

## Summary:

For the December 31<sup>st</sup> issue of NAATBatt's Advanced Battery Weekly, we highlight the ongoing sector activities.

The NAATBatt Index declined 2.8% while the U.S. Index increased 2.1% and the Asia Index remained flat. The S&P 500 and Russell 2000 increased modestly by 0.8% and 1.3%, respectively.

Executive Director James Greenberger writes about China's plan to become the leader in electric vehicle technology within 10 years and the implications of that plan for the North American PEV industry. Read "**China is More an Opportunity than a Threat**" in the Executive Director's Notes section of this newsletter below.

## Key Highlights:

- The **Seoul Metropolitan Government (SMG)** has begun deploying all-electric buses on commercial routes. The buses went into service on December 21<sup>st</sup> after an 18-month development project with **SMG, Hyundai Heavy Industries (HHI)** and **Hankuk Fiber**. The lithium-ion (li-ion) battery is supplied by **Ener1**, which signed a supply agreement with HHI in August.
- **NEC** is planning to increase electrode capacity by fivefold for rechargeable li-ion batteries in order to meet demand. The company will use a **Japanese government** subsidy to boost capacity (at its plant in **Sagamihara**) to 10 million kilowatt-hours (kWhs) by the end of 2012 (from over 2 million kWhs).
- **ActaCell** announced over \$3 million in grants from the **Department of Commerce's National Institute of Standards and Technology**. The money will provide for the company to create a strategy to show it can scale up by 1,000 times the production of a nano material for high-energy batteries for use in electrified vehicles (EVs).
- **Tesla Motors** has stated that cheaper batteries will enable the **Model S** sedan to reach profitability at much lower volumes than the **Nissan Leaf**. The company has indicated its battery packs may cost as little as \$200 per kilowatt-hour (kWh) compared to over \$700 kWh for larger form factors.
- **Xcel Energy** has teamed up with **Xtreme Power** on a project involving a one-megawatt (MW) battery to store energy from solar facilities. The 3-year project involves studying how to efficiently incorporate energy output from renewable sources onto the transmission grid.
- The **California Energy Commission (CEC)** has approved \$724,998 for energy research projects involving energy-storage technology and energy efficiency. The results from the project will be used to help the **California Public Utilities Commission** develop specific energy-storage policies for California utilities as required by **A.B.2514**.
- Two charging stations have been installed at the **Wilder Auto Center** dealership in **Port Angeles, Washington**. The charging station will be available for customers who are having service work done or who are stopping by for other reasons.
- **Eaton Corporation** has introduced its hybrid electric system into the **Indian** city bus market with debut on the **Tata Motors** electric hybrid **Starbuses**. The hybrid system combines a 5.9 liter



Cummins CNG engine rated at 172 kilowatt (KW) with an electric motor that has a peak power output of 44 KW.

## A Few More Details:

The Seoul Metropolitan Government (SMG) has begun deploying all-electric buses (as shown in **Exhibit 1**) on commercial routes. The buses went into service on December 21<sup>st</sup> after an 18- month development project with SMG, Hyundai Heavy Industries (HHI) and Hankuk Fiber. The bus is expected to be able to run for about 52 miles on a single charge and can reach a maximum speed of 62 miles per hour. The li-ion battery is supplied by Ener1, which signed a supply agreement with HHI in August.

### Exhibit 1: The Seoul Electric Bus



Source: TFTS

NEC is planning to increase electrode capacity by fivefold for rechargeable li-ion batteries in order to meet demand. The company will use a Japanese government subsidy to boost capacity (at its plant in Sagami-hara) to 10 million kilowatt-hours (kWhs) by the end of 2012 (from over 2 million kWhs). The Japan Ministry of Economy, Trade and Industry is providing 110 billion yen (\$1.3 billion) in subsidies to fund 153 projects of companies including Toyota Motor and Hitachi as part of a plan to create jobs that help reduce emissions.

Source: Bloomberg and NEC

ActaCell announced over \$3 million in grants from the Department of Commerce's National Institute of Standards and Technology. The money will provide for the company to create a strategy to show it can scale up by 1,000 times the production of a nano material for high-energy batteries for use in EVs. The company ActaCell licenses research from the University of Texas at Austin.

