

Summary:

For the December 9th 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 increased 7.7% and 7.8%, respectively. The S&P500 and Russell 2000 Indices were up 5.4% and 7.0%, respectively.

Executive Director James Greenberger writes that the case for electric vehicles turns on the need of the U.S. economy and light vehicle fleet to break the monopoly held by petroleum producers on vehicle fuels and the consequent ability of those producers to dictate price. Read "***Making the Case for Electric Vehicles***" in the Executive Director's Notes section of this newsletter below.

Key Highlights:

- **Paris** has launched the '**Autolib**' electric car-sharing program. 2,000 EVs are expected to be on the road by next summer and 3,000 are planned within the next two years.
- **Sheetak** is partnering with **Delphi Automotive** to develop a thermal energy storage system for supplemental heating or cooling for EVs. The system is being designed to reduce electrical power draw from batteries, thereby extending the fuel economy and driving range of EVs.
- **Vospers** has taken delivery of the **Renault Kangoo Z.E.**. The EV is available from £16,990 (\$25,525) + VAT with a monthly rental for the battery starting from £59 (\$92). **LG Chem Power** is the lithium-ion (li-ion) battery supplier.
- **Viridian Motor** has built an all-electric utility truck and is planning to start commercial manufacturing next year. The "**Work Ready**" truck is priced at \$13,500 and a maximum speed of 25 miles per hour and costs approximately \$0.02 per mile to charge.
- **Aptera Motors** has shut down as it was unable to procure funding. The company had received a "conditional commitment letter" for \$150 million from the federal **Advanced Technology Vehicle Manufacturing loan program** based on raising matching funds, which it was unable to do.
- **350Green** is adding 47 charging stations total in **Washington, D.C., Virginia** and **Maryland**. The first four were installed Friday morning at **Pentagon City's Fashion Centre**.
- **Porteon Electric Vehicles** is planning to rollout EVs in **Jamaica** next year. The EVs are limited to a top speed of 75 kilometers per-hour (or 47 miles per-hour).
- The **Malaysian Government** has developed an EV infrastructure roadmap that incorporates fleet test vehicle (FTV) program in **Putrajaya** and **Cyberjaya**. The FTV will serve as a benchmark in the development of a strategic plan to expand the use of EVs in Malaysia.
- Gas stations across **Beijing** are starting to add in electrical charging outlets for future EV users. Over the next 5 to 10 years, Beijing is going to add another 1,310 gas stations equipped with charging facilities.
- **Nissan** will begin accepting reservations for the **Leaf** in seven new states. The seven new states that the Leaf will be available in are **Delaware, Indiana, Louisiana, Nevada, Ohio, Pennsylvania** and **Rhode Island**.

A Few More Details:

Paris has launched the 'Autolib' electric car-sharing program. 2,000 EVs are expected to be on the road by next summer and 3,000 are planned within the next two years. The four-seat compact Bluecar (as shown in **Exhibit 1**) is a collaboration of designer Pininfarina and Groupe Bolloré. Standard subscriptions cost €10 (\$13.5) a day, €15 (\$20) a week, and €144 (\$195) a year.

Source: Atlanta Journal Constitution

Exhibit 1: The Bluecar



Source: Syndicat Mixte Autolib'

Sheetak has been awarded a \$4.7 million contract by the Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) to develop a thermal energy storage system for supplemental heating or cooling for EVs. The company is partnering with Delphi Automotive to accelerate systems integration and commercialization. The project, Thermoelectric Reactors for Efficient Automotive Thermal Storage (TREATS), is part of ARPA-E's High Energy Advanced Thermal Storage (HEATS) program. The system is being designed to significantly reduce electrical power draw from batteries, which would extend the driving range of EVs.

Source: aftermarket News

Vospers has taken delivery of the Renault Kangoo Z.E. (as shown in **Exhibit 2**). The EV is available from £16,990 (\$25,525) + VAT with a monthly rental for the battery starting from £59 (\$92). LG Chem Power is the lithium-ion (li-ion) battery supplier. A full battery charge costs between £2-£3 (\$3.12-\$4.68) and provides a range of about 100 miles – providing an equivalent to 200-300 miles per gallon.

