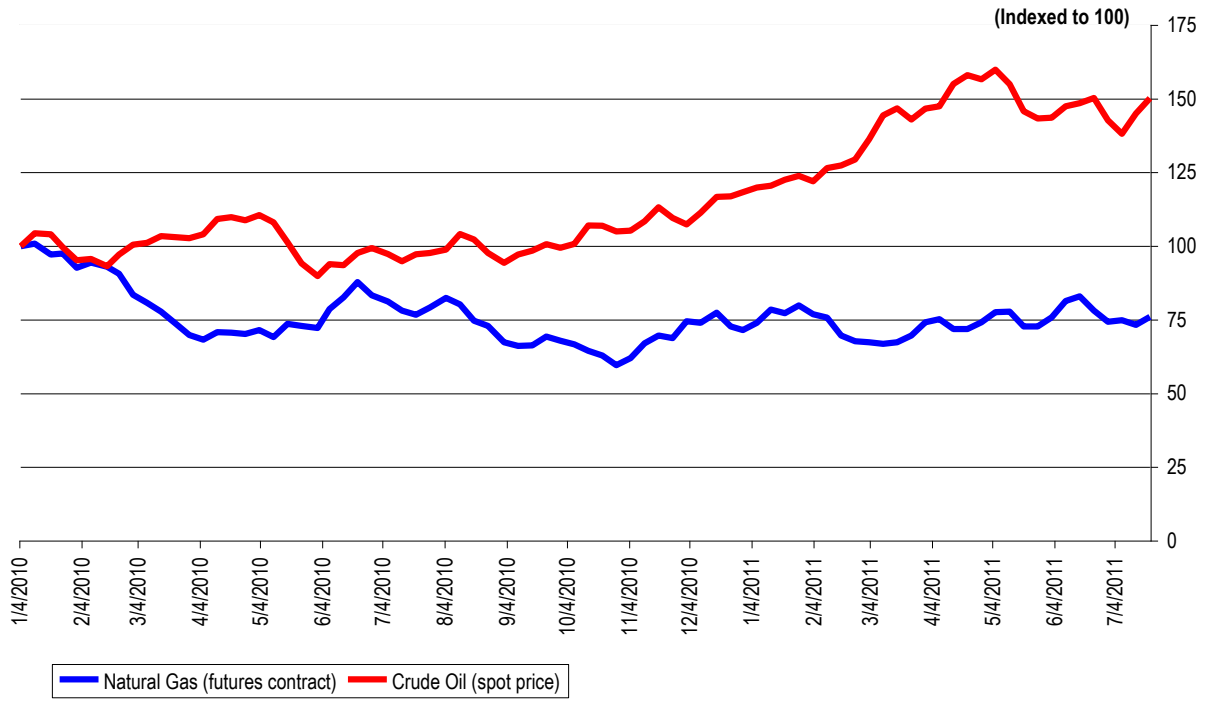
Source: Bloomberg

Exhibit 6: Commodity Prices

Commodity	Price on 7/18/2011	Price on 7/11/2011	Price on 6/17/2011	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	9,689	9,556	9,101	1.4%	6.5%
LME Lead (cash, \$ per tonne)	2,728	2,650	2,460	2.9%	10.9%
LME Nickel (cash, \$ per tonne)	23,765	23,405	21,905	1.5%	8.5%

Source: LME

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



Source: EIA

Executive Director's Notes



OVERSUPPLY OF LI-ION BATTERIES: A REBUTTAL

On Tuesday I attended a Webinar produced by Lux Research entitled “Risk and Reward in the Overhyped Electric Vehicle Market”. The program was well done, but largely rehashed an argument, which has been widely made over the past several months: That for the foreseeable future the supply of large format lithium-ion batteries will substantially exceed the demand for such batteries in automotive applications. The negative assessment by Lux and other lithium-ion skeptics is overly pessimistic, however, because it misidentifies the primary driver of the large format lithium-ion battery market.

Lux makes two arguments in support of its assessment. First, Lux suggests that adoption of heavy PHEV's (i.e., PHEV-40's, such as the Chevy Volt) and EV's (pure electric vehicles, such as the Nissan LEAF) will be driven by the “payback period” for those vehicles (i.e., fuel cost savings over EV/PHEV purchase price differential). In the Webinar, Lux presented a slide showing the purported sensitivity of PHEV/EV sales to petroleum prices. At \$70 per barrel, Lux anticipates some impact on HEV (hybrid-electric vehicles, such as the Toyota Prius) sales but virtually no impact on sales of EV's or heavy PHEV's. At \$140 per barrel, Lux anticipates a more profound impact on HEV sales, but virtually no impact on EV sales and only a mild increase in heavy PHEV sales starting sometime around 2017. At \$200 per barrel, Lux anticipates a somewhat more rapid increase in heavy PHEV sales starting at about 2015, but only a small increase in EV sales beginning at about the same time.

