

# **Raising H2 and Fuel Cell Awareness in Ohio**

**Pat Valente, Executive Director  
Ohio Fuel Cell Coalition  
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This presentation does not contain any proprietary, confidential, or otherwise restricted information.

# Overview

## Timeline

- Start-September 1, 2008
- Finish-6/30/2011
- 80% Complete

## Budget

- Total project funding
  - DOE-\$199,950
  - Contractor share - \$27,300
  - Funding received in FY10  
\$19,358
  - Funding to be received in  
FY11 - \$0

## Barriers

- Lack of education of targeted audience
- Misperception of fuel cells
- Competition of messaging from other alternative energy industries

## Partners

- Funding Partners
  - The Ohio Department of Development (ODOD)
  - Edison Materials Technology Center (EMTEC)

# Overview

- **Partners (cont'd)**  
**Interactions/Collaborations**

Ohio Board of Regents  
Ohio Department of Education  
Great Lakes Science Center  
Rolls Royce  
Stark State College  
City of Dublin  
Kent State University  
The Ohio State University  
Youngstown State University  
AEP  
Hocking College Advanced  
Energy Institute

Ohio Senate  
Akron Sierra Club  
STEM Educators  
Ohio House of Representatives  
Battelle  
GrafTech  
City of Mansfield  
Green Pathways  
NASA Glen  
Air Force Research Lab  
Ohio Fuel Cell Coalition Members

# Relevance

**Objectives:** The overall objective of proposed program is to increase the awareness and understanding of state and local government officials in Ohio concerning hydrogen and fuel cell technology; thereby, accelerating the deployment of clean energy solutions, which will improve our environment, decrease our dependence on foreign energy, and bolster the manufacturing sector.

This increase in the awareness and understanding will directly contribute to the following Hydrogen Education Subprogram objectives:

- By 2010, increase understanding of hydrogen and fuel cell technologies among state and local governments by 10 percent compared to 2004 baseline
- By 2012, increase knowledge of hydrogen and fuel cell technologies among key target populations (state and local governments) by 20 percent compared to 2004 baseline



# Relevance

The specific objectives of the proposed program are to:

## **Objectives (cont'd)**

- Compile a succinct set of educational materials that will educate the target audience, state and local government officials, about the benefits and economic development opportunities associated with hydrogen and fuel cell technologies.
- Prepare an informative and engaging agenda for the forums and market the forum appropriately.
- Conduct approximately nine forums around the state that will raise the awareness of government stakeholders as to the environmental, economic and other benefits of hydrogen and fuel cells.

# Relevance

## **Objectives (cont'd)**

- Include in the nine regional forums, statewide and region specific information about fuel cell companies, research entities and community colleges concerning fuel cell activities and give examples of early market deployment and manufacturing operations.
- Publish a bi-annual newsletter that will keep the target audience informed about technical, legislative and business developments related to hydrogen and fuel cell technologies.
- Measure the increased awareness of state and local government officials using the metrics from the DOE Hydrogen Education Subprogram 2004 Baseline Study and additional instruments to determine knowledge of financial incentives, university and college workforce development programs, and awareness of specific local company activities.

# Impact on Addressing Barriers

Knowledge of Fuel Cells has increased significantly during the May 2010 to June 2011 timeframe. The Ohio Fuel Cell Coalition has presented 19 Forums in various locations around the State of Ohio to an audience of 835 people. We surveyed each targeted audience on their knowledge of fuel cells and its importance in revitalizing the manufacturing sector and in creating jobs. The results have been very favorable.

## **Other milestones achieved:**

- Developed set of introductory materials suitable for a non technical audience (3Q, 2010)
- Developed material for community seminars (3Q, 2010)
- Developed database of state activities (3Q, 2010)
- Hold “Hydrogen 101” seminars (3Q, 2010 through 3Q, 2011)



# Approach

Ohio Fuel Cell Coalition approach to educating the targeted audience on fuel cells was to hold regional forums throughout the State of Ohio with Partners that we mentioned earlier. This approach allows the Region to see the progress that has been made in the fuel cell arena not only across the State but also specifically in the Region.

