

Summary:

For the May 28th issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities. On June 2nd, we will be hosting a webinar on "*Addressing The Challenges of Lithium Air Technology*". In addition, we have included an interview with Dan Squiller, CEO of PowerGenix.

The NAATBatt Index was up 2.5%, while the U.S. and Asia Battery Indices declined over 5%, respectively. The S&P500 declined 5.6% and Russell 2000 was down 7.8%.

Key Highlights:

- **Nissan Motor** and alliance partner **Renault** could market electric vehicles (EVs) without government incentives within 4 years. Nissan-Renault could have as many as eight EV models between them within a few years.
- **Ener1** has signed a binding letter of intent (LOI) for a new joint venture (JV) with the EV division of **Wanxiang**, the largest 'tier one' auto parts producer in China. Wanxiang is the second largest stakeholder in **Guangzhou Automobile**, which has JV partnerships that include **Honda**, **Toyota** and **Fiat**.
- **Honeywell** announced it has signed a contract with the **U.S. Department of Energy (DOE)** for a \$27.3 million grant to produce an electrolyte salt that is one of four critical components in rechargeable li-ion batteries. The grant is intended to enable Honeywell to become the first domestic supplier of high-purity electrolyte.
- About 100 representatives from Chinese automakers and trade groups participated in the **U.S.-China Advanced Technology Vehicle Summit**. The scheduled attendee list included **FAW Group**, **Dongfeng**, **Geely**, **Guangzhou Automotive**, **Wanxiang Group**, **EnerDel**, **Cummins**, **Remy** and **Allison Transmission**.
- **BYD Co** and **Daimler AG** set up a venture to develop EVs in China. Daimler and BYD will invest 600 million yuan (or \$88 million) in the 50-50 partnership.
- **General Motors** will develop an EV for India after scrapping a venture to make battery-powered compact models with **Reva Electric Car**. GM will also consider selling the **Chevrolet Volt** in India after the model debuts in November.
- **Valence Technology** received new purchase orders from **Enova Systems** to develop a new fleet of 16 hybrid-electric school buses. The school bus utilizes an 80 kilowatt (kW) hybrid drive train and a 38 kilowatt-hour (kWh) kWh li-ion battery system.
- **Azure Dynamics** announced that the **North Central Texas Council of Governments (NCTCOG)** has ordered 18 Balance(TM) Hybrid Electric shuttle buses. The vehicles re funded via an **American Recovery and Reinvestment Act of 2009 Transit Capital Assistance** program grant.
- A fleet of 30 **BYD** electric taxis are in operation in Shenzhen, South China's Guangdong province. The figure will increase to 100 by year-end as part of the local government's plan to create a green city. The goal is to have 24,000 EVs and 12,750 charging stations in operation by 2012.

A Few More Details:

Nissan Motor and alliance partner Renault could market electric vehicles (EVs) without government incentives within 4 years as target sales potentially reach up to 1 million EVs annually. The company stated that when it reaches scale (between 500,000 and 1,000,000 EVs annually), government incentives wouldn't be necessary. Nissan-Renault could have as many as eight EV models between them within a few years.

Source: Reuters

Ener1 has signed a binding letter of intent (LOI) for a new joint venture (JV) with the EV division of Wanxiang, the largest 'tier one' auto parts producer in China. The JV will begin producing battery systems in 2010 for Wanxiang's existing backlog of customers in China in the passenger and heavy-duty market segments, with the intention to expand to new customers and new geographies. Wanxiang customers include SAIC, Chana, Haima and Yutong, the world's second largest bus maker. Wanxiang is also the second largest stakeholder in Guangzhou Automobile. Guangzhou has JV partnerships that include Honda, Toyota and Fiat.

