

Summary:

In this June 18th issue of NAATBatt's Advanced Battery Weekly, we highlight the major news events that occurred within the North American advanced battery industry over the past week.

The NAATBatt index was down modestly, while the U.S. and Asia Battery Indices increased 4.4% and 5.5%, respectively. The S&P 500 and Russell 2000 increased 3.7% and 5.5%, respectively.

In "Executive Director's Notes", Jim Greenberger discusses proposals for a new "Manhattan Project" for advanced battery technology and what such a project should look like.

On June 21st, NAATBatt will host a free Webinar program entitled: "*Community Energy Storage: A New Paradigm for the Grid*". For program information and registration, please see the "North American Industry Announcements and Calendar" at the end of this newsletter.

Key Highlights:

- **THINK** began production of THINK city electric vehicles (EVs) with lithium-ion (li-ion) batteries from **Ener1**. First customer deliveries are taking place across Europe in selected markets such as The Netherlands, Norway, Spain, Sweden and Austria.
- **Frito Lay Canada** will introduce six **Smith Electric Vehicles** into its delivery fleet. The electric vehicles (EVs) will be powered by **Valence Technology** lithium-ion (li-ion) batteries and are expected to have a range of 60 kilometers (or 37 miles) before a recharge is required.
- **Ener1** announced a partnership with **Russia's Federal Grid Company (FGC)** to Develop Energy Storage Opportunities to improve the reliability and performance of the country's electric system. FGC owns almost 75,000 miles (or 120,000 kilometers) of transmission lines stretching across the country's nine time zones.
- **Ford Motor** expects that as much as a 25% of its global sales volume will be electrified. By 2020, the company expects that between 10% and 25% of its volume will in some way run on advanced batteries compared with about 2% today.
- **ECotality** announced that the **U.S. Department of Energy (DOE)** has expanded its EV Project to include two new cities; Los Angeles and Washington, D.C. The expansion is being funded by a \$30 million DOE grant extension to the ECotality's EV Project, which was created through the **American Recovery and Reinvestment Act (ARRA)**.
- **Tesla Motors** is seeking to raise \$178 million by selling a 12% stake in its initial public offering. The producer of the \$109,000 electric Roadster will offer 11.1 million shares at \$14 to \$16 each on June 29 and use the proceeds to pay for factories and possible acquisitions.
- **Advanced Membranes System (AMS)** has announced plans to open a battery separator manufacturing plant. The company has entered into a joint venture agreement with **Biax Laboratories**. The new venture, UltraLith LLC, is planning to ship products in 3Q10.
- **The European Union (EU)** is proposing to setup safety standards for drivers as EVs rollout. The rules would require drivers be protected from electric shocks and would also incorporate minimum insulation levels and standard safety labels.

- **Mitsubishi Motors** plans to cut the price of electric vehicles by 30% to 2 million yen (or \$21,890) by fiscal 2012. The company could also be increasing production to 8,500 units (from 5,000) for 2010.
- **Virginia's** public and private sectors are partnering on an initiative to increase the use of EVs in the state. State and local governments, utilities, civic groups, businesses and other entities are working on a Virginia “**Get Ready**” plan.
- **smart USA** will begin deploying a fleet of 250 EVs across the U.S. in 2H10. The EV is powered by a 30 kilowatt drive motor and 16.5 kilowatt-hour li-ion battery with a range of 82 miles.
- The **U.S. Military** and geologists working with the **Pentagon** have identified huge caches of metal and stone such as gold, copper and deposits of lithium in Afghanistan. A new source of lithium should alleviate supply shortage concerns

A Few More Details:

THINK began production of THINK city electric vehicles (EVs) with lithium-ion (li-ion) batteries From Ener1 (as shown in **Exhibit 1**). The THINK City can travel at highway speeds and cover 160 kilometres (or over 99 miles) on a single charge (via any conventional household outlet). First customer deliveries are taking place across Europe in selected markets such as The Netherlands, Norway, Spain, Sweden and Austria. The company has announced plans to establish a U.S. production facility during 2011 in Indiana and is working with Japanese partner Itochu on developing operations in Asia.

