

**NEW YORK BATTERY AND ENERGY STORAGE
TECHNOLOGY CONSORTIUM™**

YEAR ENDING MARCH 31, 2010

2009–2010 ANNUAL REPORT

**FINAL REPORT
MARCH 2010**

NEW YORK STATE
ENERGY RESEARCH AND
DEVELOPMENT AUTHORITY

nyserda
Energy. Innovation. Solutions.



The New York State Energy Research and Development Authority (NYSEDA) is a public benefit corporation created in 1975 by the New York State Legislature.

NYSEDA derives its revenues from an annual assessment levied against sales by New York's electric and gas utilities, from public benefit charges paid by New York rate payers, from voluntary annual contributions by the New York Power Authority and the Long Island Power Authority, and from limited corporate funds.

NYSEDA works with businesses, schools, and municipalities to identify existing technologies and equipment to reduce their energy costs. Its responsibilities include:

- Conducting a multifaceted energy and environmental research and development program to meet New York State's diverse economic needs.
- The **New York Energy SmartSM** program provides energy efficiency services, including those directed at the low-income sector, research and development, and environmental protection activities.
- Making energy more affordable for residential and low-income households.
- Helping industries, schools, hospitals, municipalities, not-for-profits, and the residential sector, implement energy-efficiency measures. NYSEDA research projects help the State's businesses and municipalities with their energy and environmental problems.
- Providing objective, credible, and useful energy analysis and planning to guide decisions made by major energy stakeholders in the private and public sectors.
- Since 1990, NYSEDA has developed and brought into use successful innovative, energy-efficient, and environmentally beneficial products, processes, and services.
- Managing the Western New York Nuclear Service Center at West Valley, including: overseeing the State's interests and share of costs at the West Valley Demonstration Project, a federal/State radioactive waste clean-up effort, and managing wastes and maintaining facilities at the shut-down State-Licensed Disposal Area.
- Coordinating the State's activities on energy emergencies and nuclear regulatory matters, and monitoring low-level radioactive waste generation and management in the State.
- Financing energy-related projects, reducing costs for ratepayers.

For more information, contact the Communications unit, NYSEDA, 17 Columbia Circle, Albany, New York 12203-6399; toll-free 1-866-NYSEDA, locally (518) 862-1090, ext. 3250; or on the web at www.nyserda.org

STATE OF NEW YORK
David A. Paterson, Governor

ENERGY RESEARCH AND DEVELOPMENT AUTHORITY
Vincent A. DeIorio, Esq., Chairman
Francis J. Murray, Jr., President and Chief Executive Officer

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TECHNOLOGY CONSORTIUM™**

Final Report

Prepared for the
**NEW YORK STATE
ENERGY RESEARCH AND
DEVELOPMENT AUTHORITY**

Albany, NY
www.nyserda.org

Jason H. Doling
Project Manager

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1 *Introduction*

New York State's regulations that implement the federal Clean Air Interstate Rule (CAIR) programs to control nitrogen oxide (NO_x) emissions are set forth at 6 NYCRR Parts 243 and 244. These regulations establish seasonal and annual emissions cap-and-trade programs that are designed to mitigate interstate transport of ozone and fine particulate pollution (smog). These regulatory programs will, in concert with other programs, assist states in the eastern U.S. in attaining the ozone and PM_{2.5} national ambient air quality standards.

Under Parts 243 and 244, ten percent of the NO_x emission allowances allocated to New York under these regulations were directed by the New York State Department of Environmental Conservation (DEC) to the Energy Efficiency and Renewable Energy Technology Account (the EERET Account).

The New York State Energy Research and Development Authority (NYSERDA) is designated by the regulations as the administrator of the EERET account; the regulations direct NYSERDA to sell the allowances in order to obtain funds to "support programs that encourage and foster energy efficiency measures and renewable energy technologies and cover the reasonable costs associated with the administration and evaluation of these programs by NYSERDA." [Part 243-1.2(b)(40) and Part 244-1.2(b)(39)]

These funds have been used to establish the New York Battery and Energy Storage Technology (NY-BEST) Consortium,TM announced by Governor David Paterson to help position New York as a global leader in energy storage technology for heavy-duty transportation, electric grid, and other applications. NYSERDA was charged with working with industry, academic and government partners to establish this industry-driven Consortium which is being seeded with approximately \$25 million through these Clean Air Interstate Rule proceeds. NY-BEST has three primary objectives to build the battery and energy storage industry in New York: providing members with access to testing and characterization capabilities, supporting active networking and technology transfer, and providing research and development funding to develop and commercialize new energy storage technologies.

