

## Summary:

For the April 16<sup>th</sup> issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities. On April 19<sup>th</sup>, we will be hosting a webinar on "*Legislative Initiatives for Grid-Level Energy Storage*". In addition, we have included an interview with Mohit Uberoi, President of MEGTEC Systems.

The NAATBatt and U.S. Battery Indices were up modestly while the Asia Battery Index declined 2.9%. The S&P500 and Russell 2000 also delivered modest gains..

## Key Highlights:

- The **GS Yuasa Corp** and **Mitsubishi Motors Corp** joint venture (JV), **Lithium Energy Japan**, is planning to spend 37.5 billion yen (or \$400 million) to build a 3<sup>rd</sup> lithium-ion (li-ion) battery plant in Japan. By 2012, the JV should be able to produce enough batteries for 67,800 i-MiEVs (from the current 2,300 vehicles).
- **Ford Motor Co.** is planning to collaborate with utility companies throughout the U.S. to develop an infrastructure to support the use of electric vehicles (EVs). **General Motors** also announced it would double the size of its advanced automotive battery lab in an effort to accelerate EV development.
- The **Government of Ireland** will be giving grants of 5,000 Euros (or \$6,815) for the purchase of EVs. In addition, Ireland's **Electricity Supply Board** is planning to roll out 3,500 charge points by December 2011.
- The **Renault-Nissan Alliance** and **Electricite de France SA** confirmed an experimental EV project in Yvelines, France. The Environmental and Energy Management Agency (ADEME).will support the project with 6.5 million Euros (or about \$8.9 million) funding.
- The first large EV charging station is being built in Linyi city, located in east Shandong province. The project is being developed by the **Shandong Electric Power Corp** and is expected to cost 23 million yuan (or \$3.37 million).
- **Honda Motor Co** unveiled an all-electric scooter. The EV-neo will have a range of more than 30 km (or 18.6 miles) and will be aimed at commercial users in Japan – targeting companies that make deliveries, including newspapers and pizza parlors.
- **Giant Manufacturing Company** (Taiwan-based) is planning to invest an initial \$36 million to build a new bicycle and EV plant in eastern China. The plant located in Kunshan will also produce bicycle frames and carbon fiber.
- **Zoltek Companies** announced the formation of a new subsidiary, Zoltek Automotive, which will be focused on the development of carbon fiber applications in the automotive industry. We highlight the company is currently supplying carbon fiber to Tesla Motors.
- **Advanced Battery Technologies** announced that it obtained approximately \$1.6 million in new orders of EVs. The company plans to deliver the electric scooters within the next twelve months.

## A Few More Details:

The GS Yuasa Corp and Mitsubishi Motors Corp joint venture (JV), Lithium Energy Japan, is planning to spend 37.5 billion yen (or \$400 million) to build a 3<sup>rd</sup> lithium-ion (li-ion) battery plant in Japan. The capacity addition will increase the JV's annual capacity by to power about 50,000 Mitsubishi Motors' i-MiEV electric vehicles (EVs). By 2012, the JV should be able to produce enough batteries for 67,800 i-MiEVs (from the current 2,300 vehicles).

Source: Reuters

Ford Motor Co. is planning to collaborate with utility companies throughout the U.S. to develop an infrastructure to support the use of EVs. General Motors also announced it would double the size of its advanced automotive battery lab (in Warren, MI) in an effort to accelerate EV development. GM plans to invest \$8 million to expand the lab.

Source: Dow Jones

The Government of Ireland will be giving grants of 5,000 euros (\$6,815) for the purchase of EVs. Purchasers of EVs will receive a grant and also be exempt from vehicle registration tax. Ireland's Electricity Supply Board is planning to rollout 3,500 charge points by December 2011. The effort is underway in Dublin with charging points scheduled to be installed in Cork, Galway, Waterford and Limerick.

Source: MarketWatch

The Renault-Nissan Alliance and Electricite de France SA confirmed an experimental EV project in Yvelines, France. The Environmental and Energy Management Agency (ADEME).will support the project with EUR6.5 million (or about \$8.9 million) funding. The experiment will be carried out in collaboration with Schneider Electric SA. About 100 Renault and Nissan EVs will be tested out by individual customers and professionals.

