

Summary:

For the July 30th issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities. On September 2nd, we will be hosting a webinar "Developments in Advanced Lead Acid Batteries: Everything You Thought You Knew But Don't".

The NAATBatt Index declined 3.8%, while the U.S. Battery and Asia Advanced Battery Indices increased 3.9% and 1.2%, respectively. The S&P 500 and Russell 2000 increased 4.1% and 8.5%, respectively.

Key Highlights:

- **Ceradyne** announced its **ESK Ceramics** operation is involved in the development of structural components for next generation lithium-ion batteries for the automobile industry. The company is part of a consortium with other tier-1 companies.
- **Enterprise Rent-A-Car** plans to buy 500 EVs from **Nissan Motor** in order to make the vehicles more widely available to renters. Enterprise is also adding vehicle-charging stations in 30 U.S. cities starting this fall.
- **Johnson Controls** has signed an agreement to acquire 90% of an existing joint venture (JV) with auto battery manufacturer **Delkor Corp** (Korea-based). The Delkor joint venture was part of Johnson Controls' acquisition of Delphi's global automotive battery business in 2005.
- **Qualcomm** and **ECotality** entered into an agreement to implement cellular connectivity into charging stations. ECotality will begin deploying cellular-enabled charging stations this year.
- **Eaton Corporation** announced collaboration with the **Electric Power Research Institute (EPRI)** and the **Tennessee Valley Authority (TVA)** for a prototype integrated solar-assisted electric vehicle (EV) charging station. The prototype station called "Smart Modal Area Recharge Terminal" will provide a variety of data including energy usage and the amount of solar-generated electricity produced and stored.
- **Car Charging Group** announced a partnership **LAZ Parking NY/NJ** to provide charging stations for EVs at locations throughout the New York and New Jersey metropolitan areas. The ChargePoint Level II (240 volts) charging stations are manufactured by **Coulomb Technologies**.
- **LG Chem** will be adding 2 to 3 li-ion battery supply agreements with overseas auto carmakers. The deals have been signed (details N/A) with companies from **Europe** and **Japan** to supply batteries for EVs.
- **Quallion** has developed an advanced lithium-ion system to power various components within the **Boeing X-51A WaveRider** unmanned vehicle. The vehicle uses a rechargeable lithium-ion chemistry (over the traditional silver-zinc and thermal battery solutions) to reduce ground maintenance prior to launch.
- **Hawaiian Electric Company** has proposed a plan to make it cheaper for early adopters of EVs to charge up. The 3-year pilot project would be available to 1,000 customers of Oahu, 300 in Maui County and 300 on the Big Island.
- **SK Energy** announced plans to expand its local battery manufacturing capacity for EVs. The company currently has capacity to produce 5,000 units for EVs or 80,000 units for hybrid vehicles.