Source: Reuters

Tesla Motors has stated that cheaper batteries will enable the Model S sedan to reach profitability at much lower volumes than the Nissan Leaf. The Model S is using cells similar to those in laptops compared to larger cells for Nissan. Tesla has indicated its battery packs may cost as little as \$200 per kilowatt-hour (kWh) compared to over \$700 kWh for large-form cell li-ion packs.

Source: Bloomberg

Xcel Energy has teamed up with Xtreme Power on a project involving a one megawatt (MW) battery to store energy from solar facilities. The 3-year project involves studying how to efficiently incorporate energy output from renewable sources onto the transmission grid. The Xtreme Power technology will be used to perform various energy storage and grid functions -- including output smoothing and time shifting.

Source: Platts

The California Energy Commission (CEC) has approved \$724,998 for energy research projects involving energy-storage technology and energy efficiency. The two research projects are funded by the CEC's Public Interest Energy Research program. The assessment involves the current status of energy-storage technologies and working with utilities and the energy-storage industry. The results from the project will be used to help the California Public Utilities Commission, which will develop specific energy-storage policies for California utilities as required by A.B.2514. Soladigm will use the funds to develop an improved manufacturing process for low-cost dynamic windows.

*Source: California Energy Commission*

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Two charging stations were installed at the Wilder Auto Center dealership Port Angeles, Washington. The charging station will be available for customers who are having service work done or who are stopping by for other reasons. One is outside, and one is inside, and they are designed to accommodate one car each.

*Source: Peninsula Daily News*

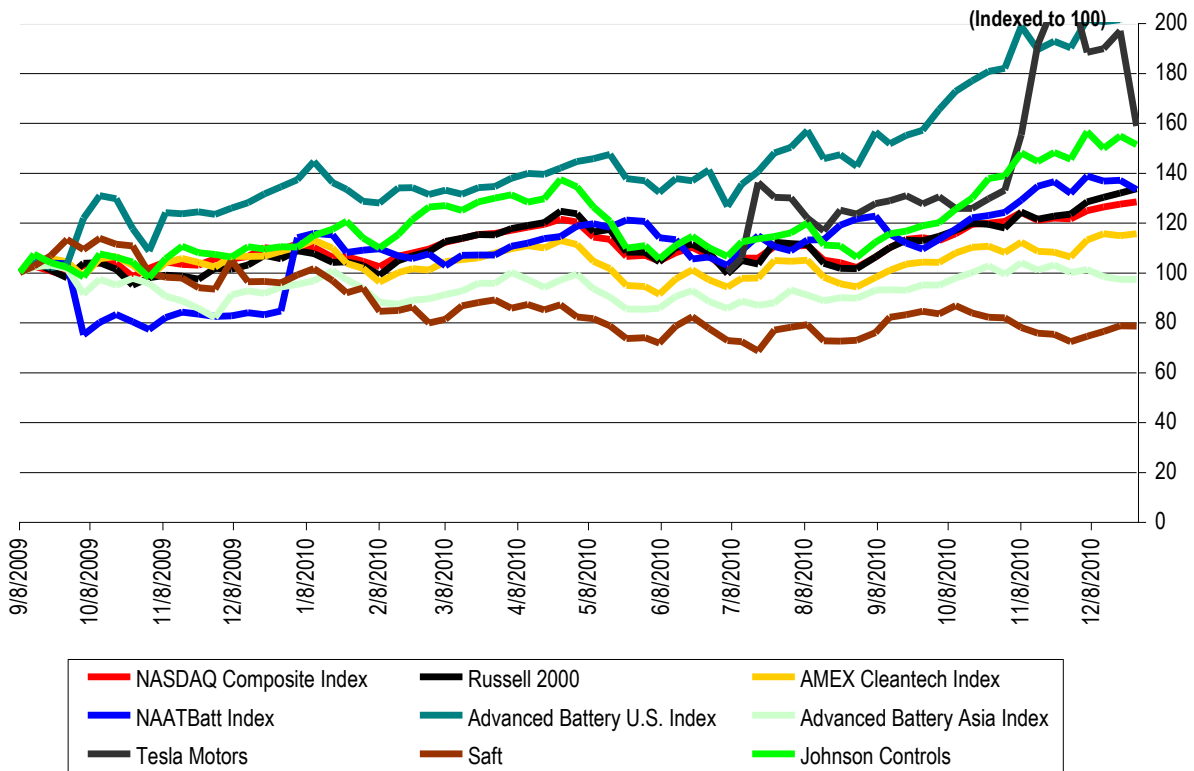
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Eaton Corporation has introduced its hybrid electric system into the Indian city bus market with debut on the Tata Motors electric hybrid Starbuses. Tata Motors jointly operated these four buses with the Delhi Transport Corporation on specific routes during the Commonwealth Games. Eaton worked with Tata to specially design the system for buses that run on Compressed Natural Gas (CNG). The hybrid system combines a 5.9 litre Cummins CNG engine rated at 172 KW (230 horse power) with an electric motor that has a peak power output of 44 KW.