Source: Ener1

Honeywell announced it has signed a contract with the U.S. Department of Energy (DOE) for a \$27.3 million grant to produce a critical component of lithium-ion (li-ion) batteries used in hybrid and electric vehicles (EVs). The grant is intended to enable Honeywell to become the first domestic supplier of high-purity lithium hexafluorophosphate (LiPF₆), an electrolyte salt that is one of four critical components in rechargeable li-ion batteries.

Source: The Star-Ledger

About 100 representatives from Chinese automakers and trade groups participated in EV conference in Indianapolis. The event billed was billed as the U.S.-China Advanced Technology Vehicle Summit with the intent of forging new relationships – possibly spurring new orders for local auto-parts makers and maybe lure a Chinese car assembly plant. The scheduled attendee list included FAW Group, Dongfeng, Geely, Guangzhou Automotive, Wanxiang Group, EnerDel, Cummins, Remy and Allison Transmission.

Source: The Indianapolis Star

BYD Co and Daimler AG set up a venture to develop EVs in China. Daimler and BYD will invest 600 million yuan (or \$88 million) in the 50-50 partnership. Daimler is pushing into EV production in China to challenge luxury leader Bayerische Motoren Werke AG. The tie-up also gives BYD access to Daimler's technologies.

Source: Bloomberg

General Motors will develop an EV for India after scrapping a venture to make battery-powered compact models with Reva Electric Car (originally an electric version of the Spark as shown in **Exhibit 1**). The automaker is planning to use technology developed in Detroit. GM will also consider selling the Chevrolet Volt in India after the model debuts in November. The company ended its partnership after Mahindra & Mahindra Ltd., India's largest sport-utility vehicle maker, agreed to buy a 55 percent stake in closely held Reva.

Source: Business Standard

Exhibit 1: The Discontinued e-Spark Program



Source: *The Economic Times*

Valence Technology received new purchase orders from Enova Systems to develop a new fleet of 16 hybrid-electric school buses intended for service in school districts across Wisconsin and Ohio. Enova Systems is the electric drivetrain provider for Navistar International's hybrid-electric school bus, the Navistar IC(TM) CE Series yellow bus (as shown in Exhibit X). The school bus utilizes an 80 kW hybrid drive train and a 38 kWh li-ion battery system.

Source: *Valence Technology*

Exhibit 2: Hybrid Electric School Bus

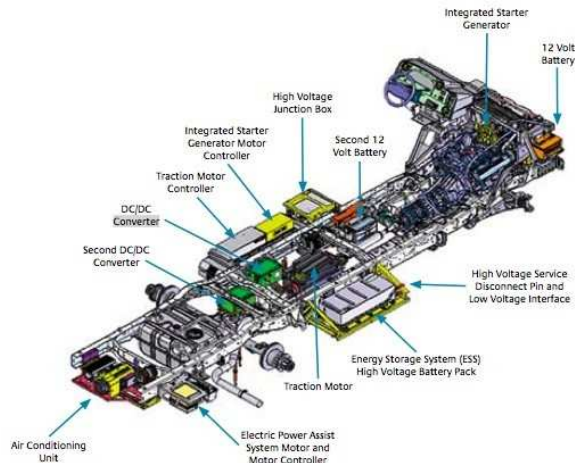


Source: *IC Bus*

Azure Dynamics announced that the North Central Texas Council of Governments (NCTCOG) has ordered 18 Balance(TM) Hybrid Electric shuttle buses (as shown in Exhibit X). The vehicles, which will be deployed in five different rural transit systems primarily in the North Central Texas (Dallas Fort Worth) area, are funded via an American Recovery and Reinvestment Act of 2009 Transit Capital Assistance program grant. Azure partnered with StarTrans Bus and Lasseter Bus and Mobility to submit the winning response to the NCTCOG RFP.