- **Pacific Gas & Electric Company (PG&E)** and **Raser Technologies** announced that PG&E will be the first company in the United States to take delivery of its extended range electric (E-REV) fleet trucks. The E-REV has been designed to achieve an average of 100 miles per gallon.
- The **Shanghai City Government** is submitting a plan to subsidize alternative-energy vehicles. The plan is different from those of other cities such as **Shenzhen** and **Changchun** in that Shanghai has added subsidy standards for the after-sales service and rental of cars and batteries.
- **Renault-Nissan** will set the price of its **Zoe EV** at less than 15,000 Euros (or \$18,000) which includes a government rebate of 5,000 Euros (or \$6,000). However, the battery will be priced separately at a monthly rate of approximately 100 Euros (or \$130).
- The **Senate energy plan** includes provision to support the EV market. The bill authorizes \$400 million to be deployed and includes new Energy Department planning, assistance to local governments, grants and R&D.
- **Xtreme Power** is installing a 15 megawatt (MW) battery to support a 30 MW wind farm in Hawaii. The batteries will smooth out the electricity flow so that the grid sees only a more gradual increase or decrease, no more than 1 MW per minute at some hours of the day.
- **General Motors** and its Chinese joint venture partner **SAIC Motor Corp** are planning to sell EVs in the coming months. The plan is to introduce a new **Buick LaCrosse** and the **Chevrolet Volt** in China in 2011.
- The **Anaheim Transportation Network (ATN)** announced a partnership with **NexGen Power Group** to test a heavy-duty, zero-emission, battery-powered transit bus for one year beginning December 2010. NexGen Power will retrofit two buses from diesel to an electric operating platform.
- **Evatran** is developing a wireless charging for EVs. The “Plugless Power” system works by fitting an adapter to the car, and mounting an induction-charging plate in the garage.
- **Porsche** announced would move forward with development of a plug-in **918 Spyder**. The EV will be built in Germany and is based on the 500-horsepower V8 concept car Porsche.
- **Samchully** introduced the nation’s first electric bicycle (ebike) as part of **Korea’s** low-carbon green growth policy. The “**Greenity**” is using rechargeable batteries from **Samsung SDI**.
- **Optimal Energy** (South-Africa based) unveiled the all-electric **Joule**. The company has signed a memorandum of understanding with East London’s Industrial Development Zone so that commercial production should begin in 2013 and could reach 50,000 units a year by 2015.
- The **Department of Environment** for the **City of Chicago** has issued a request for proposals for its plug-in EV charging infrastructure project. The selected projects could be part of the 1st phase of the planned charging station deployment.

A Few More Details:

Ceradyne announced its ESK Ceramics operation is involved in the development of structural components for next generation lithium-ion batteries for the automobile industry. The company is part of a consortium with other tier-1 companies. The project is in the early stages with commercial revenues potentially by 2015.

Source: Ceradyne

Enterprise Rent-A-Car plans to buy 500 EVs from Nissan Motor in order to make the vehicles more widely available to renters. Enterprise Holdings (which owns the brands Enterprise, Alamo and National) will include the Leaf EV in its rental fleets in eight cities: Seattle, Portland, Ore, Los Angeles, San Diego, Phoenix, Tucson, Ariz, Nashville and Knoxville, Tenn. Enterprise is also adding vehicle-charging stations in 30 U.S. cities starting this fall.

Source: WSJ

Johnson Controls has signed an agreement to acquire 90% of an existing joint venture (JV) with auto battery manufacturer Delkor Corp (Korea-based). The company is investing \$90 million in the acquisition and an additional \$40 million to add 2.7 million units in capacity. This would bring Delkor's total capacity to approximately 10 million batteries per year. The Delkor joint venture was part of Johnson Controls' acquisition of Delphi's global automotive battery business in 2005.

Source: The Business Journal of Milwaukee

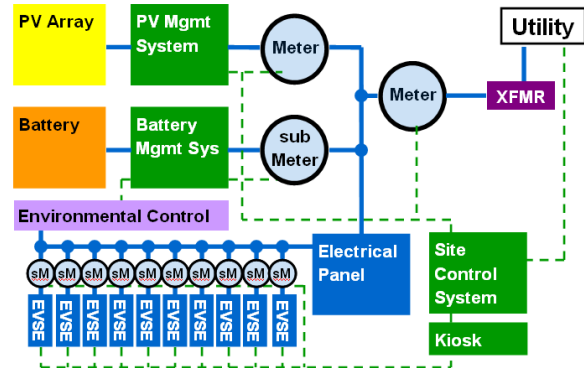
Qualcomm and ECotality entered into an agreement to implement cellular connectivity into charging stations. The solution enables ECotality to use a commercial cellular network to manage its Blink brand charging station operations, transfer usage data, download firmware updates and publish real time availability to EV drivers. ECotality will begin deploying cellular-enabled charging stations this year under the EV Project, a \$230 million project involving the U.S. Department of Energy and more than 40 project partners.

