

Summary:

For the November 18th 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 each declined 2.5%, respectively. The S&P500 was flat, while the Russell 2000 Indices were down 1.6%.

Executive Director James Greenberger writes about the proper standards for measuring the success of DOE loans and grants to new energy technology companies. Read "**Solyndra Is Not The Failure It Appears**" in the Executive Director's Notes section of this newsletter below.

Key Highlights:

- The **Chevy Volt** fire that occurred at a private facility in **Wisconsin** where the **National Highway Traffic Safety Administration (NHTSA)** conducts crash tests on new vehicles could have been prevented had protocol been followed, according to **General Motors (G.M.)**. The wrecked vehicle was subsequently left unattended with no action taken to handle the charged lithium-ion (li-ion) battery or the coolant fluid which leaked out after the crash test.
- **LG Chem** signed a deal with **ABB** to supply li-ion batteries for a smart energy storage system (ESS) in an effort to make inroads into the **European** market. The company is planning to deliver its first batch of batteries for one of ABB's power stability projects by the end of the year.
- **CODA Automotive** and **GE Energy Industrial Solutions** have finalized an automotive original equipment manufacturer (OEM) agreement for the sale and distribution of the **GE WattStation™ Wall Mount** charging station. The CODA sedan features an industry-leading 10-year, 100,000-mile battery warranty, class-leading range and a new US base price of \$39,900.
- **China** is pushing ahead with efforts to encourage the development of EVs. **Beijing** has declared the EV industry a top priority, earmarking \$1.5 billion a year for the next 10 years to transform the country into one of the leading producers of clean vehicles.
- **BetterPlace** could have a tough time with its launch initiative as rental agencies are concerned that EVs with switchable batteries might lose as much as 70% of their original value in four years. **Israeli** fleet operators are worried that the **Renault SA**-made vehicles will quickly lose their value and potential buyers who see the required electricity purchases as onerous.
- **Volvo** announced it will start field trials on its **C30** EV in the eastern metropolis. The company signed a memorandum of understanding (MOU) with **Shanghai International Autocity Development** to lease the vehicle for demonstration operations in **Jiading** district on the western outskirts of **Shanghai**.
- There could be a boom in the popularity of EVs in **Taiwan** in five or six years, according to the **Minister of Economic Affairs**. Under the three-year project, which has central government funding of NT\$2.2 billion (US\$72.8 million), local governments will begin to build the basic infrastructure required for EVs, including battery-charging stations.
- **ZBB** is launching production of a redesigned zinc-bromide battery to capitalize on demand for energy storage applications from the military and island microgrid markets. Under a recent order

from an unidentified U.S. electric utility, a ZBB storage system will be used to integrate solar power and fast-charging for EVs.

- Researchers at **Northwestern University** have developed an electrode that could allow conventional li-ion batteries to hold a charge 10 times greater than current technology. The researchers sandwiched clusters of **silicon** between the **graphene** sheets that could eliminate or marginalize the fragmentation.
- **Nissan North America** has selected **Coulomb Technologies ChargePoint Network** to provide comprehensive public charging infrastructure locations for Nissan LEAF drivers. The ChargePoint Network now is fully integrated into the Nissan Leaf website, showing current and future ChargePoint locations.
- **China** has shuttered almost 90% of lead-acid battery makers in a government crackdown to curb lead poisoning cases. The local environmental protection bureaus have inspected 1,744 lead-storage battery makers and only 229 are still operating, according to the **China Battery Industry Association**.

A Few More Details:

The Chevy Volt fire that occurred at a private facility in Wisconsin where the National Highway Traffic Safety Administration (NHTSA) conducts crash tests on new vehicles could have been prevented had protocol been followed, according to General Motors (G.M.). The electric vehicle (EV) was subject to a “pole” test, where it was rammed into a barrier at 20 mph to simulate a side impact. The wrecked vehicle was subsequently left unattended with no action taken to handle the charged lithium-ion (li-ion) battery or the coolant fluid which leaked out after the crash test. Preliminary evidence indicates that over time the normally inert coolant had ‘crystallized’ and came into contact with battery cells leading to the battery shorting out and catching fire. The Volt did well enough to earn a five-star rating, the best possible.

