

## Summary:

For the March 5<sup>th</sup> issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector highlights. On March 15<sup>th</sup>, we will be hosting a webinar on the "*Standardization of GEV Batteries: Understanding the Process and the Prospects*".

The NAATBatt Index increased 1.7% while the U.S. Battery Index decreased 2.5% for the week ending 3/1/10. The Asia Battery Index was flat. The S&P 500 and the Russell 2000 increased modestly by 0.7% and 1.6%, respectively.

## Key Highlights:

- **Daimler AG** has signed a Memorandum of Understanding (MoU) with **BYD Company Limited** entering into a comprehensive technology partnership for the development of electric vehicles (EVs) for China. Daimler and BYD are intending to develop a new EV specific to the requirements of the Chinese market.
- **Volkswagen** (VW) is aiming to be the market leader in hybrid and electric vehicles before the end of the decade. Chief executive officer Martin Winterkorn stated VW's goal is "to become the market leader in E-mobility by the year 2018. The company is targeting an EV market share of 3% within its entire range of products.
- This summer, the **United States Postal Service** will begin a yearlong pilot program of electric mail trucks in the Washington D.C. area -- using vehicles converted by five manufacturers. The participating companies are **Bright Automotive, EDAG, Quantum Technologies, ZAP** and Delaware-based **AutoPort**.
- Carlos Ghosn, chief executive of **Renault** and **Nissan**, has predicted automakers will be scrambling to meet demand for electric vehicles (EVs) – and the lithium-ion batteries that power them – within the next two years. Renault and Nissan expect to be the first automaker to market EVs in 2011 in any large volume.
- **Sanyo Electric** will be launching new 'enloop bike' models of electric hybrid bicycles that recharge themselves while being used. The "Eco Charge Mode" enables the rider to actively charge the battery while pedaling on flat roads versus only being charged during downhill stretches or deceleration.
- **Celgard** (a subsidiary of **Polypore International**) announced plans to expand production capacity at its existing lithium-ion separator manufacturing facility in Ochang, South Korea. The company plans to invest approximately \$30 million in the expansion project that should commence in 2H10.
- **China South Locomotive & Rolling Stock Corp.**, the nation's largest maker of rail carriages, is planning to set up a venture with **Liaoning Shuguang Automobile Group Co.** to capitalize on the expected growth of EVs in the world's biggest auto market. The companies will invest at least 442.2 million yuan (or \$65 million) to expand two existing subsidiaries and set up an automobile sales unit.
- **Tata Motors** is planning to showcase its first hybrid city bus during the Commonwealth Games, scheduled to be held in Delhi in October. In addition, the start-stop Indica passenger vehicle should be launched in India during 2010.

## A Few More Details:

Daimler AG has signed a Memorandum of Understanding (MoU) with BYD Company Limited entering into a comprehensive technology partnership for the development of electric vehicles (EVs) for China. Daimler and BYD are intending to develop a new EV specific to the requirements of the Chinese market. The vehicle will be marketed under a new brand jointly created and owned by Daimler and BYD. A common technology center will be established in China to develop, design and test this electric vehicle.

Source: Daimler

Volkswagen (VW) is aiming to be the market leader in hybrid and electric vehicles before the end of the decade. Chief executive officer Martin Winterkorn stated VW's goal is "to become the market leader in E-mobility by the year 2018". The company is targeting an EV market share of 3% within its entire range of products. VW is planning to launch an all-EV version of its Up minicar, the E-UP, the E-Golf and the E-Jetta in 2013. A test fleet of 500 electric Golfs is expected to be on the road next year. VW is launching its Touareg petrol-electric hybrid SUV (see **Exhibit 1**) at Geneva and added that a Jetta Hybrid will debut in 2012, followed a year later by Passat and Golf Hybrids.

Source: Headline Auto

### Exhibit 1: VW Touareg



Source: Volkswagen

This summer, the United States Postal Service, which operates the world's largest civilian vehicle fleet, will begin a yearlong pilot program of electric mail trucks in the Washington D.C. area -- using vehicles converted by five manufacturers. The participating companies are Bright Automotive, EDAG, Quantum Technologies, ZAP and Delaware-based AutoPort. The companies have six months to design and assemble the vehicles before a one-year demonstration begins this summer. There are 142,000 delivery trucks on the road -- most between 20 and 25 years old.