*Source: Business Standard*

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**Exhibit 2: Indices Performance  
(From September 8, 2009)**

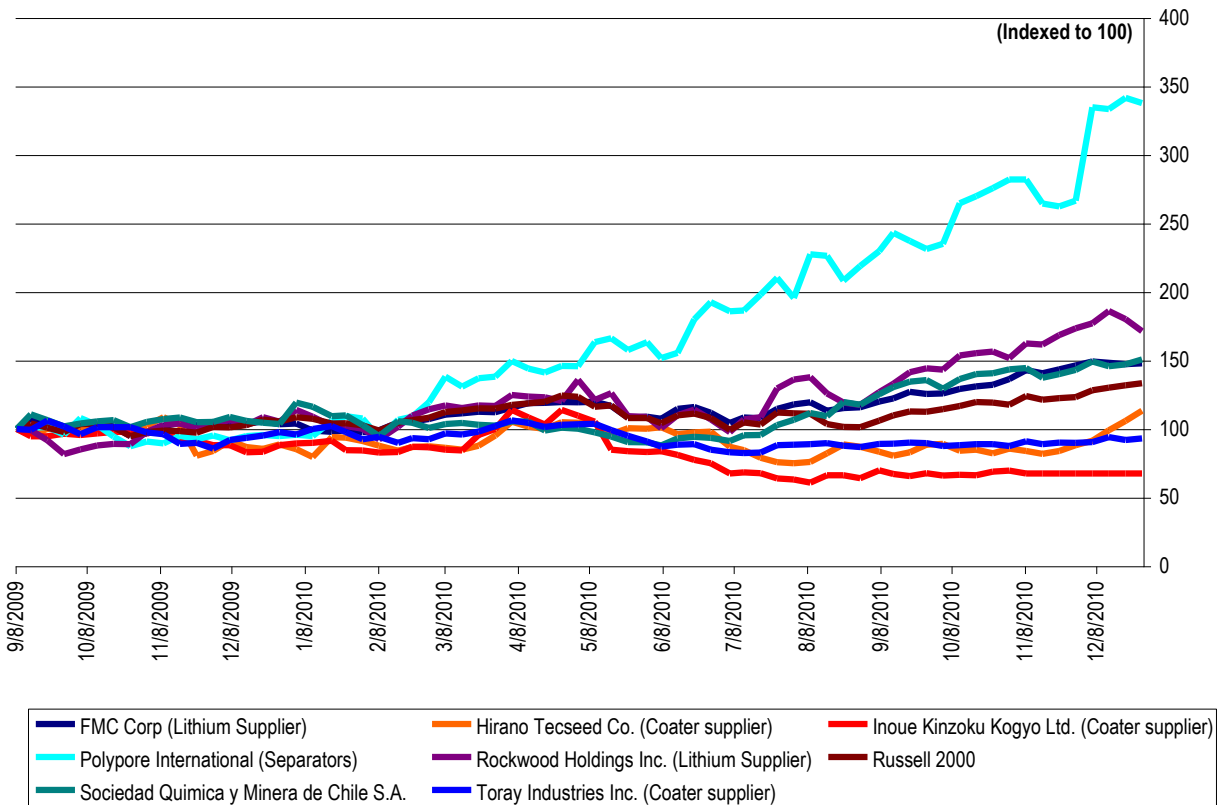


Index	Close on 12/27/2010	52-Wk High	% of 52-Wk High	Performance		
				LTM	YTD	Week
Dow	11,555.0	11,573.5	99.8%	9.9%	10.8%	0.7%
S&P 500	1,257.5	1,258.8	99.9%	11.5%	12.6%	0.8%
NASDAQ	2,667.3	2,671.5	99.8%	16.5%	24.9%	0.7%
Russell 2000	792.4	792.4	100.0%	24.7%	26.1%	1.3%
AMEX Cleantech Index	1,132.4	1,139.1	99.4%	6.4%	6.1%	0.7%

