

Summary:

For the April 15th issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt and U.S. Indices declined 3.7% and 5.7%, respectively. The Asia Index increased 2.2%. The Russell 2000 and S&P 500 decreased 1.8% and 0.6%, respectively.

Executive Director James Greenberger writes about the March sales numbers for first generation PEV's and the challenge they present for the advanced battery industry. Read "**PEV Sales: Don't Panic... Yet**" in the Executive Director's Notes section of this newsletter below.

Key Highlights:

- **NAATBatt** submitted comments urging the **U.S. Senate Energy and Natural Resources Committee** to adopt a Clean Energy Standard that includes an energy efficiency standard. NAATBatt proposed that energy efficiency be defined for that purpose as the leveling of peak electricity load. The full text of NAATBatt's comments can be read by clicking on the following link: <http://naatbatt.org/uploads/Final-Comments-to-Senate-Committee-for-publication.pdf>.
- **SB LiMotive**, a 50-50 joint venture (JV) between **Samsung SDI** and **Robert Bosch GmbH** is planning to invest \$500 million by 2013 to add one or two more car-battery production lines in **Korea**. The JV currently produces 50,000 units of rechargeable batteries for electric vehicles (EVs) per month and is planning to boost monthly production capacity to as much as 400,000 units over the next 3 years.
- **Ford Motor** released its list of 25 cities for "electric vehicle-readiness". The most weight in its ranking were allocated to factors related to private charging, such as the availability of online permit applications and assurance that inspections will be completed within a reasonable amount of time.
- **Daimler** is teaming up with **Bosch** in a JV to produce electric motors to be used in **Mercedes** and **Smart** cars. The 50-50 JV should be in place by the end of June.
- **Siemens Energy** has launched the **Charge CP700A** charging station that can fully recharge a battery within an hour. By doubling the output to 22 kilowatts, the charging station cuts charging times in half.
- **Freescale Semiconductor** and **Fuji Electric Systems** announced plans to form a partnership focused on EV technology. The companies announced plans to collaborate on a type of semiconductor used for powertrains.
- The **Manitoba** provincial government will roll out a number of EV projects over the next year. Some projects fall under a one-year memorandum of understanding the province signed in December with **Mitsubishi Heavy Industries** to develop a prototype electric bus with **New Flyer Industries**.
- The ratified **12th Five-Year** plan of **Beijing's** automotive industry shows that the number of in-use all-EVs is expected to reach 100,000 by 2015. In addition to enjoying the same level of preferential subsidies with the city of **Shenzhen**, purchasers of all-EVs will have the privilege of a lottery free license plate, no traffic restrictions and tax-free exemptions (paid by the government).
- The **Department of Energy (DOE)** has stated the **U.S.** is on track for one million EVs by 2015.

The statement was made at a meeting with the **Society of Automotive Engineers** in **Detroit**.

- **South Korea** will seek to step up cooperation with the **European Union (EU)** in such fields as renewable energy and EV sectors as a result of a meeting between the **Knowledge Economy Minister** and the **European Union Chamber of Commerce in Korea (EUCCK)**. The two sides also want to set up a so-called smart grid system that can reduce overall power consumption.
- Scientists at the **Chinese Academy of Sciences** (in **Dalian**) have found that nanofiltration membranes could enhance the efficiency of **vanadium redox** flow batteries (**VRBs**) making them a more viable tool for large-scale energy storage. By adjusting the pores in the membrane, scientists were able improve battery performance.
- A **Zotye** made electric taxi spontaneously exploded in **Hangzhou, China**. The manufacturer's EV technology department did not discover any problems.
- **ZBB Energy** has formed a development agreement with **Honam Petrochemical (Seoul, South Korea)** for production of **zinc-bromide** flow batteries. Production is scheduled to begin this fall.
- The 49-foot electric-powered **Superbus** was unveiled in **Dubai, United Arab Emirates**. The electric bus can carry 23 passengers and was created over a 7-year period by a **Dutch** team at **TU Delft University** in the **Netherlands**.
- The **Voltitude** electric bike (ebike) is scheduled to enter the market later this year. The foldable bike is heavily inspired by the famous style of the **Swiss Army Knife**.

