Clean Energy Supply Chain and Manufacturing Competitiveness Analysis for Hydrogen and Fuel Cell Technologies

THE FUEL CELL CORRIDOR™
Global Center of the Fuel Cell Industry

US DOE Office of EERE
Fuel Cell Technologies Office
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Project ID: MN012



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OFCC
OHIO FUEL CELL COALITION

OVERVIEW

TIMELINE

- Start Date: July 2015
- End Date: June 2018

BUDGET

- Start Date: July 2015
- FY14 No Funding
- FY15 Planned DOE funding: $625,000
- No funds received to date

BARRIERS

- Lack of standardization of components to lower costs
- Lack of national accessible database
- Lack of communication nationally between OEMs and suppliers

PARTNERS/COLLABORATORS

- Pat Valente, Ohio Fuel Cell Coalition (OFCC)
- Douglas Wheeler, DJW Technology (DJWT)
- Michael Ulsh, National Renewable Energy Lab (NREL)
- Scott Samuelsen, National Fuel Cell Research Center (NFCRC) at UC Irvine
- Joel Reinbold, Connecticut Center for Advanced Technology (CCAT)

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Relevance

Objective 1. Establish regional Technical Exchange Centers to increase communication between OEMs and hydrogen and fuel cell component and subsystem suppliers.

Objective 2. Establish a readily web-accessible database containing inputs from suppliers and OEMs along with a supplier contact list.

Objective 3. Standardize component and subsystem component specifications.

Objective 4. Develop strategies for lowering cost, increasing performance, and improving durability of components and subsystem components.

Relevance - Department of Energy Impact

- **National Technical Exchange Network for Supply Chain**
  - The project will develop a national technical exchange network that will increase the distribution of component specifications to suppliers and provide a database of suppliers capabilities that can accelerate mass production, reduce cost, and improve performance and durability of fuel cell systems.
  - National web-centered database of fuel cell component suppliers and subsystem component suppliers available to OEMs
- **Working Groups to Standardize Components**
  - Working groups created with hydrogen and fuel cell manufacturers (OEMs) and stack component manufacturers, and Balance-of-Plant (BoP) suppliers to establish a consensus on standard specifications for components with the objective of driving down component cost.
  - Working groups assist suppliers and OEMs in the application of Design for Manufacturing and Assembly (DFMA®) for the development of standardization.

Approach

Milestones:

- **M1 – 1st qtr/Yr 1:** Start-up of Technical Exchange Centers
- **M2 – 2nd qtr/Yr 1:** OFCC produces brochure to attract new suppliers
- **M3 – 3rd qtr/Yr 1:** OFCC and NREL hold supply chain exchanges
- **M4 – 4th qtr/Yr 1:** CCAT and NFCRC hold supply chain exchanges
- **M5 – 2nd qtr/Yr 1:** Formation of Working Group
- **M6 – 4th qtr/Yr 1:** Working group identifies pathways to standardization
- **M7 – 1st qtr/Yr 2:** Supply chain exchanges at all Technical Exchange Centers
- **M8 – 2nd qtr/Yr 2:** Transfer of data to central website

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Approach

Milestones Continued:

- **M9 – 4th qtr/Yr 2:** National Supply Chain Exchange at FCSEE
- **M10 – 1st qtr/Yr 2:** Initiation of standardization specifications
- **M11 – 2nd qtr/Yr 3:** Confirmation of data from Technical Centers meets central website requirement.
- **M12 – 4th qtr/Yr 3 :** Summary of data from supply chain exchanges to DOE
- **M13 – 4th qtr/Yr 3 :** Summary of working group standardization of fuel cell products
- **M14 - 4th qtr/Yr 3:** Recommendations for standardization of selected components

Approach

Deliverables:

- **D 1 (Task 1.2)**
  A report will be issued identifying the feedback from suppliers on the benefits and issues of the supply chain exchanges.
- **D 2 (Task 4.2)**
  A report will be issued identifying supply chain gaps and strategies to overcome these gaps and reduce supply chain cost.
- **D3 (Task 5.1)**
  Report feedback from suppliers on benefits of supply chain exchanges

