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Advanced Battery Weekly

Summary:

For the June 3rd issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt and Asia Indices increased 1.9% and 3.6%, respectively. The U.S. Index was flat. The S&P 500 and Russell 2000 increased 2.1% and 4.2%, respectively.

Executive Director James Greenberger writes about the possibility that export opportunities may provide a good short term market opportunity for U.S. advanced battery manufacturers. Read "*Exports May Drive Advanced Battery Sales*" in the Executive Director's Notes portion of this newsletter below.

Key Highlights:

- Testing on a prototype 'green bus' has commenced in London. The bus' hybrid engine technology designed by **Wrightbus** features a lithium-ion battery (li-ion) from **Valence Technology** and will achieve a fuel consumption of 10 miles per-gallon (MPG).

- **AeroVironment** has been selected by the **Oregon Department of Transportation** (**ODoT**) to install high-power Level 3 fast charging stations along the **I-5** corridor from the **California state line** to the **Willamette Valley**. The stations will be situated along a 150-mile **"Green Highway"** span of the I-5 from **San Diego** to **Vancouver, B.C.**

- **Tesla Motors** is planning to begin selling the **Model X** electric vehicle (EV) in late 2013. Production volumes of the EV may be between 10,000 and 15,000 units annually.

- The **Samsung SDI - Robert Bosch** joint venture (JV) is in talks with **Volkswagen AG** to supply li-ion batteries. Samsung SDI is also involved in discussions with other top global car makers.

- Battery manufacturers in **China** have suspended production amid a government crackdown on heavy metal pollution (lead exposure). Operations in major producing regions, including **Guangdong** and **Zheijiang**, are on hold for two weeks.

- **BASF** is planning to commercialize higher-quality electrolytes that can enhance performance by improving the efficiency of transporting electronic charges inside batteries. The move into electrolytes will expand BASF's portfolio of battery-related products and strengthen its position across the li-ion battery supply chain.

- **Mitsubishi Motors** announced that it plans to market a device that would enable the **i-MiEV** to provide power to home electric appliances in emergencies. The company plans to set the limit of power consumption at 1,500 watts, which will enable customers to use most home electronics, including rice cookers and washing machines.

- **Irish Ferries** and **ESB ecars** have introduced onboard charge points on the **Dublin-Holyhead** and **Rosslare-Cherbourg/Roscoff** routes. There are dedicated areas on the ***Ulysses*** and ***Oscar Wilde*** Irish Ferries, which enable drivers to recharge EVs during the trip between **Britain** and **France**.

- **BYD** has signed a deal to supply authorities in the **Dutch** city of **Rotterdam** with seventy-five **e6** EVs as part of the green transportation project **75-EV-RO**. The e6 has a range of up to 300 kilometers (or 186 miles) using an **iron phosphate battery**.

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- **Car Charging Group** announced it will install seven EV changing station in **West Palm Beach**, **Florida**. The company will install Level II, 240 volt, ChargePoint(R) Networked Charging stations manufactured by **Coulomb Technologies**.

- **China** is planning to phase out battery-powered electric-bicycles (e-bikes) that exceed speed and weight limits published 12 years ago. The **Ministry of Industry and Information Technology** is requiring local governments, police, regional industry and commerce offices to tighten management of e-bike manufacturing plants.

- About 75 **Nissan Leafs** have been delivered to **Hawaii**. The gradual movement to EVs provided the impetus for a new online permitting system for the installation of electric vehicle charging stations that was rolled out yesterday by the **City** and **County of Honolulu**.

- **Manitoba Hydro** is planning for its role as the 'filling station' of the future. The company estimates that within 20 years, the electrical load from zero-emission battery-powered electric vehicles will be 200 megawatts (MWs).

- **Minneapolis**, **St. Paul, Hennepin** and **Ramsey** counties all have agreed to add EVs to their fleets and will share performance and maintenance data with **Xcel Energy**. The company will use the information to gauge how EVs could affect the region's electrical grid as they become more common.