Source: Qualcomm and ECotality

Eaton Corporation announced collaboration with the Electric Power Research Institute (EPRI) and the Tennessee Valley Authority (TVA) for a prototype integrated solar-assisted EV charging station to be built at EPRI's research laboratory. Additional stations are planned for Oak Ridge National Laboratory, Nashville, Chattanooga and another site in Knoxville. The prototype station called "Smart Modal Area Recharge Terminal" or SMART(TM) station (see **Exhibit 1**) will provide data on energy usage, the time when the equipment is used, the amount of solar-generated electricity produced and stored, and the potential impact of load clusters - when several vehicles are refueled at the same time - on distribution system reliability.

Source: Eaton

Exhibit 1: A Schematic of the SMART System



Source: EPRI

Car Charging Group announced a partnership LAZ Parking NY/NJ to provide charging stations for electric vehicles (EVs) at LAZ Parking locations throughout the New York and New Jersey metropolitan areas. The ChargePoint Level II (240 volts) charging stations are manufactured by Coulomb Technologies. The company with the aid of government tax incentives, subsidies, loan guarantees and grants, is providing the charging stations at no charge to property owners/managers while retaining ownership.

Source: Car Charging Group

LG Chem will be adding 2 to 3 li-ion battery supply agreements with overseas auto carmakers. The deals have been signed (details N/A) with companies from Europe and Japan to supply batteries for EVs. The company already has 7 customers to whom they are supplying or will supply lithium ion batteries -- Hyundai-Kia automotive group, domestic electric vehicle manufacturer CT&T, General Motors, Ford Motor, Eaton Corp., China's CHANA and Volvo AB.

Source: Global Times

Quallion has developed an advanced lithium-ion system to power various components within the Boeing X-51A WaveRider unmanned vehicle (as shown in **Exhibit 2**). The vehicle uses a rechargeable lithium-ion chemistry (over the traditional silver-zinc and thermal battery solutions) to reduce ground maintenance prior to launch. The company developed a high energy density and high discharge rate pouch cell. The cell design is robust enough to handle three different performance requirements while maintaining the program's weight goals.

Source: Quallion LLC

Exhibit 2: Boeing X-51A WaveRider



Source: U.S. Air Force

Hawaiian Electric Company has proposed a plan to make it cheaper for early adopters of EVs to charge up. The 3-year pilot project would be available to 1,000 customers of Oahu, 300 in Maui County and 300 on the Big Island. Starting in October, discounted rates would be offered to EV owners that charge up during times when electricity demand is less.

Source: Associated Press

SK Energy announced plans to expand its local battery manufacturing capacity for EVs. This announcement comes on the heels of a supply agreement with Hyundai Motor and Kia Motors. Details on the expansion plan were not provided. The company currently has capacity to produce 5,000 units for EVs or 80,000 units for hybrid vehicles.

Source: Reuters

Pacific Gas & Electric Company (PG&E) and Raser Technologies announced that PG&E will be the first company in the United States to take delivery of its extended range electric (E-REV) fleet trucks. The E-REV has been designed to achieve an average of 100 miles per gallon. The truck will be powered for the first 40 miles by li-ion batteries and can continue driving over 300 miles by generating its own electricity from a small onboard gasoline-powered generator or 'range extender'. PG&E expects to take delivery of the first two E-REV fleet trucks modified with Raser's E-REV powertrain for initial testing and demonstration later this year.

Source: PGE & Raser Technologies

The Shanghai city government is submitting a plan to subsidize alternative-energy vehicles. The city government is finalizing a plan to subsidize individual buyer. The plan is different from those of other cities such as Shenzhen and Changchun in that Shanghai has added subsidy standards for the after-sales service and rental of cars and batteries. The central government is providing a subsidy of up to 60,000 yuan (or \$885). Shanghai is likely to provide up to 60,000 yuan for the city's individual buyer of each new energy vehicle (an amount between those of Changchun and Shenzhen). This dual subsidy that is worth as much as 120,000 yuan would account for about 50% of the vehicle's retail price.

Source: Global Times

Renault-Nissan will set the price of its Zoe EV (as shown in **Exhibit 3**) at less than 15,000 Euros (or \$18,000) which includes a government rebate of 5,000 Euros (or \$6,000). However, the battery will be priced separately at a monthly rate of approximately 100 Euros (or \$130). The battery can provide power for about 100 kilometers (or 62 miles) before a recharge is required. The EV is expected to become available in mid-2012.