Source: *Azure Dynamics*

Exhibit 3: Balance(TM) Hybrid Electric Shuttle Bus Chassis



Source: Azure Dynamics

A fleet of 30 BYD electric taxis is in operation in Shenzhen, South China's Guangdong province. The figure will increase to 100 by year-end as part of the local government's plan to create a green city by introducing EVs. The goal is to have 24,000 EVs and 12,750 charging stations in operation by 2012. Pengcheng Electric Taxi Co Ltd is the JV responsible for electric taxi operations and was formed last year by BYD and local bus and taxi operator Shenzhen Bus Group Co Ltd.

Source: Xinhuanews

Exhibit 4: BYD e6 Electric Taxi



Source: China Daily



Interview with Dan Squiller, CEO of PowerGenix:

Please describe PowerGenix.

PowerGenix designs, manufactures, and markets Nickel-Zinc (NiZn) rechargeable batteries—a high-power, advanced-performance, and nontoxic battery chemistry. PowerGenix is on the market with consumer rechargeable cells and batteries for power tools and portable devices. We are developing products for hybrid electric vehicles and for grid storage. Our first transportation product is a 160 AH prismatic in the military 6T format that the U.S. Army will test in the fall.

How do you see the demand evolving in the various end-markets in the long term for PowerGenix (i.e., consumer, automotive, etc.)?

Our consumer AA cells have received very positive reviews and were named one of the best products of 2009 by *Popular Science* Magazine. We will soon release an AAA. In addition to sales on the Internet, the product will be available in thousands of retail storefronts by the end of the year.

We have strong interest from power tool makers, where our NiZn batteries provide a lower cost, full power alternative to li-ion. We anticipate our first programs this year.

Consumer cell and power tool battery sales will provide a solid base for the company as we develop larger format solutions for transportation and grid storage. PowerGenix NiZn batteries have two very high-potential applications for hybrid electric vehicles (HEVs) – as a higher performance, lower weight alternative to lead acid batteries for micro-hybrid (stop-start) vehicles, and as a high-performance, cost-effective alternative to both NiMH and Li-ion for mild/full HEVs. In the next few years, we see substantial global opportunities for the micro-hybrid battery and excellent opportunities for NiZn mild/full HEV systems in the most cost-sensitive markets, such as China. We're also actively investigating opportunities for large format NiZn batteries in the stationary storage market.

How do you envision the company's roadmap evolving over the next three years?

The consumer AA product can replace NiMH products in the market today and compete as a full-performance, rechargeable alternative to primary lithium AAs. We plan to grow sales aggressively, both directly and as an OEM supplier of NiZn batteries to established players.

The portable device market will grow more slowly, but as we add new programs, it will provide a substantial and growing base of revenue.

These products will build the foundation for company growth and expansion into larger-scale applications such as transportation and grid storage.

Please highlight the challenges ahead.

While we have commercial products today, it's important to that remember NiZn is still a relatively young rechargeable chemistry. There's plenty more we can do to optimize performance and cost, especially in larger format applications. Also, as our volumes increase, the manufacturing and quality assurance challenges become more complex. As we pursue larger format applications in transportation, our go-to-market strategy may require partnerships with other battery companies and integrators.

What is your view on lithium-ion technology?