Source: The Plymouth Herald

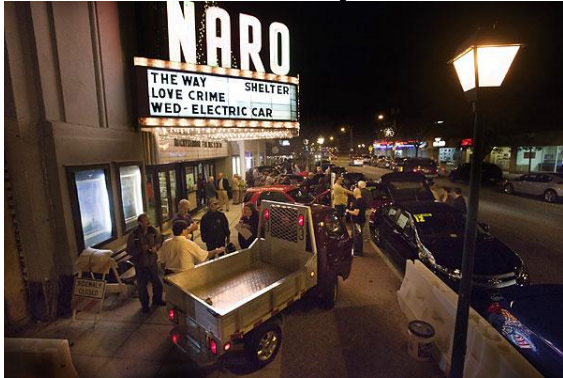
Exhibit 2: The Renault Kangoo



Source: The ChargingPoint.com

Viridian Motor has built an all-electric utility truck and is planning to start commercial manufacturing next year. The "Work Ready" truck (as shown in **Exhibit 3**) is designed primarily for agricultural uses. The truck is priced at \$13,500 and a maximum speed of 25 miles per hour and costs approximately \$0.02 per mile to charge.

Exhibit 3: The "Work Ready" Truck



Source: *The Virginia-Pilot*

Aptera Motors has shut down as it was unable to procure funding. The company had received a "conditional commitment letter" for \$150 million from the federal Advanced Technology Vehicle Manufacturing loan program based on raising matching funds, which it was unable to do. A123 Systems was the li-ion battery supplier.

Source: *Bloomberg*

350Green is adding 47 charging stations total in Washington, D.C., Virginia and Maryland. The first four were installed Friday morning at Pentagon City's Fashion Centre. The quickest of the self-serve charging stations can charge an electric vehicle in 25 minutes, which translates to about 100 miles of coverage

Source: *DCist*

Porteon Electric Vehicles is planning to rollout EVs (as shown in **Exhibit 4**) in Jamaica next year. The EVs are limited to a top speed of 75 kilometers per-hour (or 47 miles per-hour). A single charge provides a range of approximately 80 miles. The amount of energy it takes to run the car per month is equivalent to adding an extra fridge to your house or about \$3,000.

Exhibit 4: The Porteon Electric Vehicle



Source: The Gleaner

The Malaysian Government has developed an EV infrastructure roadmap that incorporates fleet test vehicle (FTV) program in Putrajaya and Cyberjaya. The FTW will serve as a benchmark in the development of a strategic plan to expand the use of EVs in Malaysia. This includes strategies that will enable the EV to be affordable amongst the general public.