A Few More Details:

SB LiMotive, a 50-50 JV between Samsung SDI and Robert Bosch GmbH is planning to invest \$500 million by 2013 to add one or two more car-battery production lines in Korea. Samsung SDI may also expand its production facilities beyond Asia to regions including Europe to meet increasing demand for lithium-ion (li-ion) batteries used in EVs. The JV currently produces 50,000 units of rechargeable batteries for EVs per month and is planning to boost monthly production capacity to as much as 400,000 units over the next 3 years.

Source: WSJ

Ford Motor released its list of 25 cities (as shown in **Exhibit 1**) for “electric vehicle-readiness”. The most weight in its ranking were allocated to factors related to private charging, such as the availability of online permit applications and assurance that inspections will be completed within a reasonable amount of time. The company expects most EV drivers will primarily be charging at home.

Exhibit 1: The 25 Cities (in alphabetical order)

Atlanta
Austin, Texas
Baltimore
Boston
Charlotte, N.C.
Chicago
Dallas
Denver
Detroit
Hartford, Conn.
Honolulu
Houston
Indianapolis
Los Angeles
New York
Orlando, Fla.
Phoenix
Portland, Ore.
Raleigh, N.C.
Richmond, Va.
Sacramento, Calif.
San Diego
San Francisco Bay Area
Seattle
Washington, D.C.

Source: Ford

Daimler is teaming up Bosch in a JV to produce electric motors to be used in Mercedes and Smart cars. The 50-50 JV should be in place by the end of June. Production should start in 2012 at sites in Hildesheim in central Germany and Stuttgart in the south-west.

Source: AFP

Siemens Energy has launched the Charge CP700A charging station that can fully recharge a battery within an hour. By doubling the output to 22 kilowatts, the charging station cuts charging times in half. The station can also recharge batteries at a lower level of output. To make this possible, the station communicates with the vehicle via the charging cable to make sure that the battery is charged at a rate the vehicle can handle.

Source: Environmental Protection

Freescale Semiconductor and Fuji Electric Systems announced plans to form a partnership focused on EV technology. The companies announced plans to collaborate on a type of semiconductor used for powertrains. Freescale plans to begin marketing Fuji's insulated-gate bipolar transistor, or IGBT, devices to its automotive customers. These devices convert alternating current (AC) control signals to the current needed to turn the motor.

Source: Reuters

The Manitoba provincial government will roll out a number of EV projects over the next year. Some projects fall under a one-year memorandum of understanding the province signed in December with Mitsubishi Heavy Industries to develop a prototype electric bus with New Flyer Industries. Mitsubishi is testing a bus in Japan.

Source: Winnipeg Free Press

The ratified 12th Five-Year plan of Beijing's automotive industry shows that the number of in-use all-EVs is expected to reach 100,000 by 2015. In addition to enjoying the same level of preferential subsidies with the city of Shenzhen, purchasers of all-EVs will also have the privilege of a lottery free license plate, no traffic restrictions and tax-free exemptions (paid by the government). The traffic restrictions and the license-plate rule in Beijing could foster EV demand.

Source: People's Daily

The Department of Energy (DOE) has stated the U.S. is on track for 1M electric vehicles by 2015. The statement was made at a meeting with the Society of Automotive Engineers in Detroit. The DOE report indicates 300,000 of the expected 1.2 million electric cars in 2015 will be Nissan Leafs.