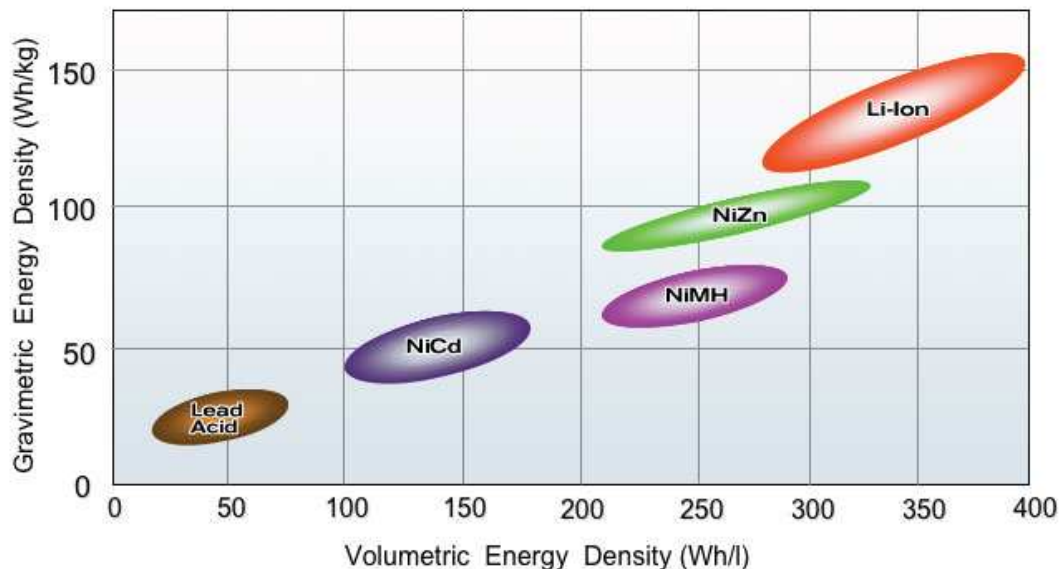
One thing to remember about the energy storage industry is that no single chemistry or battery is a “silver bullet.” The variations in applications, from grid storage to cell phones, require drastically varied performance capabilities and cost points. Lithium-ion has very strong advantages for lower rate applications where physical size and high energy density are priorities. However, Li-ion’s high cost per watt-hour prices it out of many markets and inherent safety issues have already proven a concern for many industry segments, such as transportation.

Please characterize the competitive landscape. Where do you believe PowerGenix could have a competitive advantage?

PowerGenix NiZn battery is a high-performance, high-power, and low cost alternative to NiMH and Li-ion. We’re targeting applications that require high power density, safety, and low cost.

(Below is a chart, **Exhibit 5**, representing performance of the primary rechargeable battery technologies across five major performance categories.)

Exhibit 5: A Technology Performance Comparison



Source: PowerGenix

What is the company’s go-to-market strategy?

PowerGenix’s go-to-market strategy has been to build a strong revenue base from sales of consumer and power tool products expanding into transportation and grid storage markets, directly and through partnerships.

Many in the U.S. have indicated a preference for PHEV versus all-electric, what are your thoughts?

In our view, the electrification of the automobile will come in many flavors, from micro-hybrids through to the fully electric vehicle. The auto industry is still reaching new levels of efficiency with the internal combustion engine, and coupled with their investment and understanding of gas-powered vehicles, we see the market for micro-hybrids and mild/full HEVs continuing to blossom for many years to come—especially in cost-conscious markets such as China and India that are experiencing a boom in auto sales and vehicle penetration. We believe that it will be many years before batteries for PHEVs and EVs meet the necessary cost and performance metrics for mass adoption.

How big do you envision the electric vehicle (including autos, e-bikes, etc.) market will be by 2015?

We and most industry analyst expect this to be a multi-billion-dollar market by 2015.

How do you envision U.S. and European battery manufacturers effectively dealing with the low-cost PRC manufacturers?

This will be a huge challenge for U.S. manufacturers. The battery industry is not a high-margin business, and the inherently complex and precise manufacturing processes for batteries require tremendous infrastructure investment. For the last 15-20 years, Japan and Korea have provided large R&D subsidies to their battery industries to develop core battery technology as well as advanced manufacturing technology. For this reason, Japan currently dominates the HEV battery landscape with Korea close behind, and China moving rapidly.

Even with ARRA manufacturing grants, it will be hard for U.S. battery companies to catch up and make the economics work following such large and sustained investments by their Asian rivals.