Lux's second argument, also illustrated on a slide, overlaid the foregoing oil price sensitivity analysis on top of the announced manufacturing capacity of all Tier 1 (e.g., GS Yuasa, Sanyo), Tier 2 (e.g., LG Chem, Hitachi) and Tier 3 (e.g., A123, Ener1) large format lithium-ion battery suppliers through 2020. The slide showed, in somewhat dramatic fashion, that even in the most optimistic scenario (i.e., oil at \$200 per barrel) total demand for EV/PHEV batteries by 2020 would not exceed the manufacturing capacity of even just the Tier 1 battery suppliers.

In conclusion, the Lux analyst making the presentation politely suggested that advanced battery companies need to be more “flexible” in their approach to the market. Properly understood, the message of the Webinar was to forget about the advanced automotive battery producers and invest, perhaps, in oil futures.

Although thorough and sobering, Lux's analysis of the large format lithium-ion battery market is fundamentally flawed because it misidentifies the primary driver of EV/PHEV market: Vehicle electrification is not driven by oil prices; it is driven by government policy. Predicting consumer adoption of fuel efficient vehicles based on oil prices is unsound. The number of EV's and heavy PHEV's that

American consumers will purchase between now and 2020 will have far less to do with the price of petroleum than with the nature of the government incentives and mandates that will drive consumers to make such purchases.

The tenuous relationship between gasoline prices and consumer demand for fuel economy is no secret. If the relationship was more certain, there would be no need for CAFE standards. The affection of American consumers for large automobiles has never been entirely rational. Moreover, petroleum producers have long demonstrated a willingness and an ability to manipulate oil prices in the short term in order to thwart serious progress on the problems of fuel economy and petroleum dependence. As a consequence, the more accurate predictor of consumer purchases of EV's and heavy PHEV's--and the volume of the large format lithium-ion battery market--is the nature of government mandates, not the price of petroleum.

A more important point, however, is that policies intended to incent consumers to purchase EV's and heavy PHEV's are not primarily about improving fuel economy. Adding EV's and heavy PHEV's to the national vehicle fleet would improve the overall fuel efficiency of the fleet, but they are almost certainly not the most cost-effective way to do so. Vehicle electrification is but one of many strategies that auto makers can use to improve the fuel efficiency of their fleets. Reducing the weight of vehicles, improving the efficiency of the internal combustion engine and adding start-stop batteries are other strategies and are, by most estimates, more cost effective. This is the point that Lux and other lithium-ion skeptics, such as John Petersen of Seeking Alpha, keep harping on *ad nauseum*.

But they miss the point. The need for heavy vehicle electrification (i.e., for adding large numbers of EV's and heavy PHEV's to the national vehicle fleet) is driven by the need for fuel diversity, not fuel economy. *Fuel economy* and *fuel diversity* are different and not necessarily related concepts. Reducing total petroleum usage is an economic objective driven by concerns about the impact of high energy prices on the U.S. economy and the transfer of wealth to overseas producers. Reducing petroleum dependence of the U.S. vehicle fleet by diversifying its sources of fuel is a strategic objective driven by the need to protect the country against a catastrophic Oil Shock event and to reduce the huge political, economic and strategic costs that the United States pays on an ongoing basis to guard against it.

Heavy vehicle electrification is critical to the important national objective of fuel diversity. While there may be better ways to achieve fuel economy than heavy vehicle electrification, EV's and PHEV's are indispensable in any effort to diversify the fuel sources of the national vehicle fleet and to protect the U.S. against an Oil Shock event. There simply are no other practical, near term alternatives to vehicle electrification if meaningful fuel diversity is to be achieved.

This, of course, leads us back to that primary driver of fuel economy and fuel diversity in the vehicle fleet: government policy. It is notoriously difficult to predict what government policy will be, particularly in the long term. Moreover, there is cause for pessimism that U.S. government policy will really support heavy vehicle electrification. The concepts of fuel economy and fuel diversity are regularly confused and this confusion leads to muddled policy towards both fuel economy standards and electrification initiatives. The current debate within the environmental community about the treatment of electric vehicles in CAFE standards is a case in point.

But more rational heads may yet prevail. The almost complete reliance of the entire U.S. vehicle fleet on a single source of fuel is one of the great challenges of our time. Reducing the amount of petroleum consumed—so that we can use less gasoline and pay more for it—without breaking our absolute dependence on oil is a very poor energy policy and, undoubtedly, the wildest dream of every petroleum producer.