## Technical Approach

- Regional Forums which includes “Fuel Cells 101”, a statewide overview with a regional emphasis. Stressing how the Ohio Fuel Cell Initiative is helping retain and create jobs.
- Regional Forums include information on early fuel cell successes in Ohio - i.e. forklifts, stationary, military applications, and supply chains strengths.
- We have also included in our forums how fuel cells act as an enabler with other alternative energy areas.



# Target Audience and Approach

The target audience for the proposed program are state, federal and local government officials that will be affected by the manufacturing and deployment of fuel cell technologies in their regions. Also, included in this group will be economic development, transit, and public utilities individuals. These represent the key decision makers framing the future of Ohio's fuel cell industry and early deployment of fuel cell applications for stationary power generation, niche transport, and public transit.

# Target Audience and Approach

## Target Audience Segments (in order of importance)

### Elected Officials ~550

- Retaining or increasing employment
- Need for less expensive, clean alternative energy sources
- Need for accurate, current information
- Demonstration opportunities

### Economic Development ~100

- Retaining or increasing employment
- Business matchmaking opportunities
- Demonstration opportunities
- Need for accurate, current information

### Transit ~50

- Efficient fleet vehicles
- Demonstration opportunities
- Need for less expensive, clean alternative energy sources
- Need for accurate, current information

### Utilities & Public Safety ~500

- Need for accurate, current information;
- Need for less expensive, clean alternative energy sources
- Demonstration opportunities

**Total 1,200**

# Approach

## Milestones

### Task 1: Review Educational Materials (COMPLETE AND ONGOING)

#### **Subtask 1.1 – Define Needs**

A program steering committee of ODOD and EMTEC determined the criteria for the forum. This included the following: nontechnical and concise; application focus; consistent with the DOE Hydrogen Education subprogram.

#### **Subtask 1.2 – Review and Compile Materials**

Materials were reviewed and compiled and we determined to have general fuel cell information materials with an emphasis on regional activities.

#### **Subtask 1.3 – Material Approval**

The steering committee commented and approved all materials.

### Task 2-Forum Preparation (COMPLETE AND ONGOING)

#### **Subtask 2.1 – Target Audience Database**

OFCC sought out the most cost effective marketing and communication channels to reach the audience taking advantage of emailing when available and appropriate. ODOD helped significantly in this endeavor.

#### **Subtask 2.2 – Preparation of Forum Materials**

Prepared all the forum materials for all events from May, 2010 to June , 2011. These materials consisted of: Regional presentations, packages of information which included all educational materials previously prepared. The local events will be served coffee ,water and sometimes brunch.

#### **Subtask 2.3 – Market Forums**

We secured various databases from our Regional Partners along with using the OFCC database to market the forums. We also issued press releases in the various areas.

#### **Subtask 2.4 – Venue and Logistics**

All venues and logistics were researched and secured.



# Approach

## Milestones

### Task 3 – Educational Forums (COMPLETE & ONGOING)

#### Subtask 3.1 – Conduct Forums

The following Forums were held in the past year: June 7, 2010 - Youngstown Sustainability Conference; June 17 – OFCC Board of Directors Meeting; July 13 – Dublin, Ohio; July 14 – Toledo, Ohio; July 22 – Cleveland, Ohio; August 7 – Akron Ohio; August 26 – Columbus, Ohio; September 16 – Canton, Ohio; September 30 – Dublin, Ohio; October 18 – 21 – San Antonio, Texas Fuel Cell Seminar; October 26 – Youngstown, Ohio; November 2 – Eastlake, Ohio; November 23 – Mansfield, Ohio; December 2 - Kent, Ohio; December 20 – Canton, Ohio; January 7, 2011 – University of Cincinnati; January 25, 2011 - Logan, Ohio; February 15, 2011 – Ohio Fuel Cell Members & Legislators Meeting Washington D.C.; March 1, 2011 – EMTEC Dayton, Ohio EMTEC.

#### Subtask 3.2 – Conduct Internet Web Seminars

Webinars were determined not to be an appropriate way to reach our target audience.