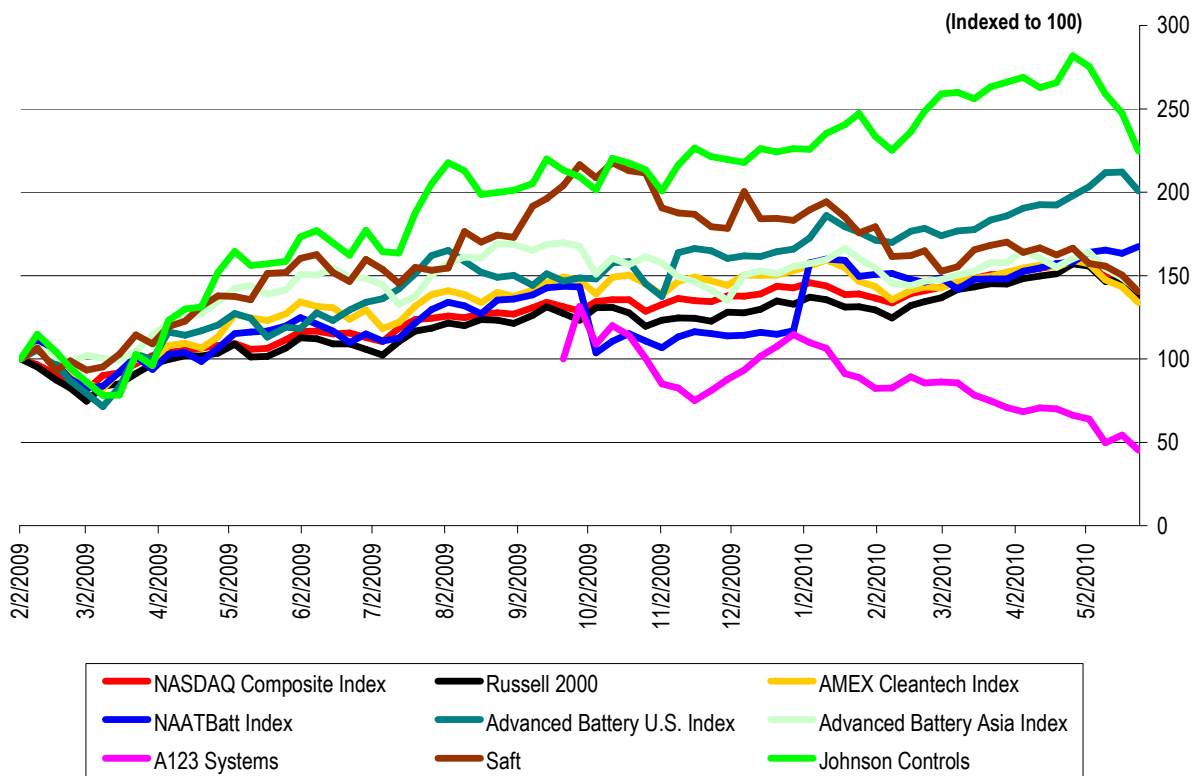
For this reason, PowerGenix has developed its technology for manufacturing on existing, and often excess, NiCd and NiMH manufacturing production lines. Through partnership with our contract manufacturer, Hunan Corun, PowerGenix is able to scale manufacturing volume in order to meet demand with very little capital investment.

As we move into larger format batteries for transportation and stationary storage, we may need to look at multiple investment and partnership models.

Any final thoughts?

After considerable R&D and product development, PowerGenix has commercialized NiZn battery technology for use in consumer products, portable devices, and transportation. The company is focused on key applications where our value proposition is strongest. We plan to grow the company using a variety of manufacturing, marketing, and partnership strategies and see strong growth ahead.

