

Summary:

For the December 16th issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt Index was flat while the U.S. and Asia Indices were down 3.6% and 7.2%, respectively. The S&P500 and Russell 2000 Indices were down 1.6% and 1.8%, respectively.

Executive Director James Greenberger suggests that the Volt fire may be an opportunity for the U.S. advanced battery industry to focus attention on consumer safety, a long-time competency of American companies. Read "**American Industry and EV Battery Safety**" in the Executive Director's Notes section of this newsletter below.

Key Highlights:

- **Ford** has started production of the **2012 Electric Focus**, which will achieve more than 100 miles per gallon equivalent (MPGe) fuel efficiency rating. A limited number of Focus Electrics will first be available in **California** and the **New York/New Jersey** areas. Distribution will expand in 2012 to the remaining 15 launch markets as production ramps up.
- **Dow Chemical** announced that its 50-50 joint venture (JV) with **Ube Industries, Advanced Electrolyte Technologies (AET)**, has secured all necessary regulatory approvals. The joint venture JV will manufacture formulated electrolytes for lithium-ion (li-ion) battery cell manufacturers in the energy storage market.
- **LG Chem** and **Sud-Chemie** have signed a Memorandum of Understanding (MOU) to establish a JV for high volume production of **Lithium Iron Phosphate (LFP)** cathode material. At a later stage, the joint development of other advanced olivine structure materials such as **Lithium Manganese Iron Phosphate (LFMP)** is also in plan.
- **Mitsubishi** has delivered its first **i-MiEV** to a retail customer in **North America** in **Hawaii**. The state offers a \$4,500 tax credit and when combined with a \$7,500 federal tax credit, the price of the EV drops to about \$16,000.
- **General Motors** and carbon fiber supplier **Teijin** have teamed up to develop stronger and lighter parts for GM trucks, cars and crossovers. Under a new contract, Teijin will employ its thermoplastic technology for fast production of carbon fiber composites that could be used on GM vehicles.
- **LIOTECH** began producing li-ion batteries in the **Novosibirsk** region. The company is a JV between **Russian Corporation of Nanotechnologies (RUSNANO)** and **Thunder Sky Limited (China-based)**. The company estimates that the world market for li-ion batteries will grow 10x over the next 9 years to be worth almost \$30 billion.
- **Car Charging Group** has been awarded a \$1 million grant by the **Pennsylvania Department of Environmental Protection** to install charging stations at 17 service plazas on the **Pennsylvania Turnpike**. The company will install Level II charging stations, which can charge a car in roughly four hours, and Level III charging stations, which can charge a car in about 20 minutes.
- **Volkswagen** is planning to unveil an electric car at the **Detroit** auto show next month. The VW electric is in addition to a gas-electric hybrid version of the **Jetta** compact sedan that will also be unveiled next month.

- A car park in **Lincoln** has become the first place in **Lincolnshire, UK** to gain a public charging point for electric cars. The facility at **Lucy Tower Car Park** cost £5,000 (or \$7,753).
- Public charging stations for EVs outnumber outlets for alternative motor fuels by almost 2:1, even though there are hundreds of times more flex-fuel vehicles than plug-in cars on U.S. roads. Drivers of the approximately 16,500 highway-worthy electric vehicles in the U.S. can choose from 4,448 public charging stations, according to **U.S. Energy Department**.

A Few More Details:

Ford has started production of the 2012 Electric Focus, which will achieve more than a 100 miles per gallon equivalent (MPGe) fuel efficiency rating. The EV will be the first to offer faster charging with 240-volt outlets, which can be installed in customer homes. The battery can be recharged in just more than three hours using a 240-volt charging station. A limited number of Focus Electrics will first be available in California and the New York/New Jersey areas. Distribution will expand in 2012 to the remaining 15 launch markets as production ramps up. The 19 launch markets also include Atlanta; Austin and Houston Texas; Boston; Chicago; Denver; Detroit; Los Angeles; San Francisco; San Diego; New York; Orlando, Fla.; Phoenix and Tucson, Ariz.; Portland, Ore.; Raleigh-Durham, N.C.; Richmond, Va.; Seattle; and Washington, D.C.