Source: Washington Post

Carlos Ghosn, chief executive of Renault and Nissan, has predicted automakers will be scrambling to meet demand for electric vehicles (EVs) -- and the lithium-ion batteries that power them -- within the next two years. Renault and Nissan expects to be the first automaker to market EVs in 2011 in any large volume. PSA Peugeot Citroën plans to launch two electric cars in Europe this year, and Mitsubishi's i-MiEV is already on the road in Japan.

Source: Financial Times

Celgard (a subsidiary of Polypore International) announced plans to expand production capacity at its existing lithium-ion separator manufacturing facility in Ochang, South Korea. The company plans to invest approximately \$30 million in the expansion project that should commence in 2H10.

The additional capacity is expected to come online in 2011 to serve customer growth in consumer electronics applications.

Source: Polypore

Sanyo Electric will be launching new 'enloop bike' models of electric hybrid bicycles that recharge themselves while being used. These electric bikes feature a next-generation riding mode called an "Eco Charge Mode". The current regenerative charging function, "Loop Charge," only recharges the battery during downhill stretches or deceleration. The electric motor on the front wheel switches to a dynamo in order to charge the battery. The "Eco Charge Mode" enables the rider to actively charge the battery while pedaling on flat roads.

Source: Sanyo Electric Company

Tata Motors is planning to showcase its first hybrid city bus during the Commonwealth Games, scheduled to be held in Delhi in October. The company is working on a full diesel-electric battery hybrid version of the city bus, a mild (start-stop) hybrid for the Indica (see **Exhibit 2**) and also electric versions of the Indica and the Nano. The start-stop Indica should be launched in India during 2010. Tata has firmed up plans to launch the electric Indica hybrid in India by the end of the year with the electric version of the Nano is going to Europe by 2013.