Exhibit 6: Indices Performance
(From February 2, 2009)

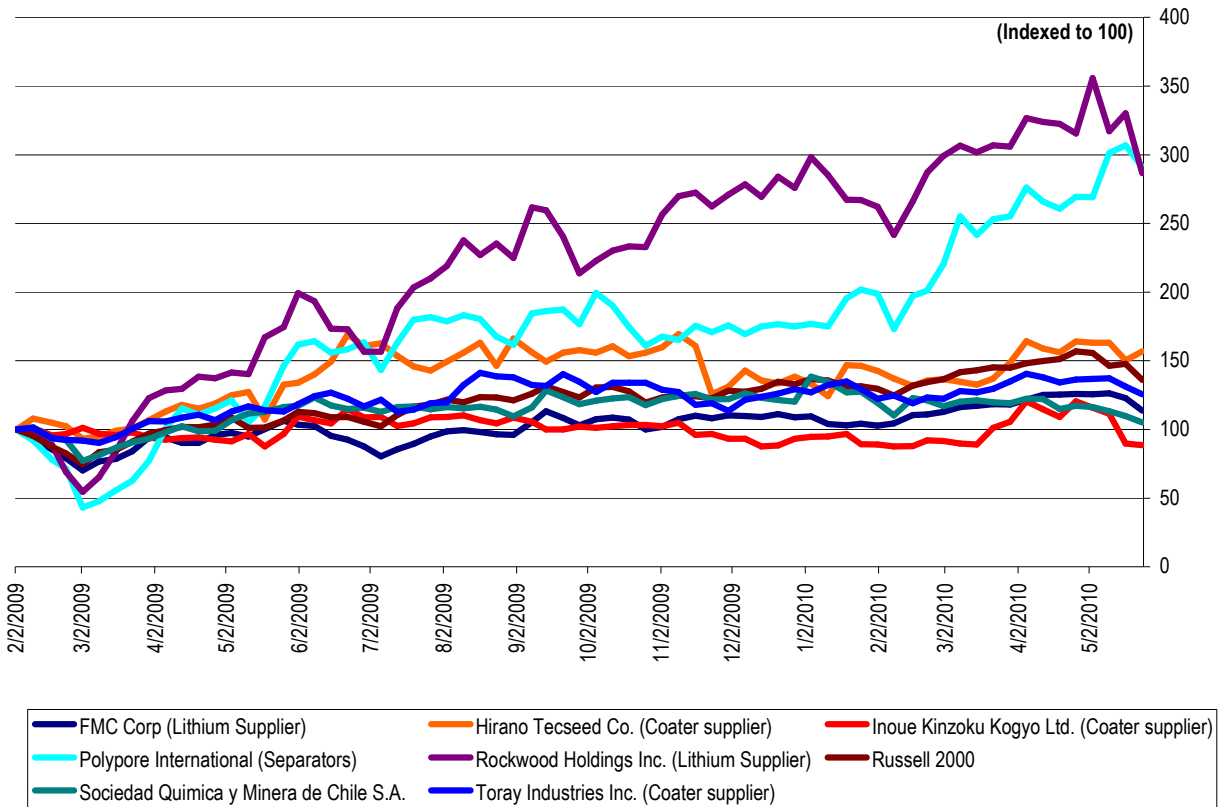


Index	Close on 5/24/2010	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	10,066.6	11,309.0	89.0%	21.6%	(3.5%)	(5.3%)
S&P 500	1,073.7	1,219.8	88.0%	21.0%	(3.8%)	(5.6%)
NASDAQ	2,213.6	2,535.3	87.3%	31.9%	(3.5%)	(6.0%)
Russell 2000	641.2	746.0	86.0%	34.3%	2.1%	(7.8%)
AMEX Cleantech Index	929.0	1,112.5	83.5%	8.4%	(12.9%)	(6.6%)

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 7: Supplier Performance
(From February 2, 2009)



