Tools for NY Small Business Participation in the Hydrogen/Fuel Cell Industry

Dan Connors, NEESC Coordinator
Connecticut Center for Advanced Technology
www.neesc.org
The Northeast Electrochemical Energy Storage Cluster (www.neesc.org) is a network of industry, academic, government and non-profit organizations, focused on the development, production and commercialization of hydrogen and fuel cell technologies, providing domestic energy and environmental solutions to the US and the world.

The Cluster’s formal organization is funded by the SBA’s “Innovative Economies Initiative”, to drive small business growth in this sector across the 7-state region spanned from New York to Maine.
NEESC – Regional Hydrogen/Fuel Cell Cluster

**New York Partner:**
Energy and Environmental Technology Application Center (E2TAC) at the SUNY/Albany College of Nanoscale Science and Engineering

**Prime contractor to SBA:**
Connecticut Center for Advanced Technology (E. Hartford, CT)
Why Hydrogen and Fuel Cells?

• Reduced emissions of greenhouse gases and primary air pollutants
• Provides an energy storage solution for integration with other renewable technologies.
• New generation capacity to meet projected electric consumption demands
• Growth of peak electric demand
• Increased energy efficiency required (oil cost/$bbl)
• Renewable Portfolio Standards
• Provides economic benefits and jobs in the region
Hydrogen/Fuel Cell Industry Job Growth

- **Permanent**, technology/manufacturing jobs
- Growth of existing **domestic** supply chain
- Excellent opportunities for **export** revenue
NEESC Cluster Economic Value

• 25+ OEM level technology/system suppliers
• $225 million/yr direct revenue
• ~2000 direct employees
• 1,000+ supply chain member organizations
• Est’d total labor (direct, indirect, induced) - ~4,000 jobs
• Est’d total revenue (direct, indirect, induced) - $580 MM/yr

Preliminary results of March 2011 economic assessment
NEESC is a Small Business Based Cluster

• 90% of Cluster membership are Commercial organizations

• 96% of commercial organizations US Owned

• > 80% are Small Businesses
  • Employ < 100 people
  • Rev < $25M/yr

• ~55% of the supply chain are manufacturing businesses

Preliminary results of March 2011 economic assessment
NEESC Tools For Cluster Small Businesses

- Identification and role of the OEM technology and system suppliers
- Online searchable databases:
  - Cluster Supply Chain, by major category, by state, key words, geographic radius search*
  - Business Incubators*
  - State stakeholder organizations (ex, NYSERDA, Greater LI Clean Cities, etc)
  - Biz, econ development resources (state SBIR offices, US Dept of Commerce, etc)
  - Workforce development training sources

* Available at www.neesc.org now
NEESC Tools For Cluster Small Businesses

• Guidance to government incentives, programs and funding opportunities

• Free guidance/mentoring to qualified early stage companies to enhance corporate investment

• Analytical tools to support stationary power and transportation hydrogen/fuel cell deployment

• Webinars and networking events
  • Next event is webinar, noon, May 9 “State of the European Hydrogen/Fuel Cell Industry”
### NEESC Technology/Systems OEM’s

<table>
<thead>
<tr>
<th>NEESC Fuel Cell Suppliers</th>
<th>NEESC Hydrogen System Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stationary Power</strong></td>
<td><strong>Hydrogen Generation</strong></td>
</tr>
<tr>
<td>• Large (MW Class)</td>
<td>• Electrolysis</td>
</tr>
<tr>
<td>• Med (10-400 kW)</td>
<td>• Avalence</td>
</tr>
<tr>
<td>• Small (1-10 kW)</td>
<td>• Giner</td>
</tr>
<tr>
<td></td>
<td>• Proton Energy Systems</td>
</tr>
<tr>
<td></td>
<td>• Treadwell</td>
</tr>
<tr>
<td></td>
<td>• Reforming</td>
</tr>
<tr>
<td></td>
<td>• Nuvera</td>
</tr>
<tr>
<td></td>
<td>• ZTEK</td>
</tr>
<tr>
<td></td>
<td>• Precision Combustion</td>
</tr>
<tr>
<td><strong>Transportation/Motive Power</strong></td>
<td><strong>Hydrogen Purification/Compression</strong></td>
</tr>
<tr>
<td>• Light Duty Vehicles (Cars)</td>
<td>• Electrochemical</td>
</tr>
<tr>
<td>• Buses/Trucks</td>
<td>• H2Pump</td>
</tr>
<tr>
<td>• APU’s</td>
<td>• Giner</td>
</tr>
<tr>
<td>• Industrial (Forklifts)</td>
<td>• Sustainable Innovations</td>
</tr>
<tr>
<td></td>
<td>• Precision Combustion,</td>
</tr>
<tr>
<td></td>
<td>• Hy9</td>
</tr>
<tr>
<td><strong>Portable Power</strong></td>
<td><strong>Car/Truck Hydrogen Fueling Systems</strong></td>
</tr>
<tr>
<td>• Military</td>
<td>• Central H2 Mfg and</td>
</tr>
<tr>
<td></td>
<td>• Distribution</td>
</tr>
<tr>
<td>• Specialty Industrial</td>
<td>• Praxair</td>
</tr>
<tr>
<td>• Consumer Electronics</td>
<td>• Distributed H2 Fueling Systems</td>
</tr>
<tr>
<td></td>
<td>• American Wind &amp; Hydrogen</td>
</tr>
<tr>
<td></td>
<td>• Avalence</td>
</tr>
<tr>
<td></td>
<td>• SunHydro</td>
</tr>
</tbody>
</table>