Source: Le Figaro

Exhibit 3: The Renault Zoe



Source: ALAMY

The Senate energy plan includes provision to support the EV market. The bill authorizes \$400 million to be deployed and includes new Energy Department planning, assistance to local governments, grants and R&D. Electric Drive Vehicle Deployment Communities Program, in which selected areas would become hot spots for the technology through cooperation among electric utilities, government agencies, automakers and others.

Source: *The Hill*

Xtreme Power is installing a 15 megawatt (MW) battery to support a 30 MW wind farm in Hawaii. The batteries will smooth out the electricity flow so that the grid sees only a more gradual increase or decrease, no more than one megawatt per minute at some hours of the day. The growth in wind farms has electricity providers scrambling to develop energy storage solutions.

Source: *New York Times*

General Motors and its Chinese joint venture partner SAIC Motor Corp are planning to sell EVs in the coming months. The plan is to introduce a new Buick LaCrosse and the Chevrolet Volt in China in 2011. In addition, the development of a prototype of the Chevrolet New Sail EV should be completed this year.

Source: *Bloomberg*

The Anaheim Transportation Network (ATN) announced a partnership with NexGen Power Group to test a heavy-duty, zero-emission, battery-powered transit bus for one year beginning December 2010. NexGen Power will retrofit two buses from diesel to an electric operating platform. Two buses, one full size 40-foot diesel bus and one 22-foot diesel bus will go through a six-month conversion process before being placed back in for a one-year demonstration test

Source: *Anaheim Transport Network*

Evatran is developing a wireless charging for EVs. The "Plugless Power" system works by fitting an adapter to the car, and mounting an induction-charging plate in the garage. The company launched a field trial around Wyethville, Virginia. The charging system is expected to be ready for full-scale production by 4Q10.

Source: *Evatran LLC*

Porsche announced would move forward with development of a plug-in 918 Spyder (as shown in **Exhibit 4**). The EV will be built in Germany and is based on the 500-horsepower V8 concept car Porsche. The EV the electric Spyder is expected to cost far more than the Tesla.

Exhibit 4: The 918 Spyder



Source: *The Christian Science Monitor*

Samchully introduced the nation's first electric bicycle (ebike) as part of Korea's low-carbon green growth policy. The "Greenity" (as shown in **Exhibit 5**) is using rechargeable batteries from Samsung SDI. The ebike is priced at 1.2 million won (\$1,016). The Knowledge Economy Ministry expects the global market in this bicycle segment to expand to 39 million units by 2011 (from 23 million in 2008).

Exhibit 5: The Electric Greenity



Source: JoongAng Daily

Optimal Energy (South-Africa based) unveiled the all-electric Joule (as shown in **Exhibit 6**). Test vehicles were on the road during the World Cup. The plan is to export 90% of the EVs. The company has signed a memorandum of understanding with East London's Industrial Development Zone so that commercial production should begin in 2013 and could reach 50,000 units a year by 2015. In South Africa, the EV will be sold for about R235000 (or ~\$32,000).

