NAATBatt
Advanced Battery Weekly

Summary:

In this April 9, 2010, issue of NAATBatt's Advanced Battery Weekly, we highlight ongoing sector activities. The NAATBatt and Asia Battery Indices were flat while U.S. Battery Index increased a modest 1.3%. The S&P500 and Russell 2000 were up 1.2% and 2.3%, respectively.

Key Sector Highlights:

- **SGL Group** and **BMW** will spend an initial $100 million to set up a U.S. carbon fiber plant to produce material for lightweight parts to be used in the Megacity electric vehicle (EV). BMW has chosen the **Bosch** and **Samsung SDI** joint venture to supply the lithium-ion (li-ion) battery cells.

- **Valence Technology** was selected as the preferred battery technology provider for the "Smart Grid Community of the Future," the first smart grid solar powered residential development in Texas. The company will supply systems for the individual smart grid residences containing EV charging stations and smart appliances.

- **SK Energy** is joining a technology assessment program led by the **U.S. Advanced Battery Consortium (USABC)** to share information on the development of advanced batteries for EVs and HEVs. The plan is for SK Energy to work with the USABC on evaluating li-ion battery technologies.

- **UPS** announced the deployment of 200 hybrid electric delivery trucks in 8 U.S. cities. The HEV fleet features vehicles from **Freightliner Custom Chassis Corporation** and a hybrid drive system from **Eaton Corporation**.

- **Nissan Motor Co** will start selling its Leaf electric compact car in China early next year. Annual targets and a manufacturing schedule for producing the EV in China (where it has a manufacturing venture with **Dongfeng Motor Group**) were not available.

- **Hitachi Ltd.** has developed a method to double the lifespan of its lithium-ion batteries to more than 10 years. The technology extends the life of manganese cathodes and will decrease the use of cobalt -- a relatively scare and expensive material.

- **Valence Technology** will be providing energy storage systems for the new plug-in electric **Mercedes eVito Taxi**. The goal of the consortium is to deliver a pollution-free fleet of taxis in time for the 2012 London Olympic Games.

- The **Port of Los Angeles** started using the world's first all-electric port truck, a vehicle capable of hauling 60,000 lbs. of freight. The **Balqon XE20** has a 50 mile range on a 6-8 hour standard full charge and a one-hour quick charge that brings the li-ion batteries up to 60% of capacity.

- **King County, Washington** is planning to install up to 200 public charging stations at transit park-and-rides, vanpool sites and motorpool lots. The program would rely on federal grant money, some from a $15 million grant awarded to the Puget Sound Clean Cities Association to develop EV infrastructure.

- **Boulder Electric Vehicle** is setting up a 60,000 square-foot factory to begin production. The company has received 25 orders and letters of intent to buy its EVs at $100,000 each.

A Few More Details:

SGL Group and BMW will spend an initial $100 million to set up a U.S. carbon fiber plant to produce material for lightweight parts to be used in the Megacity electric vehicle (EV). The plant will be located in Moses Lake, Washington. The EV is expected to launch before 2015 and BMW has chosen the Bosch and Samsung SDI joint venture to supply the lithium-ion (li-ion) battery cells.
Source: Reuters

Valence Technology was selected as the preferred provider for the "Smart Grid Community of the Future," the first smart grid solar powered residential development in Texas. The company will supply systems for the individual smart grid residences containing EV charging stations and smart appliances. With $13.5 million in funding from the U.S. Department of Energy, the $27.4 million project is scheduled to break ground this year. The team for this "Smart Grid" project includes CCET, Valence Technology, Southwest Research Institute, Electric Power Group, EcoEdge, CenterPoint Energy, Oncor, American Electric Power, Sharyland Utilities, Land Tejas Developers, Montgomery County Municipal Utility District 119, Xtreme Power/Energy Xtreme, General Electric, GridPoint, Direct Energy, Drummond Group and Frontier Associates.
Source: Valence Technology

SK Energy is joining a technology assessment program led by the U.S. Advanced Battery Consortium (USABC) to share information on the development of advanced batteries for EVs and HEVs. The plan is for SK Energy to work with the USABC on evaluating li-ion technologies for 1 year. We highlight SK Energy has been selected as the primary battery supplier for Daimler AG's Mitsubishi Fuso HEV and also for local brand CT&T's low-speed electric vehicle models.
Source: People's Daily

