State and Local Government Partnership

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PROJECT ID#: ED012

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OVERVIEW

Timeline

- Start – Sept. 2008
- Extension – Sept. 2010
- Finish – Aug. 2011
- 75% Complete*

Budget

- Total project funding
  - DOE share - $295,548
- Funding received since contract
  - $295,548
  - FY 2010: $98,123

Barriers

- **Barriers**

  > A. Lack of Readily Available, Objective, and Technically Accurate Information for Decision Makers for Specific Applications

  > B. Disconnect Between Hydrogen Information and State and Local Planning Initiatives

  > C. Lack of Technical Models to Rapidly Assess Costs and Values for Facility Development

Partners

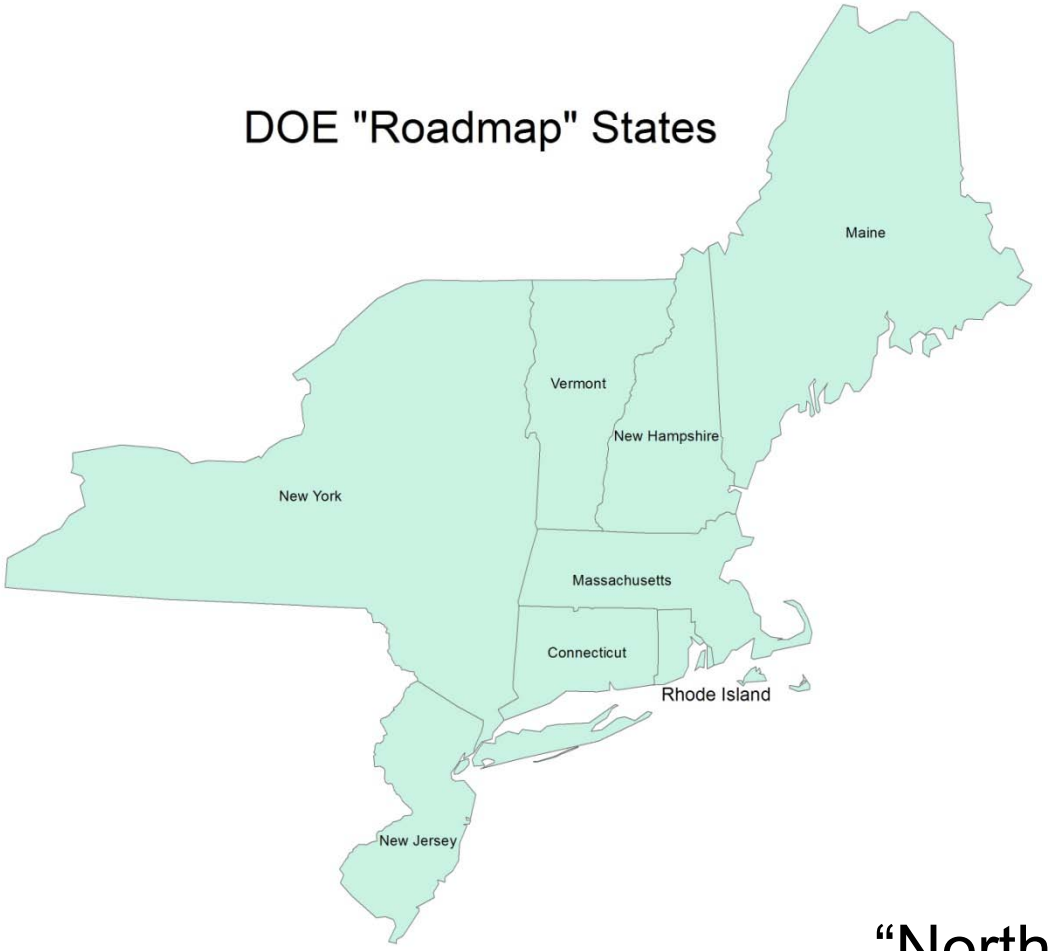
- Hydrogen and Fuel Cell Industry
- Local, State, Federal Stakeholders
- CCAT, CESA, HEC, NENY, MassH2, NECA
- End Users

*Estimated as of March 1, 2011

Objectives - Relevance

- Foster Improved Relationships
- Provide Technical Resources/Models
- Improve Exchange of Knowledge
- Coordinate State/Local Planning
- Facilitate Deployment

Project Scope - Relevance



"Northeast Region"

Project Components - Approach

The Partnership Building project has five components:

1: Identify key stakeholders; expand and strengthen partnerships.