Source: Green Transportation and Optimal Energy

Exhibit 6: The Optimal Energy's Joule

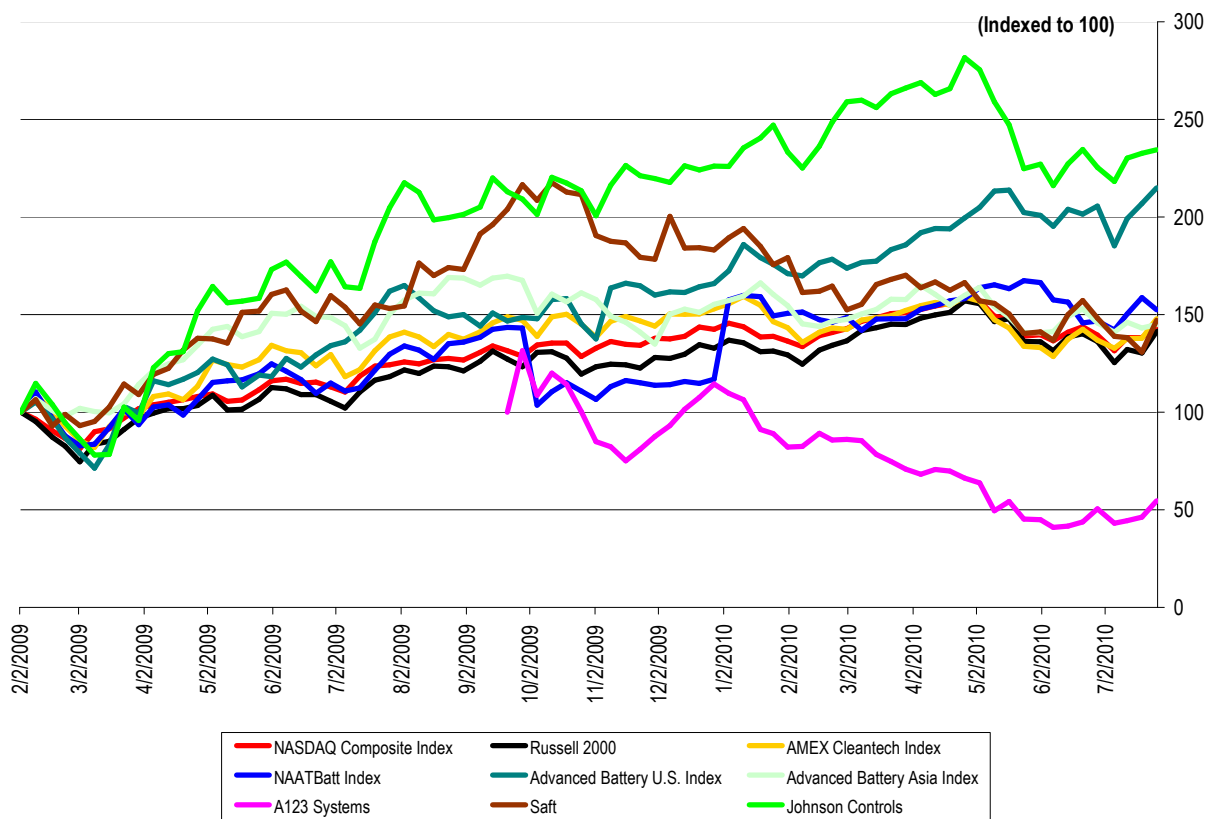


Source: Optimal Energy

The Department of Environment for the City of Chicago has issued a Request for Proposals (RFP) for its plug-in EV charging infrastructure project. The selected projects could be part of the 1st phase of the planned charging station deployment. The City and its public-sector partners are applying up to \$2,000,000 (a combination of Federal and State resources).

Source: City of Chicago

Exhibit 7: Indices Performance
(From February 2, 2009)