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 3: Supplier Performance**  
(From September 8, 2009)



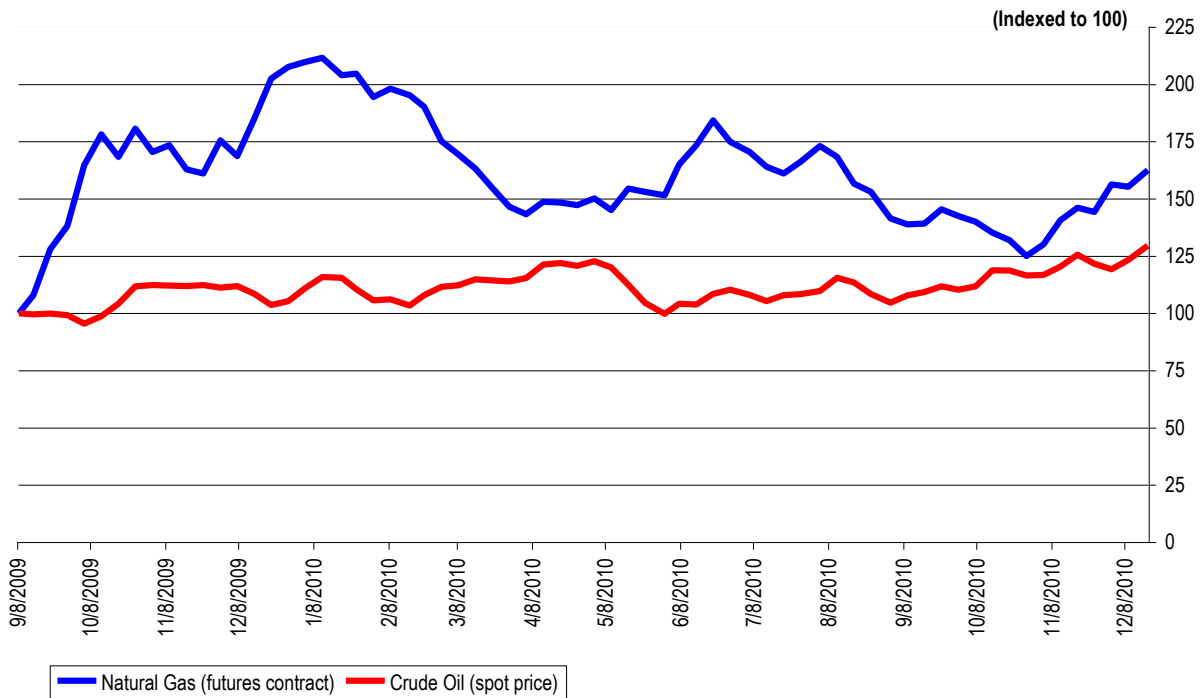
Source: Bloomberg

**Exhibit 4: Commodity Prices**

Commodity	Price on 12/29/2010	Price on 12/20/2010	Price on 11/29/2010	1 Week Change	1 Month Change
LME Copper (Cash, \$ per tonne)	9,465	9,249	8,319	2.3%	13.8%
LME Lead (cash, \$ per tonne)	2,530	2,451	2,255	3.2%	12.2%
LME Nickel (cash, \$ per tonne)	24,270	24,875	22,750	(2.4%)	6.7%

Source: LME

**Exhibit 5: Natural Gas and Crude Oil**  
**(From September 8, 2009)**



Source: EIA

## Executive Director's Notes



### **CHINA IS MORE OF AN OPPORTUNITY THAN A THREAT**

Sometime early next year, the Chinese Ministry of Industry and Information Technology is expected to release a plan to make China the world leader in “new energy technology vehicles”. The plan has long been highly anticipated and parts of it extensively leaked.