- The city of **London** has set a goal of becoming the "**electric car capital**" of **Europe** and has launched a new network of 150 charging stations, increasing the total number of stations citywide to more than 400. City officials are targeting an install base of 1,300 charging points across London by 2013.

A Few More Details:

Testing on a prototype 'green bus' has commenced in London. The bus' hybrid engine technology designed by Wrightbus features a li-ion from Valence Technology and will achieve a fuel consumption of 10 MPG. This would be almost a 40% improvement over conventional diesel double-deckers and 15% better than existing hybrid models.
Source: Energy Efficiency News

AeroVironment has been selected by the Oregon Department of Transportation (ODoT) to install high-power Level 3 fast charging stations along the I-5 corridor from the California state line to the Willamette Valley. The stations will be situated along a 150-mile "Green Highway" span of the I-5 from San Diego to Vancouver, B.C. The company's CHAdeMO compliant stations allow EV recharging from a fully-discharged state in less than 30 minutes.
Source: AeroVironment

Tesla Motors is planning to begin selling the Model X EV in late 2013. Production volumes of the EV may be between 10,000 and 15,000 units annually. The Model X will be available with three range variants with pricing of each variant similar to those of the Model S, which ranges between $57,400 and $77,400, before a $7,500 federal tax credit.
Source: Bloomberg

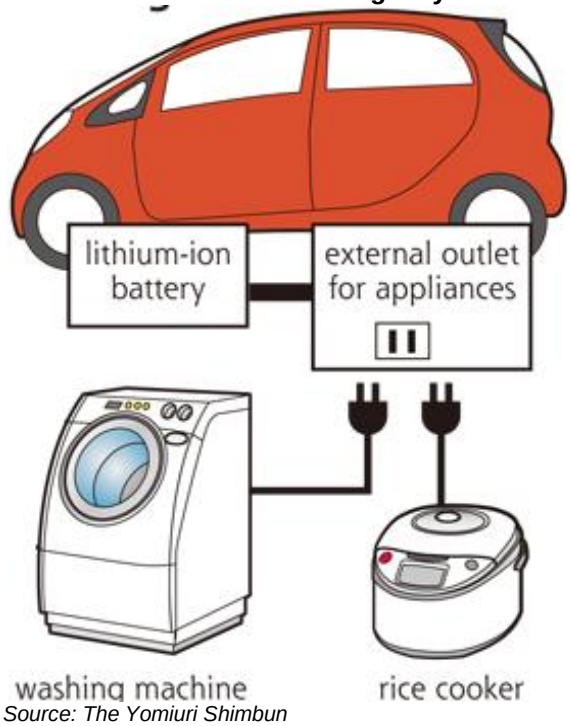
The Samsung SDI - Robert Bosch JV is in talks with Volkswagen AG to supply EV batteries. Samsung SDI is also involved in discussions with other top global car makers. The company is looking to expand into United States, China and India for battery manufacturing.
Source: Reuters

Battery manufacturers in China have suspended production amid a government crackdown on heavy metal pollution (lead exposure). Operations in major producing regions, including Guangdong and Zheijiang, are on hold for two weeks. There are nearly 300 lead-acid battery producers in Zheijiang. The southern Guangdong province is the second largest production base for batteries and more than a hundred people have been reported to have high levels of lead.
Source: All Headline News

BASF is planning to commercialize higher-quality electrolytes that can enhance performance by improving the efficiency of transporting electronic charges inside batteries. The move into electrolytes will expand BASF's portfolio of battery-related products and strengthen its position across the li-ion battery supply chain. The company has already broke ground on a $50+ million facility in Elyria, Ohio to produce advanced cathode materials for automotive li-ion batteries.
Source: Forbes

Mitsubishi Motors announced that it plans to market a device that would enable the i-MiEV to provide power to home electric appliances in emergencies (as shown in **Exhibit 1**). The company plans to set the limit of power consumption at 1,500 watts, which will enable customers to use most home electronics, including rice cookers and washing machines. The EV is equipped with a lithium-ion battery with a capacity of 16 kilowatts per hour (kWh) -- equivalent to an average household's consumption over one to 1-1/2 days.

