

Summary:

For the August 6th issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities. On September 2nd, we will be hosting a webinar "Developments in Advanced Lead Acid Batteries: Everything You Thought You Knew But Don't".

The NAATBatt Index declined 2.4%, while the U.S. Battery and Asia Advanced Battery Indices increased 1.9% and 5.8%, respectively. The S&P 500 and Russell 2000 were relatively flat.

Key Highlights:

- **Valence Technology** announced a purchase order from **Smith Electric Vehicles U.S.** to deliver \$13 million of energy storage modules for use in all electric commercial trucks. Smith produces the world's largest battery- powered truck with a range in excess of 100 miles on a single charge.
- **Ener1** announced it will be supplying battery packs to **Hyundai Heavy Industries** and **Toro**. The packs will be used to power Toro walk mowers and Hyundai electric buses in Seoul, Korea.
- **Enova Systems** is moving toward large scale production of its all-electric drive system for the **Smith Newton**. The company has order 120 units this year.
- **General Motors (GM)** is providing \$5 million in funding to **Bright Automotive**. The investment could enable Bright to begin ramping up the development of the production program for the **IDEA** and is planning to sell 50,000 vehicles annually starting in 2014.
- **GM** announced it is planning to increase U.S. production capacity for the **Chevrolet Volt** electric vehicle (EV) in 2012 to 45,000 cars (from 30,000) due to strong consumer interest. The EV price will start at \$41,000.
- **Xcel Energy** released promising preliminary results from its wind-to-battery storage project. The storage system is comprised of twenty 50 kilowatt (kW) battery modules that are able to store about 7.2 megawatt-hours (MWh) of electricity and could power 500 homes for over 7 hours.
- **Portland General Electric (PGE)** announced the opening of North America's first public-use, quick-charge station for EVs. The **Takasago Rapid Charging Station** is specialized for recharging electric vehicles with lithium-ion batteries (li-ion) and requires 20 to 30 minutes to recharge a battery to 80% of capacity.
- **Audi** has confirmed that in 3 to 5 years, an **electric city car** will be rolled out. The company has already announced plans to introduce the Audi R8 e-tron electric supercar.
- **DuPont** has introduced the first nanofiber-based polymeric battery separator that is expected to increase the performance and safety of lithium ion batteries. The **Energain™** can increase power 15% to 30% and increase battery life by up to 20% while providing stability at high temperatures.
- **International Battery** announced that it has been chosen as the energy storage system provider for **Princeton Power Systems'** advanced renewable energy system that combines large-scale solar generation with li-ion battery storage and smart controls. The completed system will be fully operational in the fourth quarter of this year as system integration testing is now underway.

- County and regional officials unveiled a draft plan to equip **San Diego** with at least 1500 electric car charging stations. The charging stations, called **Blinks**, will typically be deployed in commercial areas and maintained by local businesses.
- Motoring group **RACV** is planning to invite households to apply for 180 places on the \$5 million, 5-year trial of EVs, trade vans and motor scooters as part of the state-funded project. The announcement comes as the first Australian delivery of 20 **Mitsubishi i-MiEV** EVs arrived in Melbourne.
- The **Lee's Summit School District** is switching to an all-electric truck fleet – using vehicles from **Smith Electric Vehicles**. Smith has stated it costs about \$0.10 a mile to operate one of their electric trucks as opposed to \$0.41 cents a mile for a diesel truck.

A Few More Details:

Valence Technology announced a purchase order from Smith Electric Vehicles U.S. to deliver \$13 million of energy storage modules for use in Smith's line of all electric commercial trucks. Smith produces the Newton (as shown in **Exhibit 1**), the world's largest battery-electric-powered truck with a top speed of 50 mph, a range in excess of 100 miles on a single charge, and a payload of up to 16,280 lbs. We believe Valence is currently the only company supplying lithium-ion (li-ion) batteries to Smith.