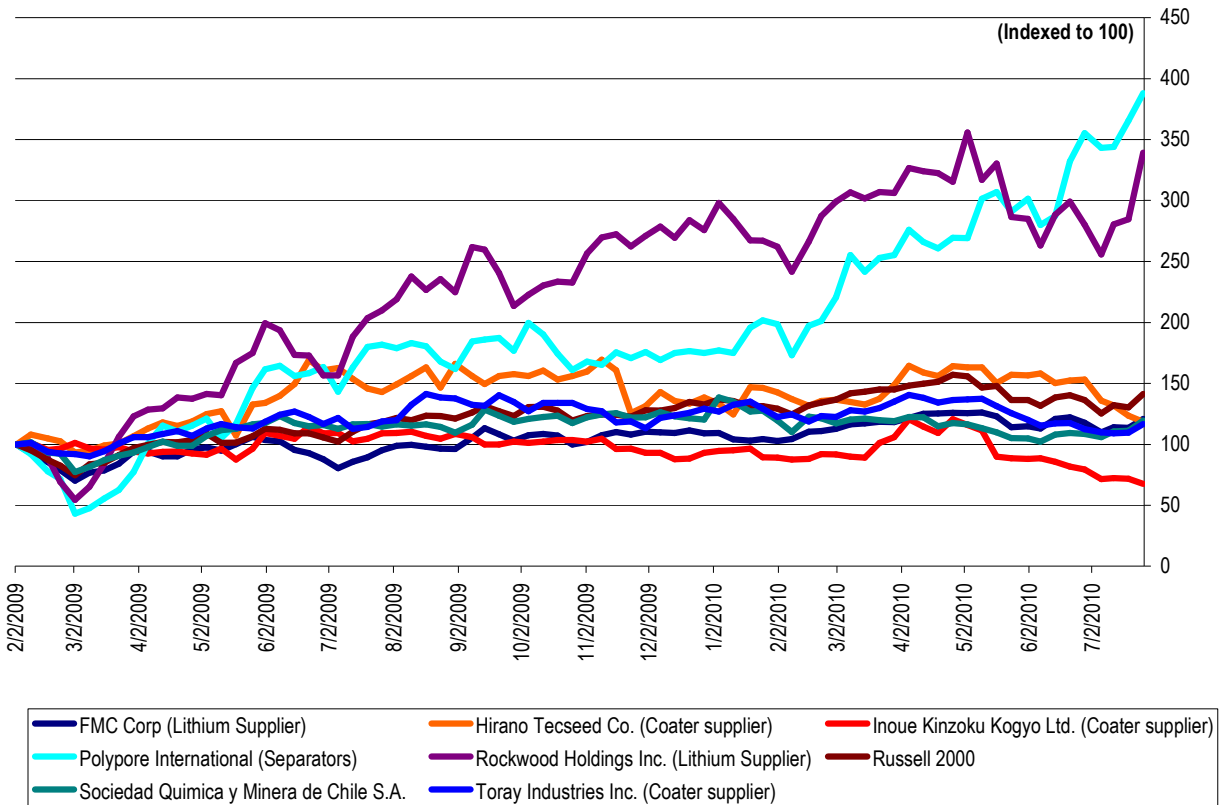


Index	Close on 7/26/2010	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	10,525.4	11,309.0	93.1%	15.8%	0.9%	3.7%
S&P 500	1,115.0	1,219.8	91.4%	13.9%	(0.1%)	4.1%
NASDAQ	2,296.4	2,535.3	90.6%	16.9%	0.1%	4.5%
Russell 2000	665.2	746.0	89.2%	21.3%	5.9%	8.5%
AMEX Cleantech Index	1,027.5	1,112.5	92.4%	6.6%	(3.7%)	7.3%

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 8: Supplier Performance
(From February 2, 2009)