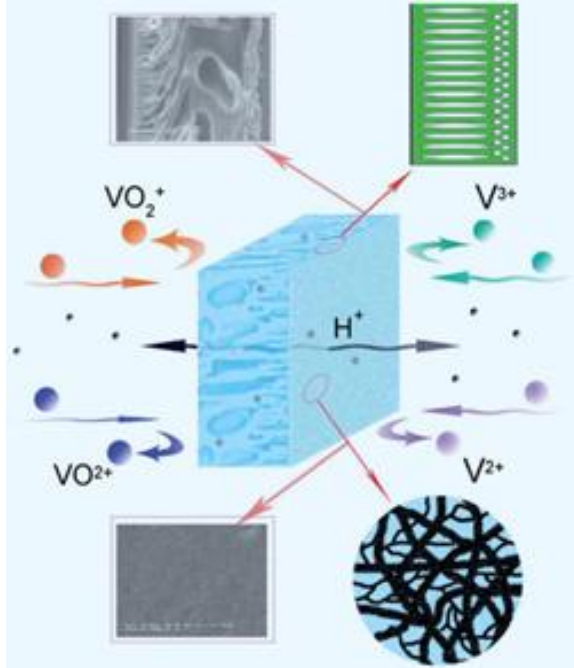
Source: Reuters

South Korea will seek to step up cooperation with the European Union (EU) in such fields as renewable energy and EV sectors as a result of a meeting between the Knowledge Economy Minister and the European Union Chamber of Commerce in Korea (EUCCK). South Korea and the EU have engaged in various projects to speed up wide-scale commercial use of clean power resources and are pursuing development of all-EVs. The two sides also want to set up a so-called smart grid system that can reduce overall power consumption.

Source: Yonhap

Scientists the Chinese Academy of Sciences (in Dalian) have found that nanofiltration (as shown in **Exhibit 2**) membranes could enhance the efficiency of vanadium redox flow batteries (VRBs) making them a more viable tool for large-scale energy storage. By adjusting the pores in the membrane, scientists were able improve battery performance by gaining more control over the ions passing from one side of the battery to the other during charge-discharge cycles. An ion exchange membrane separates two electrolyte tanks, containing species of vanadium in different valance states. When the battery is charged, the vanadium ions are oxidized or reduced, converting chemical energy into electrical energy. Ion exchange membranes should prevent the crossover of vanadium ions, while allowing protons to pass through.

Exhibit 2: Nanofiltration Membrane Function



Source: *Chemistry World*

A Zotye made electric taxi spontaneously exploded in Hangzhou, China. The taxi was part of Hangzhou's first fleet of 30 pure electric taxis. The manufacturer's EV technology department did not discover any problems.

Source: *Gasgoo*

ZBB Energy has formed a development agreement with Honam Petrochemical (Seoul, South Korea) for production of zinc-bromide flow batteries. The company has been building a new version of its zinc-bromide flow battery since January 2010. Production is scheduled to begin this fall. The batteries could be used in energy storage systems that capture and store electricity produced by solar panels.

Source: *Journal Sentinel*

The 49-foot electric-powered Superbus (as shown in **Exhibit 3**) was unveiled in Dubai, United Arab Emirates. The electric bus can carry 23 passengers and was created over a 7-year period by a Dutch team at TU Delft University in the Netherlands. The Superbus is made of lightweight carbon fiber and powered by a li-ion iron phosphate battery pack weighing up to 2,650 lbs with about the same length and width as a public bus.