2: Develop and refine existing resources to analyze potential sites and target locations for hydrogen and fuel cell deployment.

3: Educate state, local decision makers and other key stakeholders, including training on models.

4: Integrate state and local development plans with federal/DOE objectives while identifying financial and investment opportunities.

5: Develop basic “Roadmaps” for each state to provide guidance for technology deployment.

Original Activities and Milestones

Milestones	Progress Notes	% Complete
Identify Key Stakeholders	Developed a database of local and state decision-makers and key stakeholders.	Ongoing
Develop Resources for Hydrogen and Fuel Cell Deployment	Developed a brief report detailing criteria for the deployment of hydrogen and fuel cell technologies for transportation, stationary and portable power applications. Developed a database of potential sites for the deployment of hydrogen and fuel cell technology including: commercial and public buildings and transit, public and private fleet vehicle locations.	100%
Develop Online Information, Models and Tools for User Analysis	Developed an inventory of appropriate models and tools to assess environmental value, energy management, renewable energy, cost and economics; and undertook a comparison of competing technologies. Developed a website and Regional Resource Center with appropriate information, models and tools.	100%
Educate State and Local Decision Makers	Organized nine collaborative meetings with regional planning agencies, presented at local associations, conferences, held a workshop and organized a informational forum for policymakers. Assistance provided to municipalities regarding the development of fuel cell projects, grant applications, and transportation initiatives.	Ongoing
Integrate Local Energy Plans with State Plans	Worked with state Department of Transportation to develop hydrogen fueling and vehicle deployment strategies and local municipalities to integrate energy plans with state plans and energy goals.	100%
Identify Financial and Investment Opportunities	Developed a brief report of incentives, funding and investment opportunities for hydrogen and fuel cell technologies, and compared those incentives to other renewable resources	100%
Organize and Hold Regional Briefing	Developed a database of key stakeholders in northeast states for regional briefing. Organized the regional briefing/conference in collaboration with NECA.	100%
Pre and Post Program Survey	Developed survey to assess level of knowledge of local and state decision makers and key stakeholders for the beginning of the program.	100%

Additional Activities and Milestones

Milestones	Progress Notes	% Complete
Provide High Level Market Assessment	Undertaking economic modeling and use of an IMPLAN economic model to assess the economic impact of the hydrogen and fuel cell industry (H2/FC) in an 8-state region consisting of NJ, NY, CT, MA, RI, NH, VT and ME in terms of its direct, indirect and induced economic effects.	25%
Assist With the Identification and Mapping of Target Locations for Fuel Cell Deployment	Identifying target locations for fuel cell deployment in the service area based on energy intensive commercial building types identified in DOE's Commercial Buildings Energy Consumption Survey (CBECS).	35%
Develop a Toolbox for Roadmap Construction	Developing an inventory of appropriate models and tools to assess environmental value, energy management, renewable energy, cost and economics; and undertook a comparison of competing technologies.	75%
Train Individuals on Models	Planning to hold briefings, workshops, and webinars to assist in training. Will also undertake "Train the Trainer" instruction with regional organizational partners.	20%
Educate and Assist State and Local Officials and State Organizations	Building upon already existing partnerships while creating new opportunities.	25%
Develop a Basic "Roadmap" to provide Guidance for Technology Deployment	Collecting data for each state in the service area. Reviewing guidance documents, identifying stakeholders, developing strategic market assessments, identifying markets, etc.	65%
Outreach and Reporting	Undertaking outreach activities to facilitate roadmaps development and training.	75%

