

## Summary:

For the April 23<sup>rd</sup> issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities. On May 4<sup>th</sup>, we will be hosting a webinar on *"Developments in Anode Technology - Positive Progress Today and Tomorrow"*.

The NAATBatt Index increased 1.7%. The U.S. Battery Index was flat while the Asia Battery Index declined 3.3%. The S&P500 and Russell 2000 were up modestly.

## Key Highlights:

- The **Department of Energy's (DOE) Oak Ridge National Laboratory (ORNL)** is collaborating with various corporations in an effort to further advance U.S. lithium-ion (li-ion) battery production. ONL is teaming with **A123 Systems, Dow Kokam, Porous Power Technologies** and **Planar Energy**.
- **Best Buy Europe** will become the first electrical retailers to sell cars, scooters and bikes. The Best Buys will showcase the **Tesla Roadster** and UK-based **Electric Car Corporation's Citroen's C1 ev'ie** four-seater EV and a range of electric scooters and bicycles.
- **Toyota Motor Corp** is planning to launch a Prius hybrid minivan using li-ion batteries in early 2011. The EV will be priced at a level similar to current models offered that use nickel-metal hydride batteries.
- **DesignLine Middle East** (a subsidiary of subsidiary of **DesignLine International**) has delivered two all-electric buses for use in Abu Dhabi, United Arab Emirates. We highlight the company's two main U.S. contracts for selling hybrid buses are a \$50.4 million deal with the New York City Transit Authority and a \$12.2 million agreement with the city of Baltimore.
- **BYD Co.** plans to launch the all-electric vehicle (EV) e6 in Shenzhen in 2H10 by supplying e6 taxis. The strategy is to initially focus on "fleet" business' with the e6, selling the EV to taxi operators and government agencies.
- **Volkswagen** launched the zero emission 2010 Milano Taxi Concept at the Hanover Trade Show in Germany. The Milano taxi has a top speed of 120 km/hr (75 mph) with a maximum driving range of up to 300 km (or 186 miles).
- The **Mitsubishi** electric car is entering the test phase in Quebec and British Columbia (B.C.). Three i-MiEV electric cars are in B.C., while 50 cars are to arrive in Quebec before the end of the year. The objectives are to see how the EVs handle Quebec winters and another is to determine how consumers will integrate them into daily lives.
- **Nissan Motor Co.** disclosed that it had received preorders for its new Leaf EV totaling 3,754 since April 1<sup>st</sup>. The company began accepting orders for the Leaf at the beginning of the month.

## A Few More Details:

The Department of Energy's (DOE) Oak Ridge National Laboratory (ORNL) is collaborating with various corporations in an effort to further advance U.S. lithium-ion (li-ion) battery production.

Under the American Recovery and Reinvestment Act (ARRA) funding, individual Cooperative Research and Development Agreements (CRADAs) have been signed with: A123 Systems, for domestic supply of anode materials; Dow Kokam, for processing and characterization of novel cathodes; Porous Power Technologies, for improved separator materials; and Planar Energy, for scalable processing of solid-state batteries. In each case, industry cost-share exceeds 50% of the total project cost.

*Source: Oak Ridge National Laboratory*

Best Buy Europe will become the first electrical retailers to sell cars, scooters and bikes. The first of the "big box" stores, which are a joint venture between Carphone Warehouse and Best Buy, will open in Essex next Friday and will stock EVs. The Best Buys will showcase the Tesla Roadster and UK-based Electric Car Corporation's Citroen's C1 ev'ie four-seater EV (see **Exhibit 1**) and a range of electric scooters and bicycles. The Citroen's li-ion batteries are being supplied by Axion, Europe's largest independent lithium-ion battery systems supplier.

*Source: Telegraph.co.uk*

### Exhibit 1: The Citroen C1 ev'ie



*Source: Automobiles Review*

Toyota Motor Corp is planning to launch a Prius hybrid minivan using li-ion batteries in early 2011. The EV will be priced at a level similar to current models offered that use nickel-metal hydride batteries. The company will initially manufacture li-ion batteries at the Teiho factory in Aichi Prefecture with plans to eventually produce them at Panasonic EV Energy Co -- the battery joint venture with Panasonic Corp.