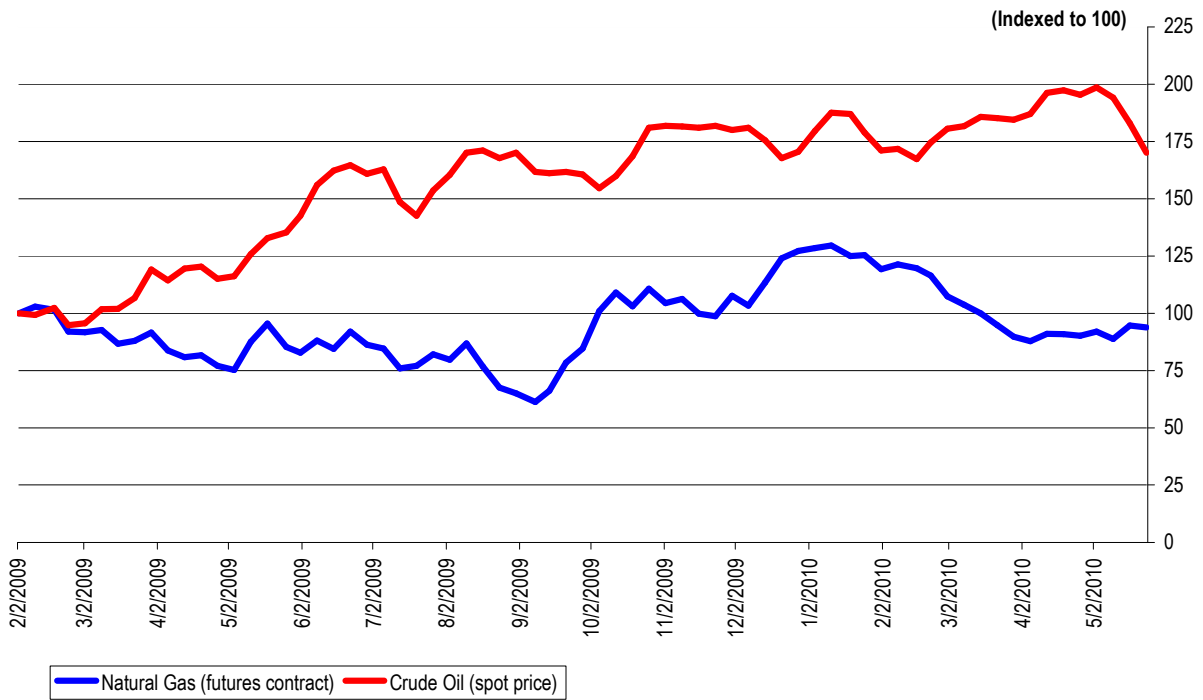
Source: Bloomberg

Exhibit 8: Commodity Prices

Commodity	Price on 5/24/2010	Price on 5/17/2010	Price on 4/26/2010	1 Week Change	1 Month Change
LME Nickel (Cash, \$ per tonne)	21,590	21,025	27,305	2.7%	(20.9%)
LME Lead (cash, \$ per tonne)	1,777	1,863	2,310	(4.6%)	(23.1%)

Source: LME

Exhibit 9: Natural Gas and Crude Oil
 (From February 2, 2009)



Source: EIA



GRID-LEVEL STORAGE MARKET MAY HELP EV ECONOMICS

Next month, NAATBatt will spearhead a new government relations initiative by member companies to promote the development of a market for grid-level energy storage technology. Much has been written about the benefits of grid-level storage technology, in particular its ability to enable the integration of variable, renewable energy sources onto the grid.

The benefits of large-scale energy storage, however, go well beyond energy balancing. A recent article in Forbes by Mark Mills, Chairman of NAATBatt member International Battery (see: <http://www.forbes.com/2010/05/14/smart-grid-general-electric-intelligent-investing-energy.html>), makes an interesting point about the revolutionary role that storage technology has played in telecommunications and suggests that, by analogy, storage could prove just as revolutionary to the grid.

For advanced battery manufacturers, however, grid-level storage offers a more short-term benefit: a potential new market for their technology. Many advanced battery companies, such as Altair Nano and A123, already offer grid-level storage products. With short-term overcapacity in lithium-ion battery manufacturing looming as a result of government investment in the sector, grid-level storage products may provide a useful way to put some of that excess capacity to use.