Exhibit 1: THINK City's In Production



Source: THINK

Frito Lay Canada will introduce six Smith Electric Vehicles (as shown in **Exhibit 2**) into its delivery fleet. The electric vehicles (EVs) will be powered by Valence Technology lithium-ion (li-ion) batteries and are expected to have a range of 60 kilometers (or 37 miles) before a recharge is required. This should provide enough range to serve the majority of the routes from Frito Lay's designated distribution centers. The company would be the first food manufacturer in the country to use EVs.

Exhibit 2: Battery Powered Frito Lay Truck



Source: Canadian Driver

Ener1 announced a partnership with Russia's Federal Grid Company (FGC) to Develop Energy Storage Opportunities to improve the reliability and performance of the country's electric system. Russia is the world's fourth largest electricity market, and is currently embarked on an intensive multi-billion-dollar effort to upgrade and improve its utility network. FGC owns almost 75,000 miles (or 120,000 kilometers) of transmission lines stretching across the country's nine time zones.

Source: *Ener1*

Ford Motor expects that as much as a 25% of its global sales volume will be electrified. By 2020, the company expects that between 10% and 25% of its volume will in some way run on advanced batteries compared with about 2% today according to Nancy Gioia (Ford's director of global electrification). Of those vehicles with batteries, 70% will be hybrids, another 20% to 25% will be plug-in hybrids and the rest will be all-EVs.

Source: *Detroit Free Press*

ECOtality announced that the U.S. Department of Energy (DOE) has expanded its EV Project to include two new cities; Los Angeles and Washington, D.C. It has broadened the offer of free home chargers to include qualified new owners of the Chevrolet Volt EV and also includes an additional 1,000 Nissan Leafs. The expansion is being funded by a \$30 million DOE grant extension to the ECOtality's EV Project, which was created through the American Recovery and Reinvestment Act (ARRA).

Source: *ECOtality*

Tesla Motors is seeking to raise \$178 million by selling a 12% stake in its initial public offering. The producer of the \$109,000 electric Roadster will offer 11.1 million shares at \$14 to \$16 each on June 29 and use the proceeds to pay for factories and possible acquisitions. The company has sold over 1,000 Roadsters and is using the share sale and a \$465 million loan from the government to help produce its second electric car, the Model S sedan.

Source: *Bloomberg*

AMS announced plans to open a battery separator manufacturing plant. The facility will represent the first new battery separator manufacturing company in the USA in decades. AMS has entered into a joint venture agreement with Biax Laboratories to open a 25,000 square foot manufacturing plant in Rutherfordton, North Carolina. The new venture, UltraLith LLC, is planning to ship products to battery manufacturers in August. It will also be the world's only plant to offer battery separator technology that meets all of the lithium battery capability targets in planned Electric Drive Vehicle (EDV) applications.

Source: *UltraLith*

The EU's 27 governments want to protect their 500 million citizens by adopting rules for EVs from the United Nations Economic Commission for Europe. The rules would require drivers be protected from electric shocks and from the build-up of hazardous gases. There would also be minimum insulation levels and standard safety labels.

Source: *Reuters*

Mitsubishi Motors plans to cut the price of electric vehicles by 30% to 2 million yen (or \$21,890) by fiscal 2012. The company is planning to increase automated processes to about 10% of total assembly (up from 2% when EV production begins). The i-MiEV (as shown in **Exhibit 3**) electric car, which targets commercial users and was priced at 4.59 million yen (or \$50,492) when it was unveiled last July, will effectively sell for 2 million yen (or \$22,000) after factoring in government subsidies. The company could also be increasing production to 8,500 units (from 5,000) for 2010. In addition, 2012 production could be increased to 30,000 units.

Source: *Nikkei and Mainichi News*

Exhibit 3: The iMiev



Source: Mitsubishi

Virginia's public and private sectors are partnering on an initiative to increase the use of EVs in the state. State and local governments, utilities, civic groups, businesses and other entities are working on a Virginia "Get Ready" plan. The electrification effort initially will target Northern Virginia, Charlottesville, Richmond and Hampton Roads, based on predictions of likely adoption.

Source: Associated Press

Smart USA will begin deploying a fleet of 250 EVs across the U.S. in 2H10. Partners for vehicle placements will be announced later this year, and series production for consumer sales in smart center dealerships will begin in 2012 with the 2013 model year. The U.S. deployment is the 2nd phase of a three-phase program.