Source: DNA

## Exhibit 2: Tata Indica Vista

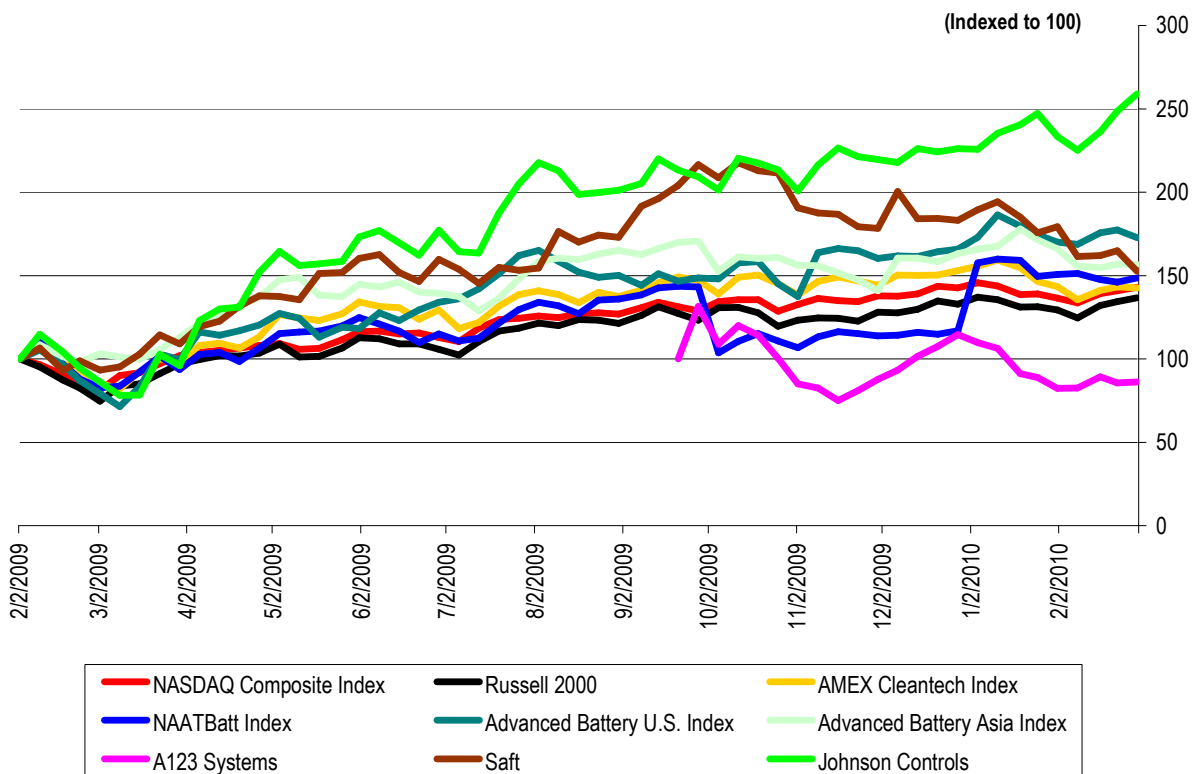


Source: Drive Inside

China South Locomotive & Rolling Stock Corp., the nation's largest maker of rail carriages, is planning to set up a venture with Liaoning Shuguang Automobile Group Co. to capitalize on the expected growth of EVs in the world's biggest auto market. The companies will invest at least 442.2 million yuan (or \$65 million) to expand two existing subsidiaries and set up an automobile sales unit. Vehicle sales in China increased 46% to 13.6 million units last year.