Exhibit 1: i-MiEV As An Emergency Power Source



Source: The Yomiuri Shimbun

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Irish Ferries and ESB ecars have introduced onboard charge points on the Dublin-Holyhead and Rosslare-Cherbourg/Roscoff routes. ESB ecars is committed to having 30 fast-charge points installed by the end of 2011, as well as 1,500 public charge points available across Ireland and 2,000 home charge units installed (dependent on e-car sales). There are dedicated areas on the *Ulysses* and *Oscar Wilde* Irish Ferries, which enable drivers to recharge EVs during the trip between Britain and France.
Source: SiliconRepublic

BYD has signed a deal to supply authorities in the Dutch city of Rotterdam with seventy-five e6 EVs as part of the green transportation project 75-EV-RO. The vehicle will be piloted in Europe for the first time. The e6 BYD has a range of up to 300 kilometers (or 186 miles) using an iron phosphate battery.
Source: The Independent

Car Charging Group announced it will install seven EV changing station in West Palm Beach, Florida. The company will install Level II, 240 volt, ChargePoint(R) Networked Charging stations manufactured by Coulomb Technologies. The charging stations will be located in the downtown West Palm Beach Clematis Street Garage, at 500 Banyan Blvd.
Source: International Business Times

China is planning to phase out battery-powered electric-bicycles (e-bikes) that exceed speed and weight limits published 12 years ago. The Ministry of Industry and Information Technology is requiring local governments, police, regional industry and commerce offices to tighten management of e-bike manufacturing plants. E-bikes can weigh no more than 40 kg and cannot go faster than 20 km (12.4 miles) per hour. The bulk of the estimated 120 million e-bikes in China have designed capacity of 30-40 kph and typically carry four batteries, which by themselves weigh at least 16-28 kg. Batteries for e-bikes accounted for about 20 percent of China's 3.7 million tonnes of refined lead consumption in 2010 with annual production of more than 17 million e-bikes.
Source: Reuters

About 75 Nissan Leafs have been delivered to Hawaii. The gradual movement to EVs provided the impetus for a new online permitting system for the installation of electric vehicle charging stations that was rolled out yesterday by the City and County of Honolulu. The state leads the nation for pre-orders for Mitsubishi's i MiEV.
Source: Honolulu Star Advertiser

Manitoba Hydro is planning for its role as the 'filling station' of the future. The company estimates that within 20 years, the electrical load from zero-emission battery-powered electric vehicles will be 200 megawatts (MWs). At current hydro rates, people can drive an EV for the equivalent cost of $0.15 per liter (or $0.57 per gallon).
Source: Winnipeg Free Press

Minneapolis, St. Paul, Hennepin and Ramsey counties all have agreed to add plug-in vehicles to their fleets, and will share performance and maintenance data with Xcel Energy. The company will use the information to gauge how EVs could affect the region’s electrical grid as they become more common. The utility expects only about a 4% to 5% increase in demand if the state reaches its goal of 400,000 plug-in vehicles on the roads by 2030.
Source: Star Tribune

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The city of London has set a goal of becoming the "electric car capital" of Europe and has launched a new network of 150 charging stations, increasing the total number of stations citywide to more than 400. Residents should see new stations opening up within the so-called Source London network. Under the program, electric car owners will pay a GBP100 annual membership that will enable them to plug their vehicles into charging stations on roadways, car parks, and supermarkets. City officials are targeting an install base of 1,300 charging points across London by 2013.