It is anticipated that energy storage will become the most critically important component of many vehicles, exceeding that of the engine, in terms of vehicle performance and value, within the next 20 years. Advancing such technology and developing products will transform the transportation and renewable power generation sectors and reduce NO_x emissions. Vehicles, both highway and off road, account for approximately 60 percent of the NO_x emissions in New York with medium and heavy-duty vehicles contributing approximately 25 percent of this amount. Energy storage will also be a critical enabler for an integrated smart electric grid, allowing load-leveling and renewable energy storage, enhancing system reliability, and reducing emissions.

To implement the NY-BEST Consortium, NYSERDA developed the "Program Plan for the Energy Efficiency and Renewable Energy Technology Account under New York's Clean Air Interstate Rules (CAIR)." After a public comment period and stakeholder workshop, this Plan was approved by the NYSERDA Board on April 27, 2009. This annual report is prepared pursuant to that Program Plan and provides an update on NY-BEST progress through the year ending March 31, 2010. It contains an accounting of CAIR proceeds, expenditures, program metrics, and a summary of program activities and implementation.

1.1 CAIR Proceeds

Pursuant to regulations (6 NYCRR Part 243 and Part 244) regarding CAIR, the Department of Environmental Conservation allocated 10 percent of the 2009, 2010, and 2011 vintage CAIR NOx allowances to NYSERDA to be made available for sale in the existing NOx allowance marketplace. NYSERDA was provided with 23,013 NOx allowances to sell consisting of 9,327 allowances for the Ozone Season Program (3,109 each year for the 2009 through 2011 allocation period) and 13,686 for the Annual Program (4,562 each year for the 2009 through 2011 allocation period).

Through a competitive solicitation, NYSERDA retained the services of Amerex Brokers, LLC, a professional emissions broker, to assist in the sale of these allowances. Sales of the Annual Program allowances began in February 2009. The NYSERDA strategy was to engage end users who had a need for compliance allowances. In light of the regulatory uncertainty, the early strategy was to place more of an emphasis on selling the 2011 and 2010 allowances. This strategy proved to be effective in capturing higher value in a downward trending market, and it also allowed Amerex to be more selective in the offers it would consider.

NYSERDA sold all of the *Annual Program Allowances* it was allocated for total gross revenues of \$23,968,500. Aggregate sales results, along with various market prices, can be found in Table 1.1.

Table 1.1: Annual NOx Allowance Sales Data

	Vintage		
	2009	2010	2011
Weighted Average Price (per allowance)	\$ 2,316	\$ 1,722	\$ 1,216
Highest Price Achieved	\$ 3,000	\$ 1,750	\$ 1,550
Lowest Price Achieved	\$ 2,000	\$ 1,500	\$ 725
Number of Allowances (13,686 total)	4,562	4,562	4,562
Gross Revenue (\$23,968,500 total)	\$10,564,500	\$7,855,500	\$5,548,500

Source: NYSERDA

NYSERDA sold all of the *Seasonal Program Allowances* it was allocated for total gross revenues of \$473,350. Aggregate sales results, along with various market prices, can be found in Table 1.2.

Table 1.2: Seasonal NOx Allowance Sales Data

	Vintage		
	2009	2010	2011
Weighted Average Price (per allowance)	\$ 83.83	\$ 53.70	\$ 15.40
Highest Price Achieved	\$ 140	\$ 125	\$ 20
Lowest Price Achieved	\$ 35	\$ 35	\$ 15
Number of Allowances (9,327 total)	3,109	3,109	3,109
Gross Revenue (\$473,350 total)	\$260,622	\$164,843	\$47,885

Source: NYSERDA

Table 1.3: Additional Relevant Statistics

Allowance sale start date:	February 2, 2009
Allowance sale end date:	February 3, 2010
Total revenue (annual + seasonal allowances):	\$24,441,850
Net revenue (less broker fees of \$266,736):	\$24,175,114
Number of counterparties:*	18
Number of end user counterparties:	15
% of allowances sold to end users:	93.9%
% of allowances sold to trading companies:	6.1%
Number of transactions:	42

Source: NYSERDA

* A counterparty is an individual buyer of allowances

2 Budget and Spending Status

This section presents financial data for the program through March 31, 2010. Available funding is \$24,441,850. The approved budget and contract commitments are presented in Table 2.1.