Source: *International Business Times*

Exhibit 3: The Electric Superbus



Source: AFP

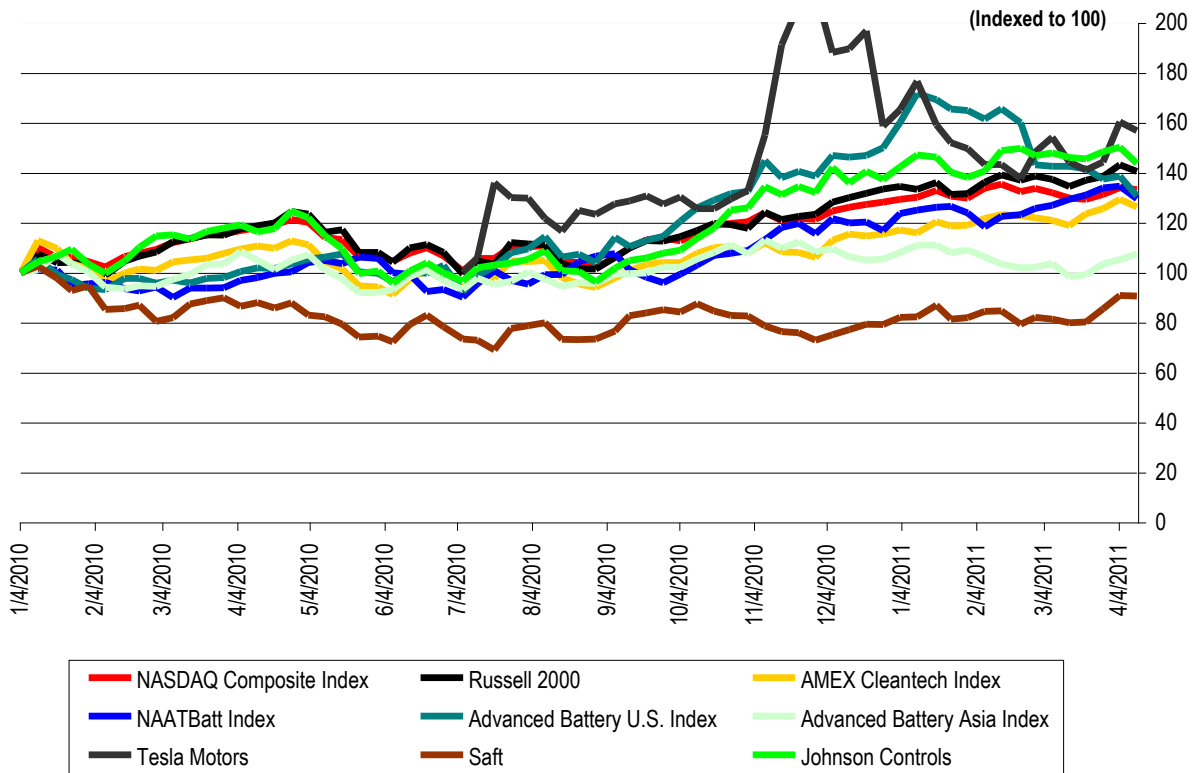
The Voltitude electric bike (ebike) is scheduled to enter the market later this year. The foldable bike is heavily inspired by the famous style of the Swiss Army Knife (as shown in **Exhibit 4**). It weighs around 50 pounds and is equipped with a 250 watt, integrated motor powered by a 36 volt li-ion battery with a top speed of just over 15 miles per hour and a range of almost 25 miles on a full charge. The battery can be plugged into a 110 or 240 volt socket, and takes roughly four hours to reach 100%.