Source: Reuters

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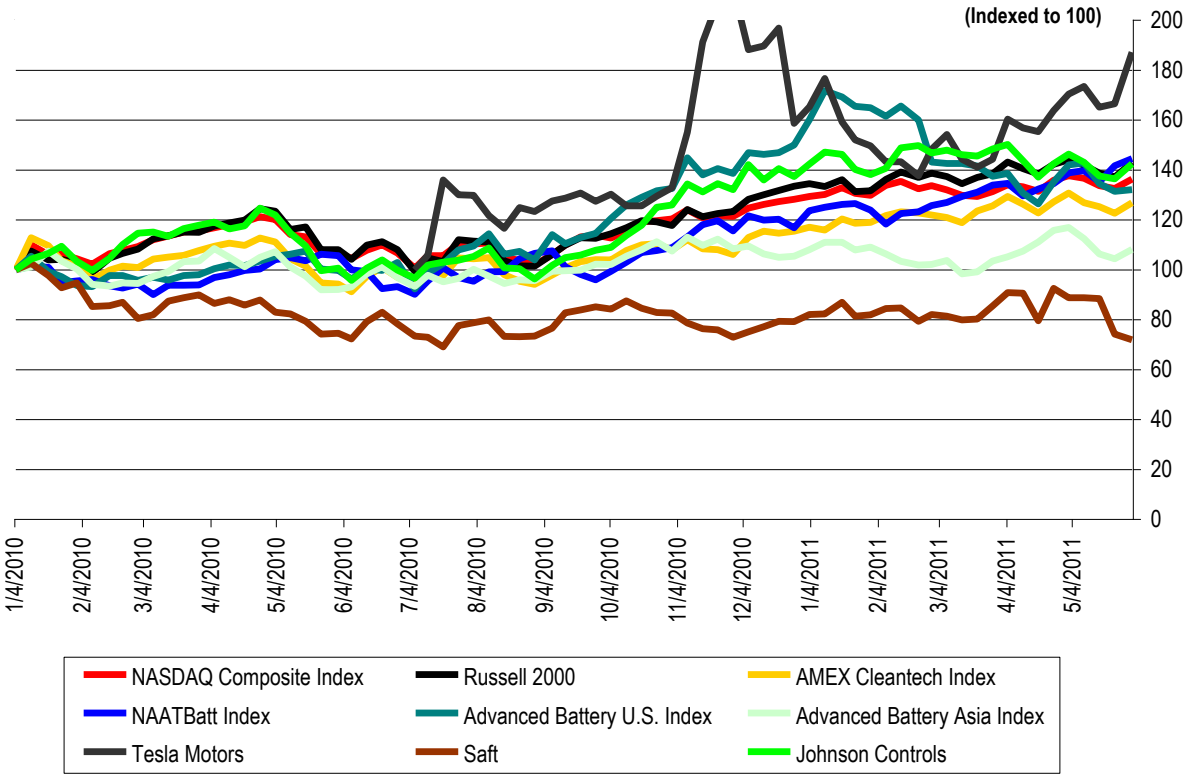
Exhibit 2: Indices Performance
(From January 4, 2010)