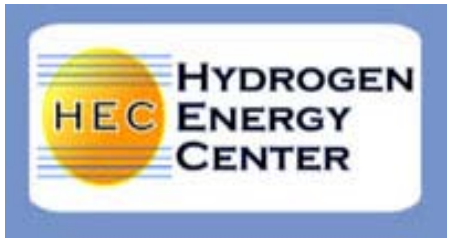
Implementation Strategy Approach

Previous Accomplishments

- Identified key stakeholders In Connecticut.
- Expanding database to include key stakeholders in the Northeast Region.
- Expanded and strengthened existing relationships with Northeast Energy and Commerce Association, and regional partners (leverage resources through SBA project).
- Developed resources to analyze potential sites for hydrogen and fuel cell deployment.
- Developed Transportation Plan for CT in partnership with CT DOT.
- Developed, tested, and refined online models and tools.
- Organized regional briefing for Northeast stakeholders.
- Completed a survey to assess stakeholders knowledge.

Partners for Implementation - Relevance

Expand partnerships to create new opportunities

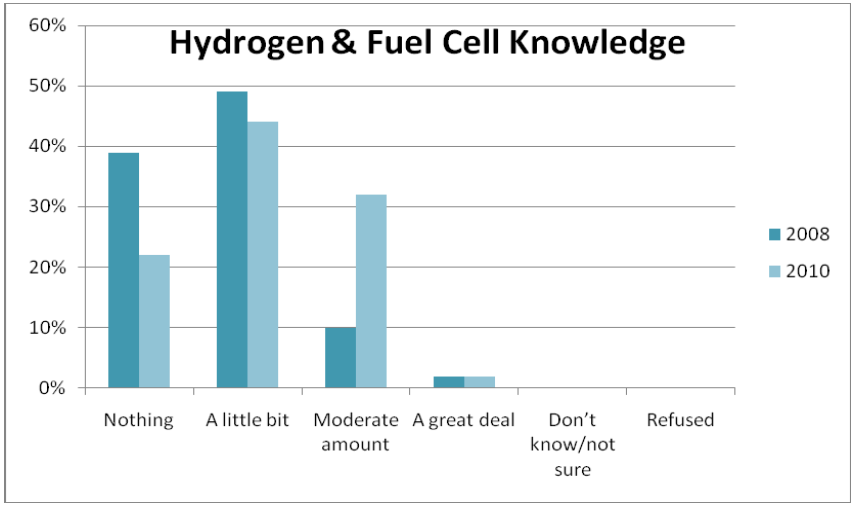


Key Survey Results - Relevance

CCAT Surveyed the Level of Knowledge of State and Local Decision Makers and Key Stakeholders

Which of the following best describes your level of knowledge on hydrogen and fuel cell technologies?

	2008	2010
Nothing	39%	22%
A little bit	49%	44%
A Moderate amount	10%	32%
A great deal	2%	2%
Don't know/not sure	0%	0%
Refused	0%	0%



- Results show a 22% increase in the number of responses that indicate that they know a "moderate amount" and a decrease of 17% in those reporting that they know "Nothing"

Regional Briefing - Progress

Hydrogen and Fuel Cell Activities Northeast Regional Meeting
Westborough, MA
July 22, 2010

U.S. Department of Energy

- *Carole Read, Fuel Cell Technologies Program, Office of Energy Efficiency and Renewable Energy*

State Panel for Regional Perspectives

- Anne Margolis, Clean Energy States Alliance
- Richard Smith, Maine Hydrogen Energy Center, President
- Keith Frame, Connecticut Clean Energy Fund, Director New Technologies
- Charlie Myers, Massachusetts Hydrogen Coalition, President

Industry Representative Panel

- Frank Wolak, FuelCell Energy, Vice President
- Mike Brown, UTC Power, Vice President, Government Affairs
- Thomas Jackson, Avalence, Chief Technology Officer
- Steve Szymanski, Proton Energy Systems, Business Development Manager
- Brad Bradshaw, Hy9, Chief Executive Officer
- Stephen Marlin, General Motors, Driver Relations Manager

Target Location- Relevance

Stationary

CBECS Data

- Food sales/services
- Inpatient Healthcare
- Lodging
- Public Assembly
- Education

Uninterruptible power supplies

Transportation

- Buses
- Automobiles
- Fueling stations

Portable

- Back-up power
- Specialty vehicles
- Auxiliary power
- Electronic devices

Technical Accomplishments

Developed and refined resources to analyze potential sites for hydrogen and fuel cell deployment throughout the region:

- Regional Resource Center models
  - Environmental Value (lbs/kWh)
  - Energy Management (kWh/peak/off peak)
  - Renewable Energy (RPS/REC)
  - Technology Comparative Analysis (electric/thermal value)
  - Cost/Economics (ROI)

Roadmap Development - Progress

8 State Market Assessment

Market Attributes/Industry Status	CT	NY	NJ	MA	ME	NH	RI	VT
Stationary Power								
• Strong market drivers (elect cost, environment factors, critical power)	✓	✓	✓	✓	✓	✓	✓	✓
• Indigenous industry base	✓	✓		✓				
Transportation Power (cars/buses)								
• Strong market drivers (appeal to market, environment factors,)	✓	✓	✓	✓	✓	✓	✓	✓
• Indigenous industry base	✓	✓		✓				
• Hydrogen highway/infrastructure plans	✓	✓		✓				
Portable Power (military/industrial/consumer)								
• Indigenous industry base		✓		✓	✓			
Economic Development Factors								
• Technically trained workforce	✓	✓	✓	✓	✓	✓	✓	✓
• Supportive state policies	✓	✓		✓				
Economic Impact								
• Jobs Provided (OEM / Supply Chain)	/	/	/	/	/	/	/	/
• Total Revenue (OEM / Supply Chain)	/	/	/	/	/	/	/	/
• Total Number of Companies								

Future Work

FY11 (Ending August 30, 2011)

- Continue to educate state and local decision makers and other key Stakeholders.
- Establish target maps and economic/marker analyses.
- Enhance use of the Regional Resource Center.
  - Provide links to DOE models for analyses.
  - Refine models and tools for applicability to the service area.
  - Incorporating links to partners websites throughout the Northeast.
- Develop required state “roadmaps”.
- Organize and hold additional regional briefings, workshops, and webinars.

Project Schedule – Future Work

Activity	1st Qtr. 2011	2st Qtr. 2011	3rd Qtr. 2011
Provide High Level Market Assessment			
Assist with the identification and Mapping of Target Locations for Fuel Cell deployment			
Develop a Toolbox for Roadmap Construction			
Train Individuals on Models			
Develop a Basic “roadmap” to provide guidance for technology deployment			
Identify Key Stakeholders			
Educate and Assist State and Local Officials and State Organizations			
Outreach and Reporting			

Collaborations

- Hydrogen and Fuel Cell Industry
  - (FuelCell Energy, UTC Power, Trenergi, Proton Energy Systems, Nuvera).
- Federal Partners
  - DOE, DOD, Department of Commerce).
- State Partners
  - Legislators, State Agencies (Utility, Environment, Energy, Transportation, etc.)
- Regional Organizational Partners
  - CPES, NECA, CESA, HEC, NENY, MassH2
- Local Partners
  - Mayors, First Selectmen, Public Works Officials, Council of Governments
- Utilities
  - Northeast Utilities, United Illuminating, New York Power Authority, National Grid, PSEG

Project Summary

- **Relevance** – Increase awareness, improve state/regional and municipal relations, and provide community supported solutions to address local and regional energy issues to foster economic growth and job creation for the industry.
- **Approach** – Develop partnerships, technical models, and guidance documents to encourage and promote hydrogen and fuel cell technology in early market applications.
- **Progress**
  - Continue to improve existing relationships and create new opportunities
  - Provide technical resources, including development of economic models
  - Improve level of awareness among stakeholders
  - Coordinate State/Local Planning and development of uniform “roadmaps”
  - Assist the process for deployment for stationary, transportation, and portable fuel cell applications
- **Collaborations** – Collaborate with government, regional, local, and industry partners and utilities.
- **Proposed Future Research** – Continue to organize and hold regional briefings, webinars, and workshops for additional outreach.