Exhibit 4: The Voltitude Ebike



Source: Huffington Post

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

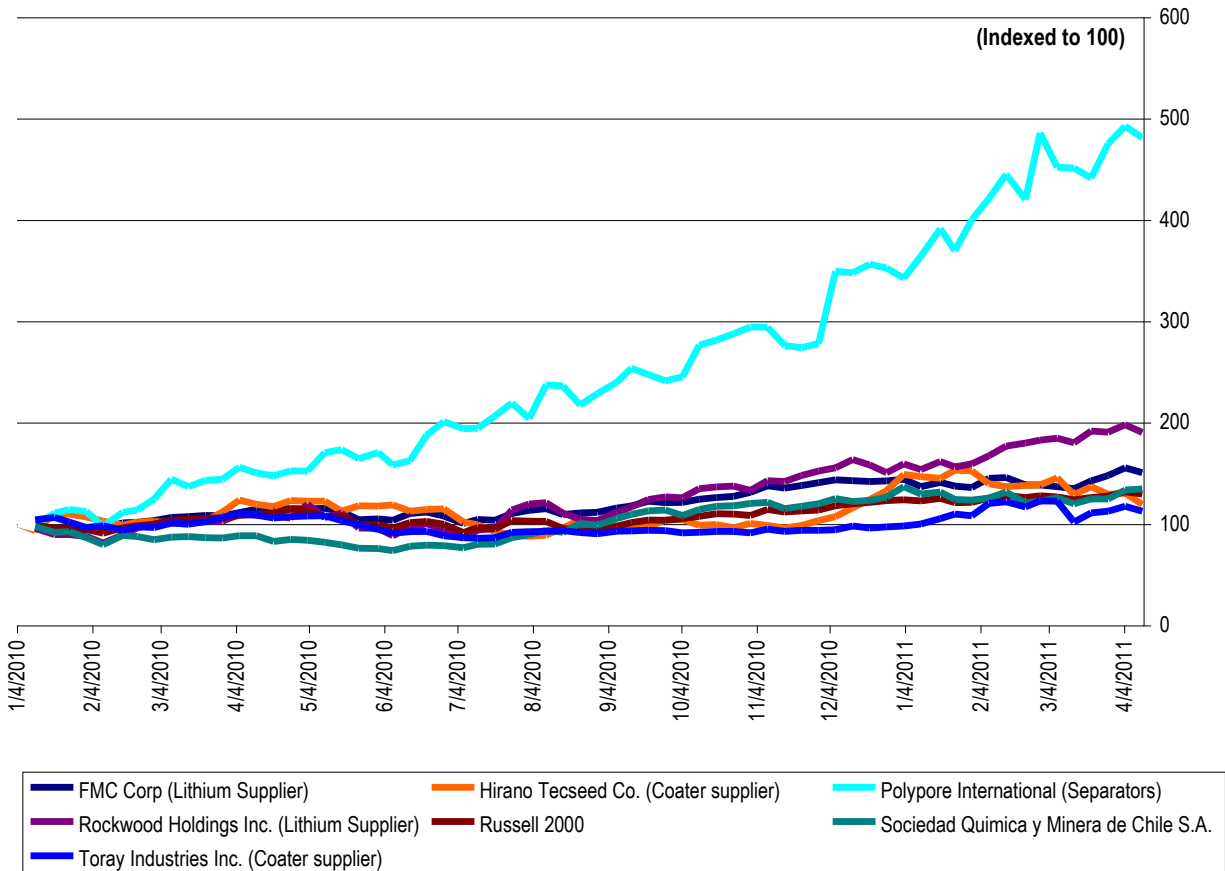


Index	Close on 4/11/2011	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	12,381.1	12,454.5	99.4%	12.6%	6.1%	(0.2%)
S&P 500	1,324.5	1,344.1	98.5%	10.8%	4.1%	(0.6%)
NASDAQ	2,771.5	2,840.5	97.6%	12.9%	3.0%	(0.6%)
Russell 2000	833.9	859.1	97.1%	18.5%	4.4%	(1.8%)
AMEX Cleantech Index	1,238.6	1,271.0	97.4%	14.3%	7.8%	(2.4%)