The upshot of the plan is that the Chinese government expects to spend upwards of \$15 billion over the next ten years, largely to build capacity and infrastructure for electric vehicles. Somewhat troubling, the plan appears to require any foreign company that wants to sell into the Chinese PEV market do so through a joint venture that is at least 51% Chinese owned.

The Ministry's plan raises two principal concerns amount U.S. companies. The first is that if the Chinese government invests \$15 billion in vehicle electrification, the U.S. will be left well behind in the race for electric vehicles. The second is that if the Chinese government only permits majority-owned Chinese companies access to the PEV market, American companies wishing to access that market will be forced into joint ventures to which they will have to contribute, and potentially lose control of, valuable intellectual property and know-how.

The first concern is largely unfounded. The development of vehicle electrification technology is not a race; it is a boxing match. More important, it is a boxing match in which there is a third fighter in the ring-- and the one at the moment that is winning the fight: petroleum-fueled vehicles. U.S. industry should welcome new investment in electrification technology from whatever quarter it comes. America's strategy ultimately to win the fight must rely on its traditional strengths in innovation and applied technology. Those advantages are in no way threatened by short term Chinese investment in electric vehicle infrastructure, even if that investment is disproportionate to what the U.S. is willing and able to invest.

The second concern has greater legitimacy. The Chinese properly understand that in order to become the world leader in electric vehicle technology it must acquire technology and technological expertise from abroad. This, again, should pose no concern. In today's world technology moves easily across borders; attempts to constrain its transferability are Sisyphean in nature. And who would want it otherwise? After all, technology is what we in the United States have to sell.

The issue is simply one of price. Using the joint venture requirement to acquire more intellectual property and know-how than China would acquire if it simply bought product directly from foreign suppliers is nothing more than attempt to decrease the cost to China of acquiring the technology it seeks. It is one of

the oldest tactics in the bazaar. We should not be offended or scared or storm out of the bazaar in outrage, but simply recognize the tactic for what it is.

Of course, someone does have to bargain back. Only tourists take the first offer. In the case of the United States, that will need to be the federal government in some form. After all, the federal government has largely funded the development of much of the technology that China would like to acquire and in our free market economy no entity other than the federal government has the necessary leverage to bargain against another government entity.

But the federal government needs to remember that trade is a good thing. Cutting a deal in the bazaar leaves both parties better off than before. We should not hesitate to cut deals with our new, and potentially best, trading partner, China, in the areas of PEV's and PEV-related technology. Just keep in mind that China has few thousand years head start on us in the tactics of the bazaar. Let's not be tourists.



James J. Greenberger  
Executive Director



## NAATBatt Membership Applications for 2011

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### **2011 Membership Applications and Dues Structure**

NAATBatt is now accepting applications for membership for the 2011 calendar year. Membership dues for 2011 are \$10,000 for Corporate Members, \$10,000 for OEM Members, \$10,000 for Utility Members, \$5,000 for Associate Members, \$1,000 for Individual Members, and \$500 for Non-Profit/Government Members. Please click on <http://naatbatt.org/membership-inquiry/> and indicate that you are interested in a 2011 membership.

### **Why Join NAATBatt?**

NAATBatt's mission is to grow the market for advanced electrochemical energy storage technology in North America. NAATBatt provides regular educational programming on topics of interest to the advanced battery community, a weekly newsletter chronicling developments in the North American advanced battery market, networking opportunities for industry participants and their customers, including our recently concluded conference on PEV's and the grid, and public policy initiatives, such as the recent NAATBatt-sponsored meeting with Chairman Jon Wellinghoff of FERC and production of written comments to FERC in support of distributed energy storage technology.

NAATBatt recently concluded the highly successful meeting and conference entitled "The Impact of PEV's on T&D Systems: Challenges and Solutions", in Louisville, Kentucky. The conference was the largest cross-industry event to date focused on the impact of plug-in electric vehicles on the grid. The conference outlined the improvements and upgrades that utilities must make to the grid in order for it to accommodate mass-market electric vehicles. The conference emphasized the critical role that grid-connected energy storage can play in promoting vehicle electrification in the United States. Emphasizing the necessary relationship between grid-connected storage and electric vehicles is one of NAATBatt's primary missions.