Thank You

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Acknowledgement:

Technical Slides

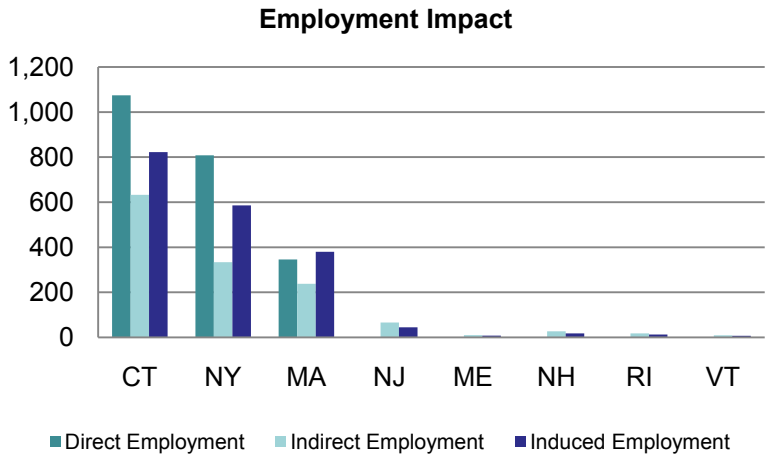
Roadmap Development - Progress

8 State Market Assessment

Market Attributes/Industry Status	CT	NY	MA	NJ	ME	NH	RI	VT
Stationary Power								
• Strong market drivers (elect cost, environmental factors, critical power)	✓	✓	✓	✓	✓	✓	✓	✓
• Indigenous industry Base	✓	✓	✓					
Transportation Power (cars / buses)								
• Strong market drivers (appeal to market, environment factors)	✓	✓	✓	✓	✓	✓	✓	✓
• Indigenous industry base	✓	✓	✓					
• Hydrogen highway / infrastructure plans	✓	✓	✓					
Portable Power (military / industrial / consumer)								
• Indigenous industry base		✓	✓		✓			
Economic Development Factors								
• Technically trained workforce	✓	✓	✓	✓	✓	✓	✓	✓
• Supportive state policies	✓	✓	✓					
Economic Development Factors								
• Jobs Provided (OEM / Supply Chain)	1074 / 1455	808 / 920	346 / 618	0 / 111	0 / 18	0 / 45	0 / 32	0 / 16
• Total Revenue in millions (OEM / Supply Chain)	254.4 / 496.9	119.1 / 292.2	56.9 / 171.2	0 / 26.5	0 / 2.9	0 / 8.66	0 / 6.91	0 / 3.34
• Total Number of Companies	518	176	207	8	10	22	10	3

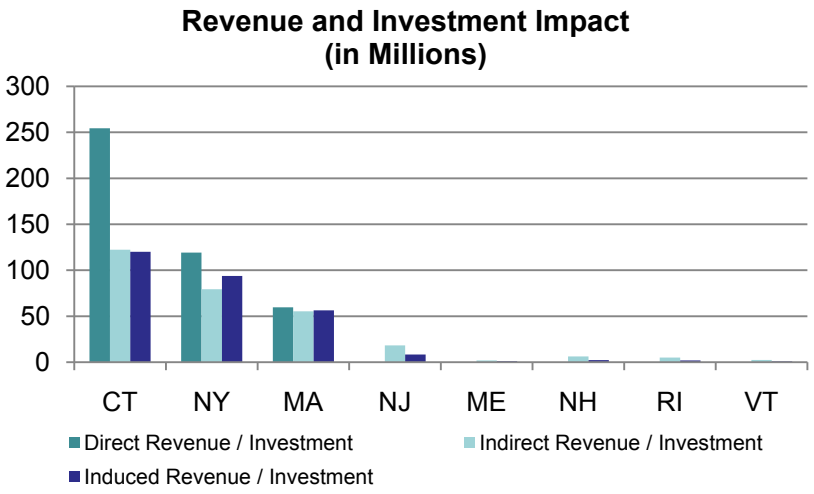
Employment Impact - Progress

	Direct Employment	Indirect Employment	Induced Employment	Total Employment
Connecticut	1,074	633	822	2,529
New York	808	334	586	1,728
Massachusetts	346	238	380	964
New Jersey	0	66	45	111
Maine	0	10	8	18
New Hampshire	0	27	18	45
Rhode Island	0	18	13	32
Vermont	0	9	7	16
Total	**2,228**	**1,335**	**1,878**	**5,440**