- FuelCell Energy
- UTC Power
- Accumetrics, Infinity Fuel Cells, Nuvera Fuel Cells, Trenergi
- General Motors
- UTC Power
- Delphi, CellTech, Nuvera, Plug Power
- Accumetrics, CellTech, MTI Micro, Protonex
- Protonex
- Lilliputian, MTI Micro
Online Searchable Supply Chain Database

![Map with marked locations](image)

<table>
<thead>
<tr>
<th>Search Type: Supplier</th>
<th>Product: Equipment</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name</td>
<td>Address</td>
<td>City</td>
</tr>
<tr>
<td>Fluid Metering Inc.</td>
<td>5 Aerial Way</td>
<td>Syosset</td>
</tr>
<tr>
<td>IMR Test Labs</td>
<td>131 Woodedge Drive</td>
<td>Lansing</td>
</tr>
<tr>
<td>Intertek</td>
<td>303 Normanskill Street</td>
<td>Albany</td>
</tr>
<tr>
<td>KNF Clean Room Products Corporation</td>
<td>1800 Ocean Avenue</td>
<td>Ronkonkoma</td>
</tr>
<tr>
<td>Lee Spring Company</td>
<td>140 50th Street</td>
<td>Brooklyn</td>
</tr>
<tr>
<td>Pillar USA Inc.</td>
<td>45 Turner Drive</td>
<td>Middletown</td>
</tr>
</tbody>
</table>

Online Searchable Incubator Database

Search Type: Incubator

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>Website</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adirondack Regional Business Incubator</td>
<td>36 Elm Street</td>
<td>Glens</td>
<td>NY</td>
<td><a href="http://www.arb.biz">www.arb.biz</a></td>
<td>518.761.6007</td>
</tr>
<tr>
<td>Batavia Industrial Center (BIC)</td>
<td>56 Harvestor Avenue</td>
<td>Batavia</td>
<td>NY</td>
<td><a href="http://www.bic4biz.com/">http://www.bic4biz.com/</a></td>
<td>585-343-2800</td>
</tr>
<tr>
<td>Business Resource Center</td>
<td>One Development Court</td>
<td>Kingston</td>
<td>NY</td>
<td><a href="http://www.sunyulster.edu/continuing_ed/business_resource_center/index.jsp">http://www.sunyulster.edu/continuing_ed/business_resource_center/index.jsp</a></td>
<td>845-339-1322</td>
</tr>
<tr>
<td>Center for CleanTech Entrepreneurship</td>
<td>235 Harrison Street</td>
<td>Syracuse</td>
<td>NY</td>
<td><a href="http://www.thecleantechcenter.com/">http://www.thecleantechcenter.com/</a></td>
<td>315-579-0028</td>
</tr>
<tr>
<td>Center For Environmental Sciences And Technology Management Incubator</td>
<td>251 Fuller Road - CESTM B110</td>
<td>Albany</td>
<td>NY</td>
<td><a href="http://www.nysstar.state.ny.us/incubators/capital/cestm.htm">http://www.nysstar.state.ny.us/incubators/capital/cestm.htm</a></td>
<td>518.437.8686</td>
</tr>
</tbody>
</table>

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Web: www.neesc.org

Connecticut Center for Advanced Technology (CCAT)

Acknowledgment
Market Pull

Expand Business

Create Jobs

Increased Demand

Increased Deployment

Increased Awareness

Cost Reductions

Increased Production

Create Jobs

Increased Demand

Increase Awareness

Increased Deployment

Cost Reductions

Increased Production
Electric Generation: Fuel Cell Power Facility

- Energy Efficiency (50% to 90%)
- High Availability Factor (24/7 ≈ 93%)
- High Productivity (CHP and CHHP)
- Low Carbon Emissions
Hydrogen & Fuel Cell Transportation

- Zero Carbon Emissions
- Safe
- Efficient
  - Transit
    - 12.4 mpge
  - Passenger
    - 62 mpge

Chevy Equinox, Kia Borrego, Mercedes B Class F-Cell, Toyota FCHV, Honda FCX Clarity, Nissan FCV
Hydrogen Refueling

- High Efficiency
- Fast Fill
- Safe
- Zero Carbon Emissions
Strategic Market Assessment

- Electric Generation
- Transportation
- Hydrogen Refueling
Mapping Strategic Targets

Potential Hydrogen and Fuel Cell Applications

Energy Intensive Industries

Legend

Energy Intensity

Million BTU
- 2943 - 250770
- 250771 - 961285
- 961286 - 2916000
- 2916001 - 8736500
- 8736501 - 80375600

CT Electrical Regions

- CT
- Norwalk-Stamford
- SWCT