Source: Malaysian News Agency

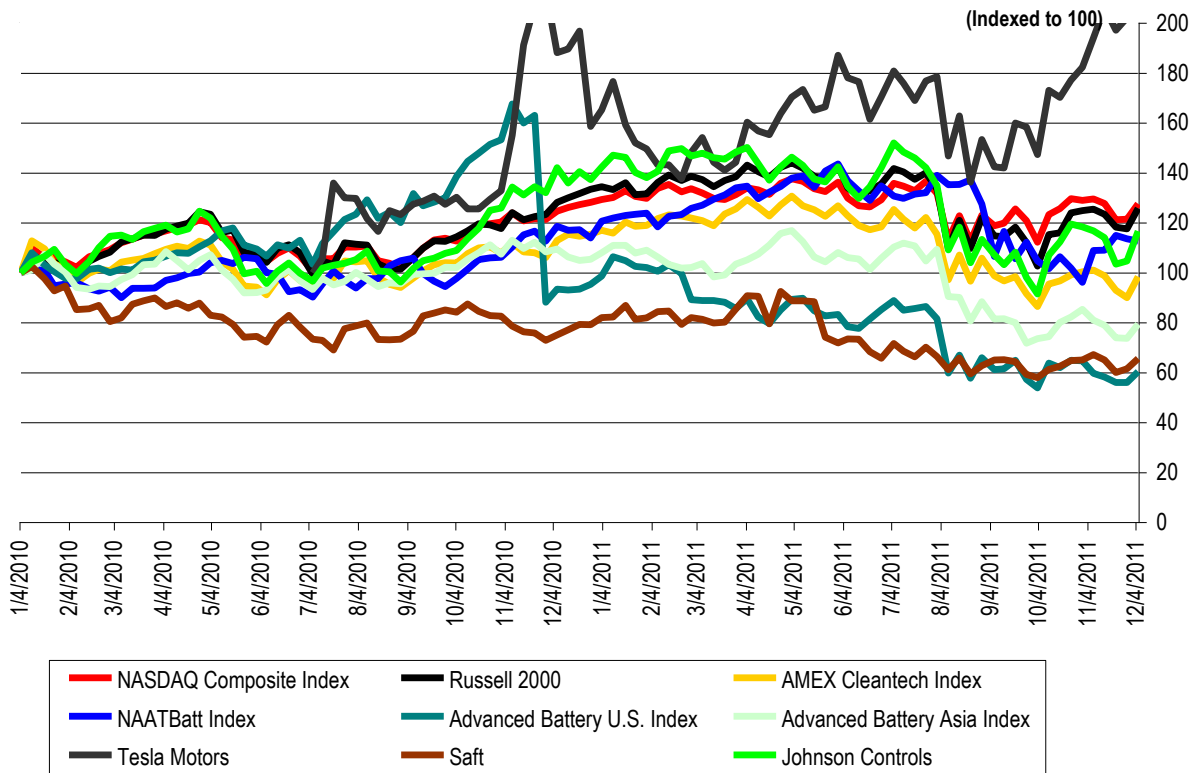
Gas stations across Beijing are starting to add in electrical charging outlets for future EV users. Over the next 5 to 10 years, Beijing is going to add another 1,310 gas stations across the city to satisfy the demand for oil products. Each of these stations will be equipped with charging facilities.

Source: China Car Times

Nissan will begin accepting reservations for the Leaf in seven new states. The seven new states that the Leaf will be available in are Delaware, Indiana, Louisiana, Nevada, Ohio, Pennsylvania, and Rhode Island. The company expects the EV to be available in all 50 states by March 2012. The Leaf is currently available in 29 states and Washington, D.C.

Source: Nissan

Exhibit 5: Indices Performance
(From January 4, 2010)