Source: Dow Jones

The first large EV charging station that is capable of charging 45 cars simultaneously is being built in Linyi city (in east Shandong province). The project is being developed by the Shandong Electric Power Corporation and is expected to cost 23 million yuan (or \$3.37 million). Shandong is one of China's biggest auto producing provinces and has been developing electric cars since 2004. The province has more than 30 EV producers, and is targeting an annual production capacity of 300,000 EVs by 2015.

Source: China Daily

Honda Motor Co unveiled an all-electric scooter. The EV-neo (see **Exhibit 1**) will have a range of more than 30 km (or 18.6 miles) and will be aimed at commercial users in Japan – targeting companies that make deliveries, including newspapers and pizza parlors. While there are no immediate plans for a launch outside Japan, China would probably be in sight, with annual demand for electric bikes in that market estimated at 17 million units. The scooter's li-ion batteries can be recharged to about 80% of capacity in 20 minutes using a rapid charger, or fully charged with a normal socket in 4 hours. The batteries will be supplied by Toshiba Corp. We also note Yamaha Motor, the world's second-biggest motorcycle maker, is also due to begin selling a battery-run scooter in Japan later this year, with plans for launch also in Taiwan and Europe.

Source: Reuters and Japan Times

## Exhibit 1: The EV-neo Electric Scooter



Source: *MotorcycleUSA*

Giant Manufacturing Company (Taiwan-based) is planning to invest an initial \$36 million to build a new bicycle and EV plant in eastern China. The company is the world's largest bicycle maker by revenue. The facility to be located in Kunshan city (of Jiangsu province) will have an annual capacity of 1.5 million bicycles once it becomes operational in 2011. In addition, the Kunshan plant will produce bicycle frames and carbon fiber.

Source: *AFP*

Zoltek Companies announced the formation of a new subsidiary, Zoltek Automotive, which will be focused on the development of carbon fiber applications in the automotive industry. The initiative is established to take the next step in facilitating adoption of carbon fibers by customers in the automotive field. We highlight the company is currently supplying carbon fiber to Tesla Motors.

Source: *Zoltek*

Advanced Battery Technologies announced that it obtained approximately \$1.6 million in new orders of EVs during a conference in Wuxi City, Jiangsu Province, China. The company plans to deliver the electric scooters within the next twelve months.

Source: *Advanced Battery Technologies*



## Interview with Mohit Uberoi, President of MEGTEC Systems:

### Please describe MEGTEC Systems.

MEGTEC is a global design, engineering, manufacturing and services company providing turnkey coating, drying and environmental systems and equipment to various industries including energy storage, solar, printing, and other process industries. We have been in business for 40+ years and have approximately 800 employees on 5 continents.

We have engineering and manufacturing locations in the U.S., Europe and Asia, and support our customers with a global service network.

### How large are the businesses across the various facets of the clean tech portfolio?

MEGTEC has a substantial presence in various clean technology markets. The three major business units are:

- **Advanced Materials Processing** -- focuses on markets such as lithium-ion batteries, solar, membranes and composites
- **Environment, Climate and Energy** -- providing air abatement systems, carbon management and energy recovery systems
- **Printing and Packaging Applications** – providing equipment for digital, commercial, newspaper printing and packaging markets

More than 50% of our revenue is derived from clean tech businesses. We are seeing substantial growth opportunities in this segment and, in fact, have recently added more than 30 employees to support our growth initiatives.

### Where is MEGTEC benefiting the most from the growing advanced battery applications market?

MEGTEC has seen significant demand for equipment and services related to the new manufacturing capacity for lithium-ion batteries being installed in North America. We have a number of orders in house related to this business. Short term, we see this as the biggest opportunity. We are also involved in active discussions with companies in Europe and China regarding new lines for installation in 2011 and beyond. In fact we just recently received an order to supply a Li-ion coating line in China.

**What pivotal role can MEGTEC play in a lithium-ion battery industry that is aggressively driving cost lower in order to drive electric vehicle adoption?**

We see many opportunities to drive costs down in this business segment. The production facilities that we have seen operating for lithium-ion battery applications have typically been slower lines, with low productivity that lack instrumentation such as vision systems, beta gauges etc. for in-line process control. For future production capacity, we see a demand for higher productivity, reduced waste and more stringent production requirements. We have recently invested capital in developing an advanced pilot coating line at our De Pere, Wisconsin facility that can be used to test coating formulations as well as develop process parameters for scale up to full scale production. We have added mixing as well as corona treatment capabilities to our line to make it beneficial for customers to do research and development testing. MEGTEC has extensive theoretical modeling capabilities that can be used to optimize production processes.