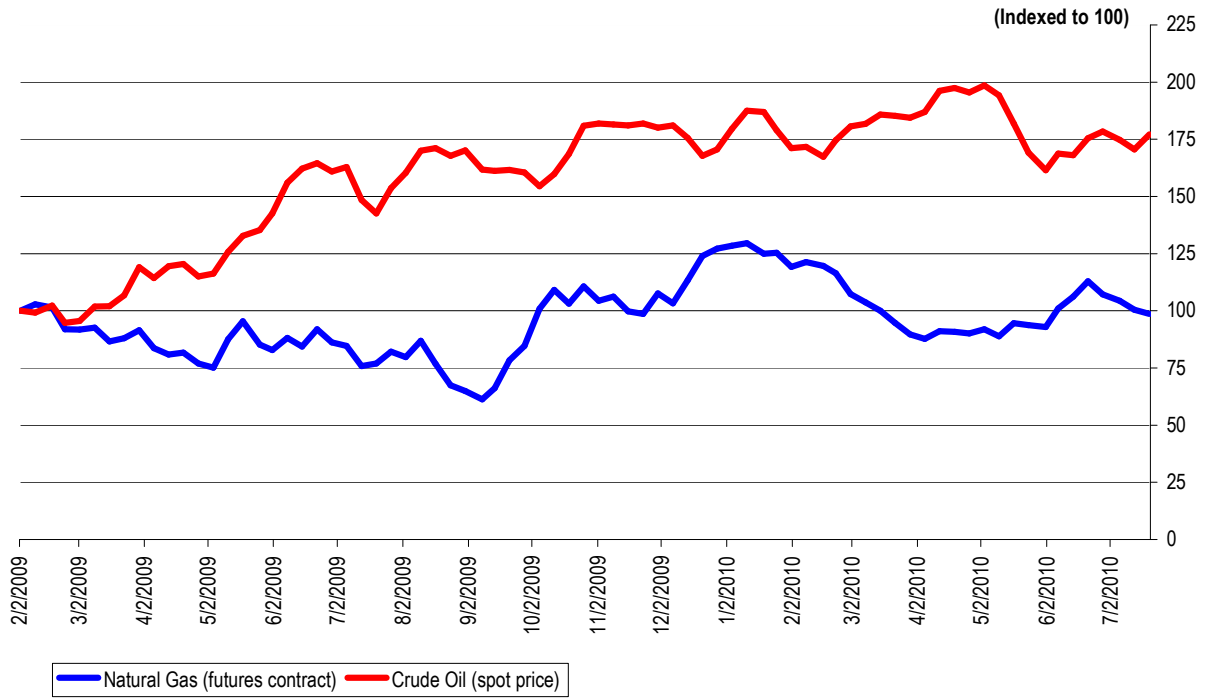
Source: Bloomberg

Exhibit 9: Commodity Prices

Commodity	Price on 7/26/2010	Price on 7/19/2010	Price on 6/25/2010	1 Week Change	1 Month Change
LME Nickel (Cash, \$ per tonne)	20,410	18,730	19,450	9.0%	4.9%
LME Lead (cash, \$ per tonne)	1,959	1,751	1,801	11.9%	8.8%

Source: LME

Exhibit 10: Natural Gas and Crude Oil
(From February 2, 2009)



Source: EIA

Executive Director's Notes



COMMUNITY ENERGY STORAGE MAKES PROGRESS AT THE FERC

Yesterday, I was proud to lead a delegation of ten NAATBatt member firms and supporting organizations to a meeting with Chairman Jon Wellinghoff of the Federal Energy Regulatory Commission (FERC). Representatives of General Motors Corporation, The Dow Chemical Company, EnerSys, EaglePicher Technologies, Altairnano, Applied Intellectual Capital/East Penn Manufacturing, A123 Systems, Saft America, American Electric Power, and CH2M Hill attended.

The purpose of the meeting was to call the FERC's attention to the importance of community energy storage (CES) both to the grid and to vehicle electrification. CES systems consist of a series of relatively small (25-75 kW) stationary batteries serving a few homes or small commercial loads but networked together so as to provide a multi-megawatt power resource to the grid.

CES is the stationary energy storage application that offers something for everyone. For local distribution systems, it provides back up power to connected loads, flicker mitigation and a convenient way to integrate locally generated renewable energy (e.g., solar PV) onto the grid. As a generation resource, it provides a way to balance and better exploit variable renewable energy resources (e.g., wind). And at the grid level CES can reduce the need for investment in new transmission assets by mitigating transmission overload, addressing transmission line trips, and reacting to voltage dips. NAATBatt has been predicting for some time that CES might prove to be the first "killer app" for advanced batteries.

Delegation members were also interested that Chairman Wellinghoff understood the important role that CES can play in vehicle electrification. CES can help insure that recharging the first wave of EV's and PHEV's which will soon be sold into the mass market does not destabilize the grid (Murphy's Law dictating, of course, that the owners of those first wave EV's and PHEV's will all seek to recharge them at the same time). Blackouts and brownouts attributed to EV and PHEV recharging would be disastrous for the future of electric drive. Also, because CES can use batteries similar to those that will be installed in EV's and PHEV's (or at least capable of being produced in the same factories), CES can provide battery makers with the volumes they need to reduce prices and make EV's and PHEV's more affordable for consumers. Finally, CES may provide a secondary market for retired EV and PHEV batteries, which could have profound implications for battery prices.