Table 2.1. Available Funding and Financial Status through March 31, 2010

	Budget ¹	Expenditures and Commitments ²
Testing and Characterization Equipment	\$3,445,114	\$0
Consortium Operations and Management ³	4,671,000	100,028
Research Grants	13,055,000	8,054,347
Technology Transfer	500,000	0
NYSERDA Administration ⁴	1,711,000	537,369
Program Evaluation and Accountability	500,000	0
Brokerage Fees for NOx Allowance Sales	266,736	266,736
New York State Cost Recovery Fee	293,000	12,342
TOTAL ³	\$24,441,850	\$8,970,822

Source: NYSERDA

¹ “Budget” reflects the amounts that were approved by the NYSERDA Board in the Program Plan on April 27, 2009. At the time, total available funding from allowance sales was unknown and three budget ranges were included: \$20 million, \$30 million, and \$35 million. The budgeted amounts above reflect the rounded pro-rated budget based upon the actual funds received for the program.

² “Commitments” represents the total cumulative encumbrances made and total research awards announced in March 2010 that are in contract negotiations.

³ A contract between NYSERDA and NY-BEST, Inc. to provide for the services of an Executive Director, operational support staff, and operating expenses over the next five years is under development and anticipated to be executed during 2010 totaling approximately \$4.35 million. An additional \$100,028 has been used for facilitation and web development services through a consultant and for three competitive market analyses being developed by teams of university MBA students and advisors.

⁴ “NYSERDA Administration” expenses relate to the development, implementation and administration of the Program Plan and management of Consortium activities.

3 *Summary of Program Benefits*

The primary objectives of the NY-BEST Consortium include:

- Accelerating the commercial introduction of energy storage technology in NYS;
- Building the human capital and expertise to sustain a vibrant commercial energy storage industry in New York; and
- Leveraging seed resources of approximately \$25 million to create a sustainable organization that provides value to its members and to New York State.

Program benefits from NY-BEST will span the various stages of research and development, product development, and commercialization. Evaluation of benefits resulting from product research and development includes long time frames associated with research, introducing product to market, and the different stages of investments during the product lifecycle. During this first year, NY-BEST progress centered around establishing the Consortium and awarding the first round of research and development projects. The following metrics will be used to assess the success of NY-BEST and will be included in subsequent year's reports.

Consortium Operations:

- Increase in number of members
- Success stories from research, commercialization, and vendor partnerships made as a result of NY-BEST
- Progress toward reaching self-sufficiency
- Technology transfer activities held (e.g., conferences, symposiums, workshops, seminars, publications)

Testing and Characterization:

- Use of NY-BEST sponsored testing and characterization capabilities
- Jobs (staffing)
- Technology Readiness Levels and Manufacturing Readiness Levels of technologies examined

Research and Development:

- Publications
- Invention disclosures and patents
- Licenses
- Recognition awards to NY-BEST members or affiliated researchers
- Outside research funding received
- Research and development jobs supported

Commercialization Success at Specific Companies or Organizations:

- Outside funding received including angel and venture capital
- Product sales and new products launched
- Licenses
- Cost savings
- Capital expenditures
- Jobs created and retained
- Energy, economic, and environmental benefits

3.1 Research and Development Funding Solicitation

In summer 2009, NYSERDA working with a NY-BEST working group solicited research topics of interest to parties in the energy storage community in New York. Sixty-seven concept papers were received and evaluated. This guidance was used to develop the first NY-BEST Market-Driven Research solicitation issued in October 2009. Thirty-six proposals seeking almost \$22 million in CAIR funding were received in December 2009. In March 2010, nineteen projects were awarded with 27 partners comprising \$8 million in CAIR funding and \$7.3 million in cost-share, for a total investment of \$15.3 million. These projects include applications in transportation, smart grid, renewable energy technologies, and other industries. **These projects will help to support 136 engineers, researchers and other positions over the next one to four years and train 17 graduate and undergraduate students.** The following awards were made in two categories: industry-led near-term commercialization partnerships, and technology development.