Source: The Detroit Bureau

LG Chem signed a deal with ABB to supply li-ion batteries for a smart energy storage system (ESS) in an effort to make inroads into the European market. LG Chem will also provide a battery management system for ABB’s ESS businesses. The global ESS battery market is expected to grow an average of 35 percent annually to 12 trillion won (\$10.8 billion) in 2020, according to the company. LG Chem is planning to deliver its first batch of batteries for one of ABB’s power stability projects by the end of the year.

Source: JoongAng Daily

CODA Automotive and GE Energy Industrial Solutions have finalized an automotive original equipment manufacturer (OEM) agreement for the sale and distribution of the GE WattStation™ Wall Mount charging station. The companies are also work on additional opportunities such as retail outlet displays, marketing event co-promotions, and consumer activities. The CODA sedan features an industry-leading 10-year, 100,000-mile battery warranty, class-leading range and a new US base price of \$39,900.

Source: Coda Automotive

China is pushing ahead with efforts to encourage the development of EVs. Regulators in Beijing, including the National Development and Reform Commission, are calling for 25 pilot cities to draw up plans to push EV sales, which also include installing charging facilities and charging spots. Beijing has declared the EV industry a top priority, earmarking \$1.5 billion a year for the next 10 years to transform

the country into one of the leading producers of clean vehicles. 25 cities have been handpicked to support the effort; including Beijing, Shanghai, Shenzhen and Hangzhou.

Source: Reuters

BetterPlace could have a tough time with its launch initiative as rental agencies are concerned that EVs with switchable batteries might lose as much as 70% of their original value in four years. Israeli fleet operators are worried that the Renault SA-made vehicles will quickly lose their value and potential buyers who see the required electricity purchases as onerous. Accounting for over 50% of the about 216,000 new cars sold in Israel by leasing to corporations, rental agencies are concerned about the uncertainty regarding the cars' resale value.

Source: WSJ

Volvo announced it will start field trials on its C30 EV in the eastern metropolis. The company (owned by Zhejiang Geely Holding Group) signed a memorandum of understanding (MOU) with Shanghai International Autocity Development to lease the vehicle for demonstration operations in Jiading district on the western outskirts of Shanghai. Shanghai is the third locale outside Sweden after Paris and Los Angeles where the automaker is testing its electric C30 (as shown in **Exhibit 1**).

Exhibit 1: Volvo C30



Source: China Daily

There could be a boom in the popularity of EVs in Taiwan in five or six years, according to the Minister of Economic Affairs. Although EVs are not cheap, the Smart Electric Cars Pilot Project initiated by the Ministry of Economic Affairs has been set up to help purchasers or lessors of EVs. Under the three-year project, which has central government funding of NT\$2.2 billion (US\$72.79 million), local governments will begin to build the basic infrastructure required for EVs, including battery-charging stations.

Source: Taipei Times

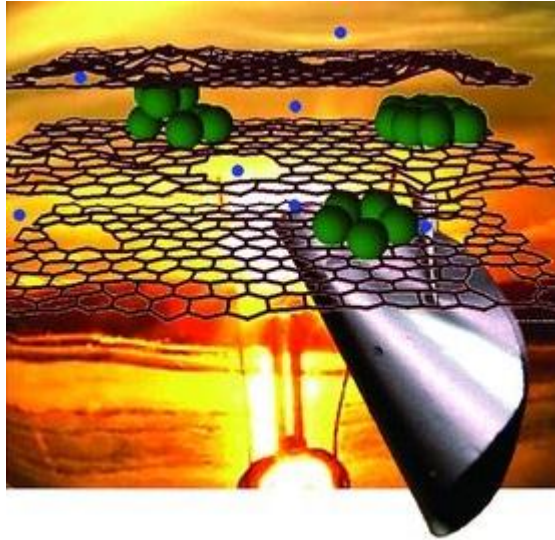
ZBB is launching production of a redesigned zinc-bromide battery to capitalize on demand for energy storage applications from the military and island microgrid markets. Under a recent order from an unidentified U.S. electric utility, a ZBB storage system will be used to integrate solar power and fast-charging for EVs. The installation will serve as the company's template for future large commercial customer sites for integrating solar power with charging stations.

Source: Milwaukee Journal Sentinel

Researchers at Northwestern University have developed an electrode that could allow conventional li-ion batteries to hold a charge 10 times greater than current technology. Li-ion batteries are charged by electrons moving from the electrolyte into the anode. The researchers sandwiched clusters of silicon

between the graphene sheets (as shown in **Exhibit 2**) that could eliminate or marginalize the fragmentation. They also "drilled" 10- to 20-nm holes in the sheets to speed up the recharging process, by as much as ten times. Current batteries use anodes made of graphene, which allow one lithium atom per six carbon atoms. Silicon, which allows four lithium atoms per one silicon atom, has been considered a superior medium for building batteries, but silicon tends to contract and expand significantly during charging, which can cause the battery to suffer fragmentation.