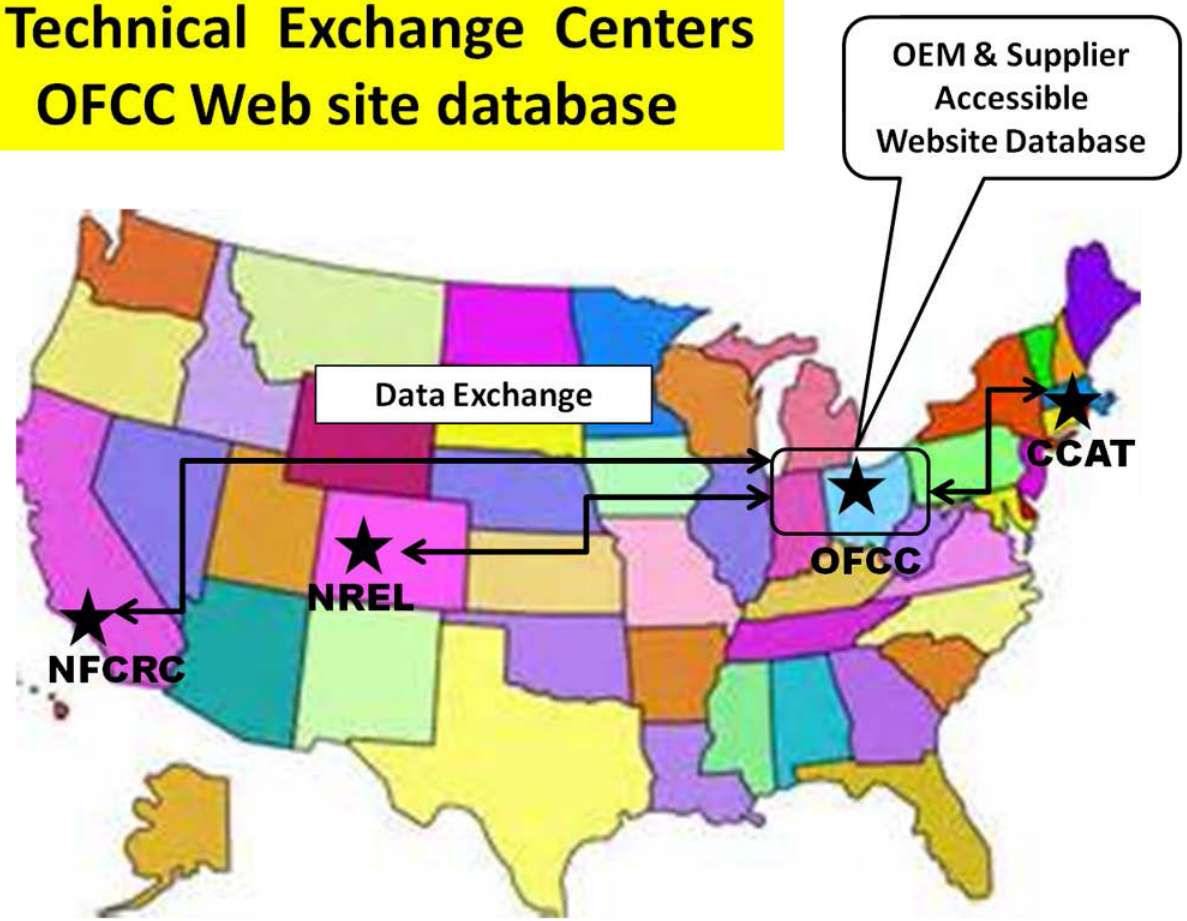
Approach

Deliverables:

- **D 4 (Task 6.1)**
  A report reviewing standardization and production process changes for initial standardized product.
- **D 5 (Task 7)**
  Final report

Accomplishments: New Project: Start-up July 1, 2015

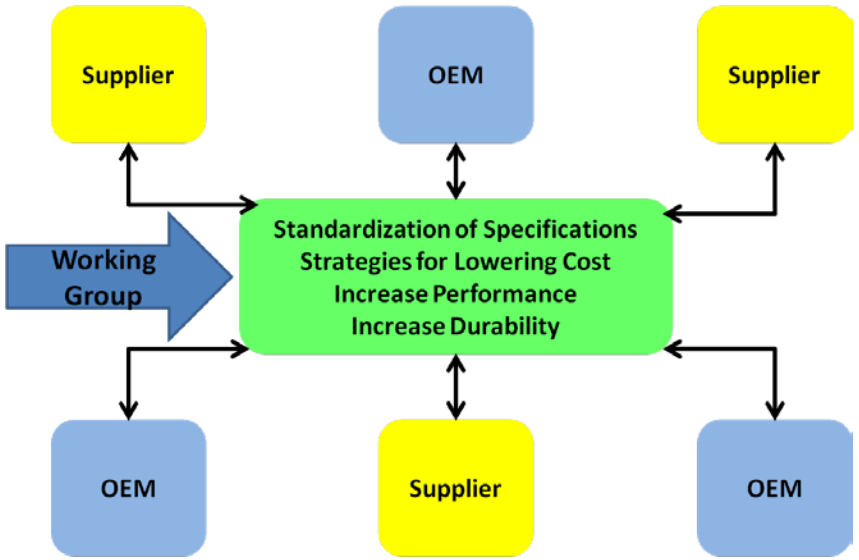
4 Technical Exchange Centers
OFCC Web site database