Industry-Led Commercialization Partnership Awards: \$4.86 million in CAIR funds

- **General Electric Co. (Schenectady)** is developing improvements to its sodium metal halide batteries for use in a new generation of cleaner locomotives and stationary applications to smooth intermittent renewable power generation as it interconnects with the grid and critical load back-up power and other applications. *NYSERDA CAIR funding \$2.50 million.*
- **Ultralife Corporation (Newark – Wayne County)** is integrating battery and ultracapacitors on a common power circuit serving two renewable-energy generation sources. This will enable increased renewable-energy contributions to the grid. The system can also provide backup electricity during an outage and, during normal operation, allow customers to draw on the stored energy to reduce both their peak electric grid demand and the utility charges associated with peak demand. *NYSERDA CAIR funding \$2.36 million.*

Technology Development Awards: \$3.19 million in CAIR funds.

- **Binghamton University** is developing lithium air storage systems that could have applications in vehicle or grid systems. *NYSERDA CAIR funding \$200,000.*
- **Brookhaven National Laboratory, Binghamton University, and University at Buffalo** are partnering on three projects to develop improved batteries for use in stationary grid scale energy storage applications, including, lithium-air, lithium-ion, and lithium-titanate batteries. *NYSERDA CAIR funding \$552,890.*
- **Cerion Enterprises (Rochester)** is developing innovative materials for next-generation lithium-ion batteries. *NYSERDA CAIR funding \$200,000.*
- **City University of New York**, under two projects, is developing a novel nickel-zinc battery that uses low-cost materials and technologies to improve the performance of ultracapacitors. *NYSERDA CAIR funding \$349,597.*
- **College of Nanoscale Science and Engineering at the University at Albany** is developing electrolytes to improve the performance of ultracapacitors. *NYSERDA CAIR funding \$200,000.*
- **Cornell University (Ithaca)** is developing non-flammable battery electrolytes with improved temperature and voltage performance. *NYSERDA CAIR funding \$200,000.*

- **General Motors (Honeoye Falls – Monroe County)** is developing materials for improved lithium-ion battery electrodes for automotive applications. *NYSERDA CAIR funding \$196,090.*
- **Hollingsworth & Vose, Co. (Easton – Washington County)** is developing an advanced separator for valve-regulated lead-acid batteries. *NYSERDA CAIR funding \$200,000.*
- **Impact Technologies (Rochester)** is developing a novel method to increase the lifetime of batteries by assessing battery health through the use of in-cell measurement techniques. *NYSERDA CAIR funding \$99,766.*
- **Ioxus (Oneonta)**, under three projects, is improving its ultracapacitor performance by developing a novel electrode-electrolyte interface, using nanostructured materials in the electrodes, and developing a new high-density electrode material. *NYSERDA CAIR funding \$600,000.*
- **Rensselaer Polytechnic Institute (Troy)** is developing next-generation lithium-ion rechargeable batteries. *NYSERDA CAIR funding \$200,000.*
- **Rochester Institute of Technology** is developing methods to recycle and reuse lithium-ion batteries to minimize waste streams to landfills and maximize reclamation. *NYSERDA CAIR funding \$195,869.*

4 Program Activities and Implementation

4.1 Consortium Operations

In November 2009, NY-BEST began to accept members. The Consortium was incorporated in January 2010 as a New York State not-for-profit corporation. Subsequently, the organizing members met in Troy, New York, on March 9-10, 2010, to elect a Board of Directors, review progress during the past year, and discuss future priorities. Over 50 members have now joined the consortium including large and small companies, end users, and members of the research community. A list of current members is included in Appendix 5.3.

During the upcoming year, NY-BEST will issue a solicitation to procure an Executive Director and organization to provide operational support to assist the Consortium as it expands. These individuals will be key in helping the Consortium create a business plan to drive toward a vibrant and self-sustaining consortium. They will also assist members in finding strategic partners and building relationships. This could include facilitating introductions between NY-BEST members and potential prospects, vendors, and holding technical workshops and conferences. Model agreements for NY-BEST that help to facilitate collaboration and technology transfer will also be created including for Consortium-sponsored equipment and capabilities.

4.2 Testing and Characterization Capabilities

Access to testing and characterization capabilities is a critical element for the advancement of battery and energy storage technologies. In an effort to identify the current state of capabilities and needs within the State, a survey was developed with input from the NY-BEST Testing Working Group and issued in July 2009. Under a contract with NYSERDA, the New York Academy of Sciences (NYAS) was contracted to analyze the results. In total, NYAS reviewed the 24 surveys completed, 69 research concept papers received, and conducted 43 interviews¹.