Exhibit 2: Sandwiched Clusters of Silicon



Source: PC Magazine and Advanced Energy Materials

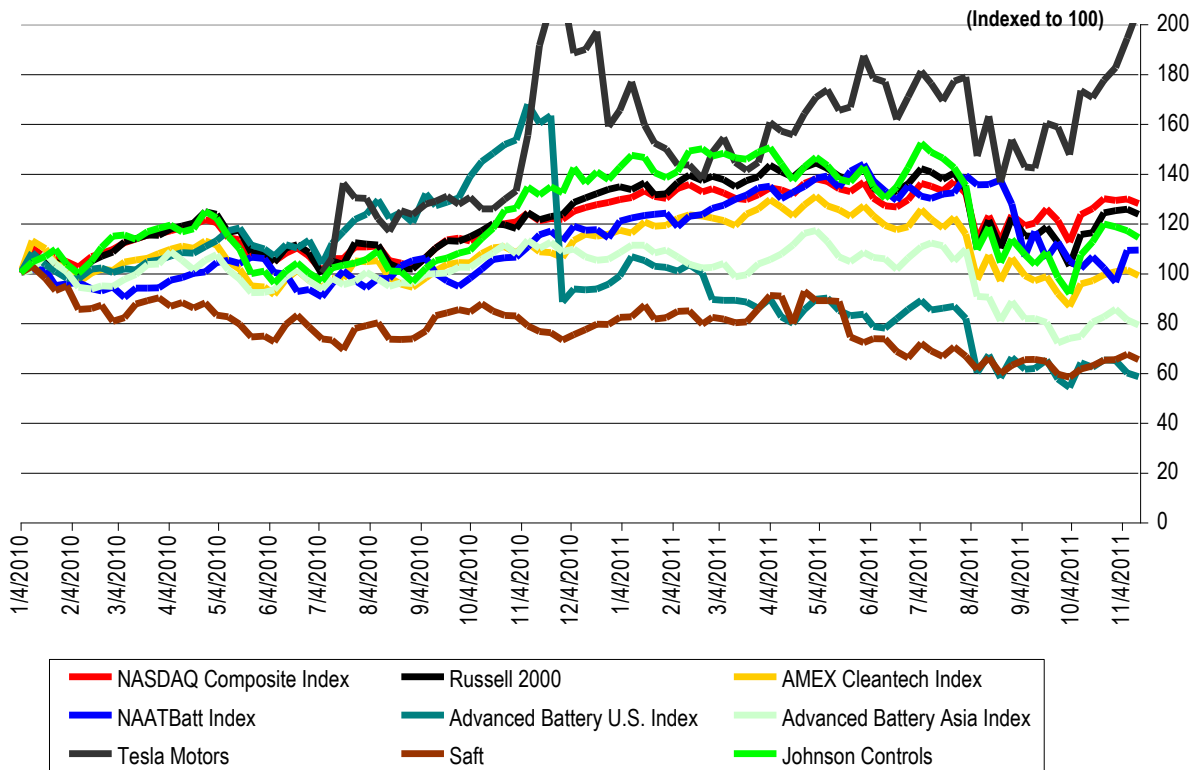
Nissan North America has selected Coulomb Technologies ChargePoint Network to provide comprehensive public charging infrastructure locations for Nissan LEAF drivers. The ChargePoint Network now is fully integrated into the Nissan LEAF website, showing current and future ChargePoint locations. Nissan LEAF owners can now log on to the Nissan LEAF website, enter their zip codes and receive up-to-date information on charging infrastructure in their area.

Source: Nissan Americas

China has shuttered almost 90% of lead-acid battery makers in a government crackdown to curb lead poisoning cases. The local environmental protection bureaus have inspected 1,744 lead-storage battery makers and only 229 are still operating, according to the China Battery Industry Association. The country produced 160.2 million Kilovolt-Ampere Hour of lead- acid batteries in 2010.