Source: Valence Technology

Exhibit 1: The Smith All-Electric Newton



Source: Smith Electric Vehicles

Ener1 announced it will be supplying battery packs to Hyundai Heavy Industries and Toro. The packs will be used to power Toro walk mowers and Hyundai electric buses (as shown in **Exhibit 2**) in Seoul, Korea. The city is expected to have 34 electric buses operating on six routes in 1H11.

Source: Ener1

Exhibit 2: The Elec-City Bus



Source: JoongAng Daily

Enova Systems is moving toward large scale production of its all-electric drive system for the Smith Newton. Smith has placed an order for 50 units of Enova's 120 kilowatt (kW) drive system. The company has order 120 units this year.

Source: Enova Systems

General Motors (GM) is providing \$5 million in funding to Bright Automotive. The investment could enable Bright to begin ramping up the development of the production program for the IDEA (as shown in **Exhibit 3**). The plug-in hybrid electric (PHEV) fleet vehicle is designed to operate in electric mode for 40 miles before switching to an estimated 36 mpg hybrid mode – enabling the vehicle to potentially achieve over 100 miles per gallon based on daily driving patterns. The company plans to sell 50,000 vehicles annually starting in 2014.

Source: *The Detroit News*

Exhibit 3: The Bright Automotive IDEA



Source: *Bright Automotive*

General Motors announced it is planning to increase U.S. production capacity for the Chevrolet Volt electric vehicle (EV) in 2012 to 45,000 cars (from 30,000) due to strong consumer interest. The EV (as shown in **Exhibit 4**) has a range of about 340 miles and can travel 40 miles on the power of its 16 kilowatt-hour (kWh) lithium-ion (li-ion) battery. When the battery's power runs low, a gasoline-powered engine generates power that extends the range another 300 miles. The EV price will start at \$41,000.

Exhibit 4: The GM Volt Assembly



Source: *WSJ*

Xcel Energy released promising preliminary results from its wind-to-battery storage project in Minnesota. Xcel Energy purchased the sodium-sulfur batteries from NGK Insulators Ltd. The test results indicate that the battery has the ability to (i) effectively shift wind energy from off-peak to on-peak availability; (ii) reduce the need to compensate for the variability and limited predictability of wind generation resources; and, (iii) support regional electricity market by responding to real-time imbalances between generation and load. The twenty 50-kilowatt battery modules are roughly the size of two semi trailers and weigh approximately 80 tons. They are able to store about 7.2 megawatt-hours of electricity, with a charge and discharge capacity of one megawatt. Fully charged, the battery could power 500 homes for over 7 hours.

Source: Xcel Energy

Portland General Electric (PGE) announced the opening of North America's first public-use, quick-charge station for EVs. The Takasago Rapid Charging Station is specialized for recharging electric vehicles with lithium-ion batteries and requires only 20 to 30 minutes to recharge a battery to 80% of capacity. PGE and NEC officially opened the quick-charge station (as shown in **Exhibit 5**) during a two-day Nissan LEAF test drive event at PGE. Portland and the state of Oregon have been designated as top-tier launch markets for the Nissan LEAF when it goes on sale in the United States in December.

Source: Portland General Electric

Exhibit 5: Governor Ted Kulongoski, charging up an all-electric Nissan LEAF



Source: Portland General Electric

Audi has confirmed that in 3 to 5 years, an electric city car will be rolled out. The company has already announced plans to introduce the Audi R8 e-tron electric supercar (as shown in **Exhibit 6**) in limited numbers in 2012. The electric city car could be a spinoff of the A1 e-tron concept unveiled earlier this year. On a full charge, the compact Audi A1 e-tron concept can travel 31 miles in city traffic. After the battery has been depleted, a range-extender enables the EV to travel an additional 124 miles.

Source: WhatCar

Exhibit 6: The Audi R8 e-tron



Source: Autoweek

DuPont has introduced the first nanofiber-based polymeric battery separator that is expected to increase the performance and safety of lithium ion batteries. The Energain™ battery separators can increase power 15% to 30% and increase battery life by up to 20% while providing stability at high temperatures. The initial uses for the separator are in hybrid and EV batteries, the technology also will be targeted for batteries in renewable energy, grid applications, and specialty consumer applications, including laptops, cell phones and power tools, among others.