- Phase one began with placement of 100 EVs in London in 2007.
- Phase two is producing 1,500 cars for cities in Europe, the United States and Canada as well as selected markets in Asia.
- Phase three will be series volume production starting in the 2012 model year.

The EV is powered by a 30 kilowatt drive motor and 16.5 kilowatt-hour li-ion battery with a range of 82 miles. It takes only three and a half hours to charge the battery from 20 to 80 percent of its capacity and less than eight hours to fully charge it using a 220 volt outlet. The battery can also be charged using a common household 110V outlet. The vehicles can reach highway speeds and offer a range of 82 miles on a single charge.

Source: Smart USA

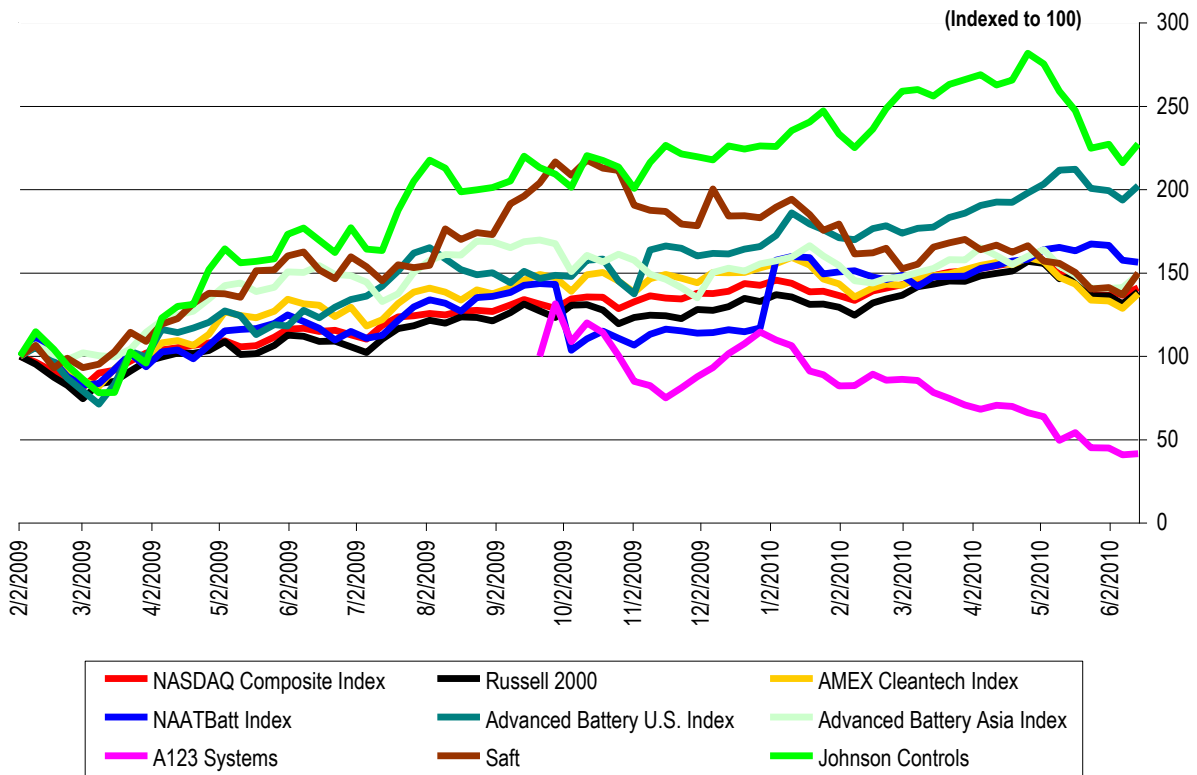
The U.S. military and geologists working with the Pentagon have identified huge caches of metal and stone such as gold, copper and deposits of lithium in Afghanistan. A new source of lithium should alleviate supply shortage concerns. A 2008 U.S. Geological Survey report highlighted the use of lithium in cell phone batteries skyrocketed from 1.8 metric tons in 1996 to 170 metric tons in 2005. The evolution of the EV will drive more consumption of lithium. The Uyuni Salt Flat in Bolivia (as shown in **Exhibit 4**) is one of the world's large untapped reserves of lithium with enough material to provide batteries for 4.8 billion EVs.