Source: Bloomberg

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

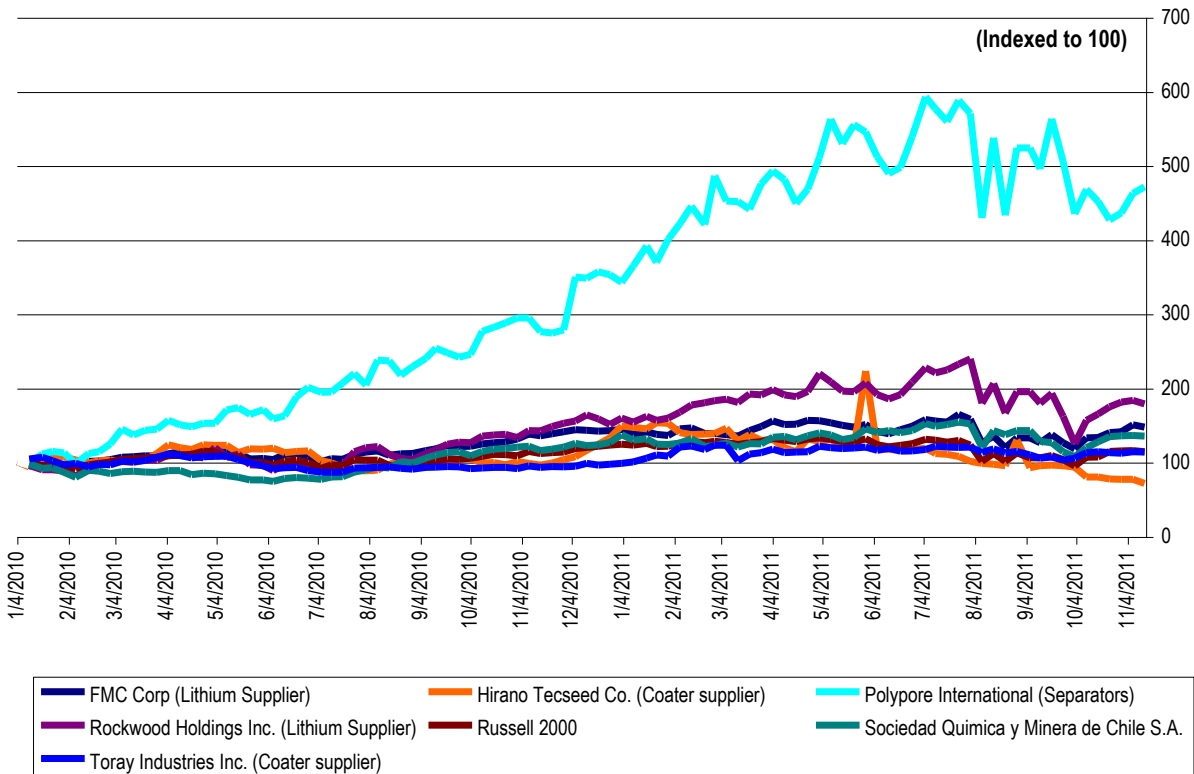


Index	Close on 11/14/2011	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	12,079.0	12,928.5	93.4%	7.9%	3.5%	0.1%
S&P 500	1,251.8	1,370.6	91.3%	4.3%	(1.6%)	(0.7%)
NASDAQ	2,657.2	2,887.8	92.0%	5.1%	(1.3%)	(1.4%)
Russell 2000	732.9	868.6	84.4%	1.5%	(8.2%)	(1.6%)
AMEX Cleantech Index	968.7	1,298.6	74.6%	(9.0%)	(15.7%)	(2.3%)