Source: Bloomberg

**Exhibit 3: Indices Performance  
(From February 2, 2009)**

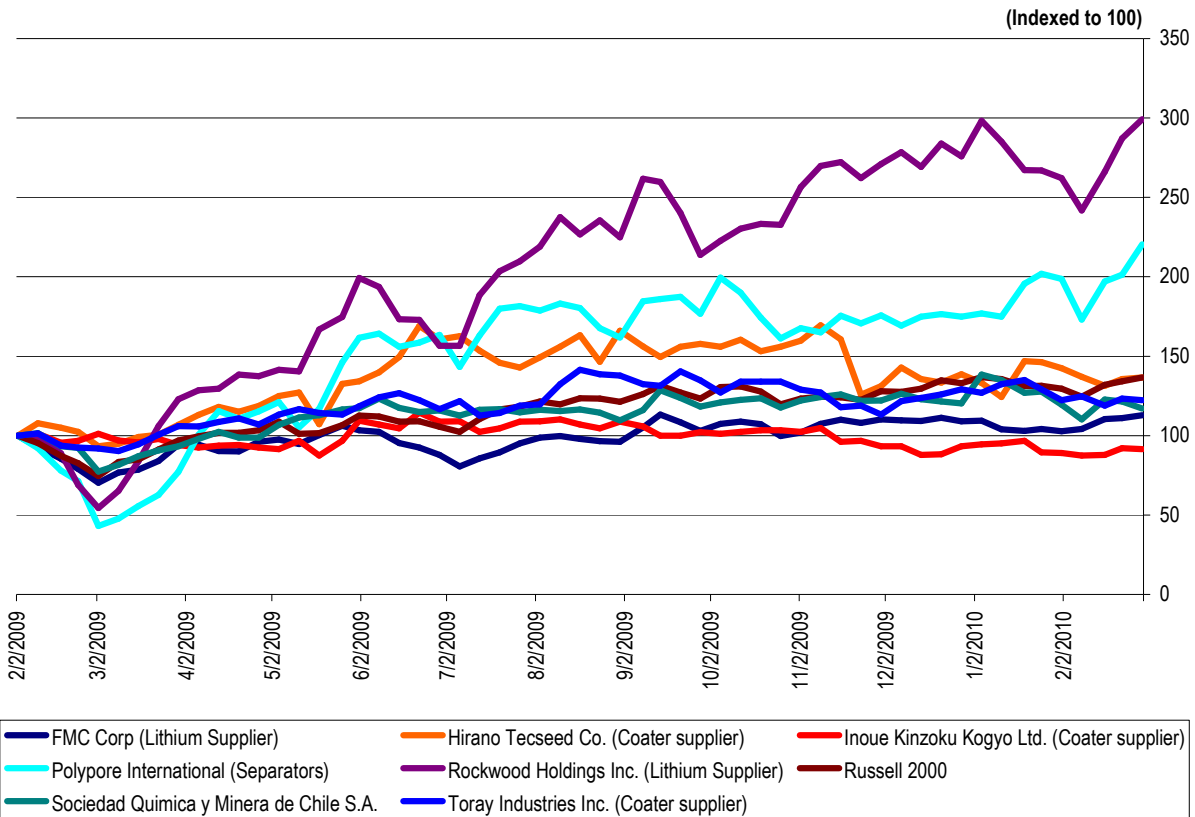


Index	Close on 3/1/2010	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	10,403.8	10,767.2	96.6%	47.4%	(0.3%)	0.2%
S&P 500	1,115.7	1,150.5	97.0%	52.9%	(0.1%)	0.7%
NASDAQ	2,273.6	2,326.3	97.7%	67.7%	(0.9%)	1.4%
Russell 2000	642.7	649.2	99.0%	65.2%	2.3%	1.6%
AMEX Cleantech Index	989.8	1,112.5	89.0%	58.3%	(7.2%)	(0.5%)

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 February 2, 2009)



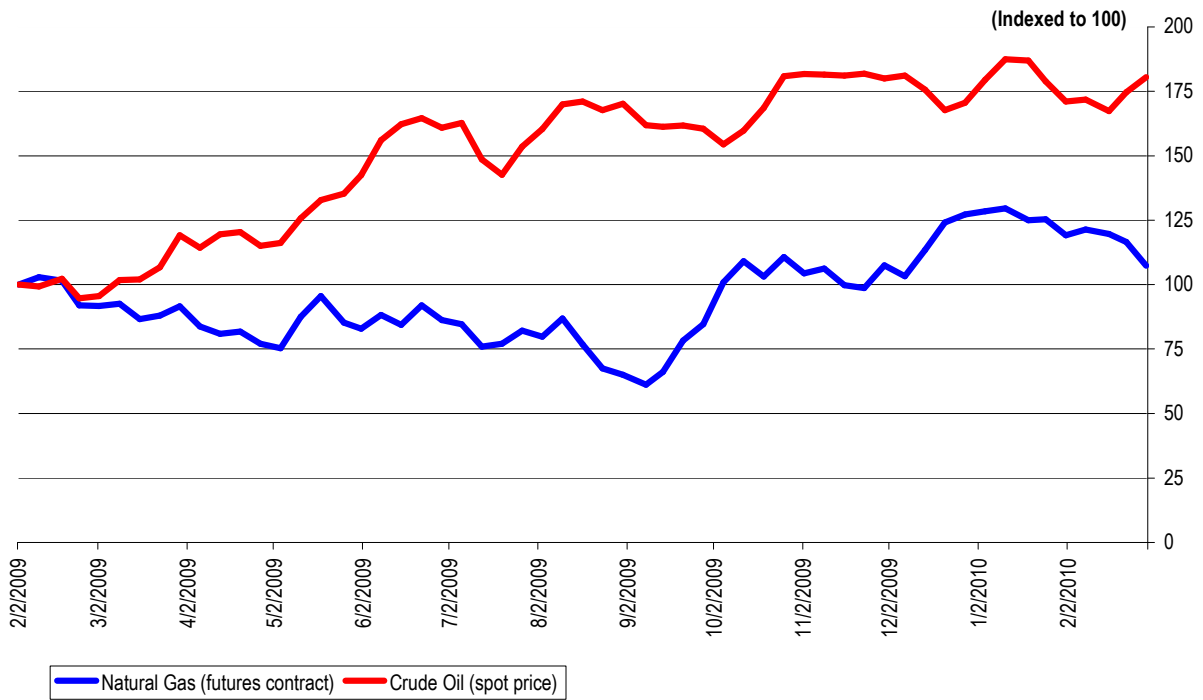
Source: Bloomberg

**Exhibit 5: Commodity Prices**

Commodity	Price on 3/1/2010	Price on 2/22/2010	Price on 2/1/2010	1 Week Change	1 Month Change
LME Nickel (Cash, \$ per tonne)	21,365	20,530	18,000	4.1%	18.7%
LME Lead (cash, \$ per tonne)	2,151	2,319	2,000	(7.2%)	7.5%