Source: DuPont

International Battery announced that it has been chosen as the energy storage system provider for Princeton Power Systems' advanced renewable energy system that combines large-scale solar generation with li-ion battery storage and smart controls. The \$1.5M solar generation system will connect to the Public Service Enterprise Group (PSE&G) electric grid. The 200-kilowatt solar array and energy storage system will be controlled and connected to the electric grid using Princeton Power Systems' Grid-tied Inverter (GTIB) product. The installation will demonstrate advanced smart grid functionality including microgrid operation, demand response, time shifting, frequency regulation and power dispatch. The inverter and energy storage system will be housed in a mobile shipping container that is expandable to include 1MWh of storage. The completed system will be fully operational in the fourth quarter of this year as system integration testing is now underway.

Source: International Battery

County and regional officials unveiled a draft plan to equip San Diego with at least 1500 electric car charging stations (as shown in **Exhibit 7**). The charging stations, called Blinks, will typically be deployed in commercial areas and maintained by local businesses. The charging stations are being financed with federal stimulus funds.

Exhibit 7: Potential Distribution of Charging Stations in San Diego



Source: KPBS

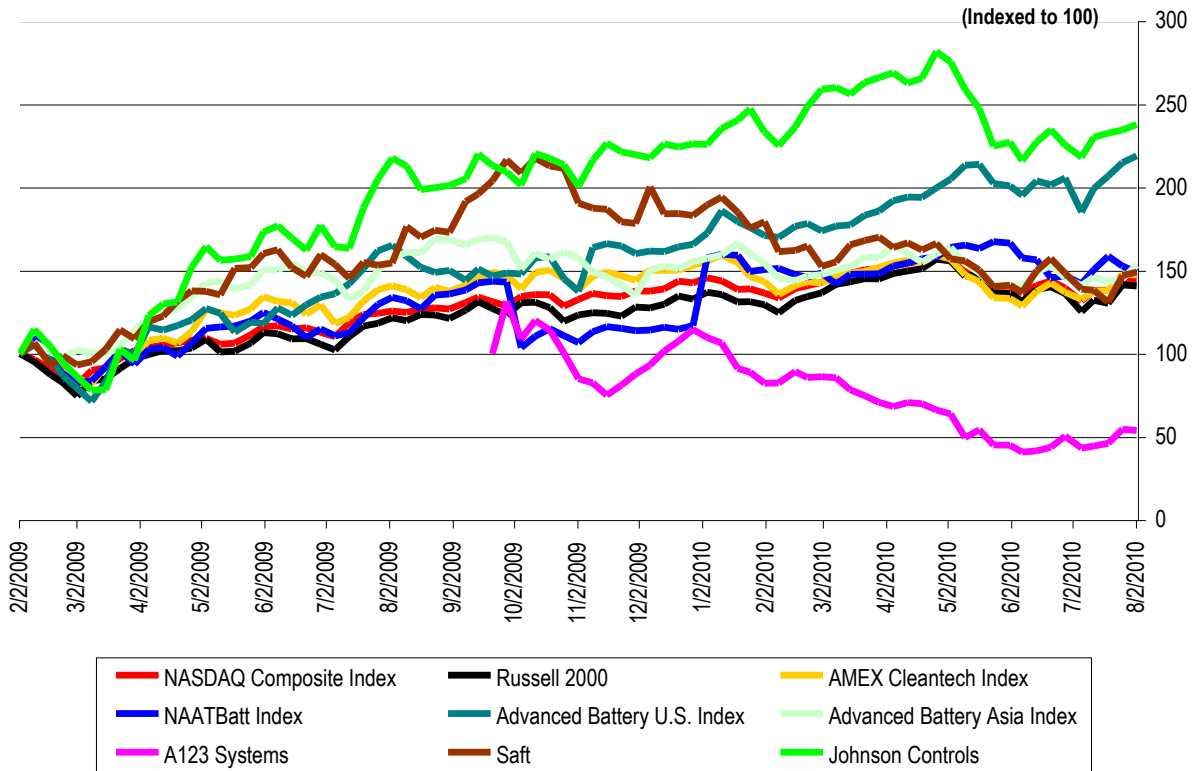
Motoring group RACV is planning to invite households to apply for 180 places on the \$5 million, 5-year trial of EVs, trade vans and motor scooters as part of the state-funded project. The announcement comes as the first Australian delivery of 20 Mitsubishi i-MiEV EVs arrived in Melbourne. Another 20 i-MiEVs will arrive next month, with Mitsubishi Australia indicating that 110 vehicles will be on the roads by year end. The i-MiEV - its name stands for Mitsubishi Innovative Electric Vehicle – provides a range of 120 kilometres (or 75 miles) before a recharge is required.