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



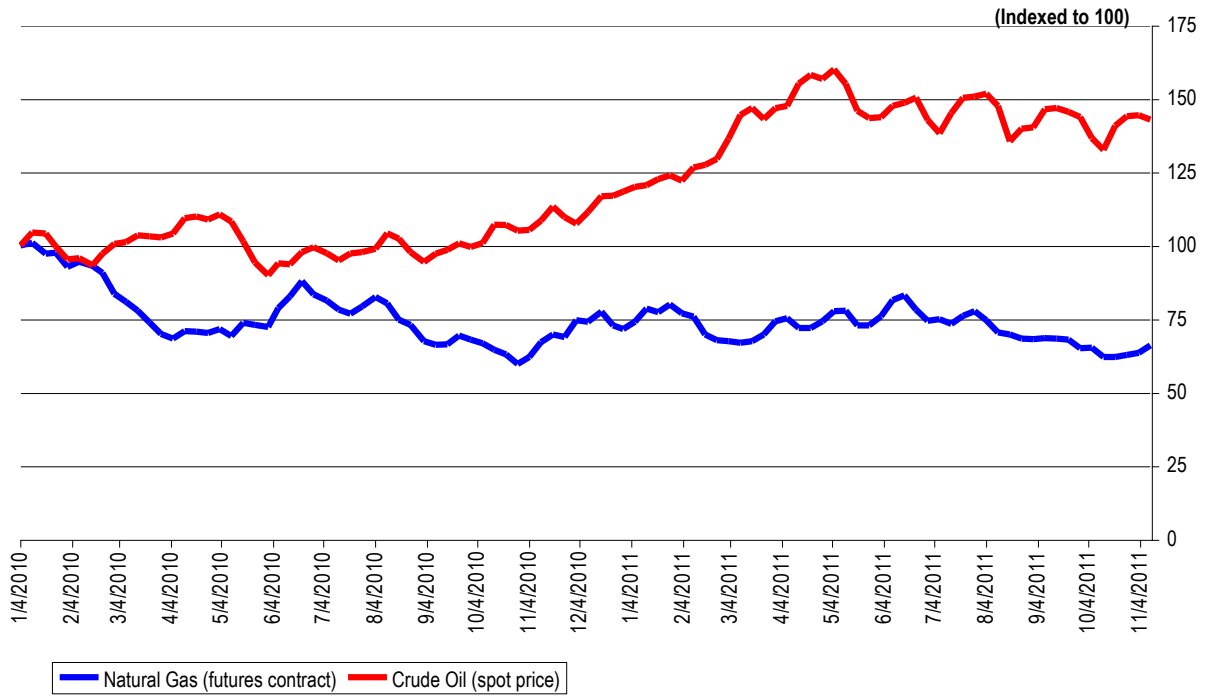
Source: Bloomberg

Exhibit 5: Commodity Prices

Commodity	Price on 11/14/2011	Price on 11/7/2011	Price on 10/14/2011	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	7,731	7,775	7,500	(0.6%)	3.1%
LME Lead (cash, \$ per tonne)	1,990	1,976	2,007	0.7%	(0.8%)
LME Nickel (cash, \$ per tonne)	18,070	18,605	18,850	(2.9%)	(4.1%)

Source: LME

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



Source: EIA

Executive Director's Notes



SOLYNDRA IS NOT THE FAILURE IT APPEARS

On Thursday, Secretary of Energy Steven Chu had the unenviable task of testifying before a House subcommittee about Solyndra and explaining why that company's bankruptcy will cause the government to take a \$500 million loss. The subcommittee's response to Secretary Chu's testimony was in large part predictably hostile, with some lawmakers demanding that he be fired. Several business writers, notably Kimberley Strassel in today's Wall Street Journal, kept up the pressure, accusing the Secretary of being a "green Gordon Gekko", taking huge risks in private companies with other people's money.

Victory, as the saying goes, has a 100 fathers but defeat is an orphan. And so it fell to Secretary Chu to play the orphan on Thursday. The problem is that, though Solyndra as a company has failed, it is far from clear that the technology in which the Department of Energy invested by way of its loans has failed. The final verdict on the success of the DOE's investment in solar energy technology, as well as its investments in advanced battery technology, is still out. But there are plenty of indications that the ultimate outcome may be more positive than many in the Congress and the media imagine.

Properly understood the DOE's loans and grants are investments in technology, not in individual companies. Individual companies may come and go. Ownership of the financed technologies may change. Whether the stockholders of Solyndra make a return on their investment or are wiped out in a bankruptcy matters little to the DOE or to U.S. taxpayers. What is important is that the technology that was financed continues to develop, that the domestic know-how with respect to that technology continues to build, and that a market for the technology begins to develop. Those are the measures of success for a government technology investment, not the success or failure of a private business that happened at one time to own the technology.

By the measures of success that should matter, it is far from clear that the investments made by the DOE in Solyndra and in hundreds of other technology projects over the past three years have failed. Notwithstanding the bankruptcy of Solyndra, the efficiency of solar cells continue to rise, their costs continue to fall, and new technologies keep entering the marketplace to fight for a piece of a market that barely existed three years ago. The same is true in advanced batteries.

The bottom line is that the DOE appears to be winning most of its technology bets, not losing them. Gordon Gekko might see things differently, but the country should not.



James J. Greenberger
Executive Director

November 18, 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

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.

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- ***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>.
- **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/>.

- **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/>



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