**How can MEGTEC improve operational efficiencies?**

MEGTEC has seen opportunities to improve efficiencies in the production process as well as in the environmental management systems used at electrode manufacturing facilities. As an example, at a facility in Asia, we were able to show the customer that he could improve his production rate by 60% by upgrading his drying system which was the bottleneck in the production process. In another case, we were able to show that the customer could save substantial operating costs by recovering and reusing the NMP solvent used in the manufacturing process.

The key is to determine where the bottlenecks are located in the production facility and develop an optimization plan. We have a completely separate engineering services group that works with our customers on rebuilds and process optimization to improve the efficiencies of existing process assets.

**Discuss the competitive landscape.**

Most of the suppliers for coating lines for lithium-ion applications are based in Asia. The lines that are operating today are relatively narrow in width, low speed, and lack instrumentation to allow for high speed, high quality production. We see tremendous opportunities for improving productivity and quality, thereby reducing costs. For example, converting from a single-sided coating process to a simultaneous two-side coating and drying process will have a substantial impact on productivity and costs.

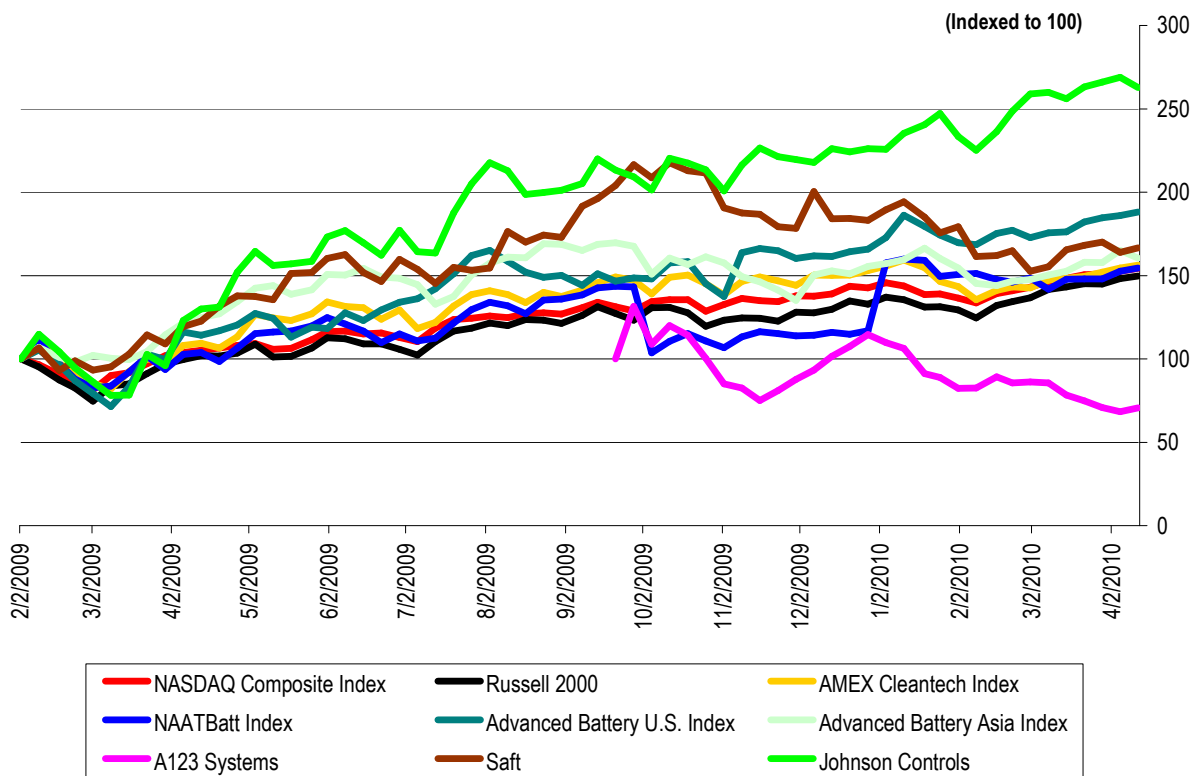
**What is the go-to-market strategy?**

MEGTEC's strategy is to be an integrated coating, drying and environmental solutions provider for this industry. Our strategy is focused on combining MEGTEC's 40+ years of experience, our ability to innovate, and the use of our advanced pilot line to help develop customized solutions for our customers' needs. Our global engineering, manufacturing and services footprint is attractive for companies building production facilities across the globe. We also have strong relationships with other suppliers in the industry and can work with them to develop complete solutions for our customers.