Source: *The Age*

The Lee's Summit School District is switching to an all-electric truck fleet – using vehicles from Smith Electric Vehicles. The electric trucks cost about twice as much as a diesel truck. However, the school district was able to get grant money to help off set the cost. After 7 years, the district expects to save about \$19,000 a year per truck. Smith Electric stated it costs about \$0.10 cents a mile to operate one of their electric trucks as opposed to \$0.41 cents a mile for a diesel truck.

Source: *Fox4KCS*.

**Exhibit 8: Indices Performance
(From February 2, 2009)**

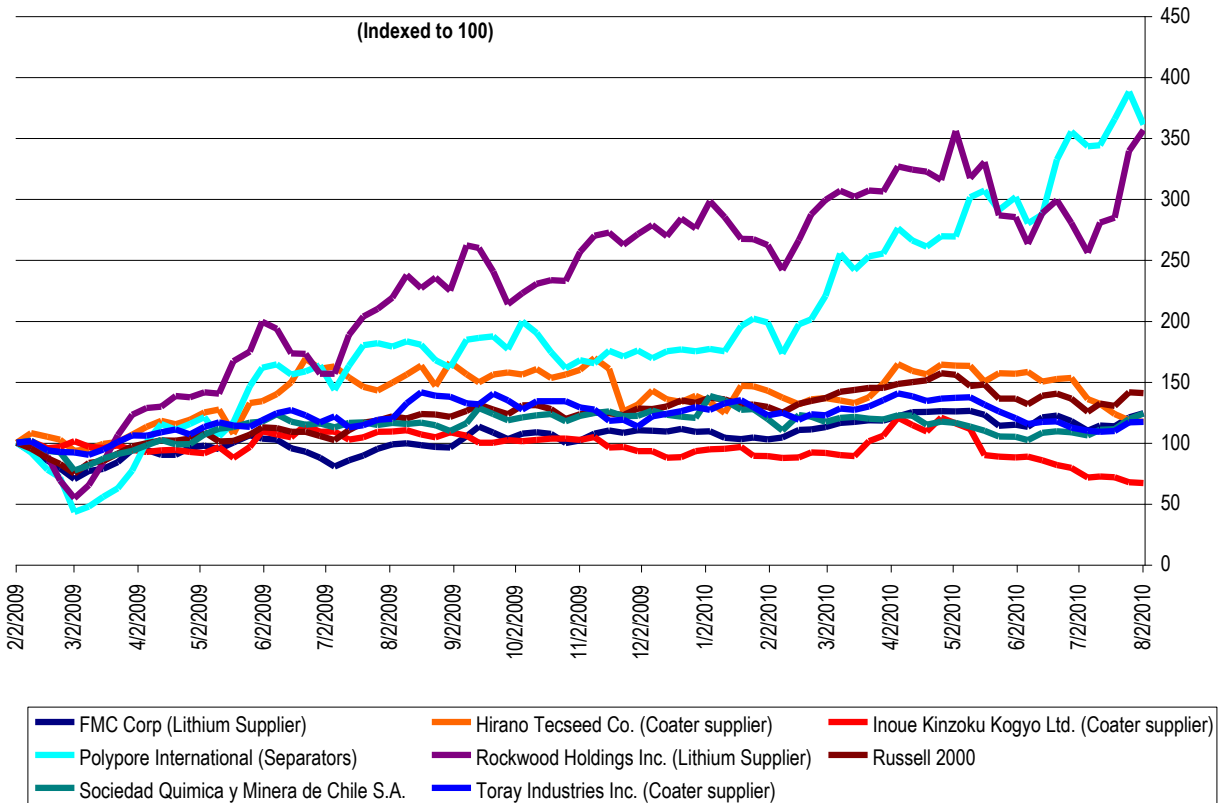


Index	Close on 8/2/2010	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	10,674.4	11,309.0	94.4%	16.4%	2.3%	1.4%
S&P 500	1,125.9	1,219.8	92.3%	13.7%	0.8%	1.0%
NASDAQ	2,295.4	2,535.3	90.5%	14.9%	0.0%	(0.0%)
Russell 2000	661.9	746.0	88.7%	18.3%	5.4%	(0.5%)
AMEX Cleantech Index	1,023.6	1,112.5	92.0%	5.1%	(4.1%)	(0.4%)

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 9: Supplier Performance
(From February 2, 2009)