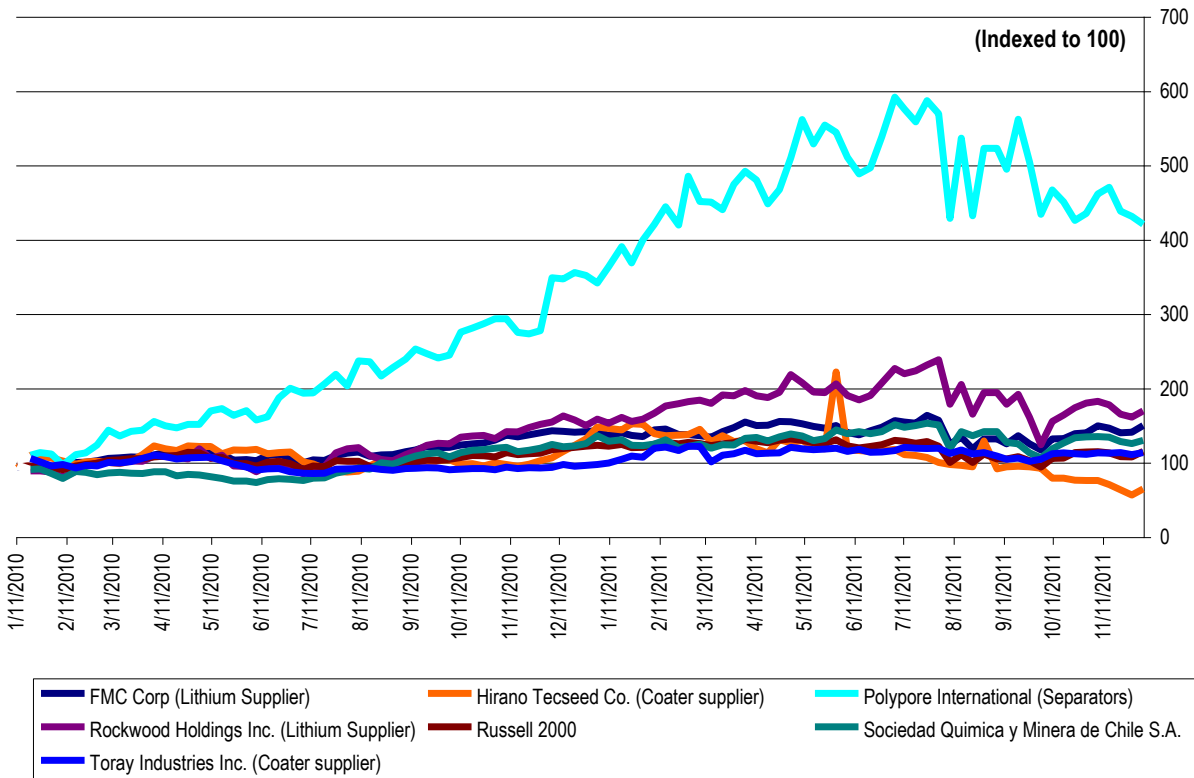


| Index | Close on 12/5/2011 | 52-Wk High | % of 52-Wk High | Performance | | |
|----------------------|--------------------|------------|-----------------|-------------|---------|------|
| | | | | LTM | YTD | Week |
| Dow | 12,097.8 | 12,928.5 | 93.6% | 6.3% | 3.7% | 5.0% |
| S&P 500 | 1,257.1 | 1,370.6 | 91.7% | 2.7% | (1.2%) | 5.4% |
| NASDAQ | 2,655.8 | 2,887.8 | 92.0% | 2.5% | (1.3%) | 5.1% |
| Russell 2000 | 747.0 | 868.6 | 86.0% | (1.1%) | (6.5%) | 7.0% |
| AMEX Cleantech Index | 966.4 | 1,298.6 | 74.4% | (12.8%) | (15.9%) | 9.4% |

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 6: Supplier Performance
(From January 4, 2010)