*Source: Nikkei Business Daily*

DesignLine Middle East (a subsidiary of subsidiary of DesignLine International) has delivered two 100% electric buses for use in Abu Dhabi, United Arab Emirates. The Eco-Smart I buses are expected to be operation before July on Sir Bani Yas Island, making it the first destination in the world to have an entirely electric transportation system. We highlight the company's two main U.S. contracts for selling hybrid buses are a \$50.4 million deal with the New York City Transit Authority and a \$12.2 million agreement with the city of Baltimore.

*Source: Charlotte Business Journal*

BYD Co. plans to launch the all-electric vehicle (EV) e6 in Shenzhen in 2H10 by supplying e6 taxis. The company plans to sell the e6 model for slightly more than \$40,000. The strategy is to initially focus on "fleet" business' with the e6, selling the EV to taxi operators and government agencies. The company reiterated plans to launch the e6 in the U.S. during 2H10.

Source: WSJ

Volkswagen launched the zero emission 2010 Milano Taxi Concept (see **Exhibit 2**) at the Hanover Trade Show in Germany. The Milano taxi has a top speed of 120 km/hr (75 mph) with a maximum driving range of up to 300 km (or 186 miles). The EV is powered by an electric motor delivering a peak power of 85 kW using a 45 kWh li-ion battery pack and can be recharged to 80% of capacity in 1 hour. Volkswagen has stated intentions to become world's leading automaker by 2018, leading in all segments including EVs.

Source: Nitrobahn

### Exhibit 2: The Milano Taxi



Source: Nitrobahn

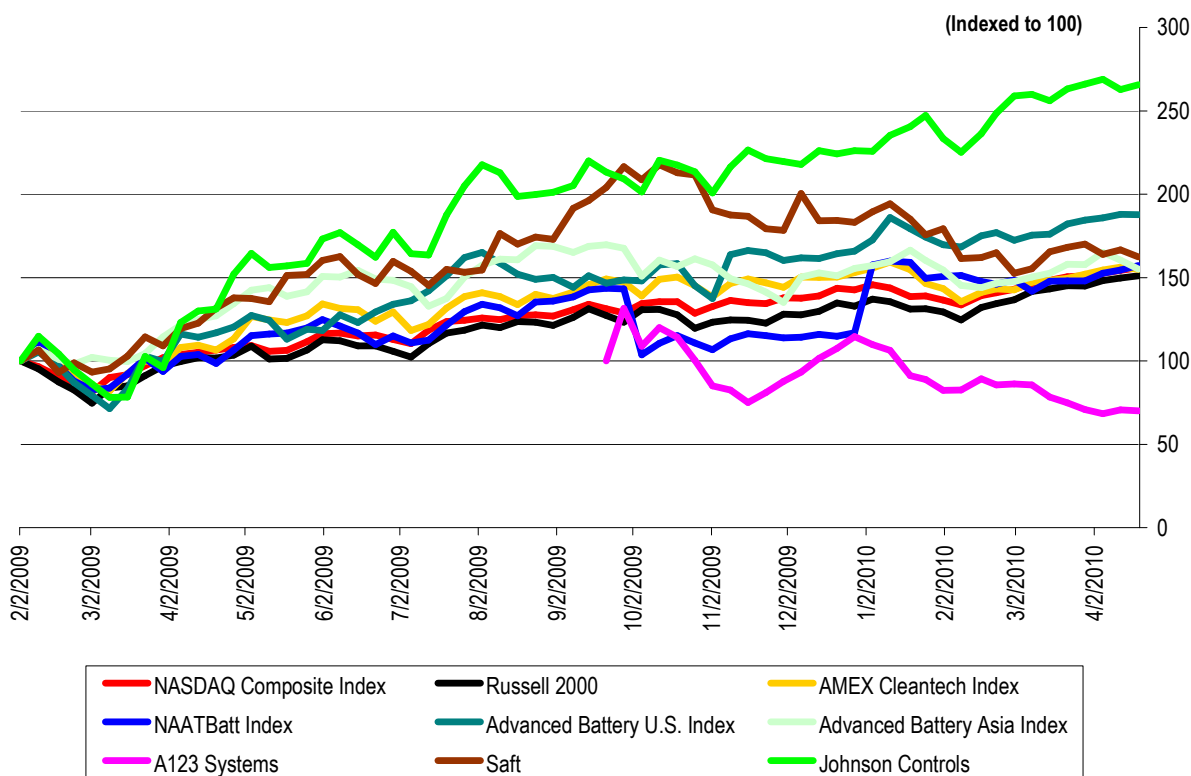
The Mitsubishi electric car is entering the test phase in Quebec and British Columbia (B.C.). Three i-MiEV electric cars are in B.C., while 50 cars are to arrive in Quebec before the end of the year under a 3-year, \$4.5-million project involving Hydro-Québec and the city of Boucherville. For the Boucherville tests, the i-MiEV cars will be used by municipal employees and local business people. The objectives are to see how the EVs handle Quebec winters and another is to determine how consumers will integrate them into daily lives. It is anticipated 85% of the EV recharging will take place either at home or at the workplace. By 2020, Mitsubishi expects PHEVs will account for 20% sales.