**Any closing thoughts?**

We are excited about the opportunities that exist in the clean tech and advanced battery market segment. It is also gratifying to be working on projects that will help the environment and the climate and hopefully improve the quality of life on our planet.

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



Index	Close on 4/12/2010	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	11,006.0	11,067.0	99.4%	36.2%	5.5%	0.3%
S&P 500	1,196.5	1,199.2	99.8%	39.9%	7.2%	0.8%
NASDAQ	2,457.9	2,463.2	99.8%	49.7%	7.1%	1.2%
Russell 2000	705.1	706.5	99.8%	51.7%	12.3%	1.1%
AMEX Cleantech Index	1,085.7	1,112.5	97.6%	41.6%	1.8%	1.1%

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)



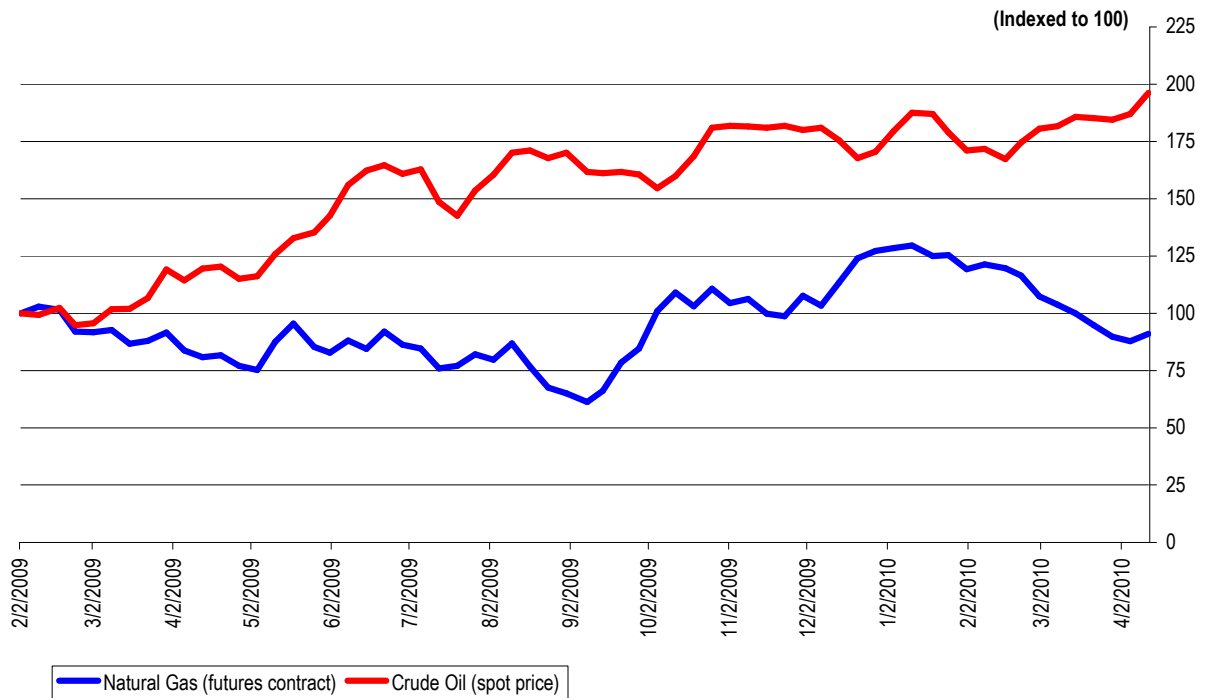
Source: Bloomberg

**Exhibit 6: Commodity Prices**

Commodity	Price on 4/12/2010	Price on 4/5/2010	Price on 3/12/2010	1 Week Change	1 Month Change
LME Nickel (Cash, \$ per tonne)	25,575	23,925	21,775	6.9%	17.5%
LME Lead (cash, \$ per tonne)	2,315	2,153	2,251	7.5%	2.8%