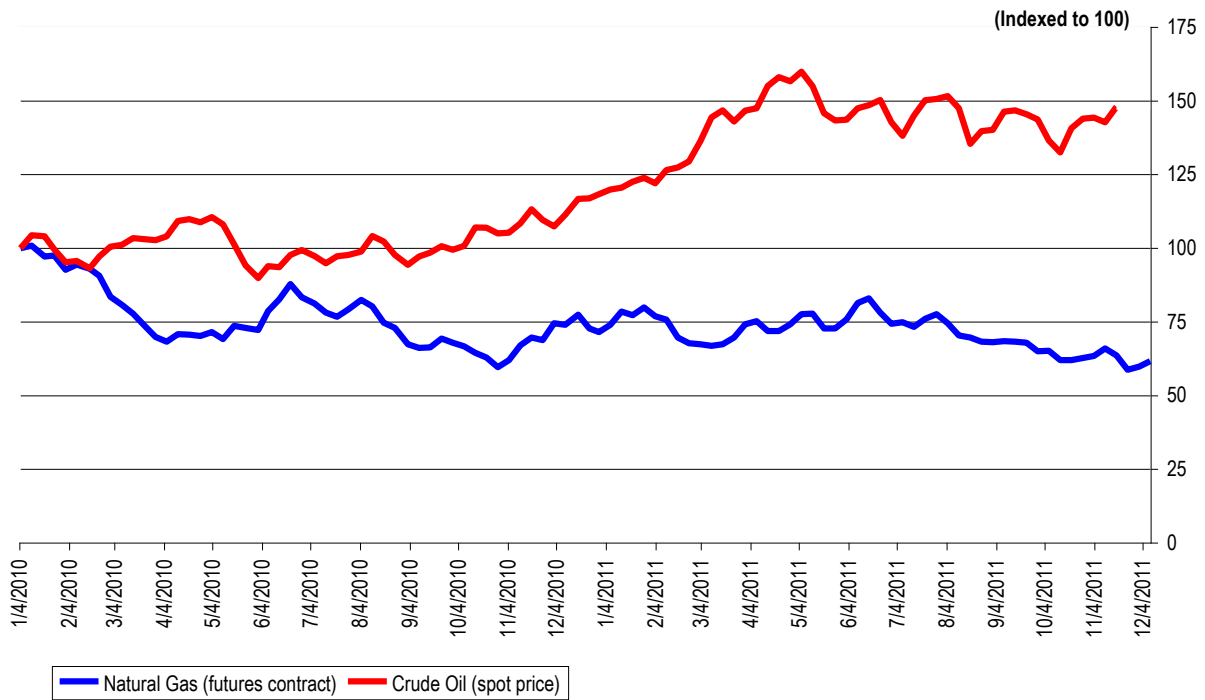
Source: Bloomberg

Exhibit 7: Commodity Prices

| Commodity | Price on 12/5/2011 | Price on 11/28/2011 | Price on 11/4/2011 | 1 Week Change | 1 Month Change |
|---------------------------------|--------------------|---------------------|--------------------|---------------|----------------|
| LME Copper (Cash, \$ per tonne) | 7,842 | 7,381 | 7,929 | 6.3% | (1.1%) |
| LME Lead (cash, \$ per tonne) | 2,075 | 2,003 | 2,022 | 3.6% | 2.6% |
| LME Nickel (cash, \$ per tonne) | 17,885 | 17,270 | 18,480 | 3.6% | (3.2%) |

Source: LME

Exhibit 8: Natural Gas and Crude Oil
(From January 4, 2010)



Source: EIA

Executive Director's Notes



THE CASE FOR ELECTRIC VEHICLES

I spent the better part of today editing a draft of the NAATBatt white paper on distributed energy storage (DES). The white paper will argue that the principal barrier to DES deployment is that the technology appears uneconomic to utilities and to utility regulators because it is impossible for ratepayers who invest in DES systems to recover the value of the benefits such systems provide to consumers around the country, as opposed to those consumers who, through their utility bills, pay for the DES system. This is the Tragedy of the Commons, as Garret Hardin termed it, turned on its head.

Among the common, national benefits of DES technology the white paper will identify is DES's ability to help reduce the cost to consumers of electric vehicles (EVs). The EV cost reduction effect of DES arises from its positive impact on the volume of advanced battery production (by increasing advanced battery production, DES helps manufacturers achieve economies of scale and reduce unit cost) and on its ability to provide a market for second use EV batteries (thereby providing a residual value to the vehicle that EV purchasers can capture).

But reducing the cost of EVs is only important if deploying EVs is important and has value to the nation as a whole. In reading the draft of the white paper, I noted that the writer had included the usual statistics illustrating U.S. dependence on foreign oil. Among those statistics are that the U.S. imports about 11.8 million barrels of oil per day, comprising about half of domestic petroleum demand; that about 70% of that petroleum is used in the transportation sector; and that about 60% of the oil used in the transportation sector is used as gasoline in light vehicles. Those statistics support the argument that reducing oil imports is an important national goal and that EVs can help reduce those imports.

But in reading the draft it struck me that the most important statistic was missing—and is in fact missing in most of the discussions I hear about the importance of EVs. The missing statistic is that nearly 100% of the U.S. light vehicle fleet is dependent upon petroleum-based fuels. This complete dependence, and the monopoly pricing power that it gives petroleum producers around the world, is the central reason why EVs are important and why their deployment is so critical to our national well-being.

To be sure, increasing the fuel efficiency of the U.S. light vehicle fleet is important. EVs can be an important tool in achieving that goal, though they are but one of many tools available to auto makers and, perhaps, not yet the most cost effective tool in the shed.

But increased fuel efficiency of light vehicles will not solve the problem that has bedeviled our nation for decades: the long-term hemorrhage of American jobs and capital to petroleum producers. If our light

vehicle fleet is 100% dependent on petroleum-based fuels, reducing use of those fuels will neither save money nor reduce vulnerability to supply disruptions in the long run. As in any market controlled by a monopoly, the monopolist has the option to raise its prices as demand declines. The consumer cannot come out ahead by conservation alone.

It is not enough that the U.S. reduce its use of petroleum; the complete dependence of the U.S. light vehicle fleet on petroleum must be broken. Only by breaking that complete dependence oil, not by simply reducing the volume of its use, can the monopoly pricing power of petroleum producers be brought to an end. Today that monopoly is the single greatest threat to the American economy and national security. EVs are the only realistic tool we have to break it.



James J. Greenberger
Executive Director

December 9, 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.ieseet-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/>.
- **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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