Source: *Ford Motor Company*

Dow Chemical announced that its 50-50 joint venture with Ube Industries, Advanced Electrolyte Technologies (AET) has secured all necessary regulatory approvals. The joint venture (JV) will manufacture formulated electrolytes for lithium-ion (li-ion) battery cell manufacturers in the energy storage market. The Advanced Electrolyte Technologies (AET) JV has plans to construct a manufacturing facility with the capacity of producing 5,000 tons of electrolytes per year at Dow's Michigan Operations in Midland, Michigan. Production startup for the new facility is expected in late 2012. AET also has future plans to construct manufacturing facilities in China and Europe.

Source: *The Dow Chemical Company*

LG Chem and Sud-Chemie have signed a Memorandum of Understanding (MOU) to establish a JV for high volume production of Lithium Iron Phosphate (LFP) cathode material. The JV is expected to become a source for LFP as the market expands to include electric vehicles (EVs), solar energy and smart grid applications. At a later stage, the joint development of other advanced olivine structure materials such as Lithium Manganese Iron Phosphate (LFMP) is also in plan. LFMP cathode materials allow for batteries with higher energy density while maintaining the advantages of LFP.

Source: *Sud-Chemie*

Mitsubishi has delivered its first i-MiEV to a retail customer in North America in Hawaii'. The state offers a \$4,500 tax credit and when combined with a \$7,500 federal tax credit, the price of the EV drops to about \$16,000. There are about 17,000 i-MiEVs on the road already in Japan and in Europe. The car will be delivered nationwide by June.

Source: *CBS News*

General Motors and carbon fiber supplier Teijin have teamed up to develop stronger and lighter parts for GM trucks, cars and crossovers. Under a new contract, Teijin will employ its thermoplastic technology for fast production of carbon fiber composites that could be used on GM vehicles. Teijin's contribution will be its ability to mass produce carbon fiber thermoplastic components with cycle times of under a minute. For Teijin, the deal could widen its business beyond specialty and high-end automotive carbon fiber

applications. Teijin will open its Teijin Composites Application Center in the northern U.S. early next year, GM said.

Source: Transport Topics

LIOTECH began producing li-ion batteries in the Novosibirsk region. The company is a joint venture between Russian Corporation of Nanotechnologies (RUSNANO) and the International holding Thunder Sky Limited. Thunder Sky owns 50.0001% of the enterprise, Rusnano 49.9999%. The batteries are primarily destined for the electric transport and energy supply industries, as the company estimates that the world market for li-ion batteries will grow 10x over the next 9 years to be worth almost \$30 billion.

Source: Novosibirsk News

Car Charging Group has been awarded a \$1 million grant by the Pennsylvania Department of Environmental Protection to install charging stations at 17 service plazas on the Pennsylvania Turnpike. The company will install Level II charging stations, which can charge a car in roughly four hours, and Level III charging stations, which can charge a car in about 20 minutes. The EV charging stations will be installed at the service plazas in three phases. The first phase of the work will be incorporated into ongoing service-plaza renovations between Harrisburg and New Jersey. Later phases will involve service plazas between Harrisburg and Ohio, and then along the Northeastern Extension. The project is expected to be completed by June 30, 2013. Car Charging Group will install EV charging stations manufactured by Coulomb Technologies

Source: Car Charging Group

Volkswagen is planning to unveil an electric car at the Detroit auto show next month. The VW electric is in addition to a gas-electric hybrid version of the Jetta compact sedan that will also be unveiled next month. The Jetta hybrid is not due in showrooms until November.