NAATBatt is a not-for-profit trade association qualified under Section 501(c)(6) of the Internal Revenue Code that is working for the benefit of the entire industry. **Every dollar spent on NAATBatt memberships and programs goes to recouping program costs and to supporting activities intended to benefit the entire advanced battery industry.** At a time when it seems that the only people making money on advanced lithium-ion technology are professional conference organizers, the advanced battery industry should take control of its own market and its own future. NAATBatt exists to market for the industry, not to the industry. But NAATBatt needs your support to do it. Please join us.

## North American Industry Announcements and Calendar

- **10x Advanced Battery R&D:** 10X Advanced Battery R&D: Breaking Barriers in Advanced Battery Performance & Value will be held at the Techmart Meeting Center in Santa Clara, California on **January 10-12, 2011**. The conference will survey technology advances in battery chemistries, ultracapacitors, fuel cells and other technologies that could dramatically reduce the costs of energy storage within a 3-10 year time frame. The conference Web site is: <http://www.infocastinc.com/index.php/conference/414>. NAATBatt is a supporting organization.
- **Advanced Automotive Batteries Conference & Symposium 2011:** The Advanced Automotive Batteries 2011 Conference (AABC) will be held on **January 24-28 2011**, in Pasadena, California. This is the next domestic program in the series of conferences on automotive batteries produced by Dr. Menahem Anderman and Total Battery Consulting. The conference Web site can be found at: <http://www.advancedautobat.com/automotive-battery-conference-2011/index.html>.
- **Advanced The 28<sup>th</sup> International Battery Seminar & Exhibit:** Power Source's annual International Battery Seminar & Exhibit will be held on **March 14-17, 2010**, at the Broward County Convention Center in Fort Lauderdale, Florida. A link to the conference Web site can be found at: <https://powersources.net/florida/28th.html>.
- **TREM11: Strategic Metals for National Security and Clean Energy:** The TREM11 conference on rare earth and strategic metals will be held on **March 22-23, 2010** at the Ritz-Carlton Pentagon City, in Arlington, Virginia. NAATBatt is a supporting organization of the conference. Information about the conference can be found at: <http://www.tremcenter.org/>.
- **Plug-In Electric Vehicle Infrastructure USA 2011:** The Plug-In Electric Vehicle Infrastructure USA 2011 conference will examine five key areas of interest to those working with PEV's and their supporting infrastructure. The conference will be held **March 31-April 1, 2011**, at the Hilton Mission Bay in San Diego California. The conference Web site is: <http://www.evupdate.com/electricvehicleusa/index.shtml>.
- **2011 Battery Conference:** The 2011 Battery Congress will be held at the University of Michigan – Michigan League in Ann Arbor, Michigan on **April 11-12, 2011**. Information about the Congress can be found at: <http://batterycongress.org/about-2/>
- **The Battcon™ International Stationary Battery Conference:** The Battcon™ International Stationary Battery Conference is a three day, noncommercial, technical event for storage battery users from a broad range of industries. The conference will be held from **May 16 to 18, 2011** at the Swan and Dolphin Resort, Orlando, Florida. The conference Web site is: <http://www.battcon.com/>
- **Shmuel DE-Leon Energy, Ltd.,** an industry knowledge base company has developed a new power sources DataBase including 28,000 records of industry vendors, cells datasheets with a full parametric searching capabilities. The product provides industry users and companies with a knowledge tool to find the power sources resources and vendors for their EV needs. See: [www.batteriesdatabase.com](http://www.batteriesdatabase.com), [www.sdle.co.il](http://www.sdle.co.il), or contact: [shmued33@gmail.com](mailto:shmued33@gmail.com).

- **Energy Overviews** a media company which publishes weekly newsletters covering several renewable energy industry verticals, including Clean Transportation, is offering NAATBatt members as a group the opportunity to subscribe to Energy Overviews' newsletters, databases and other services for the price of \$250 per year, a discount from the standard subscription rate of \$587 per year, *provided that* at least 20 NAATBatt member companies accept this offer. See <http://www.epoverviews.com/>. If your company is interested in a subscription, please contact Jim Greenberger at [jgreenberger@naatbatt.org](mailto:jgreenberger@naatbatt.org).
- **NAATBatt Membership Information.** NAATBatt is taking applications for 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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