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)**



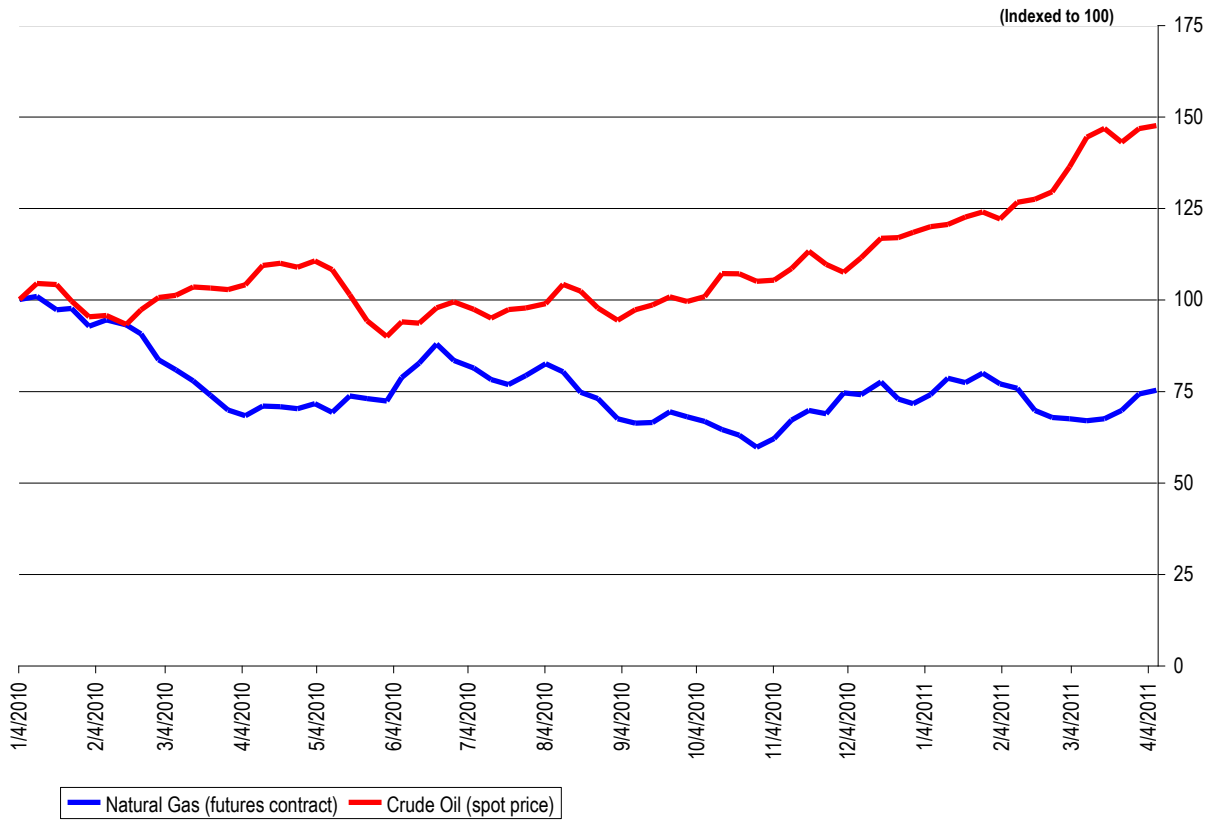
Source: Bloomberg

Exhibit 7: Commodity Prices

Commodity	Price on 4/11/2011	Price on 4/4/2011	Price on 3/11/2011	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	9,781	9,419	9,048	3.8%	8.1%
LME Lead (cash, \$ per tonne)	2,939	2,840	2,428	3.5%	21.0%
LME Nickel (cash, \$ per tonne)	27,415	25,600	25,670	7.1%	6.8%

Source: LME

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



Source: EIA

Executive Director's Notes



PEV SALES: DON'T PANIC...YET

It is an easy time to be an electrification skeptic. Over the past two years the federal government has spent billions of dollars in grants and loan guarantees to produce technology for electric vehicles. Last March General Motors sold a grand total of 608 Chevy Volts and Nissan a total of 298 LEAF's. Plug-in electric vehicle (PEV) sales in the United States by other manufacturers were nominal.

There are, of course, good explanations for these low numbers. Both General Motors and Nissan are intentionally rolling out their electric products slowly and carefully. Any new technology that fundamentally changes a familiar consumer product takes time to catch on. Besides, in March General Motors sold less than twice as many Escalades and Corvettes, vehicles with much greater familiarity to and brand recognition among U.S. consumers. No need to panic just yet.

Still, the narrative does not sound good. If the point of PEV's is to reduce petroleum dependence and greenhouse gas emissions, what difference will even ten, twenty or fifty thousand PEV sales make in the context of a national automobile fleet of 245 million vehicles? And how can a meaningless difference justify the billions that have been spent? The skeptics are going to have a field day.

We must recognize that the skeptics are to some extent right. A few thousand PEV's will make little difference to American energy security or to the environment. Vehicle electrification only makes sense if it includes a significant portion of the national automotive fleet. PEV's must be made attractive to mainstream consumers if our massive national investment in them is to be justified.

There is only one way for PEV's to penetrate the mainstream consumer market: the price of those vehicles, and the batteries that power them, must be brought sharply down. Recharging infrastructure, demonstration communities, secure lithium supplies and the like are all important issues. But they are background noise.

The success or failure of electric vehicles in the United States will turn on one, and only one, factor: the upfront price to consumers of the advanced batteries that power those vehicles.