The challenge for CES is not technical but regulatory. The FERC and state regulators are already struggling with the question of whether energy storage should be treated as a generation or a transmission asset. How storage is classified will determine how and by whom storage facility owners are paid and who regulates them. CES comes with an additional complexity: By definition, all CES facilities

interconnect to distribution systems. As a consequence, it is not clear that CES and other distributed storage technologies can ever qualify for FERC incentive transmission rates and other benefits which may be available to bulk storage facilities that are interconnected directly to the transmission system.

During our meeting on Thursday, Chairman Wellinghoff expressed strong support for storage technology and his commitment to making sure that storage facilities are fairly compensated for all of the services that they provide to the grid. This was reassuring to hear. The challenge to the industry is to help the FERC devise a system by which operators and regulators of storage facilities can define precisely what services a particular storage facility provides and a mechanism by which a single facility can be fairly compensated from different revenue streams for different services. We must ask FERC to confirm unambiguously that a single storage facility serving multiple functions can be compensated in multiple ways and, most importantly for CES, that it can be subject to different jurisdictions (including FERC jurisdiction) based on the functions the storage facility serves rather than based on the point to which the facility interconnects in the power system.

NAATBatt's meeting with the FERC underscores NAATBatt's strategy of concentrating on making solid progress in getting right the mundane regulatory issues that will define the advanced battery industry in the years ahead. Unfortunately, as we learned this week, Congress may be deadlocked for the foreseeable future for reasons wholly unrelated to energy storage and electric drive. Big picture legislation may be on hold for a while. That is no excuse, however, not to keep moving forward. There is a lot of important work that still needs to be done.



James J. Greenberger
Executive Director

North American Industry Announcements and Calendar

- **Next Webinar Program: Advanced Lead Acid Battery Technology:** The NAATBatt Webinar series continues on Thursday, September 2, 2010, with a program entitled "*Developments in Advanced Lead Acid Battery Technology: Everything You Thought You Knew But Don't*". The program will examine some new developments in lead acid batteries that may breathe new life into a hundred year old technology that many have already written off in favor of advanced lithium-ion. Our speakers, from East Penn Manufacturing/Applied Intellectual Capital and EnerSys, will explain why reports of the death of lead acid technology may be greatly exaggerated and how lead acid may yet compete with lithium-ion batteries in advanced automotive and grid-level stationary storage applications. More information about the Webinar as well as registration instructions will be contained in the next newsletter.
- **Challenges and Opportunities: Building a U.S. Battery Industry for Electric Drive Vehicles: Progress Challenges and Opportunities:** The National Academy of Sciences' Board on Science, Technology, and Economic Policy (STEP), in cooperation with the Michigan Economic Development Corporation and the Department of Energy, will hold a conference in Livonia, Michigan on July 26-27. The conference will bring together key stakeholders from industry, federal and state governments, and universities to review DOE and other initiatives to support the battery industry and highlight key issues to be addressed.
- **Plug-In 2010:** The Plug-In 2010 Conference & Exposition will be held at the San Jose McEnery Convention Center July 26-29, 2010, in San Jose, California. The conference will discuss the future of vehicle electrification. Information about the conference can be found at <http://www.plugin2010.com/>
- **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
- **U.S. National Electric Vehicles Safety Standards Summit:** The U.S. National Electric Vehicles Safety Standards Summit, a joint program of the National Fire Protection Association and SAE International, will be held on October 21-22, 2010, at the Cobo Convention Center in Detroit, Michigan. Information about the event can be found at: http://www.nfpa.org/newsReleaseDetails.asp?categoryId=488&itemId=46997&cookie_test=1
- **Rare Earth Metals Summit III:** Infocast's Rare Earth Metals Summit III will be held in Washington, D.C. on October 25-27, 2010. The conference will examine the supply and value chains for rare and strategic metals, including lithium. NAATBatt is a supporting organization of the conference and NAATBatt members will be entitled to a 10% discount on registration.



- **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