Exhibit 4: The Uyuni Salt Flat in Bolivia



Source: National Geographic

**Exhibit 5: Indices Performance
(From February 2, 2009)**

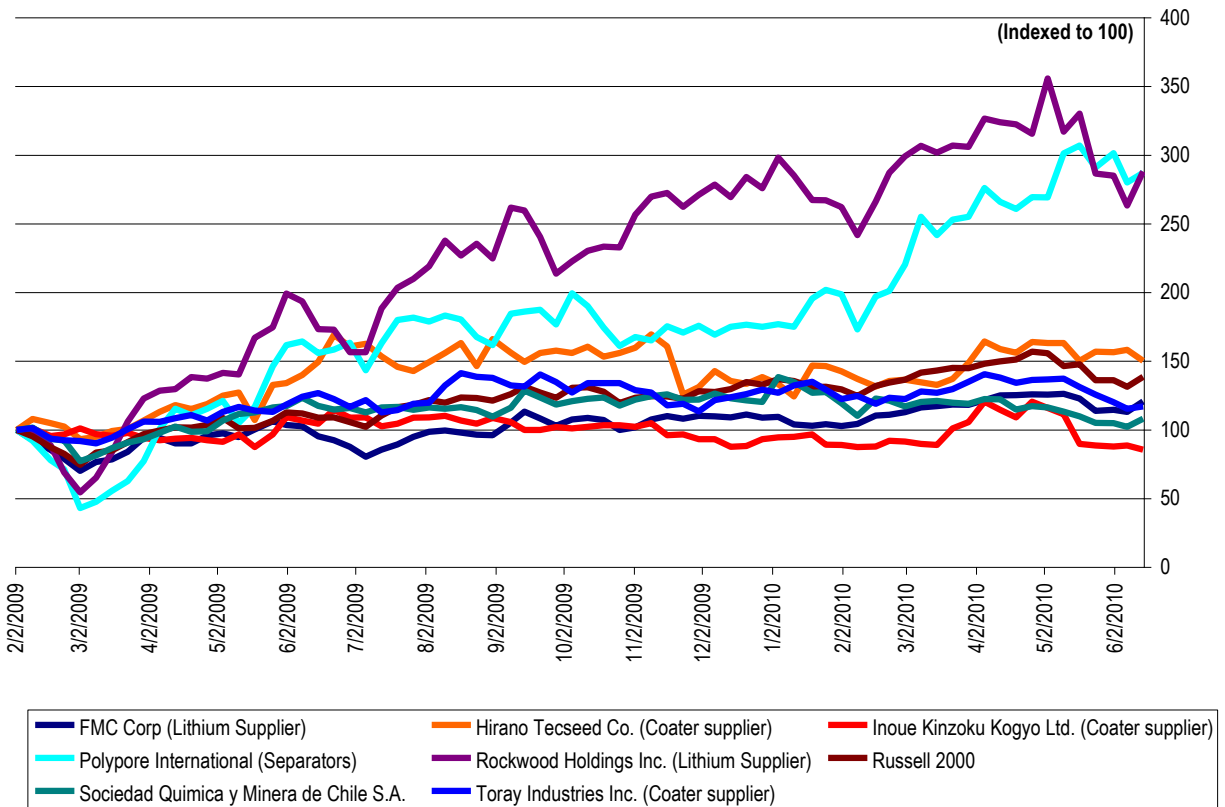


Index	Close on 6/14/2010	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	10,190.9	11,309.0	90.1%	18.3%	(2.3%)	3.8%
S&P 500	1,089.6	1,219.8	89.3%	18.0%	(2.4%)	3.7%
NASDAQ	2,244.0	2,535.3	88.5%	23.5%	(2.2%)	3.2%
Russell 2000	652.3	746.0	87.4%	27.4%	3.8%	5.5%
AMEX Cleantech Index	954.1	1,112.5	85.8%	5.2%	(10.6%)	6.8%

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 6: Supplier Performance
(From February 2, 2009)