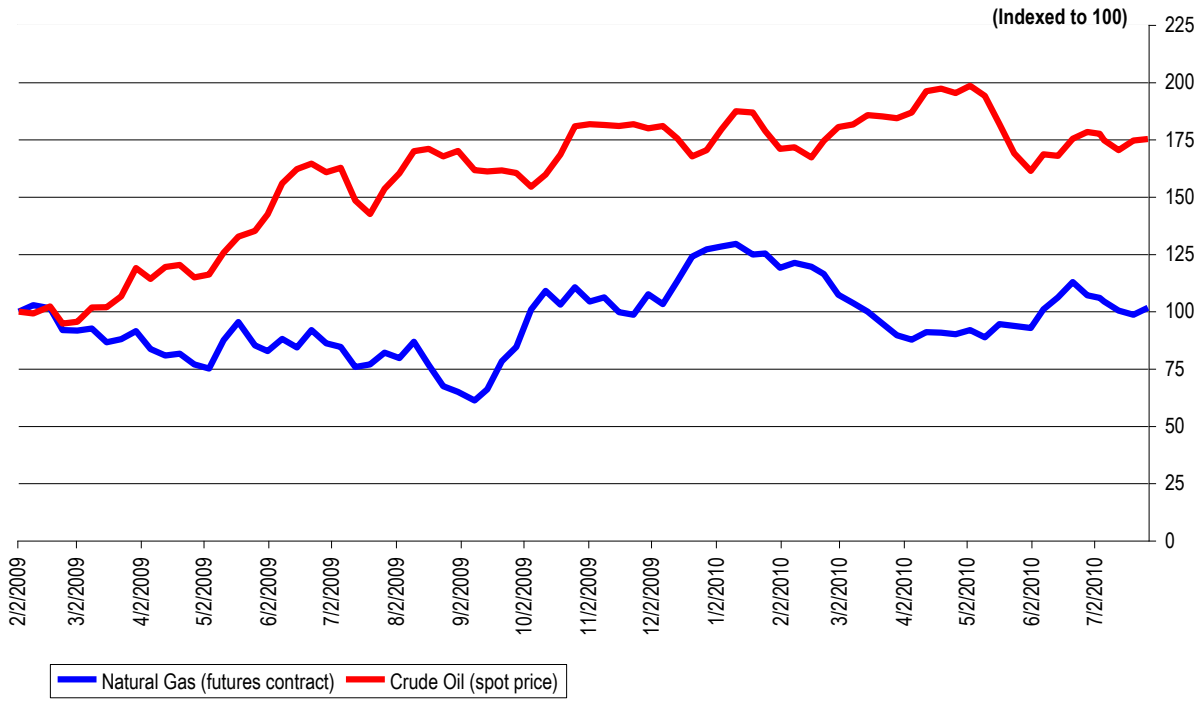
Source: Bloomberg

Exhibit 10: Commodity Prices

Commodity	Price on 8/2/2010	Price on 7/26/2010	Price on 7/2/2010	1 Week Change	1 Month Change
LME Nickel (Cash, \$ per tonne)	21,415	20,410	19,110	4.9%	12.1%
LME Lead (cash, \$ per tonne)	2,083	1,959	1,735	6.3%	20.1%

Source: LME

Exhibit 11: Natural Gas and Crude Oil
 (From February 2, 2009)



Source: EIA

Executive Director's Notes



COMMENTS TO FERC UNDERLINE NEED TO LISTEN TO UTILITIES ON CES

On Monday, August 9, NAATBatt will file with the FERC comments in response to its Request for Comments Regarding Rates, Accounting and Financial Reporting for New Electric Storage Technologies, Docket No. AD10-13-000. The filing of NAATBatt's comments will culminate a process that has involved numerous meetings and telephone conferences among more than 20 companies, including automotive OEM's such as General Motors and Nissan, battery makers such as EnerSys, A123 Systems, Saft America and Altairnano, and electric utilities such as AEP, SCE and Xcel.

NAATBatt's comments should be helpful in focusing the FERC's attention on regulatory issues that it must help resolve in order for community energy storage (CES) and other advanced distributed energy storage systems to be productively deployed onto the grid. Without resolving those regulatory challenges, advanced energy storage, and distributed energy storage applications in particular, will face an uphill fight.

But more important than the comments themselves was what participants in the comment process learned. Automakers sat with battery makers and with electric utilities, and, ultimately, with the highest officials at the FERC, and all learned much from each other.

First, we learned that CES is real and can bring unique benefits to the grid. Pushing energy storage out to the edge of the grid makes storage more flexible and more valuable. Revolutions in energy storage and telecommunications technologies mean that thousands of boxes in the backyards of America can now, though the power of a network, perform many of the same functions that were once the sole province of large generators and transmission providers.