Source: Detroit Free Press

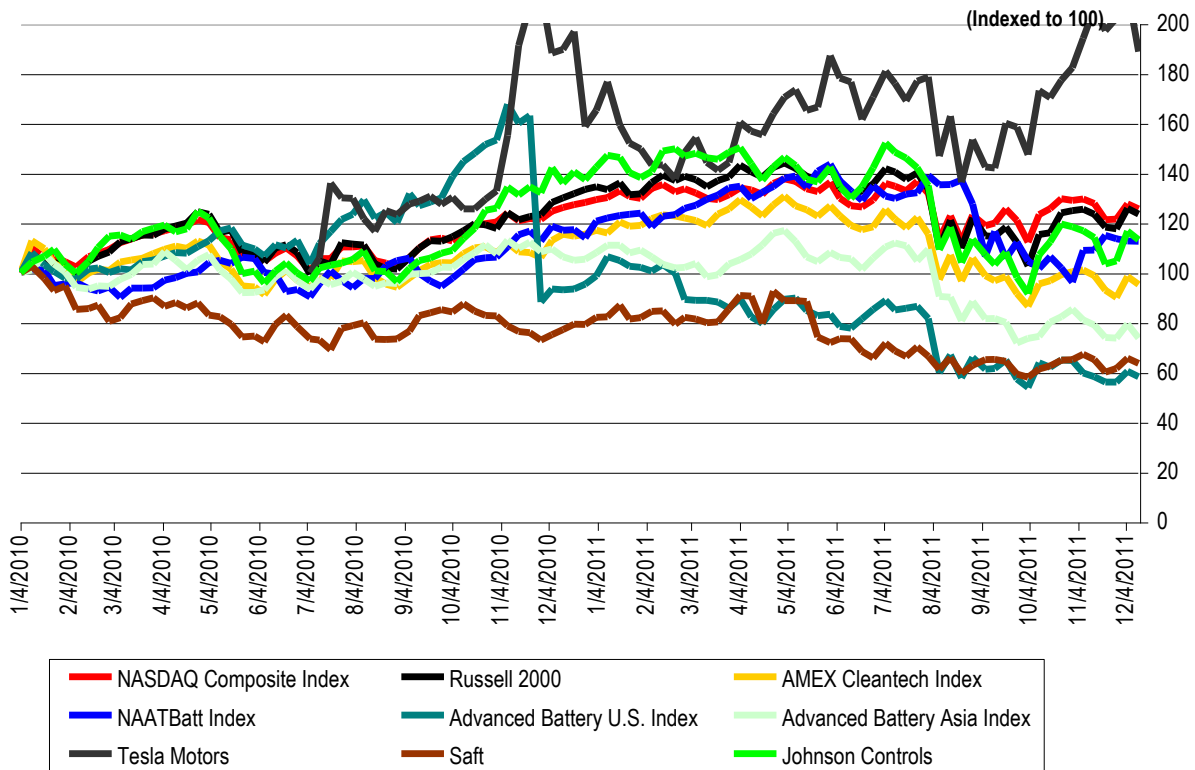
A car park in Lincoln has become the first place in Lincolnshire, UK to gain a public charging point for electric cars. The facility at Lucy Tower Car Park cost £5,000 (or \$7,753). The electric charging point is on the top floor of the multi-storey car park. Staff at the City of Lincoln Council will be testing the dual charger in the coming weeks, as Cenex loaned them an EV Smart Car for a pool car.

Source: The Lincolnite

Public charging stations for EVs outnumber outlets for alternative motor fuels by almost 2:1, even though there are hundreds of times more flex-fuel vehicles than plug-in cars on U.S. roads. Drivers of the approximately 16,500 highway-worthy electric vehicles in the U.S. can choose from 4,448 public charging stations, according to U.S. Energy Department. That's one per 3.7 electric cars compared to 2,468 places to fill up the 7.6 million vehicles that can run on E85, a fuel that is 85% ethanol. E85-capable vehicles, also known as flex-fuel vehicles, can run on either E85 or traditional gasoline.

Source: Bloomberg

Exhibit 1: Indices Performance
(From January 4, 2010)