Source: LME

**Exhibit 6: Natural Gas and Crude Oil**  
 (From February 2, 2009)



Source: EIA



## STANDARDIZATION OF GEV BATTERIES

In the struggle to reduce the cost of the batteries that power grid-enabled vehicles (GEV's), standardizing the size, shape and connections of large format Li-Ion cells seems an obvious place to start. Standardization of key components is the hallmark of a maturing technology. In the case of GEV's, standardizing large format cells will reduce their cost of manufacture, make battery packs and GEV's easier and cheaper to design, and encourage the development of residual applications for large format Li-Ion cells, all of which will reduce the cost of GEV's to American customers.

So if standardization is such a good thing, why are all first generation GEV's released or planned for release in the United States (except for Tesla) using non-standard large format cells? There are two reasons: First, standardization of products in an industry ultimately occurs because customers demand it. But today there are no customers for mass-market GEV's. The only real customer, in the sense that it financed the first generation of GEV's, is the federal government. And which federal agency has the jurisdiction to push for GEV battery standardization (DOE, DOC, DOT, NIST)? No one knows.

The second reason is that industrial standards setting in the United States is generally done by consensus. This contrasts with a more "top down" approach to standards in the EU. In order to set standards in a U.S. market, each of the leading market participants must first conclude that standardization is in its own best interest—that its product cannot become the VHS to its competitors' Beta. In a still emerging industry, with no real pressure from government or consumers to economize and standardize, this may take a while. One can only hope that we have the time.

On Monday, March 15, NAATBatt will produce the next in its series of information Webinars, entitled "*Standardization of GEV Batteries: Understanding the Process and the Prospects*". We are honored to have as presenters representatives of the two organizations that are leading the battery standardization efforts in the United States: Bob Galyen, Chair of the SAE's Battery Standards Committee (Magna), and Dr. Priya Tabaddor, Director, Business Development for Global Energy Services at Underwriters Laboratories.

If you are planning to make, use or recharge advanced batteries for transportation applications in the United States, this is a program you should not miss. How, when and through what process GEV batteries standardize will have wide ranging implications for the industry. To register, please e-mail Suzanne Schnitzer at: [Suzanne@mcloudcommunications.com](mailto:Suzanne@mcloudcommunications.com) before March 12.

Finally, thank you to Dr. Mohit Uberoi of MEGTEC Systems and John Dispennette of KEMET North America for outstanding presentations at our March 1 Webinar on "*Reducing Waste in the Manufacture of Li-Ion Cells and Electrodes*". An audio file of their presentations will be posted on the NAATBatt Web site shortly.



Please remember that we cannot continue to bring you quality programs to grow our industry without your support. If you have not yet joined NAATBatt, please complete the membership inquiry form on our Web site at: <http://naatbatt.org/membership-inquiry/>

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



## Contact Information:

### National Alliance for Advanced Technology Batteries

122 South Michigan Avenue, Suite 1700  
Chicago, Illinois 60603  
(312) 588-0477

[www.naatbatt.org](http://www.naatbatt.org)

### Officers

Randy Moore  
*Chairman*

[rmoore@naatbatt.org](mailto:rmoore@naatbatt.org)

Jim Greenberger  
*Executive Director*  
[jgreenberger@naatbatt.org](mailto:jgreenberger@naatbatt.org)

Michael Lew  
*Head of Business Development*  
[mlew@naatbatt.org](mailto:mlew@naatbatt.org)

Ralph Brodd  
*Chief Technology Officer*  
[rbrodd@naatbatt.org](mailto:rbrodd@naatbatt.org)

Sandy Kane  
*Chief Financial Officer*  
[skane@naatbatt.org](mailto:skane@naatbatt.org)