UPS announced the deployment of 200 hybrid electric delivery trucks (see **Exhibit 1**) in 8 U.S. cities (Austin, Houston, Philadelphia, Chicago, Washington, D.C., Long Island, Minneapolis and Louisville). The 200 new HEV delivery trucks are expected to reduce fuel consumption by roughly 176,000 gallons over the course of a year compared to an equivalent number of traditional diesel trucks. The hybrids also should reduce by 1,786 metric tons the amount of CO2 gases released annually into the atmosphere. The HEV fleet features vehicles from Freightliner Custom Chassis Corporation and a hybrid drive system from Eaton Corporation. Earlier this year, Eaton Corp. signed a 4-year li-ion cell and battery supply agreement with LG Chem for use in medium and heavy-duty electric and hybrid-electric vehicles.
Source: UPS and Eaton

Exhibit 1: UPS HEV

Source: UPS

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Nissan Motor Co will start selling its Leaf electric compact car in China early next year. The company could also roll out the hybrid version of its Infiniti model in China in 2-3 years. Annual targets and a manufacturing schedule for producing the EV in China (where it has a manufacturing venture with Dongfeng Motor Group) were not available.
Source: Chevrolet.com

Hitachi Ltd. has developed a method to double the lifespan of its lithium-ion batteries to more than 10 years. The technology extends the life of manganese cathodes and will decrease the use of cobalt -- a relatively scare and expensive material. The new technology will be first targeted for application in EVs and wind farms.
Source: Bloomberg

Valence Technology will be providing energy storage systems for the new plug-in electric Mercedes eVito Taxi. A consortium, involving Mercedes-Benz UK and Zytek Automotive Technology has utilized Valence's li-ion battery (35kWh) and a 70kW Zytek electric drive. The maximum speed is 75 miles hour per hour and has a projected range of at least 120 miles. The goal of the consortium is to deliver a pollution-free fleet of taxis in time for the 2012 London Olympic Games.
Source: Valence Technology

The Port of Los Angeles started using the world's first all-electric port truck, a vehicle capable of hauling 60,000 lbs. of freight (equivalent to 22 Teslas, or a 40-foot shipping container full of televisions). The Balqon XE20 (see **Exhibit 2**) has a 50 mile range on a 6-8 hour standard full charge and a one-hour quick charge that brings the lithium-ion batteries up to 60% of capacity. At the Port of LA alone, trucks made 1.2 million trips between ships and a local railyard (per Arley Baker, the Port's director of communications. If EVs made the trips, the Port estimated, it could eliminate 35,606 tons of tailpipe emissions.
Source: Autopia

Exhibit 2: Balqon XE20

Source: Port of Los Angeles

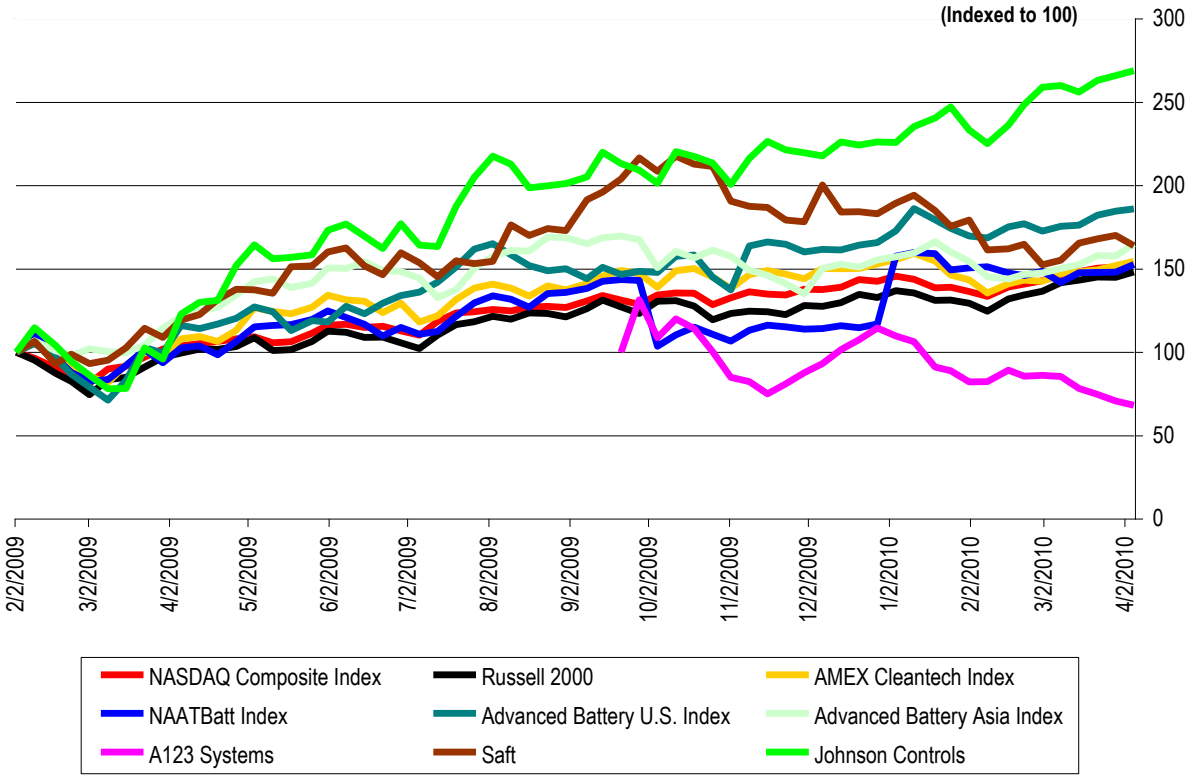
King County, Washington is planning to install up to 200 public charging stations at transit park-and-rides, vanpool sites and motorpool lots. The county currently has 29 slow-charging stations installed (including park-and-rides) This program would rely on federal grant money, some from a $15 million grant awarded to the Puget Sound Clean Cities Association to develop EV infrastructure.
Source: Seattle Post-Intelligencer

