



2017
Energy Storage
Cluster Results and Successes



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Executive Summary:

The Energy Storage Innovation & Business Sector Cluster, (the Cluster), facilitated and administered by Team NEO, is a network of industry, academic, government and non-government leaders working to create and build an ecosystem of energy storage-related organizations for grid integration, transportation, industry and aerospace. The objective of the Cluster is to support and ensure the timely development and delivery of needed products and services for the energy storage market while creating jobs and growing the regional and state economy.

Through networking, education, outreach and sector advocacy, the Cluster strives to:

- Build opportunities for increased collaboration between Cluster organizations, both “seekers” and “solvers”
- Accelerate innovation
- Collaborate and work with other economic development organizations, within and outside the region
- Identify and develop opportunities for funding (technology investment and operational) in areas related to energy storage
- Support energy storage as a key component of renewable energy
- Drive economic growth through accelerated demonstration, deployment and adoption of energy storage products and services

During 2017, specific tasks were critical for the continued growth, development and member value of the Cluster:

Task 1. Expand Cluster participation through the involvement of major corporations with an expressed interest in energy storage; expand general Cluster participation among other economic development stakeholders and organizations outside of the region.

Outcome: More than 75 companies, universities, and research institutes actively participated in cluster meetings and activities. Cluster involvement by major corporations included: Eaton Corporation, Nidec, American Electric Power, FirstEnergy, Rockwell, Schneider Electric, and Siemens. Nearly 150 participants were active in quarterly cluster meetings.

Task 2. Host events that increase collaboration between Cluster members, advocate for the value and growth of the energy storage market opportunity and introduce new technologies and/or energy storage opportunities to Cluster participants.

Outcome: The Cluster held three quarterly Cluster meetings and attracted a national conference to Cleveland.

Task 3. Obtain funding to update the 2011 regional Energy Storage Roadmap



Outcome: In 2017 a grant from the Burton D. Morgan Foundation was obtained to update the original 2011 Energy Storage Roadmap. The Roadmap update will be completed by October 2018.

Task 4. Build opportunities for increased collaboration between organizations looking for energy storage solutions (seekers) and providers of energy storage technology (solvers).

Outcome: Several connections resulted for organizations such as Case Western Reserve University (CWRU), Johnson Controls, NASA, FirstEnergy, Eaton, and Siemens.

Task 5. Utilize the Cluster and the advantages of NEO and participation in the Cluster as a business attraction tool for Northeast Ohio and Ohio.

Outcome: A developing Solid Oxide Fuel Cell system company was attracted to Northeast Ohio.

Task 1 Outcomes:

Expand Cluster participation through the involvement of major corporations with an expressed interest in energy storage; expand general Cluster participation among other economic development stakeholders and organizations outside of the region.

Company Participation Roster

A. F. Mensah	GEM Energy	Ohio Aerospace Institute
ABB	Go Sustainable Energy	Ohio Facilities Construction
Association of Energy Engineers	GrafTech	Comission
American Electric Power	Greater Cleveland Partnership	Ohio Federal Research Network
Angstrom Materials	Green Strategies	Ohio State
Arisdyne	Harris Battery	Parker
Ashlawn Energy	Heat Spotter Inc.	Pison Stream Solutions
Avmat	Hydrostor	Power Tree
Babcock & Wilcox	Inglewood Associates, LLC	Purdue Res Foundation
Baldwin Wallace University	JCESR/Argonne Nat Lab	RETTEW
Beckett Energy	Jobs Ohio	Rockwell Automation
Bounce/AGBA	Johnson Controls	Schneider Electric
CSA Group	Kent State University	Siemens
Cleveland State University	Lorain County Community	Sustainable Energy Services
Cuyahoga County	College	The Tech Belt Energy
CWRU/GLEI	LED Lighting IQ	Innovation Center
Denora	LG Chem Power	Telepath Association
Design Flux	LG Fuel Cell Systems	The FFEF
Dovetail Solar	Lubrizol	TMI Fuel Cell Systems
Eaton	MacDonald-Hopkins	Toyo System USA
Echogen	Megajoule	University of Pittsburgh
Energizer	NASA Glenn Research Center	University of Akron
EnerNOC	NETL	University of Dayton
Exacter	Nexceris	University of Pittsburgh
FirstEnergy	Nidec	Verder
General Electric	Nikola Labs	Zin Technologies

2017 Steering Committee

A steering committee is an important engine for decision-making and driving Cluster activities and goals. The steering committee formed reflects an impressive list of diverse industry experts, each committed to driving the development of Energy Storage in Northeast Ohio.