Source: Montreal Gazette

Nissan Motor Co. disclosed that it had received preorders for its new Leaf EV totaling 3,754 since April 1<sup>st</sup>. The company began accepting orders for the Leaf at the beginning of the month and had set a target of selling 6,000 units by the end of fiscal 2010 on March 31, 2011.

Source: Xinhua

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

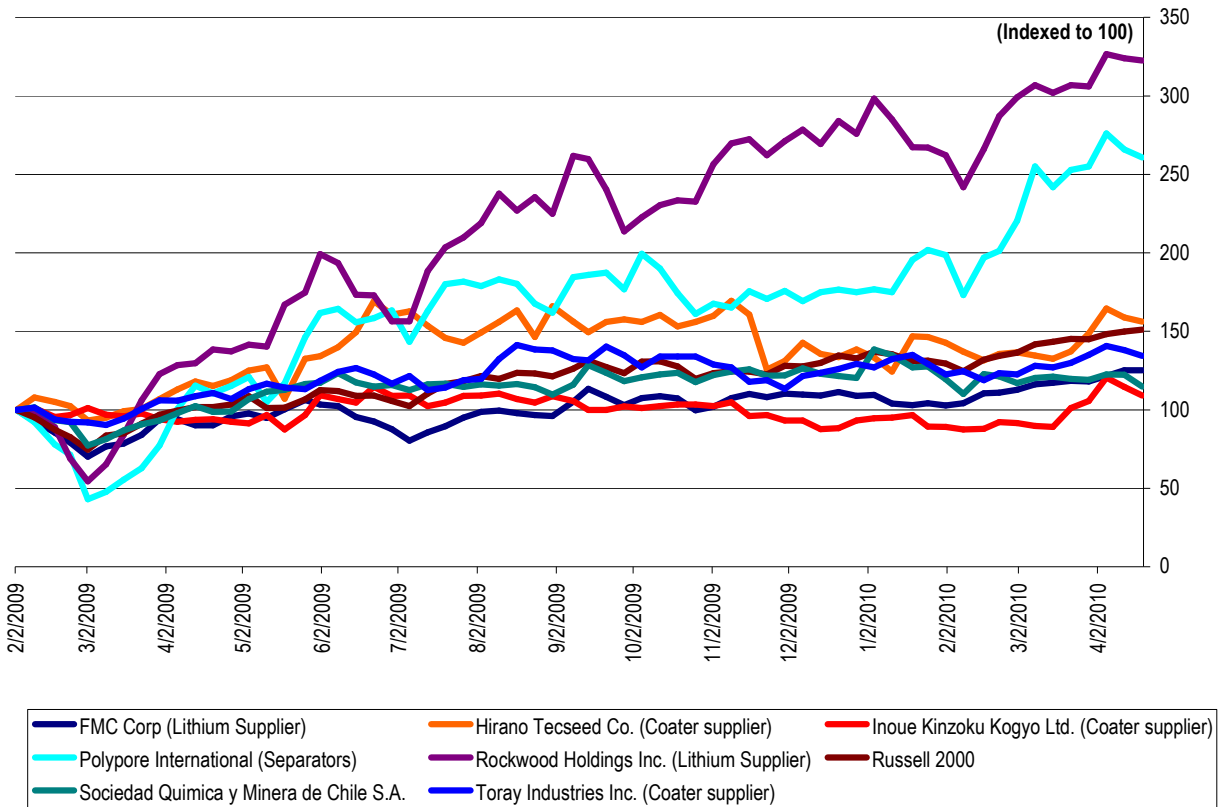


Index	Close on 4/19/2010	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	11,092.1	11,189.6	99.1%	36.5%	6.3%	0.8%