### Task 4 – Follow up Activities (COMPLETE & ONGOING)

#### Subtask 4.1 – Draw Audience

The task of drawing an audience to the 2011 Symposium started during this time frame. The venue for this years symposium will be in Cleveland at the Kent State/Stark.

#### Subtask 4.2 – Newsletter

Follow up the forums by disseminating a newsletter—a bi-annual newsletter will be published specifically to provide timely, accurate, hydrogen and fuel cell information to government stakeholders. **RESULTS – The OFCC has distributed quarterly newsletters instead of bi-annual to a 4000 member data base which includes government stakeholders.**



# Approach

## Milestones (continued)

### **Subtask 4.3 – Matchmaking and Other Services**

Follow up the forums with matchmaking services – Linking of government agencies, fuel cell companies and end users to facilitate demonstrations and early market adoption.

**RESULTS – The OFCC has meetings linking government agencies with fuel cell companies and end users to facilitate demonstrations, early market adoptions, access to capital and other economic development incentive programs.**

### **Task 5 – Program Management (COMPLETE & ONGOING)**

#### **Subtask 5.1 – Program Management**

The OFFC partnered with EMTEC to insure oversight and to coordinate efforts including invoices and other administrative duties.

#### **Subtask 5.2 – Define Metrics**

The OFCC surveyed all audiences in the forum on their knowledge of Fuel Cells, Ohio's fuel cell initiative and other Ohio based programs such as: College Workforce development programs, financial incentives and most important awareness of specific regional activities.

#### **Subtask 5.3 – Reporting**

The OFFC got off to a slow start and was late with its quarterly reports but is now caught up.

# Technical Accomplishments and Progress

Knowledge of Fuel Cells has increased significantly during the May, 2010 to March, 2011 timeframe. The Ohio Fuel Cell Coalition has presented 19 Forums in various locations around the State of Ohio to an audience of 835 people. We surveyed each targeted audience on their knowledge of fuel cells and its importance in revitalizing the manufacturing sector and in creating jobs in Ohio. The results have been very favorable.

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# Technical Accomplishments and Progress

- Number of Forums
  - The original plan was to do 9 forums in the State and last year we held 19 forums and this year we held 15 for a total of 34 forums.
- Increased Number of Attendees
  - Our original goal was to have 1200 attendees and last year we attracted 835 and the year before we had 900 attendees for a total of 1735 attendees.

## **Results of Survey Questions**

- Benchmark Knowledge of Fuel Cells
  - The original benchmark of knowledge of Fuel Cells ranged from no knowledge to very knowledgeable with the vast number in the range of no knowledge to some knowledge. After the forums the range of knowledge has shifted from some knowledge to good knowledge.
- Did we have the appropriate information distributed at the forums?
  - The overwhelming response to this survey question was “Yes” that the information provided helped increase individuals knowledge of fuel cells.



# Technical Accomplishments and Progress

## Results of Survey Questions (cont'd)

- Awareness of the Fuel Cell Industry in Ohio
    - The overwhelming response to this questions was yes compared to their original knowledge of the Fuel Cell Industry in Ohio.
  - Economic Impacts of the Fuel Cell Industry in Ohio
    - The forums certainly helped increased the knowledge of the economic impact of Fuel Cells in the State of Ohio. After the forums the surveys shifted the knowledge from little or no knowledge to overwhelmingly knowledgeable
- 
- **Creation of Fuel Cell Coalition Portal/Database**
    - The OFCC will be formally launching a portal that will contain information on fuel cells and equipment available to companies for Fuel Cell R&D, deployment and assistance. The portal was discussed during each forum. The OFCC has also built a substantial database during this time frame which included the targeted audience.