The U.S. government will support vehicle electrification long term and will do what it needs to do to make sure that EV's and PHEV's become a significant part of the national vehicle fleet. It will not do this because oil prices rise to \$140 or \$200 per barrel. It will do this because the United States needs to do it in order to avoid a national disaster and because not all national leaders are fools.

Don't sell your lithium-ion battery producer stocks just yet.



James J. Greenberger
Executive Director

July 22, 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

NAATBatt 2011 Annual Meeting and Conference: NAATBatt's 2011 Annual Meeting and Conference will be held on **September 7-8, 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. The annual meeting will also feature the **Industry-Academic Advanced Battery Summit** with presentations by some of the top university battery research programs in the United States. Attendees will learn who is working on what in advanced battery research programs in the United States. There is more going on than you think. Information about the 2011 conference is posted on the NAATBatt Web site at: www.naatbatt.org. Please join us in Louisville in September!

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.

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- **1st North American & Asian Lithium-Ion Technology Conference:** The North American & Asian Lithium-Ion Technology Conference will be held on **August 24, 2011** at the University of Nevada Las Vegas in Las Vegas, Nevada. The conference is co-sponsored by UNLV and an affiliate of the Lion Battery Industry Association of South China. More information about the conference can be found at: <http://lbiana.org/industry-events/>

- **NAATBatt 2011 Annual Meeting and Conference: September 7-8, 2011** in Louisville, Kentucky. Registration is now open for the 2011 Annual Meeting and Conference, which will include the 1st Industry-Academic Advanced Battery Summit. See the note above for more details, or click [here](#).
- **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.
- **4th International EV Battery Tech USA: Global Cost Reduction Initiative:** EV Battery Tech USA will be held on **September 21-22, 2011**, in Detroit, Michigan. The leading automotive OEM's will attend the conference and discuss how to reduce the cost of EV batteries by specifically evaluating near-term advances in energy density, battery life extension, preventative methods for cell degradation and failure, battery safety improvement and testing. NAATBatt is a supporting organization of the conference and NAATBatt members are entitled to a 15% discount on registration. The conference Web site may be viewed at: <http://www.ev-battery-tech.com/>.
- **Developing Grid Storage Projects:** Infocast will produce the Developing Grid Storage Projects conference in Dallas, Texas on **October 5-6, 2011**. The conference will discuss the regulatory drivers and business models for grid storage projects in the United States. NAATBatt will be a supporting organization of the conference.
- **The Business of Plugging In:** The Center for Automotive Research will host The Business of Plugging In conference at the Hyatt Regency in Dearborn, Michigan on **October 11-13, 2011**. The conference will examine the challenges of moving EV's from early adoption to mass market acceptance and will feature a ride-and-drive event highlighting the newest EV's. More information can be found at: www.bpiconference.com.
- **EESAT 2011:** The biannual international Electrical Energy Storage Applications and Technologies conference (EESAT) will be held at the San Diego Marriott Hotel and Marina in San Diego, California on **October 13-16, 2011**. The conference will highlight specific electrical energy storage applications and technologies, especially as they relate to the electricity grid. More information about EESAT 2011 can be found at: <http://www.sandia.gov/eesat/index.html>.
- **The Battery Show:** The Battery Show conference and exposition will be held in Novi, Michigan on **October 25-27, 2011**. The conference will include a business and a technology track as well as a wide range of exhibits by battery makers and suppliers. Information about the show can be found at: <http://www.thebatteryshow.com/conference-program-2011>.
- **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.

- ***International Electric Vehicle Symposium:*** The Electric Drive Transportation Association will produce the 26th international Electric Vehicle Symposium and exposition (EVS26) on **May 6-9, 2012** in Los Angeles, California. Information about EVS26 can be found at www.EVS26.org.
- ***IEEE PES Transmission and Distribution Conference and Exposition:*** The IEEE PES Transmission and Distribution Conference will be held in Orlando, Florida on **May 7-10, 2012**. The conference will focus on innovation in power delivery systems, including storage systems. Information about the conference can be viewed at: <http://www.ieeet-d.org/>.



Contact Information:

National Alliance for Advanced Technology Batteries

122 South Michigan Avenue, Suite 1700
Chicago, Illinois 60603
(312) 588-0477

www.naatbatt.org

Officers

Randy Moore
Chairman

rmoore@naatbatt.org

Jim Greenberger
Executive Director

jgreenberger@naatbatt.org

Michael Lew
Head of Business Development
mlew@naatbatt.org

Ralph Brodd
Chief Technology Officer
rbrodd@naatbatt.org

Sandy Kane
Chief Financial Officer
skane@naatbatt.org