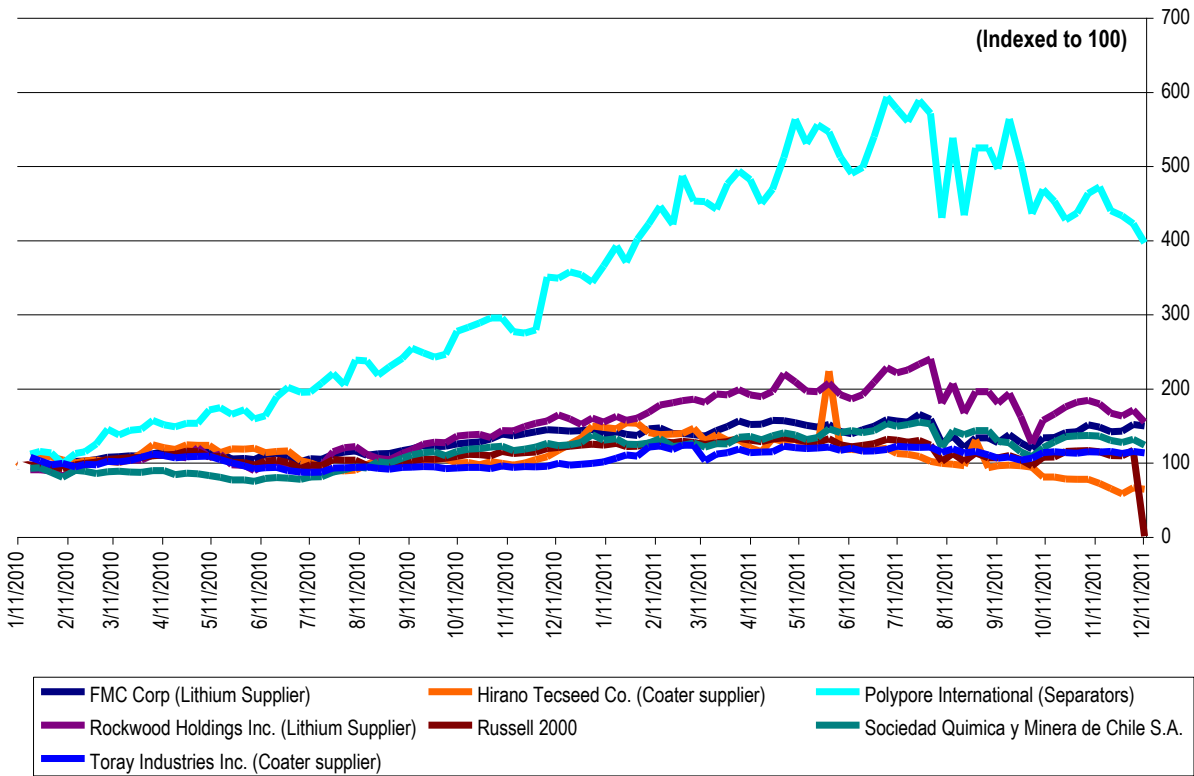


Index	Close on 12/12/2011	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	12,021.4	12,928.5	93.0%	5.4%	3.0%	(0.6%)
S&P 500	1,236.5	1,370.6	90.2%	(0.5%)	(2.8%)	(1.6%)
NASDAQ	2,612.3	2,887.8	90.5%	(1.3%)	(2.9%)	(1.6%)
Russell 2000	733.3	868.6	84.4%	(5.6%)	(8.2%)	(1.8%)
AMEX Cleantech Index	935.0	1,298.6	72.0%	(17.5%)	(18.6%)	(3.3%)