Source: LME

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



Source: EIA

## Executive Director's Notes



### MAKING THE CASE FOR GRID-LEVEL ENERGY STORAGE

Since the advent of the modern electricity industry, the usefulness of electric power has always been constrained by the necessity of consuming that power in the instant of its creation. This constraint has become increasingly problematic as larger issues of national and societal concern require that inherently variable renewable sources of energy, such as wind and solar, become a larger part of the electrical generation base.

Advanced electrochemical energy storage would seem a perfect solution to this problem. But by almost any measure its adoption as a balancing technology for variable renewable generation sources on the grid has been painfully slow. The reason why utilities have been slow to adopt grid-level electrochemical energy storage is because that technology is in competition with at least three other technologies offering “balancing capacity”. And for the moment electrochemical energy storage is losing.

The first and most formidable competing technology is the gas turbine. The low price of natural gas and the ease of its dispatchability make its balancing capacity attractive to grid operators. Why store when you can just make more? Since utilities suffer no penalty for using a non-renewable, carbon-emitting generation source to balance and ultimately displace renewable wind and solar generation, there is little market support for grid-level electrochemical energy storage beyond a few demonstration projects.

Other forms of energy storage, such as mechanical and thermal storage, also compete with advanced batteries. Pumped hydro storage and compressed air storage are technologies that have been around for years. Existing hydro storage projects are valuable assets for grid operators, but the potential costs of developing new projects make advanced battery storage cheap by comparison. Flywheel technologies and thermal storage also hold promise for certain applications, but neither provides a solution that is as robust or as flexible as electrochemical technology.

Finally, advanced electrochemical energy storage competes to some extent with transmission and the grid itself. Assuming that we had a robust national electricity grid based on modern and ubiquitous transmission infrastructure and smart grid technology, the case for large scale storage becomes harder to make. If you lose power in one sector, because the wind slows or clouds form, you just wheel it in from another. This is a beautiful vision, and one that shines with unfortunate glitter in the eyes of some of our colleagues in the wind and solar industries. But it is reminiscent of that punch line in the old joke about economists: “Assume a can opener.” Renewable energy is ready to be deployed today—and so is grid-level electrochemical energy storage.

For a variety of reasons, electrochemical energy storage is the best way to provide “balancing capacity” for renewable energy sources and to maximize their contribution to the grid long term. In addition, developing a market for grid-level electrochemical energy storage can also help reduce reliance on imported petroleum by providing an aftermarket for electric vehicle batteries. The challenge remains one of reducing its short term cost, particularly in comparison to gas turbine-generated electricity. To address the short term challenge, some form of government intervention will be necessary.

Next Monday at 2:00 p.m., EDT, we will explore a number of proposed government initiatives to help grow the market for grid-level energy storage in our upcoming Webinar program. Our speakers 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. David and Janice will discuss a number of proposals at both the national and state level to create a market for grid-level storage solutions and to provide this technology with the running room it needs to develop a low cost solution. If you are interested in learning where the opportunities for grid-level energy storage products are likely to be over the next few years, I would suggest that you join us on Monday.

A handwritten signature in black ink, appearing to read "James J. Greenberger".

James J. Greenberger  
Executive Director

## 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>.
- **Meeting with Ambassador from Thailand:** On Wednesday, April 21, Underwriters Laboratories, Inc. will be hosting, in cooperation with the US-ASEAN Business Council, a roundtable lunch at UL’s headquarters in Northbrook, Illinois for H.E. Don Pramudwinai, the Ambassador of the Kingdom of Thailand to the United States. Ambassador Pramudwinai has expressed an interest in promoting cooperation between the United States and Thailand in energy storage technology and would like to meet with U.S. stored energy companies that may have an interest in business opportunities in Thailand. Any NAATBatt member interested in attending the lunch should contact Jim Greenberger, at [jgreenberger@naatbatt.org](mailto:jgreenberger@naatbatt.org), to inquire about the possibility of attendance.
- **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. 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>.
- **NAATBatt Membership is Now Open.** 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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