We need a national strategy for bringing down advanced battery costs. That strategy must focus on three things: Increasing the volume of advanced battery production, improving the energy density of the batteries themselves, and reducing the upfront price that consumers must pay for the vehicles that contain them.



Make no mistake: the skeptics are sharpening their knives and hoping to destroy vehicle electrification or, more correctly, to delay it for several decades. Time is short; the skeptics will not be silent long. We need to focus on the real problem and get to work.

A handwritten signature in black ink, which appears to read "James J. Greenberger". The signature is fluid and cursive, with a large initial 'J'.

James J. Greenberger
Executive Director

April 15, 2011



NAATBatt Membership Applications for 2011

2011 Membership Applications and Dues Structure

NAATBatt is accepting applications for membership for the 2011 calendar year. Membership dues for 2011 are \$10,000 for Corporate Members, \$10,000 for OEM Members, \$10,000 for Utility Members, \$5,000 for Associate Members, \$1,000 for Individual Members, and \$500 for Non-Profit/Government Members. Please click on <http://naatbatt.org/membership-inquiry/> and indicate that you are interested in a 2011 membership.

Why Join NAATBatt?

NAATBatt's mission is to grow the market for advanced electrochemical energy storage technology in North America. NAATBatt provides regular educational programming on topics of interest to the advanced battery community, a weekly newsletter chronicling developments in the North American advanced battery market, networking opportunities for industry participants and their customers, including our recently concluded conference on PEV's and the grid, and public policy initiatives, such as the recent NAATBatt-sponsored meeting with Chairman Jon Wellinghoff of FERC and production of written comments to FERC in support of distributed energy storage technology.

NAATBatt recently concluded the highly successful meeting and conference entitled "The Impact of PEV's on T&D Systems: Challenges and Solutions", in Louisville, Kentucky. The conference was the largest cross-industry event to date focused on the impact of plug-in electric vehicles on the grid. The conference outlined the improvements and upgrades that utilities must make to the grid in order for it to accommodate mass-market electric vehicles. The conference emphasized the critical role that grid-connected energy storage can play in promoting vehicle electrification in the United States. Emphasizing the necessary relationship between grid-connected storage and electric vehicles is one of NAATBatt's primary missions.

NAATBatt is a not-for-profit trade association qualified under Section 501(c)(6) of the Internal Revenue Code that is working for the benefit of the entire industry. **Every dollar spent on NAATBatt memberships and programs goes to recouping program costs and to supporting activities intended to benefit the entire advanced battery industry.** At a time when it seems that the only people making money on advanced lithium-ion technology are professional conference organizers, the advanced battery industry should take control of its own market and its own future. NAATBatt exists to market for the industry, not to the industry. But NAATBatt needs your support to do it. Please join us.

North American Industry
Announcements and Calendar

Get More Information! **NAATBatt Workshop on Problems in Utility Deployment of Distributed Energy Storage Systems:** On **April 21, 2010**, NAATBatt and the U.S. Department of Energy will co-host in Chicago an interactive workshop examining the issues, problems and challenges that electric utilities face in deploying distributed energy storage systems on the grid. Although DES systems have many benefits, profitably deploying DES systems and adding them to rate base continues to be a major challenge for utilities. The NAATBatt/DOE workshop will encourage utility and battery executives to sit together and have a frank discussion about those challenges and how they might be addressed. The workshop is by invitation only. For more information about the workshop, please click [here](#).

Save the Date! **NAATBatt 2011 Annual Meeting and Conference:** NAATBatt has announced that its 2011 Annual Meeting and Conference will be held on **September 7-9, 2011** in Louisville, Kentucky. The annual meeting will feature a Battery Industry-Academic Summit and a survey of the next five years of advanced battery technology development. More information about the 2011 conference will be posted soon on the NAATBatt Web site at: www.naatbatt.org. Visit the NAATBatt Web site for information about the 2010 conference. Please save the date for 2011!