S&P 500	1,197.5	1,213.9	98.6%	37.9%	7.3%	0.1%
NASDAQ	2,480.1	2,517.8	98.5%	51.1%	8.1%	0.9%
Russell 2000	711.4	725.1	98.1%	48.8%	13.3%	0.9%
AMEX Cleantech Index	1,076.0	1,112.5	96.7%	39.7%	0.8%	(0.9%)

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)



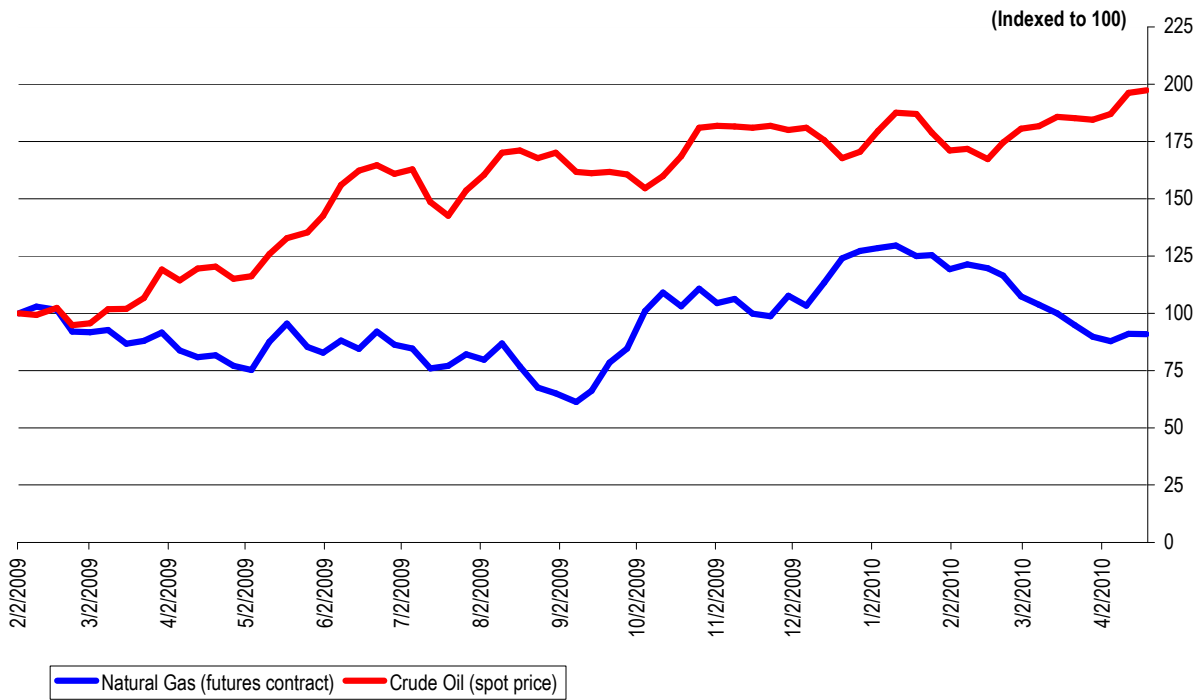
Source: Bloomberg

**Exhibit 5: Commodity Prices**

Commodity	Price on 4/19/2010	Price on 4/12/2010	Price on 3/19/2010	1 Week Change	1 Month Change
LME Nickel (Cash, \$ per tonne)	26,400	25,575	22,675	3.2%	16.4%
LME Lead (cash, \$ per tonne)	2,187	2,315	2,210	(5.5%)	(1.0%)