We also learned that CES is still a new technology and that the business models necessary to exploit fully its potential are still being developed. One interesting model is joint ownership of CES facilities. In a joint ownership model different entities would own the right to use a CES facility at different times and for different purposes. A local utility may own the right to use the CES facility at peak times but convey to an unregulated entity the right to bid power from the CES facility into the wholesale power market at other times. Current regulatory schemes, however, make such innovative models problematic, which is one of the issues NAATBatt will address in its comments.

Finally we learned that the nature of CES is such that no matter how ownership is divided, at the end of the day all CES facilities will likely be operated in some form by local, regulated utilities. It is difficult to imagine how an independent, unregulated third party might be able to finance or service thousands of power boxes in consumers' back yards. This means that, regardless of what ownership models and regulatory models develop for CES, it is likely that local electric utilities will probably be the customers of the battery manufacturers hoping to play in the CES market.

That utilities will be the ultimate customers for CES is an important realization. For whatever its theoretical benefits, CES will only be successful and deployed in mass when it makes economic sense for utilities to deploy it. Too often, storage advocates have taken positions that are adverse to the utility industry. Battery makers need to concentrate their efforts on working with utilities, and on listening carefully to them, if battery makers are going to move this technology forward. A few demonstration projects funded by DOE grants and studied endlessly will never build an industry. Listening to the customer is key. If utilities are going to be the ultimate customers of advanced battery systems, it is critical that the battery industry not get sideways with its customers.