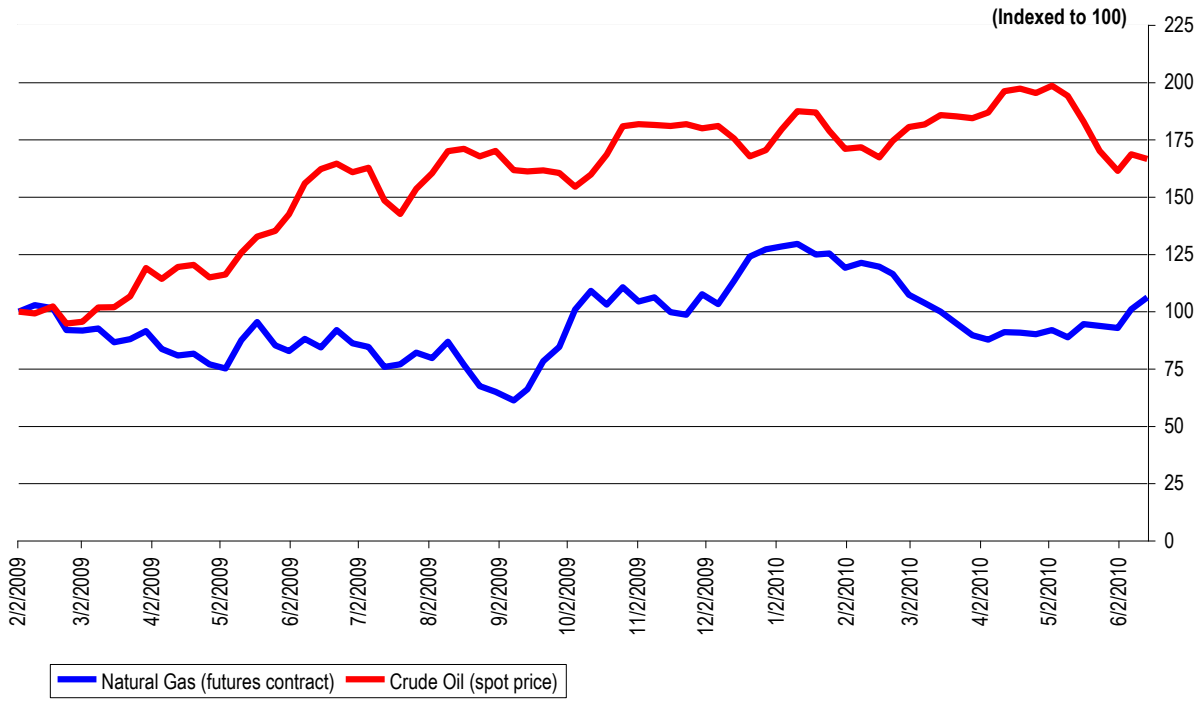
Source: Bloomberg

Exhibit 7: Commodity Prices

Commodity	Price on 6/14/2010	Price on 6/7/2010	Price on 5/14/2010	1 Week Change	1 Month Change
LME Nickel (Cash, \$ per tonne)	19,725	18,000	22,150	9.6%	(10.9%)
LME Lead (cash, \$ per tonne)	1,673	1,558	1,952	7.4%	(14.3%)

Source: LME

Exhibit 8: Natural Gas and Crude Oil
(From February 2, 2009)



Source: EIA

Executive Director's Notes



A MANHATTAN PROJECT FOR ADVANCED BATTERIES

Gerald F. Seib's Capital Journal column in this morning's Wall Street Journal, entitled "Time to Plug In Electric Cars", makes good reading. Mr. Seib notes that although prior to the BP oil spill, energy legislation was suspended in a partisan coma, the spill has galvanized America's yearning for a different energy future. Support for electric cars has become a unique area of bipartisan agreement on energy policy. Mr. Seib quotes Sen. Lamar Alexander as suggesting a "mini-Manhattan project" to electrify half our cars and trucks in 20 years.

The concept of a Manhattan Project for advanced batteries is, of course, not a new one. Referring to a Manhattan Project for advanced batteries is a somewhat common rhetorical flourish, which generally suggests spending a lot of money on something having to do with electrifying transportation infrastructure. But what that something is is never really specified. Given that promoting electric cars may be the one Big Idea that Republicans and Democrats actually agree upon and may be willing to fund over the next few years, it is time to start talking about what a Manhattan Project for advanced battery technology should really look like.