The most significant recommendation identified was to create a searchable database of capabilities available within New York for use by NY-BEST members. This database was launched in February 2010 and continues to be enhanced with additional equipment and with leading researchers. NYSERDA is currently serving as a facilitator to match member needs with capabilities until an independent NY-BEST management team assumes this function in the future. CAIR funding of \$3.45 million was also budgeted to procure or subsidize needed testing and characterization capabilities.

An Advisory Committee to the NY-BEST Board has been created to develop the process for identifying needed capabilities, recommending usage policies, and begin identifying equipment that should be considered for purchase. Working with the Executive Director and operational support staff, this group will help to develop a strategy to maximize the value of the NY-BEST testing funding budgeted to fill niches where capabilities do not currently exist. This could include a combination of subsidizing testing

¹ The complete report is available at: <http://www.ny-best.org/sites/default/files/resources/NY-BEST%20NYAS%20report%20020810.pdf>

services for members and/or acquiring needed capabilities that, in addition to serving members, could be accessed by non-members at a higher fee. Beginning in 2010, specific testing and characterization needs are expected to be identified and procured.

4.3 Networking, Technology Transfer and Facilitation

A key element of this Consortium's model is active participation, communication and networking. Activities during 2009-10 included:

- Working groups comprising industry, academic and government partners met from July 2009 to February 2010 around three main topics: governance, testing capabilities, and market-driven research. In addition to establishing a foundation from which NY-BEST will grow, the working group meetings which occurred in person and by phone provided an opportunity for networking. Initial feedback from members has suggested that these meetings helped forge relationships between members which had not previously existed.
- Annual Meeting and Conference was held in March 2010. In addition to electing the board of directors and discussing progress, two panel discussions were held: "Opportunities for Energy Storage in Medium and Heavy-Duty Electric Vehicle Applications and Grid Storage" and "Testing and Characterization Capabilities; Access and Usage Policies; and Best Practices to Leverage Existing Capabilities." Several opportunities for networking were also provided and well received based on the results of an evaluation survey.
- NY-BEST website, www.ny-best.org, was launched in February 2010. The website serves two goals: informing potential NY-BEST members about the benefits of membership, and promoting the services and capabilities of NY-BEST members to their potential customers and partners. Website sections include: funding opportunities, resources such as relevant market studies, news summaries, and member profiles. The searchable testing and characterization database is also included on this site for members.
- NY-BEST email newsletter was launched in December 2009. The newsletter is distributed approximately every two weeks to almost 400 individuals who have expressed an interest in NY-BEST. It includes federal, state and non-profit funding opportunities, Consortium news, and battery and energy storage industry news from within New York State and beyond.

For 2010-11, an energy symposium is planned in conjunction with Brookhaven National Laboratory to highlight the energy storage industry in New York. Several technology transfer sessions based on the research projects funded are also planned as is the Annual Meeting and Conference.

4.4 Research and Development Funding

A key goal of NY-BEST is developing technologies that will have significant value added in New York through R&D, design, engineering, and/or manufacturing. The first NY-BEST market-driven research solicitation was issued in October 2009 and met with a tremendous response: 36 proposals were received seeking almost \$22 million in NYSERDA funding. In March 2010, nineteen projects were announced totaling approximately \$15.3 million, with \$8 million contributed by NYSERDA in CAIR funding. These include numerous seed projects and two larger product development opportunities with GE and Ultralife and their academic partners.

Three competitive market analyses are underway at University at Albany, Columbia University, and Rensselaer Polytechnic Institute. Each team is comprised of Executive MBA, Technology Masters, and technical graduate students. Two of these analyses are in Grid Storage (customer-sited and utility-scale) and one is in medium and heavy-duty transportation storage. Each analysis is examining international competition, New York strengths, and potential niches where New York companies and NY-BEST can position the industry for growth in New York. An Advisory Committee to the Board of Directors has also been created to assist with developing a strategic research plan using these market analyses as support. This strategic research plan will be used, in part, to help identify future research and development funding priorities. The business plan will complement this strategic research plan by discussing ideas to bring technologies to commercialization and identifying approaches for dealing with the diverse range of energy storage technologies and organizations represented within the consortium.

During 2010-11, NY-BEST will also work closely with the New York State Smart Grid Consortium, a public-private partnership founded in 2008 to promote broad statewide implementation of the smart electric grid. In particular, NY-BEST will work with the Smart Grid Consortium, research community, and industry to develop a comprehensive application for an anticipated \$125 million Department of Energy Innovation Hub in Energy Storage.