James J. Greenberger
Executive Director

North American Industry Announcements and Calendar

- **Next Webinar Program: Advanced Lead Acid Battery Technology:** The NAATBatt Webinar series continues on Thursday, September 2, 2010, with a program entitled "*Developments in Advanced Lead Acid Battery Technology: Everything You Thought You Knew But Don't*". The program will examine some new developments in lead acid batteries that may breathe new life into a hundred year old technology that many have already written off in favor of advanced lithium-ion. Our speakers, Stephen Clarke of East Penn Manufacturing/Applied Intellectual Capital and John Gagge of EnerSys Americas, will explain why reports of the death of lead acid technology may be greatly exaggerated and how lead acid may yet compete with lithium-ion batteries in advanced automotive and grid-level stationary storage applications. More information about the Webinar as well as registration instructions will be distributed shortly.
- **The Battery Show 2010:** The Battery Show, a conference and exposition focused on multiple battery chemistries and applications will be held in San Jose, California on October 5-7, 2010. Information about the show can be found at: <http://www.thebatteryshow.com/index.php>
- **218th Meeting of the Electrochemical Society:** The next biannual ECS meeting will take place on October 10-15, in Las Vegas, Nevada. The meeting will feature a wide range of experts throughout the fields of solid-state and electrochemical science and technology, getting together to communicate with both colleagues and a vital market. More information can be found at <http://www.electrochem.org/meetings/biannual/218/218.htm>
- **Advanced Energy Storage 2010:** FullPower, Inc. will be leading a series of exhibits on October 12-14, in San Diego, California to showcase the technological capabilities of leading suppliers of advanced batteries, energy storage systems, and ultracapacitors. Seminars will discuss the insights and impacts on these various technologies. Additional information may be found at <http://www.fullpowerinc.com/AES2010/AESHome.html>
- **Battery Power 2010 Conference:** Battery Power 2010 will be held in Dallas, Texas on October 19-20, 2010. NAATBatt is a supporting organization of the conference. Information about the conference and registration for it may be found at: http://www.batterypoweronline.com/bppt-conf10/bp10_supportingorg.php
- **U.S. National Electric Vehicles Safety Standards Summit:** On October 21-22, in Detroit, Michigan, the National Fire Protection Association (NFPA) will be holding a safety summit along with co-sponsor SAE International in order to ensure standards on electric cars. The summit will focus on how to implement such standards on a rapidly growing industry, in which technology is swiftly improving. To find out more about the summit visit http://www.nfpa.org/newsReleaseDetails.asp?categoryId=488&itemId=46997&cookie_test=1
- **Rare Earth Metals Summit III:** Infocast's Rare Earth Metals Summit III will be held in Washington, D.C. on October 25-27, 2010. The conference will examine the supply and value chains for rare and strategic metals, including lithium. NAATBatt is a supporting organization of the conference and NAATBatt members will be entitled to a 10% discount on registration. Additional details will follow.

- **Annual DOE Program Update Conference – Energy Storage R&D Programs:** Sandia National Laboratory's U.S. DOE Energy Storage Systems Research Program (ESS) will be held on November 2-4, in Washington D.C. The program will review the latest DOE sponsored research in advanced battery technology, power conditioning and others topics relating to advanced energy storage. Registration for the conference can be found here: <http://www.sandia.gov/ess/About/newsevents.html#conf>
- **Future of Electric Vehicles Conference:** The Future of Electric Vehicles Conference will be held in San Jose, California on December 7-8, 2010. The conference will have representatives for all electric vehicle types, components, and uses. The conference will permit attendees to learn more about electric vehicles in each and every form. Information and registration for the conference can be found on the website at: <http://www.idtechex.com/electric-vehicles-usa-10/>
- **Advanced Automotive Batteries Conference & Symposium 2011:** The Advanced Automotive Batteries 2011 Conference (AABC) will be held on January 24-28 2011, in Pasadena, California. This is the next domestic program in the series of conferences on automotive batteries sponsored by Dr. Menahem Anderman and Total Battery Consulting. The conference Web site can be found at: <http://www.advancedautobat.com/automotive-battery-conference-2011/index.html>.
- **NAATBatt Membership Information.** NAATBatt is taking applications for 2010 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, committees and the upcoming roadmap project 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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