Boulder Electric Vehicle is setting up a 60,000 square-foot factory to begin production. The company has received 25 orders and letters of intent to buy its aerodynamic delivery trucks, at a cost of $100,000 each (see **Exhibit 3**). The EV can travel 120 miles before an 8-hour recharge is required.
Source: The Denver Post

Exhibit 3: Boulder All-Electric Electric Delivery Truck

Source: Boulder Electric Vehicle

Exhibit 4: Indices Performance
(From February 2, 2009)

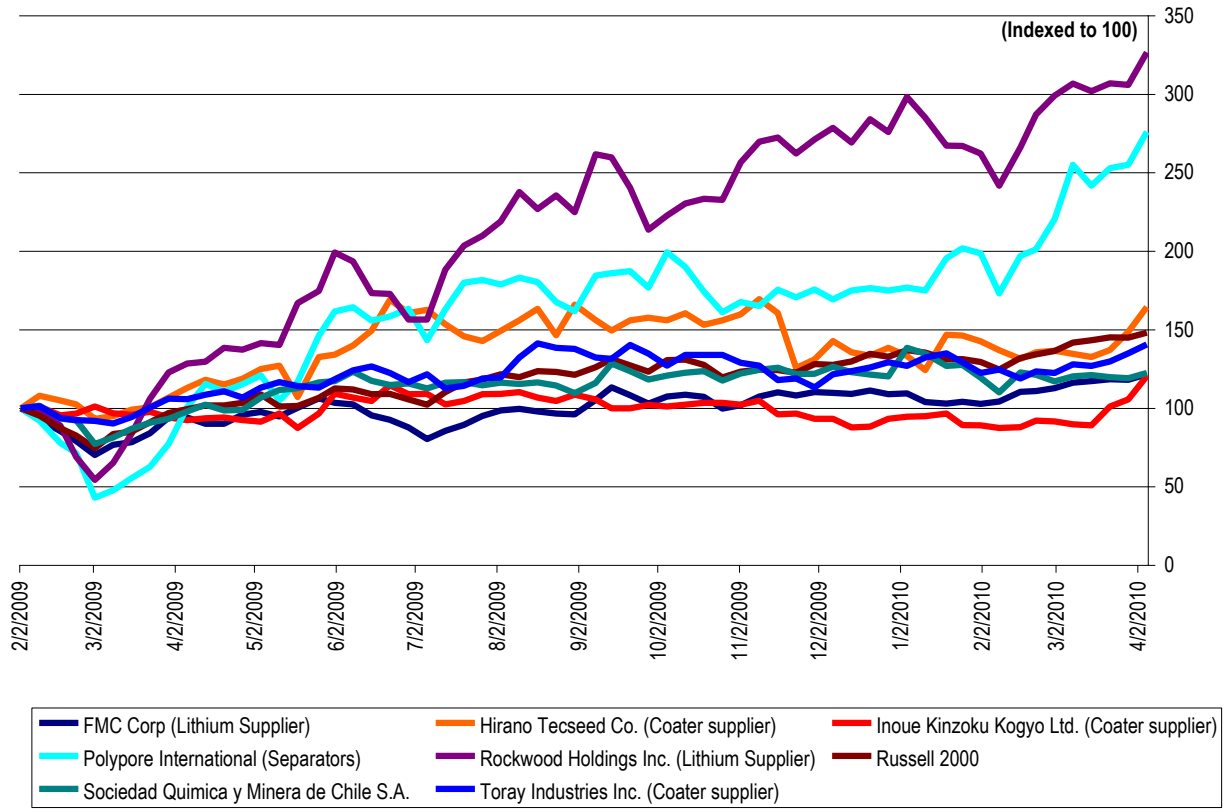


Index	Close on 4/5/2010	52-Wk High	% of 52-Wk High	Performance LTM	YTD	Week
Dow	10,973.6	10,985.3	99.9%	36.9%	5.2%	0.7%
S&P 500	1,187.4	1,180.7	100.6%	41.4%	6.3%	1.2%
NASDAQ	2,429.5	2,432.3	99.9%	51.6%	5.9%	1.0%
Russell 2000	697.7	693.3	100.6%	54.0%	11.1%	2.3%
AMEX Cleantech Index	1,073.7	1,112.5	96.5%	41.1%	0.6%	1.7%

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 5: Supplier Performance
(From February 2, 2009)



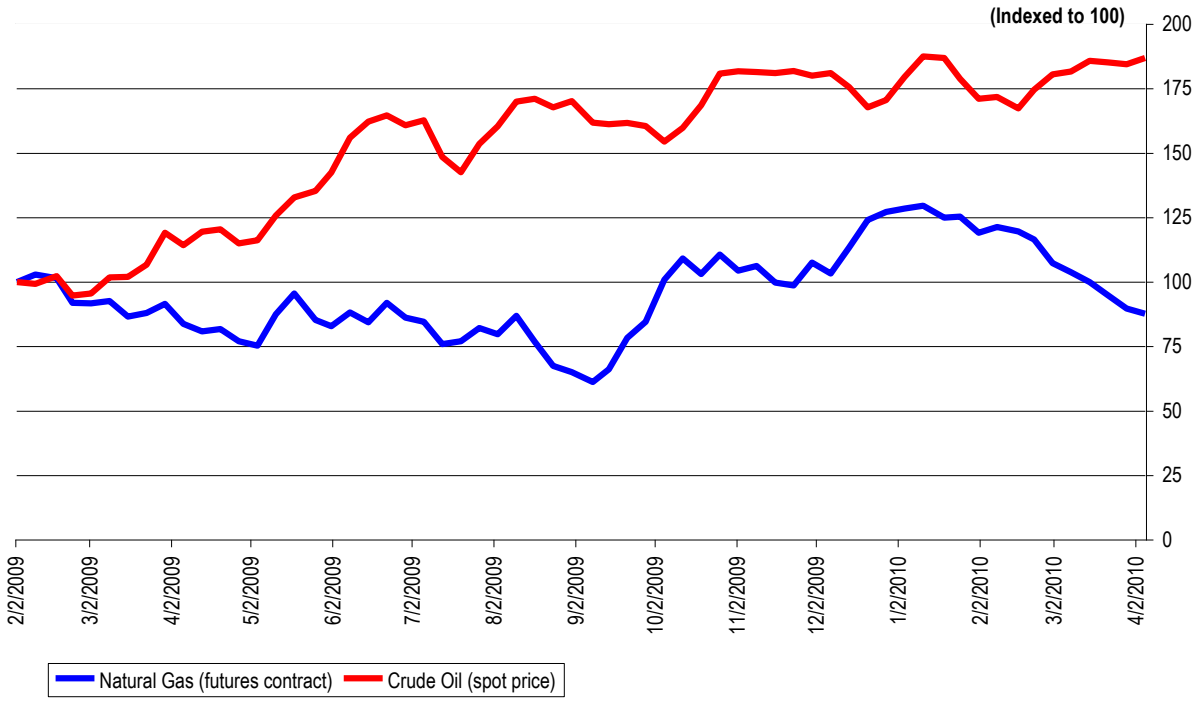
Source: Bloomberg

Exhibit 6: Commodity Prices

Commodity	Price on 4/5/2010	Price on 3/29/2010	Price on 3/5/2010	1 Week Change	1 Month Change
LME Nickel (Cash, $ per tonne)	23,925	23,925	22,475	0.0%	6.5%
LME Lead (cash, $ per tonne)	2,153	2,153	2,173	0.0%	(0.9%)

Source: LME

Exhibit 7: Natural Gas and Crude Oil
(From February 2, 2009)



Source: EIA

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Executive Director's Notes:

A ROADMAP IS NEEDED FOR ADVANCED BATTERY DEVELOPMENT

Earlier this week, Associate Professor Yang Shao-Horn of MIT announced a potential break-through in lithium-air technology. Professor Shao-Horn and her team claim to have developed a way to increase by up to three times the energy efficiency of lithium-air cells through the use of gold and platinum catalysts. This is intriguing news given that lithium-air technology, even before Prof. Shao-Horn's announcement, promised energy storage densities that may be as much as ten times that of lithium-ion technology.