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



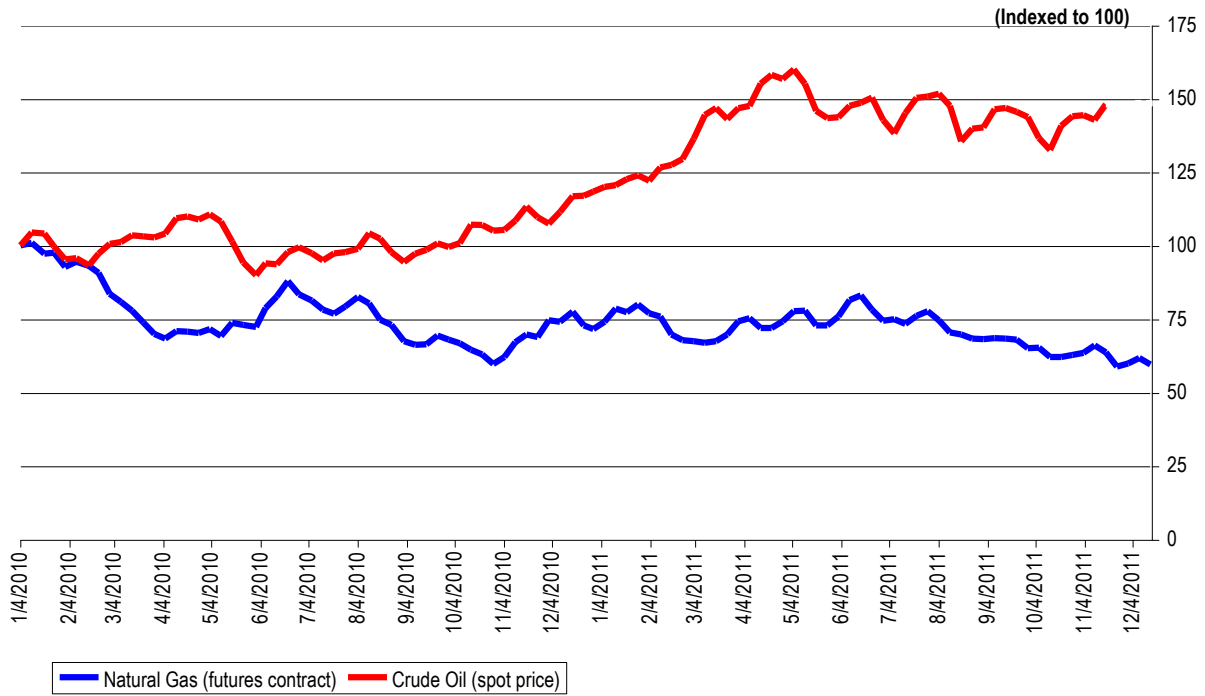
Source: Bloomberg

Exhibit 3: Commodity Prices

Commodity	Price on 12/12/2011	Price on 12/5/2011	Price on 11/11/2011	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	7,611	7,842	7,450	(2.9%)	2.2%
LME Lead (cash, \$ per tonne)	2,087	2,075	1,948	0.6%	7.1%
LME Nickel (cash, \$ per tonne)	18,260	17,885	18,140	2.1%	0.7%

Source: LME

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



Source: EIA

Executive Director's Notes



AMERICAN INDUSTRY AND EV BATTERY SAFETY

Discomfort continues in the industry this week as news of the NHTSA investigation into the Chevy Volt fire continues in the media. Conversations around the water cooler center on how bad this really is and whether the problem is a passing piece of bad news or an existential threat to the future of electric drive.

The actual safety problem with the Volt battery appears minor. According to reports, standard safety procedures were not followed after the crash test at issue and the problem in the battery arose several days later. No one was injured; property damage was minor. As safety incidents in the automotive sector go, but for the fact that the fire involved an electric vehicle, the incident would have passed without much notice.

The issue, however, is one of perception. And in the world of consumer products, perception is more real than reality itself. At this point there appears to be uncertainty among the general public as to whether the Volt fire was something isolated or something indicative of a more fundamental safety problem in electric vehicles.

Public concerns about the safety of electric vehicles can never be, and should never be, fully put to rest. Storing energy is dangerous, whether that energy is stored in a battery, a gasoline tank, a compressed gas or in a uranium atom. The public understands this. But what the public wants to know, and needs to be reassured of, is that the inherent danger of EV batteries is not great and can be managed to the most minimal level possible by using the safest possible technology and manufacturing techniques.

Over the past few years, it has been hard to miss the endless stories about what we do poorly in this country. Well, there is one thing we happen to do very well: Americans make safer consumer products than anywhere else in the world. The Japanese, the Koreans, the Europeans, and most certainly the Chinese, cannot touch us when it comes to consumer safety standards. The American pharmaceutical industry has ridden this fact to dominance of its domestic and foreign markets for the past several decades.

The bright side of the Volt fire is that it may just show the way for American companies and American technology to get a leg up in the advanced battery race. Let's see product safety as an opportunity, not as a threat. Let's encourage the NHTSA and other agencies of state and federal government to require the highest levels of safety possible in EV batteries. Safety is something we do very well as a country (relatively speaking). Let's use that advantage to put American workers and American technology to work building safe advanced batteries for EV's.



James J. Greenberger
Executive Director

December 16, 2011

NAATBatt Membership Applications for 2011

2012 Membership Applications and Dues Structure

NAATBatt is now accepting applications for membership for the 2012 calendar year. Membership dues for 2012 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. Companies purchasing 2012 memberships will be entitled to the benefits of membership during the balance of the 2011 calendar year. Please click on <http://naatbatt.org/membership-inquiry/> and indicate that you are interested in a 2012 membership.