Source: LME

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



Source: EIA

## Executive Director's Notes



### INCENTIVIZING ENERGY STORAGE R&D

Last Wednesday, a group of 100 companies and venture capital firms, led by the National Venture Capital Association (NVCA) and TechNet, submitted a letter to Congress urging continued support for the Advance Projects Research Agency – Energy (ARPA-E). ARPA-E is an agency of the U.S. Department of Energy, whose mission is to fund high-risk projects that will develop transformational energy technologies, including energy storage. Over the past year, ARPA-E has disbursed more than \$150 million of grants to support the development of new energy technologies, many of them related to advanced electrochemical energy storage.

While we at NAATBatt fully back the efforts of the NVCA and TechNet in support of ARPA-E and add our voice to their petition, we strongly believe that it does not go far enough. ARPA-E is a good and important program. But since its authorization nearly three years ago, it has managed to invest only \$151 million in new technology. The sad fact is that notwithstanding the new funding of this past year, both public and private investment in energy R&D has fallen in real dollar terms since 1980. That we spent a whopping \$151 million last year to address the biggest economic, military, societal and environmental challenge of our time is not laudable, it is pathetic and outrageous.

But though our outrage is well-founded, it must not blind us to hard realities. The lack of funding for energy R&D is not the result of a lack of commitment to new technology among those running national energy policy today. Just the opposite is true. The lack of funding for energy R&D—which has been chronic since the 1980's—is a consequence of the lack of a political constituency for basic energy research. Those who truly care about next generation anode and cathode technologies may not number much beyond those who signed the NVCA petition and those reading this newsletter.

Moreover, the entire venture model, which funded a revolution in computer and IT technologies over the past three decades, may be less well suited to energy technology. The heavy capital investment requirements and long product development cycles that characterize new energy storage technologies are challenging to a financial industry that is driven by five year internal rates of return. Even if the government provides seed capital for new technologies, it is unclear where the next rounds of financing will come from. The amount of venture investment it took to start Google and take it public would be insufficient to equip so much as a single production line at a next generation battery plant.

The better strategy for directing much needed investment capital into energy R&D should focus more on demand-pull than on technology-push. If electric vehicles can be made cheap and practical, consumers will buy them. If utilities can profit from electric vehicles and energy storage, rather than just have to deal with them reactively, utilities will facilitate and adopt them. And, most importantly, if the major automotive



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OEM's, technology companies and domestic battery manufacturers--most of whom remain today effectively on the sidelines of advanced energy storage technology--really believed that American consumers and utilities were going to buy the best and most efficient electric vehicles and grid-level storage devices in large numbers, the amount that would be invested in stored energy technology by the private sector would dwarf in an instant the paltry \$151 million of ARPA-E grants.

The time has come for the stored energy technology community to come together and develop a funding strategy that works. That strategy, while supportive of funding for advanced research, must first and foremost focus on getting consumers to buy electrified vehicles and utilities to buy energy storage technology. If we can do that, we might actually make some progress on the biggest economic, military, societal and environmental challenge of our time.



James J. Greenberger  
Executive Director

## Announcements:

- **Next Webinar Program:** The NAATBatt bi-monthly Webinar series continues on Tuesday, May 4, 2010, with a program entitled "*Developments in Anode Technology*". The program will look at new anode technologies coming onto the market today and explore next generation non-carbon based anodes that may shape the market of the future. The speakers at the May 4 program will be Dr. Bharat Chahar, Co-Founder and Product Manager, CPreme® Energy Storage Systems at ConocoPhillips Specialty Products, and Prof. Gleb Yushin of the Georgia Institute of Technology, School of Material Science and Engineering. 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/?06123165585>.
- **AABC Conference in Orlando:** The 10<sup>th</sup> 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>.
- **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>.
- **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](http://www.batterypoweronline.com/bppt-conf10/bp10_supportingorg.php)
- **NAATBatt Membership Information.** 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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