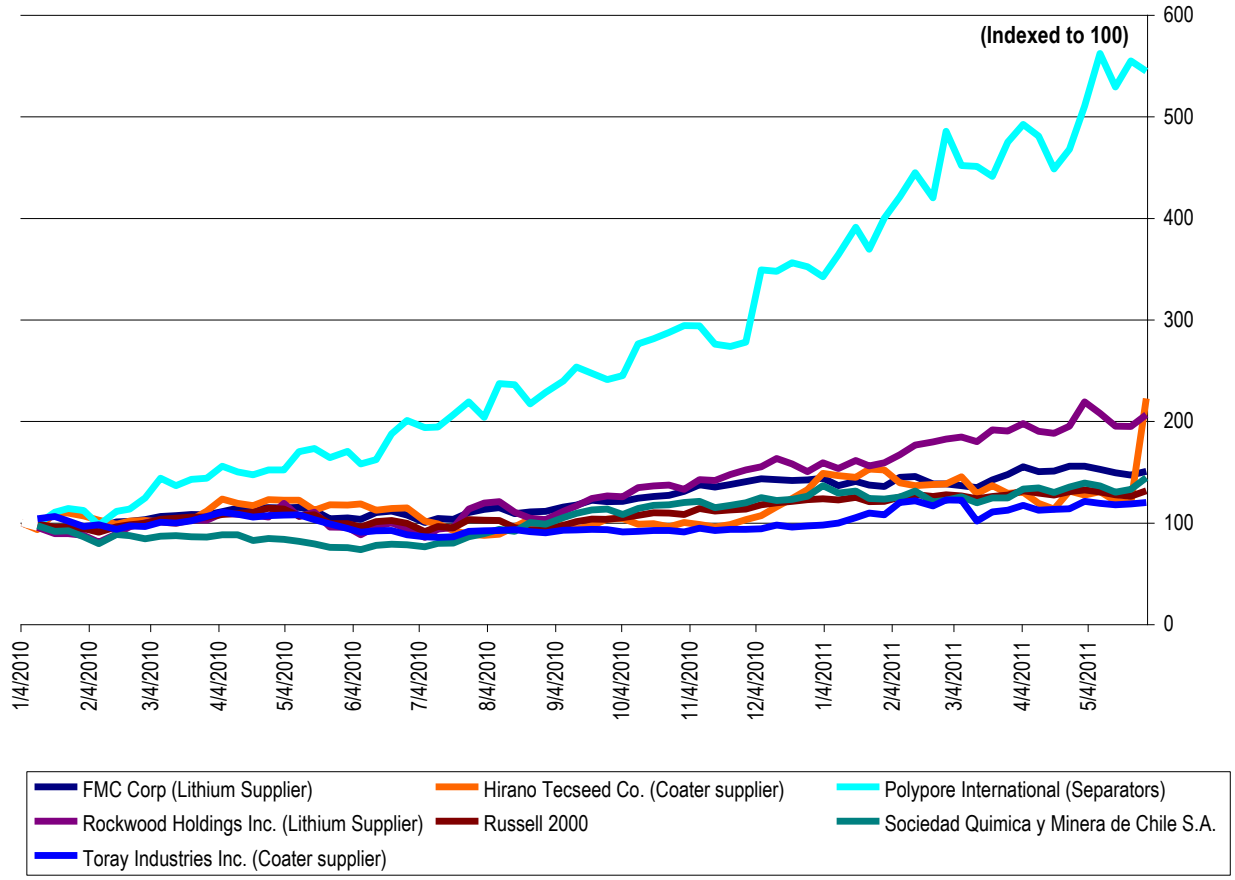


Index	Close on 5/31/2011	52-Wk High	% of 52-Wk High	Performance LTM	YTD	Week
Dow	12,569.8	12,928.5	97.2%	24.0%	7.7%	1.5%
S&P 500	1,345.2	1,370.6	98.1%	23.7%	5.8%	2.1%
NASDAQ	2,835.3	2,887.8	98.2%	26.3%	5.3%	2.8%
Russell 2000	848.3	868.6	97.7%	29.0%	6.2%	4.2%
AMEX Cleantech Index	1,244.0	1,292.4	96.3%	32.9%	8.3%	3.4%

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)