Speaker Presentations from the NAATBatt 2010 Annual Meeting and Conference are Now Available! NAATBatt's 2010 Annual Meeting and Conference entitled "The Impact of PEV's on T&D Systems: Challenges and Solutions" was a great success. More than 40 industry experts presented and the conference on topics relating to how the grid was going to accommodate the new load that will be generated by plug-in electric vehicles. Copies of the speaker presentations are available on a secured portion of the conference Web site. Access to the Web site is free to NAATBatt members and conference attendees. Access to the presentations is now available to all other for the price of \$250. Please contact James 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.

- **Electric Drive Vehicle Association 2011 Meeting and Annual Conference:** The EDVA 2011 Meeting and Annual Conference will be held on **April 19-21, 2011** in Washington, D.C. The Web site for the meeting can be viewed at: <http://www.edtaconference.org/ht/d/sp/i/18736/pid/18736>.
- **Workshop on Problems in Utility Deployment of Distributed Energy Storage Systems:** NAATBatt will sponsor a special workshop and roundtable discussion among utility and battery executives in Chicago on **April 21, 2011**. The purpose of the workshop is to identify the specific challenges that utilities face in evaluating, procuring, deploying and adding to their rate base advanced battery systems for storing electrical energy in the distribution portion of the grid. Attendance at the workshop is by invitation only. Please direct inquiries to: jgreenberger@naatbatt.org
- **The Council for Chemical Research Annual Meeting:** The Council for Chemical Research will hold its annual meeting on **May 1-3, 2011** in Dearborn, Michigan. The title of the meeting is "Advanced Materials: Driving Transformative Research in Transportation and Automobiles". The conference Web site may be viewed at: <http://www.ccrhq.org/2011-annual-meeting>.
- **The Battcon™ International Stationary Battery Conference:** The Battcon™ International Stationary Battery Conference is a three day, noncommercial, technical event for storage battery users from a broad range of industries. The conference will be held from **May 16 to 18, 2011** at the Swan and Dolphin Resort, Orlando, Florida. The conference Web site is: <http://www.battcon.com/>
- **21st Annual ESA Meeting:** The 21st annual meeting of the Electricity Storage Association will be held on **June 6-8, 2011** at the Fairmont Hotel in San Jose, California. Information about the meeting can be found on the meeting Web site at: http://www.electricitystorage.org/ESA/calendar/21st_esa_annual_meeting_-_save_the_date/.
- **4th Symposium on Beyond Lithium-Ion:** Beyond Lithium-Ion IV will be held **June 7-9, 2011**, at Pacific Northwest National Laboratory in Richland, Washington. The goal of the Symposium is to advance understanding on the directions and challenges in present-day vehicle batteries and the future of storage technologies. The meeting is one of a series of Symposia organized by a consortium of IBM Research and U.S. National Laboratories. The meeting website is <http://beyondli-ioniv.labworks.org/>.
- **Storage Week 2011:** Infocast will host Storage Week 2011 in San Diego on **July 11-14, 2011**. The program, now in its third year, will cover a range of storage policies, markets, project applications and technologies involved in the integration of storage onto the grid. NAATBatt is a Supporting Organization of the program and NAATBatt members will be entitled to a 15% discount on admission.
- **Plug-In 2011 Conference and Exhibition:** The Plug-In 2011 Conference and Exhibition will be held on **July 18-21, 2011** in Raleigh, North Carolina. The Conference Web site can be viewed at: <http://www.plugin2011.com/>.
- **NAATBatt 2011 Annual Meeting and Conference: September 7-9, 2011** in Louisville, Kentucky (see note above).

- **2nd Battery Safety Conference:** Knowledge Foundation will host the 2nd Battery Safety Conference on **November 7-8, 2011** in Boston, Massachusetts. The conference will discuss safety incidents and product recalls regarding lithium-ion batteries. The conference Web site can be accessed at: http://www.knowledgefoundation.com/viewevents.php?event_id=253&act=evt
- **7th Lithium Mobile Power Conference:** Knowledge Foundation will host the 7th Lithium Mobile Power Conference on November 9-10, 2011 in Boston, Massachusetts immediately following the battery safety conference. The conference will provide a general survey of the lithium-ion battery industry. The conference Web site can be accessed at: http://www.knowledgefoundation.com/viewevents.php?event_id=254&act=evt.



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