Grid-level storage also has the potential to lower the cost of EV's and PHEV's to consumers by providing a secondary application for retired automotive batteries. Although the technology is still unproven, if retired automotive batteries could be repurposed for applications such as community energy storage, the implication for EV and PHEV costs would be significant. Bringing down the cost of EV and PHEV batteries is essential to the success of the advanced battery industry. Grid-level storage may provide an opportunity to do just that.

It is important that all advocates for vehicle electrification get behind the push for grid-level storage. While grid-level storage is itself a revolutionary technology, it is also potentially an enabling technology for the EV's and PHEV's. Grid-level storage may prove to be an important strategy for bringing down advanced automotive battery costs—the key barrier to penetration of the consumer market by EV's and PHEV's. Creating the legislative and regulatory conditions necessary to develop a viable market for grid-level storage will not be easy. The support of the OEM's and advanced automobile supply chain companies will be necessary to achieve it. Let's hope they will have the foresight to do so.



James J. Greenberger
Executive Director
May 28, 2010

North American Industry Announcements and Calendar

- **Next Webinar Program: Lithium Air** The NAATBatt bi-monthly Webinar series continues on Wednesday, June 2, 2010, with a program entitled “*Addressing the Challenges of Lithium Air Technology*”. Lithium air is the next generation battery technology with, perhaps, the greatest potential, offering theoretical energy densities of more than ten times that of lithium-ion. But lithium air faces great challenges and its commercialization is highly uncertain. NAATBatt will take a look at this exciting if problematic technology and provide an honest assessment of where it is, how far it needs to go, and what it will take to get there. The speakers on June 2 will be Dr. Winfried Wilcke, Program Director at IBM’s Almaden Research Center, and Dr. Lonnie Johnson, President and CEO of Excellatron Solid State LLC. The program will begin at 2:00 p.m., EDT and last approximately 60 minutes. To register, please go to: <http://events.meetingbridge.com/Register/?EventCode=06123170031>. Registration for the June 2 program is complimentary.
- **Southern Growth Policy Center Conference:** A conference of Southern governors, automobile executives and economic development officials outlining strategies for continuing the development of the automobile industry in the South will be held in Lexington, KY on June 7-8, 2010. NAATBatt is a supporting organization of the conference. For more information about the program, entitled *Driving the Next 20 Years: Creating the New Southern Automotive Industry*, visit: <http://www.southerngrowth.com/conference/conf.html>.
- **44th Power Sources Conference:** The 44th Power Sources Conference will be held on June 14-17 at the Riviera Hotel in Las Vegas. The conference will examine developments in a wide variety of battery chemistries. Information about the conference can be found at: <https://www.powersourcesconference.com/>
- **The 15th International Meeting on Lithium Batteries:** The 15th International Meeting on Lithium Batteries will be held in Montreal, Canada on June 27-July 2, 2010. The meeting will honor Prof. John Goodenough of the University of Texas. Information about the meeting and registration information can be found at: <http://www.imlb.org/#>
- **Storage Week 2010:** Storage Week 2010, sponsored by Infocast, will be held on July 12-15, 2010 in San Diego. The conference will focus on grid level storage with separate tracks on bulk storage and grid services. Information about the conference can be found at: <http://www.infocastinc.com/index.php/conference/storage10>.
- **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>
- **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



- **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.



Contact Information:

National Alliance for Advanced Technology Batteries

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

www.naatbatt.org

Officers

Randy Moore
Chairman

rmoore@naatbatt.org

Jim Greenberger
Executive Director
jgreenberger@naatbatt.org

Michael Lew
Head of Business Development
mlew@naatbatt.org

Ralph Brodd
Chief Technology Officer
rbrodd@naatbatt.org

Sandy Kane
Chief Financial Officer
skane@naatbatt.org