5 Appendices

5.1 Timeline of NY-BEST Progress During 2009-10

Jan 2009	Governor Paterson announces a battery storage initiative in State of the State Address
Feb 2009	- Draft Clean Air Interstate Rule Plan to fund NY-BEST developed - Planning begins for NY-BEST Stakeholder Workshop in April: stakeholders, companies, and researchers identified; agenda developed; facilitator contracted
Mar 2009	Public comments received on draft CAIR Plan
Apr 2009	- Stakeholder workshop held in Albany with 129 attendees - CAIR Plan approved by NYSERDA Board - Inventory of energy storage expertise at New York's universities and labs prepared
May 2009	- Three working groups representing 25 different organizations established: (1) Governance, (2) Testing, and (3) Market-Driven Research - Consultant engaged to help with facilitation and NY-BEST web site development
June 2009	- Full-day meetings of each working group held to identify short and long-term priorities and review organizational models - Research topic concept papers requested; 67 received in July
July to Sep 2009	- Proposed operating structure for Consortium developed based on best practices presented by Governance Working Group - Testing needs and capabilities survey issued; New York Academy of Sciences engaged to analyze results and conduct interviews of needs and capabilities
Oct 2009	NY-BEST Research Solicitation issued based on input from concept papers; 36 proposals received Dec 17 seeking almost \$22 million in NYSERDA funding
Nov 2009	- NYSERDA announced it will serve as interim testing facilitator to help NY-BEST members find required capabilities for research, prototyping, testing and validation - NY-BEST logo developed and adopted by working group - NY-BEST website launched (www.ny-best.org)
Dec 2009	- NY-BEST bylaws finalized with guidance from Governance Working Group - Begin accepting organizing members - Board of Director nominations begin - Begin distributing news updates by email with funding opportunities, Consortium news, and industry highlights every two weeks - Request issued for student MBA and technical teams to conduct competitive market analyses in "medium/heavy-duty transportation" and "grid storage"
Jan 2010	Certificate of Incorporation filed to establish NY-BEST as a non-profit organization

Feb 2010	• New York Academy of Sciences report on testing capabilities and needs completed • Market-Driven Research Solicitation proposals reviewed • Testing capabilities database released for NY-BEST members to find necessary testing and characterization capabilities • Selected three university teams to conduct competitive market analyses to be completed in May 2010
Mar 2010	• First annual membership meeting and conference held in Troy, New York, to adopt bylaws, elect board of directors, review progress and discuss future priorities • 19 awards announced under first research and development solicitation totaling \$15.3 million (\$8 million NYSERDA and \$7.3 million cost-share).

5.2 NY-BEST Board

The 17 member Board of Directors represent industry, the research community, end users, and government partners. Board terms are designed so that half the board seats are up for election each year to allow for continuity and member engagement. The officers, board members and terms are as follows:

Chair – Matthew Fronk

Director of Center for Sustainable Mobility – Rochester Institute of Technology; former Director of GM Fuel Cell Research Lab (retired) (2 year term)

Vice-Chair Industry: Julius Cirin

Vice President, Corporate Communications Officer – Ultralife Corporation (1 year term)

Vice-Chair Academic: M. Stanley Whittingham

Director, Institute for Materials Research – Binghamton University (2 year term)

Vice-Chair At-Large: Michael G. Field

President, Operations and Engineering Division – The Raymond Corporation (2 year term)

Secretary/Treasurer: Paul F. Mutolo

Director of External Partnerships – Energy Materials Center at Cornell University (2 year term)

Sanjoy Banerjee, Distinguished Professor of Chemical Engineering and Director of the Energy Institute – City University of New York (1 year term)

Aubrey Braz, Vice President – Consolidated Edison Company of New York (2 year term)

Richard Fioravanti, Director of Storage Applications and Support – KEMA, Inc. (1 year term)

Catherine Hill, Counsel – Whiteman, Osterman & Hanna, LLP (1 year term)

Rich Hopf, General Manager Transport Systems – BAE Systems, Inc. (2 year term)

Robert K. Jaworski, Chief Strategy Officer – Ioxus, Inc. (1 year term)

Wolf W. von Maltzahn, Associate VP for Research – Rensselaer Polytechnic Institute (1 year term)