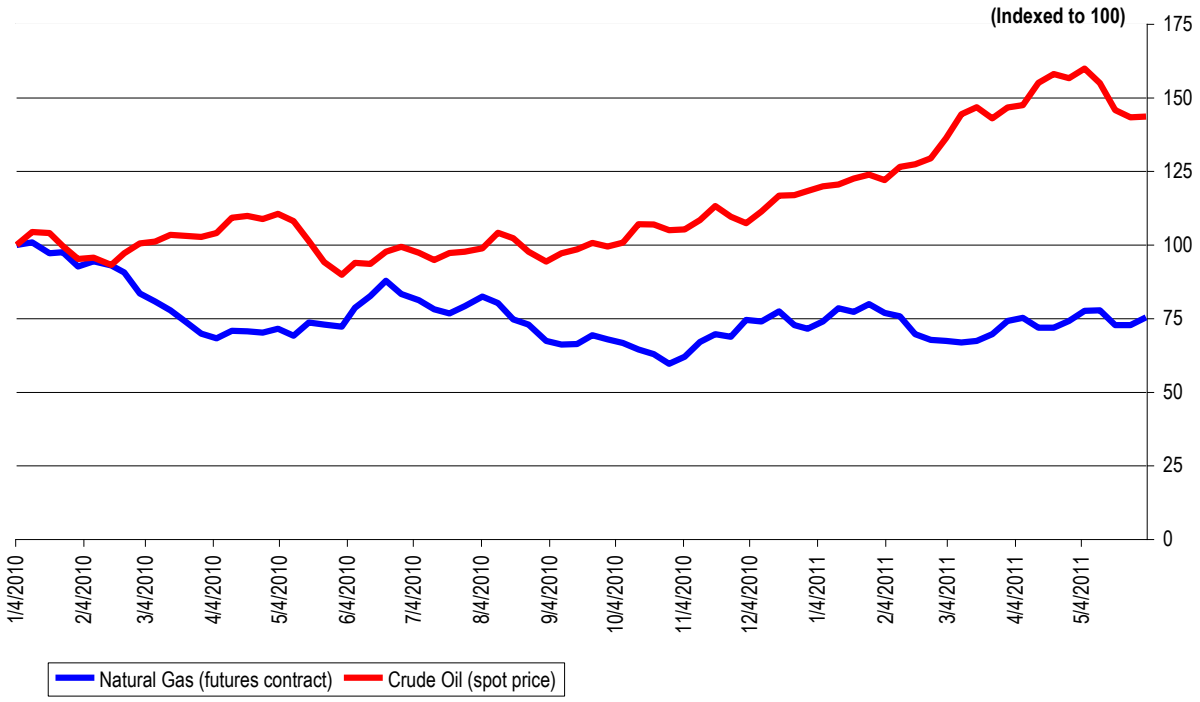
Source: Bloomberg

Exhibit 4: Commodity Prices

Commodity	Price on 5/31/2011	Price on 5/23/2011	Price on 4/28/2011	1 Week Change	1 Month Change
LME Copper (Cash, $ per tonne)	9,224	8,830	9,370	4.5%	(1.6%)
LME Lead (cash, $ per tonne)	2,531	2,420	2,530	4.6%	0.0%
LME Nickel (cash, $ per tonne)	23,150	22,605	26,605	2.4%	(13.0%)

Source: LME

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



Source: EIA

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Executive Director's Notes

EXPORTS MAY DRIVE ADVANCED BATTERY SALES

Over the past three years, public and private investment in the U.S. advanced battery sector soared on growing interest in vehicle electrification. What many overlooked in making those investments was the long product development cycle in the U.S. automotive market. New automobile models take several years to design and bring to market. On the day that electric vehicles become a compelling market proposition in the United States or any developed market, it will still take a decade or more for those vehicles to be designed, produced and to enter the market in significant numbers.

The electric utility market has much the same problem, but on steroids (or, more accurately, on Lunesta). On a sophisticated, mature electricity grid where reliability is statistically high, the addition of a new technology, such as energy storage, must be studied exhaustively before it can be deployed in significant volume. Technological conservatism in the utility industry is not the product of poor imagination or character flaws as much as a recognition that, in an absolute sense, incumbent technology already works pretty well.

In the short term, therefore, the best opportunities for the U.S. advanced battery industry may not lie in mature markets with long product development cycles, but in less mature markets overseas where energy storage represents a profound and immediate improvement on incumbent technologies. Recent announcements by several U.S. advanced battery companies of foreign system sales may be a sign of things to come.

This year, at NAATBatt's annual meeting next September in Louisville (click here for more information), we will spend time exploring new foreign markets for advanced batteries, how to identify prospects in those markets, and how to finance those sales. This may be a little different from servicing the one million domestic EV's imagined just a few years ago. But it will keep the industry alive, keep cutting edge advanced battery technology domestic, and allow time for that million vehicle market to catch up.

James J. Greenberger
Executive Director

June 3, 2011

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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.

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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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