# Collaborations

## **PRIME** – (Helped in preparing, reviewing and assisting with forums.)

- EMTEC
- Ohio Department of Development

## **UNIVERSITIES** - (Helped in hosting or presenting forums.)

- Ohio Board of Regents
- Hocking College Advanced Energy Institute
- Stark State College
- Youngstown State University
- The Ohio State University
- Kent State University
- University of Toledo

## **INDUSTRY** - (Helped in hosting or presenting forums.)

- Rolls Royce
- Honda
- Plug Power
- Battelle
- GrafTech
- Crown Equipment
- Gorman-Rupp

## **FEDERAL LABS** - (Helped in hosting or presenting forums.)

- NASA
- ARFL

# Proposed Future Work

- Draw audience to 2011 OFCC Symposium
  - One of the most effective and cost effective means of following up with government stakeholders is drawing them to the annual Ohio Fuel Cell Symposium This meeting will detail the matchmaking and other follow-up services OFCC provides as part of this program and on its own.
- After the 2011 Symposium we will hold additional forums in Toledo, Dayton, Lima, Cincinnati and Athens.
- We will compile all survey results and compare to original milestones.
- After the final forum, we will compile a newsletter summarizing all forums in the last 12 months.

# Project Summary

- **Relevance:**

- The proposed program demonstrates a strong fit with the objectives of the Hydrogen Education subprogram by targeting state and local government decision makers; thereby, acting as a conduit for the DOE and raising the awareness of this important stakeholder group.

- **Approach:**

- Ohio Fuel Cell Coalition approach is to educate the targeted audience on fuel cells by holding regional forums throughout the State of Ohio with various partners and collaborators. This approach allows the regions to see the progress that has been made in the fuel cell arena not only across the State but also specifically in the Regions.

- **Technical Support and Accomplishments:**

- Knowledge of Fuel Cells has increased significantly during May 10, 2010 to March, 2011 timeframe. The Ohio Fuel Cell Coalition has presented 19 forums in various locations around the State of Ohio to an audience of 835 people. We surveyed each targeted audience on their knowledge of fuel cells and its importance in revitalizing the manufacturing sector and in creating jobs in Ohio. The results have been favorable.



# Project Summary

- **Collaborations:**

- As noted earlier our collaborations have increased significantly in the past year. Our collaborators included prime contractors and a host of 22 collaborators including universities, industry, and federal labs.

- **Future Work:**

- Draw audience to annual 2011 Ohio Fuel Cell Symposium. Which also included matchmaking services and collaborations. We will also be holding an additional 5 - 7 forums throughout the State.
- We will then compile total results and summarize the findings.



# Supplemental Slides

# Ohio Competitive Advantages- Support for Industry Growth

Ohio is competitively advantaged to participate in the fuel cell/hydrogen economy growth, and developing this industry is critical to Ohio interests.

- Builds on Ohio's manufacturing infrastructure and can help reverse the decline in manufacturing jobs
- Returns Ohio as the driver in a critical segment of industry, and acts as economic lever for additional technology development
- Creates high skill/high income jobs

# Ohio Competitive Advantages- Support for Industry Growth

- **Technical support**
  - University R&D/collaboration
    - Research entities
    - Federal labs– NASA GRC, Air Force Research Lab
  - Community and Technical Colleges
  - Industrial manufacturing and advance materials expertise
- **Business support**
  - EMTEC, NorTech, ODOD, other development support
  - Ohio Fuel Cell Coalition
- **Financial support**
  - Third Frontier Fuel Cell initiative
  - Strategic and supply chain partners
- **Central logistics and manufacturing location**
  - Within 500 miles of 60% of US markets
  - Proximity to auto manufacturers; access to entire state manufacturing sector

# Ohio: Growing Activity and Visibility in Fuel Cell Industry

## **Company investments or projects**

- Rolls-Royce Worldwide HQ located in Canton
- NexTech Materials (Columbus)
- Crown Equipment (New Breman)
- GrafTech (Parma)
- Catacel-Fuel Cell Processing
- Battelle-GPU/APU
- ETI (Mansfield)
- Lockheed Martin/TMI (Akron)



# Ohio Accomplishments

- Commitment - over \$85 million in state support since 2003
- Global recognition
- Research and commercialization
- Supply chain leadership
- Educational initiatives
- New entrants and private investment

**Pat Valente**

**Executive Director**

**Ohio Fuel Cell Coalition**

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**614.542.7308**

**pat.valente@fuelcellcorridor.com**

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