New scientific breakthroughs such as those announced by Prof. Shao-Horn are exciting. Collectively they hold the promise of electric drive vehicles one day being functionally equivalent or superior to ICE vehicles in range and refueling burden. The challenge, of course, is how do we get the science from the lab to the show room floor?

What we lack in the advanced battery industry is not a vision of where our technology needs to go, but a clear and coherent plan of how industry, research institutions and government can work together to get there. The USABC has set the targets. Individual companies are making good progress (or at least predicting good progress) in moving towards them. But nowhere is there a comprehensive list of the individual technical problems and challenges that need to be overcome in order to achieve the goals themselves.

Lithium-air is a case in point. Lithium-air is a technology that holds tremendous potential. But most would agree that lithium-air technology is still a long way from commercialization. As a consequence, companies and researchers interested in investigating this promising technology are starved for funds and are encouraged to focus on shorter term, less ambitious goals.

A clear roadmap to commercialization for lithium-air and other lithium-based energy storage technologies could change that dynamic. If companies and investors knew exactly what technical challenges lay between Professor Shao-Horn's lab and a Ford or GM or Tesla production line, attracting capital to lithium-air and other advanced energy storage technologies would be much easier. If investors could understand exactly what the challenges were and exactly how those challenges fit together with other unresolved challenges, risk would be easier to assess and success easier to benchmark.

The concept of a technology roadmap is not novel. SEMATECH, which was the inspiration for NAATBatt, pioneered a roadmap for the semiconductor industry, which has evolved into the very successful International Technology Roadmap for Semiconductors (ITRS) (see:

http://www.itrs.net/Links/2009ITRS/Home2009.htm). More recently, in September of last year, the solid state lighting industry, with support from the U.S. Department of Energy, produced the first draft of a Solid-State Lighting Research and Development: Manufacturing Roadmap (http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl-manufacturing-roadmap_09-09.pdf). Both of these industries understand that the key to arriving at a destination is to understand how you are going to get there.

Later this year, NAATBatt will convene a meeting of the advanced battery industry to begin the process of road mapping the technologies needed to achieve the USABC goals and beyond. That roadmap will outline the technology challenges faced by manufacturers of anodes, cathodes, separators, electrolytes, battery systems integrators, and advanced materials suppliers, as well as those working in next generation technologies. A successful roadmap will help advance energy storage technology and, perhaps as important, make the individual technology challenges and the significance of their solution more easily understood by those outside the industry upon whom many within it depend for funding.

I look forward to sharing with you more information about the roadmap project soon and welcome your thoughts, suggestions and participation.

James J. Greenberger
Executive Director

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Announcements:

- ***Next Webinar Program:*** The NAATBatt bi-monthly Webinar series continues on April 19, 2010, with a program that will focus on the market for grid-level energy storage for power balancing and quality applications. The focus of the program "*Legislative Initiatives for Grid-Level Energy Storage*", will be legislative proposals, currently pending at the state and federal levels that could create or expand the market for electrochemical storage of energy at the grid level. Our speakers on April 19 will be David Berick, Senior Advisor for Energy Affairs to U.S. Senator Ron Wyden (D-OR), and Janice Lin, Director of the California Energy Storage Alliance. The program will begin at 2:00 p.m., EDT and last for approximately 45 minutes. To register, please click on the following link: http://events.meetingbridge.com/Register/?06123163476.

- ***AABC Conference in Orlando***: The 10th Annual International Advanced Automotive Battery Conference & Symposia will run from May 17-21, 2010, in Orlando, Florida. Information and registration for the conference is at: http://www.advancedautobat.com/AABC/index.html.

- ***Discount Offered to NAATBatt Members for EV Report***: Dr. Menahem Anderman, President of Total Battery Consulting, Inc. and Advanced Automotive Batteries, has kindly offered to all NAATBatt members a 15% discount on his upcoming report "The Plug-In Hybrid and Electric Vehicle Opportunity Report", due to be released this month. Members interested in purchasing the report should contact Jo Anna Mortensen at: joanna@advancedautobat.com. The discount offer is good through April 15.

- ***NAATBatt Membership is Now Open***. Following some delay and technical glitches, NAATBatt is now 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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