Steering Committee Members

FirstEnergy	CWRU	Rockwell Automation
NASA Glenn Research Center	Beckett Energy	CSA
Dovetail Solar	Eaton	Nidec
Great Lakes Energy Institute		

Goal 2 Outcomes:

Host events that increase collaboration between Cluster members, advocate for the value and growth of the energy storage market opportunity and introduce new technologies and/or energy storage opportunities to Cluster participants.

First Quarter Cluster Meeting – February 9th

40+ Attendees

A key presentation was delivered by NASA Glenn Research Center Chief Technologist regarding energy storage and the NASA mission. Part of this Cluster event was a facilitated discussion by Bush Consulting where they walked attendees through a “visioning” exercise for the Cluster. A networking reception followed.

Second Quarter Cluster Meeting - June 21

40 + Attendees

A feature presentation was made by the Joint Center for Energy Storage Research (JCESR) at Argonne National Lab regarding how to work with and obtain value from the National Labs in energy storage. The CSA Group also presented their capabilities regarding battery testing and evaluation. A Canadian company, Hydrostor, introduced a novel compressed air technology with applicability for the utilization of abandoned salt domes under Lake Erie. A networking reception followed.

Third Quarter Cluster Meeting – October 10

70 + Attendees

The Cluster event focused on the developing microgrid project in Cuyahoga County. More than 70 people attended the event where a broad scope of possible opportunities was presented for regional organizations. A networking reception followed the event.

Cluster Promotion

Developing Northeast Ohio as a leader in Energy Storage and Micro-Grid Technology involves significant promotion of Cluster activities at local and national events. The Cluster was promoted at the following events:

FirstEnergy Economic Development Day – May 16

A presentation by Team NEO introduced the benefits of the Cluster to numerous economic development entities (city and regional organizations) and provided an advocacy position for energy storage as a developing and growing industry.

STUDIO – November 14-17

Team NEO, working with FirstEnergy and CWRU, was successful in attracting the Energy Storage Association’s national technical conference to Cleveland. (The previous conference was held in San Francisco). The conference in Cleveland was a recognition outside of Ohio of the development and growth of the Cluster. Cluster organizations contributed \$30k to sponsor the event. Approximately 25% of Cluster organizations were represented at the conference. Cluster member, NASA Glenn Research Center, was a keynote presenter.

Task 3 Outcomes:



Obtain funding to update the 2011 regional Energy Storage Roadmap.

In 2017, a grant from the Burton D. Morgan Foundation was obtained to update the original 2011 Energy Storage Roadmap. The Roadmap update will be completed by mid- 2018.

Task 4 Outcomes:

Build opportunities for increased collaboration between organizations looking for energy storage solutions (seekers) and providers of energy storage technology (solvers).

Networking at Cluster events resulted in connections for Case Western Reserve University with Johnson Controls. Johnson Controls provided the battery system for a 3 site “Building to Grid Ingratiation Demonstration.” Other Cluster participants including FirstEnergy, Eaton and Siemens.

In addition, by leveraging relationships gained through the Cluster, CWRU and FirstEnergy collaborated with A.F. Mensah on a custom battery design to be outfitted on the CWRU wind turbine.

NASA Glenn Research Center, through a connection at a Cluster event, is investigating aircraft battery testing with the CSA Group.

NASA Glenn Research Center was also able to connect with GE Lighting to investigate super conductive materials.

As a result of a connection at a Cluster event, Cuyahoga County began a dialog with Hydrostor regarding the utilization of abandon salt domes under the Lake for potential energy storage.

Task 5 Outcomes:

Utilize the Cluster and the advantages of Northeast Ohio participation in the Energy Storage Cluster as a business attraction tool for Northeast Ohio and Ohio.

Cluster participation was expanded to include organizations involved in fuel cells (specifically supply chain). Petra Power, a developing solid oxide Fuel cell integrator, will be re locating to the Tech Belt Energy Innovation Center in Warren, Ohio in 2018.

A one-page “benefits of Ohio in energy Storage” was developed to further help market the Ohio energy storage opportunity.

Conclusion:

2017 was a growing and positive year for the Cluster. Participation by large industrial organizations increased and general participation grew to 150 individuals. Positive connections were made by Cluster participants and the Cluster gained significant recognition outside of the region, which resulted in the national ESA technical conference coming to Cleveland.