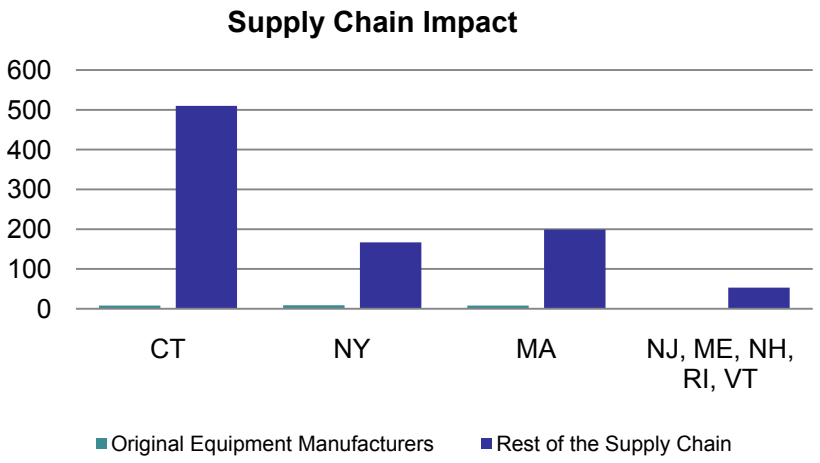
Revenue and Investment Impact - Progress

	Direct Revenue / Investment	Indirect Revenue / Investment	Induced Revenue / Investment	Total Revenue / Investment
Connecticut	254,420,000	122,348,972	120,123,933	496,892,905
New York	119,129,000	79,335,734	93,775,496	292,240,230
Massachusetts	59,600,000	55,258,311	56,348,105	171,206,416
New Jersey	0	18,230,011	8,303,939	26,533,950
Maine	0	1,940,003	964,768	2,904,771
New Hampshire	0	6,321,810	2,331,407	8,653,217
Rhode Island	0	5,063,691	1,844,172	6,907,863
Vermont	0	2,509,428	831,988	3,341,416
Total	**433,149,000**	**291,007,960**	**284,523,808**	**1,008,680,768**



Supply Chain Impact - Progress

	Original Equipment Manufacturers	Rest of the Supply Chain	Total Supply Chain
Connecticut	8	510	518
New York	9	167	176
Massachusetts	8	199	207
New Jersey	0	8	8
Maine	0	10	10
New Hampshire	0	22	22
Rhode Island	0	10	10
Vermont	0	3	3
Total	**25**	**736**	**766**



Data Collection - Progress

Market Attributes/Industry Status	CT	NY	MA	NJ	ME	NH	RI	VT	Phase
Energy Information Administration's (EIA) Commercial Building Energy Consumption Surveys (CBECS).									
Education	✓	✓	✓	✓	✓	✓	✓	✓	2nd - (95%)
Food Sales with 25+ employees					✓	✓		✓	1st - (38%)
Food Services with 25+ employees					✓	✓		✓	1st - (38%)
Inpatient Healthcare (hospital / rehabilitation)	✓/	✓/	✓/	✓/	✓/✓	✓/✓	✓/	✓/✓	1st - (69%)
Lodging					✓	✓		✓	1st - (38%)
Public Orders of Safety	✓	✓	✓		✓	✓	✓	✓	2nd - (84%)
Additional Potential Targets									
Airports	✓	✓	✓	✓	✓	✓	✓	✓	2nd - (95%)
Military Bases (ERDC-CERL)	✓	✓	✓	✓	✓	✓	✓	✓	2nd - (95%)
LMOP Sites	✓	✓	✓	✓	✓	✓	✓	✓	2nd - (95%)
Federal Owned Building	✓	✓	✓	✓	✓	✓	✓	✓	2nd - (95%)
State Owned Building	✓								1st - (13%)
Sewage Treatment Plants					✓	✓		✓	1st - (38%)
Telecommunication Sites	✓								1st - (13%)
State Fuel Dispensing Stations	✓	✓	✓	✓	✓	✓	✓	✓	2nd - (90%)
Gas Stations	✓	✓	✓	✓	✓	✓	✓	✓	1st - (95%)
Alternative Fueling Stations	✓	✓	✓	✓	✓	✓	✓	✓	2nd - (95%)