Why Join NAATBatt?

NAATBatt's mission is to grow the market for advanced electrochemical energy storage technology in North America. We concentrate primarily on two markets: electric drive for motor vehicles and distributed, grid-connected electricity storage.

NAATBatt members enjoy a variety of exclusive benefits including: discounted admission to NAATBatt conferences; admission to by invitation-only NAATBatt workshops, such as the Workshop on Distributed Energy Storage that NAATBatt co-sponsored last April in Chicago with the U.S. Department of Energy; admission to Members-Only Site Visits, at which one NAATBatt firm will host all other NAATBatt members for a tour of the host's facility; the opportunity to announce news and new product developments in the Member's News section of the widely read NAATBatt Advanced Battery Weekly; free access to speaker presentations made at NAATBatt programs and workshops; and invitations to attend private meetings with government leaders, such as the NAATBatt-sponsored trip to Washington last year to meet with Chairman Jon Wellinghoff of FERC.

NAATBatt membership also helps support the development of an important industry that could just change the world. NAATBatt provides 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, and thought leadership on issues relating to energy storage markets and technology through the NAATBatt blog.

NAATBatt recently held its 2nd Annual Meeting and Conference in Louisville, Kentucky, which included the 1st Industry-Academic Advanced Battery Summit. The Summit is a new program that NAATBatt has started to encourage the more efficient transfer of advanced battery technology from leading U.S. research universities to industry. NAATBatt identified and brought to Louisville representatives from 15 of the top university advanced battery programs around the country to make flash presentations to industry about what those programs are working on and what technology they have available to license. In all there were 48 high quality presentations made at the Conference and the Summit, copies of which are available to conference attendees and NAATBatt members only.

NAATBatt will soon announce two other initiatives for the benefit of its members that will increase their access to capital and play an important role in growing the market for advanced electrochemical energy storage. Please stand by for some very interesting developments.



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

SAVE THE DATE!!! NAATBatt will hold a **workshop on managing thermal runaway** issues in lithium-ion batteries at the University Club in Chicago, Illinois on **April 3, 2012**. The workshop will permit industry leaders to hear from the top experts and researchers in North America about addressing thermal runaway issues through better design of electrolytes, cathode materials, anode material and battery cells. Admission will be open to NAATBatt members and special invitees only. Please contact jgreenberger@naatbatt.org for more information about the program.

Presentations from the NAATBatt 2011 Annual Meeting and Conference Now Available: Speaker presentations, speaker bios and attendee lists from the just concluded NAATBatt's 2011 Annual Meeting and Conference are now available on the NAATBatt Web site. Go to www.naatbatt.org and navigate to the 2011 Annual Meeting and Conference link to view them. The links are password protected, and the password is available to NAATBatt members and conference attendees for no charge. Others may purchase access to the presentations for \$250. Please contact Jim Greenberger at jgreenberger@naatbatt.org for your password. Photos from the conference will be posted shortly.

Presentations from the Workshop on Distributed Energy Storage Posted: Presentation materials, handbooks, attendee lists and working group discussion summaries from the April 21, 2011 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. Please contact Jim Greenberger at jgreenberger@naatbatt.org for your password.

Presentations from the NAATBatt 2010 Annual Meeting and Conference are 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.