A Manhattan Project for advanced batteries should consist of two parts. The first part should fund basic battery research. The energy density and cost per megawatt hour of lithium-ion cells are simply not where they need to be to support wholesale electrification of our transportation infrastructure. Until that technology problem is solved, electrifying half our cars and trucks will remain a pipedream.

Over the past two years, the federal government has finally begun spending more than nominal amounts of money on advanced battery development. The ARPA-E program is a good example of this new commitment and fills an important need. ARPA-E seed funds relatively small amounts of money into a large number of high risk research projects in the hope that at least a few of those projects will show promise.

The first part of a new Manhattan Project, however, must go beyond the seed funding approach of ARPA-E. We must take a hard look at what the technological alternatives are that will permit batteries to perform in the way that we need them to perform in order to support widespread vehicle electrification. And then we must make a major bet on one or two of them. Perhaps that technology will be some form of metal air battery or solid state technology. The bet must be carefully vetted and chosen. But the bet must be big and for all the marbles. That was, after all, what the first Manhattan Project did.

A Manhattan Project for batteries must also have a second critical component: It must build current domestic battery manufacturing capacity and competence. Technology alone does not create wealth or economic activity. Technology must be applied to the manufacture goods and services in order to create wealth. Spending billions for the United States to become an outsource R&D provider for other parts of the world is neither wise nor palatable.

As this column has discussed before, the best way to grow advanced battery manufacturing capacity and competence in the United States is to build a strong domestic market for advanced battery projects. The nature of advanced batteries dictates that manufacturing capacity will follow demand. Unfortunately, as we may find out when the new federally-funded lithium-ion manufacturing capacity comes on line next year, it does not necessarily work the other way around.

The second component of a Manhattan II Project therefore must subsidize demand for energy storage products. That demand will create a market that encourages companies to invest in the tooling, equipment and people that produce advanced batteries. Building current capacity and expertise in advanced batteries is essential. As a country we must have the capacity and expertise in place to exploit the new battery technologies we create. Otherwise the benefit of those new technologies will go elsewhere.

Creating consumer demand for electric vehicles is an obvious way to build a market for advanced batteries. But it is not the only way. Producing products for grid-level storage, for example, would also provide an opportunity for battery manufacturers to build capacity and refine expertise. A Manhattan Project could focus in part on certain types of grid-level storage, such as community energy storage, as a way to build capacity and expertise in advanced battery technology that would be relevant to transportation-related technology.

We must be cautious, however, about how any Manhattan Project subsidizes demand. The continuity of any subsidy depends upon sustaining long term political support for it. If government subsidies for electric drive are to be sustained, they must be seen as benefiting ordinary Americans. Structuring subsidies in the form of tax credits, which favor the rich, or geographic preferences, which favor designated, progressive communities, are good ideas, but they may not be politically sustainable. If the country is to make a major investment in creating a market for advanced batteries, we must find a way to do it that will bring the American people on board.

Senator Alexander is right: It is time for a Manhattan Project for advanced batteries. Weaning the United States off of petroleum will be hard and expensive. But, contrary to the expectations of just a few months ago, the political will may be there to make such an investment. We in the battery community have to start talking about just what that investment should be.



James J. Greenberger
Executive Director

North American Industry Announcements and Calendar

- **Next Webinar Program: Community Energy Storage-- Repurposing Retired Automotive Batteries.** The NAATBatt Webinar series continues on Monday, June 21, 2010, with a program entitled "*Community Energy Storage: New Paradigm for the Grid*". The program will examine community energy storage, an advanced battery application that may lie at the intersection of automotive and grid-level energy storage. The speakers at the program will be Dr. Gilbert Weiland of Oak Ridge National Laboratory's Computing and Computational Sciences Directorate, and Thomas Walker, P.E., Principal Engineer at American Electric Power. The program will begin at 2:00 p.m., EDT, and continue for approximately 60 minutes. To register, click on the following link: <http://events.meetingbridge.com/Register/?06123175845>. Registration for the June 21 program is complimentary.
- **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 at the Rancho Bernardo Inn in San Diego, CA. The conference will focus on grid level storage with separate tracks on bulk storage and grid services. NAATBatt is a supporting organization of the conference. Information about the conference can be found at: <http://www.infocastinc.com/index.php/conference/storage10>.
- **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 seeks to 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.
- **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 19-20, 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



- **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.



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