Hank McGlynn, President – AEYCH, LLC and former Vice President and General Manager at BAE Systems (retired) (1 year term)

Glen Merfeld, Manager of Chemical Energy Systems Laboratory – GE Global Research (2 year term)

Jim Misewich, Associate Laboratory Director – Brookhaven National Laboratory (2 year term)

Francis J. Murray, Jr., President & CEO – New York State Energy Research and Development Authority (NYSERDA) (permanent director)

Edward Reinfurt, Executive Director – New York State Foundation for Science, Technology and Innovation (NYSTAR) (permanent director)

5.3 List of NY-BEST Members

	Member	Location
1	AEYCH	Endicott, NY
2	Alfred University	Alfred, NY
3	American Wind Power & Hydrogen LLC	New York, NY
4	Amphenol Corporation*	Sidney, NY
5	Ascension Industries	North Tonawanda, NY
6	BAE Systems Platform Solutions	Johnson City, NY
7	Binghamton University, SUNY	Binghamton, NY
8	Bren-Tronics, Inc.	Commack, NY
9	Brookhaven National Laboratory	Upton, NY
10	Center for Economic Growth	Albany, NY
11	Cerion Enterprises	Rochester, NY
12	City University of New York	New York, NY
13	Clarkson University	Potsdam, NY
14	College of Staten Island, CUNY	Staten Island, NY
15	Columbia University	New York, NY
16	Consolidated Edison Company of New York, Inc.	New York, NY
17	Cornell University	Ithaca, NY
18	Corning Incorporated	Corning, NY
19	Custom Electronics, Inc. / Ioxus, Inc.	Oneonta, NY
20	Dayton T. Brown, Inc.	Bohemia, NY
21	Electrical Power worX Corp.	Alfred, NY
22	ElectroMotive Designs, LLC	Ronkonkoma, NY
23	Energenics Systems, LLC	Bohemia, NY
24	ENrG Incorporated	Buffalo, NY
25	General Electric	Niskayuna, NY
26	General Motors LLC	Honeoeye Falls, NY
27	Heslin Rothenberg Farley & Mesiti P.C.	Albany, NY
28	Hoffman Warnick LLC	Albany, NY
29	Ice Energy *	Latham, NY
30	Impact Technologies, LLC	Rochester, NY
31	Intertek Testing Services NA, Inc.	Cortland, NY
32	Israeli Chemicals Ltd. (ICL America, Inc.)	Ardsley, NY
33	KEMA, Inc.	Fairfax, VA
34	Metropolitan Development Association	Syracuse, NY
35	NewWorld Capital Group	New York, NY
36	Oak-Mitsui Technologies	Hoosick Falls, NY
37	Primet Precision Materials, Inc.	Ithaca, NY
38	Progressive Machine & Design	Victor, NY

39	Rensselaer Polytechnic Institute	Troy, NY
40	Rochester Institute of Technology	Rochester, NY
41	Sendyne Corp.	New York, NY
42	Stony Brook University	Stony Brook, NY
43	Syracuse University	Syracuse, NY
44	TechCity Properties	Kingston, NY
45	Tecknowledgey, Inc.	Peekskill, NY
46	The Paper Battery Company	Troy, NY
47	The Raymond Corporation	Greene, NY
48	Ultralife Corporation	Newark, NY
49	University at Albany, CNSE	Albany, NY
50	University at Buffalo, SUNY	Buffalo, NY
51	University of Rochester	Rochester, NY
52	Utility Savings & Refund, LLC *	Irvine, CA
53	Whiteman Osterman & Hanna LLP	Albany, NY
54	Xactiv, Inc.	Fairport, NY

* joined after March 31, 2010

5.4 Map of New York State Members



For information on other
NYSERDA reports, contact:

New York State Energy Research
and Development Authority
17 Columbia Circle
Albany, New York 12203-6399

toll free: 1 (866) NYSERDA
local: (518) 862-1090
fax: (518) 862-1091

info@nysesda.org
www.nysesda.org

**NEW YORK BATTERY AND ENERGY STORAGE
TECHNOLOGY CONSORTIUM™**

**YEAR ENDING MARCH 31, 2010
2009–2010 ANNUAL REPORT**

**STATE OF NEW YORK
DAVID A. PATERSON, GOVERNOR**

**NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY
VINCENT A. DEIORIO, ESQ., CHAIRMAN
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