- **1st North American & Asian Lithium-Ion Technology Conference:** The North American & Asian Lithium-Ion Technology Conference will be held on **January 12, 2012** 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/>
- **International Battery Association – Pacific Power Source Symposium Joint Meeting 2012:** The 2012 meeting of the International Battery Association and Pacific Power Source Symposium will be held on **January 9-13, 2012** at the Hilton Waikoloa Village in Hawaii. Information about the program may be viewed at: <http://www.soest.hawaii.edu/PPSS/index.htm>.
- **IEEE PES Conference on Innovative Smart Grid Technologies:** The IEEE PES Conference on Innovative Smart Grid Technologies will be held on **January 16-20, 2012** at the Washington Marriott Wardman Park hotel in Washington, D.C. The conference will examine a wide range of smart grid technologies, including energy storage. Information about the conference can be found at: <http://www.ieee-isgt.org/>
- **2nd Annual 10X Advanced Battery R&D:** The 10x Advanced Battery R&D conference: Breaking Barriers in Advanced Battery Performance and Value will be held on **January 23-24, 2012** in Santa Clara, California. The conference will examine next generation technologies that may dramatically reduce battery costs and/or increase battery energy density. NAATBatt is a supporting organization of the conference.
- **12 International Advanced Automotive Battery Conference:** The 2012 International Advanced Automotive Battery Conference (AABC) will be held on **February 6-10, 2012** in Orlando, Florida. The program will feature five days of intensive meetings, symposia and tutorials. Information about the program can be found at: <http://www.advancedautobat.com/>.
- **Electric Vehicle & Infrastructure Summit:** The Electric Vehicle & Infrastructure Summit will be held on **February 22-23, 2012** at the Double Tree Toronto Airport in Toronto, Canada. The Summit will focus on the collaboration necessary to implement electric cars in Canada. Information about the program can be found at: http://www.evehiclesummit.com/?utm_source=streamsend&utm_medium=email&utm_content=15056571&utm_campaign=EV%20Summit%202012.
- **The 29th International Battery Seminar & Exhibit:** Powersources.net will present the 29th International Battery Seminar & Exhibit at the Broward County Convention Center in Fort Lauderdale, Florida on **March 12-15, 2012**. The Seminar will discuss the state of the art of worldwide energy storage technology developments for portable products, power and vehicular applications. The Web site for the conference can be found at: <https://powersources.net/florida/frameset.html>.
- **TREM 12: Critical Energy & Defense Materials Policy Conference:** The IAGS Technology & Rare Earth Metals Center will hold the Critical Energy & Defense Materials Policy Conference in Arlington, Virginia on **March 13-14, 2012**. More information about the conference can be found at: http://tremcenter.org/index.php?option=com_content&view=category&layout=blog&id=118&Itemid=541.
- **NAATBatt Workshop on Thermal Runaway:** NAATBatt will hold a technical workshop on strategies for addressing thermal runaway in lithium-ion traction batteries. The workshop will be

held in Chicago, Illinois on **April 3, 2012**. More information about the program will be released shortly.

- **Advanced Lithium Ion Battery International Symposium:** Active Communications International will host the Advanced Lithium Ion Battery International Symposium on **April 18-20, 2012** in Charlotte, NC focusing on R&D efforts aimed at lithium-ion batteries. The conference Web site may be viewed at: <http://www.wplgroup.com/acil/conferences/advanced-lithium-ion-battery-international-symposium.asp>.
- **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/>.
- **5th Symposium on Energy Storage: Beyond Lithium Ion:** The 5th Symposium on Energy Storage: Beyond Lithium Ion will be held in Berkeley, California on **June 5-7, 2012**. The Symposium will focus on next generation battery technologies, such as silicon anode technology, lithium sulfur batteries and lithium air. More information can be found at: <http://bestar.lbl.gov/bli5/program/>.
- **Next Generation Batteries 2012:** Knowledge Foundation will host Next Generation Batteries 2012: New Battery Chemistries & System Designs - Lithium & Beyond in Las Vegas on **June 7-8, 2012**. More information about the program can be found at: http://www.knowledgefoundation.com/viewevents.php?event_id=275&act=evt
- **45th Power Sources Conference:** The 45th Power Sources Conference will be held at Bally's Las Vegas Hotel in Las Vegas on **June 11-14, 2012**. The meeting will focus on energy generation and storage technology (largely, but not exclusively, electrochemical), which is of interest to the U.S. Department of Defense, other government agencies, and to the civilian marketplace. More information can be found at: <http://www.powersourcesconference.com/>.
- **ITEC 2012:** The 2012 IEEE Transportation Electrification Conference and Expo will be held on **June 18-20, 2012** at the Hyatt Regency Dearborn, in Dearborn, Michigan. ITEC is focused on components, systems and standards for efficient power conversion for all types of electrified transportation. More information can be found at: <http://itec-conf.com/>
- **The Battery Show:** The Battery Show: The Expo for Advanced Batteries will return to Novi, Michigan on **November 13-15, 2012** and will be co-located with a new event, entitled "Charging Infrastructure Expo 2012." More information about the show and expo can be found at: <http://www.thebatteryshow.com/>.



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