- National level membership
  - OEMs
  - Suppliers
- Analyze needs of OEMs
  - Multiple suppliers
  - Challenges for components and subsystems
    - Lowering cost
    - Increasing performance
    - Improving durability
- Standardization of component specifications
- Mitigate the gap
  - OEM needs and supplier components

Accomplishments: New Project: Start-up July 1, 2015

Working Groups



OFCC DJWT NREL NFCRC CCAT

Responses to Previous Year Reviewers' Comments

N/A.

Project to start 3rd Qtr. 2015

Collaborators

Collaborators	Relevance of Collaborators
Joel Reinbold, Connecticut Center for Advanced Technology (CCAT)	Establish and coordinate the East Coast Technical Exchange Center; assist with supply chain mapping and standardization.
Douglas Wheeler, DJW Technology (DJWT)	Establish and coordinate the West Coast Technical Exchange Center at NFCRC; set –up working group; consulting.
Scott Samuelsen, National Fuel Cell Research Center (NFCRC) at UC Irvine	Establish and coordinate the West Coast Technical Exchange Center.
Michael Ulsh, National Renewable Energy Lab (NREL)	Technical support and establish and coordinate Central Plain States Technical Exchange Center; establish working groups.

Remaining Barriers and Issues

New Project: Start-up July 1, 2015
From our objectives

- Formation of a robust supply chain serving OEMs in the hydrogen and fuel cell systems industry.
- Reducing the cost of materials and components for hydrogen fuel cell systems.
- Increasing the reliability of the materials and components for these systems.
- Standardizing the parts and components with the establishment of multiple suppliers.

Proposed Future Work

Task 1: Creation of Technical Exchange Centers (Month 1 – Month 12)

Task 2: Formation of Supplier Working Groups to Standardize Components (Month 3 – Month 12)

Task 3: Operation of Regional Technical Exchange Centers (Month 13 – Month 24)

Task 4: Supplier Working Group Standardization (Month 13 to Month 24)

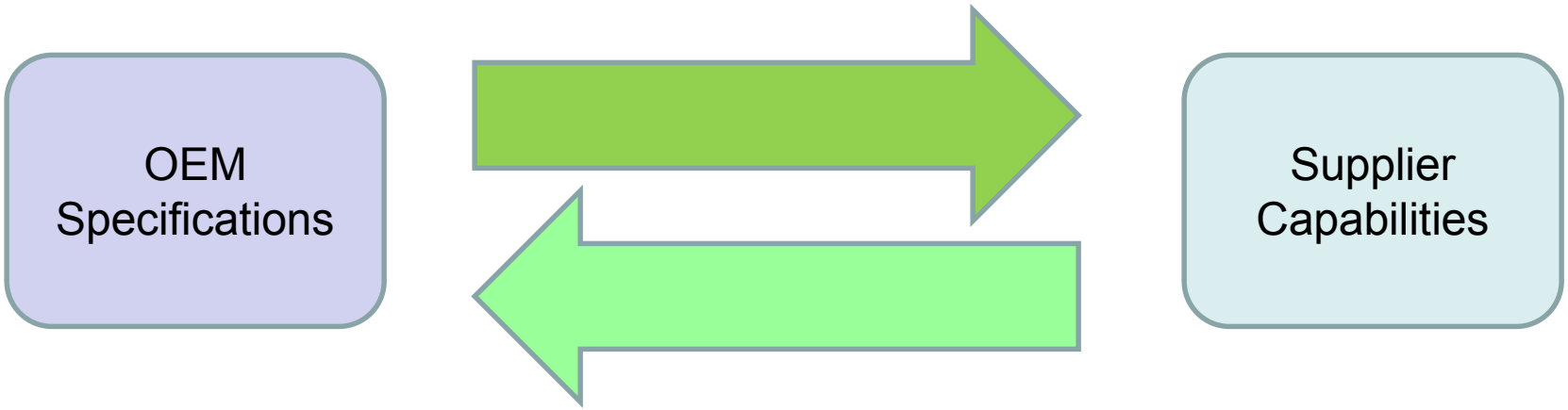
Task 5: Completion of Operation of Technical Exchange Centers (Month 25 to Month 36)

Task 6: Completion of Working Group Standardization (Month 25 – Month 36)

Task 7: Management and Reporting (Month 1 to Month 36)

Technology Transfer Activities

- Project focus is two way technology transfer between OEMs and Suppliers

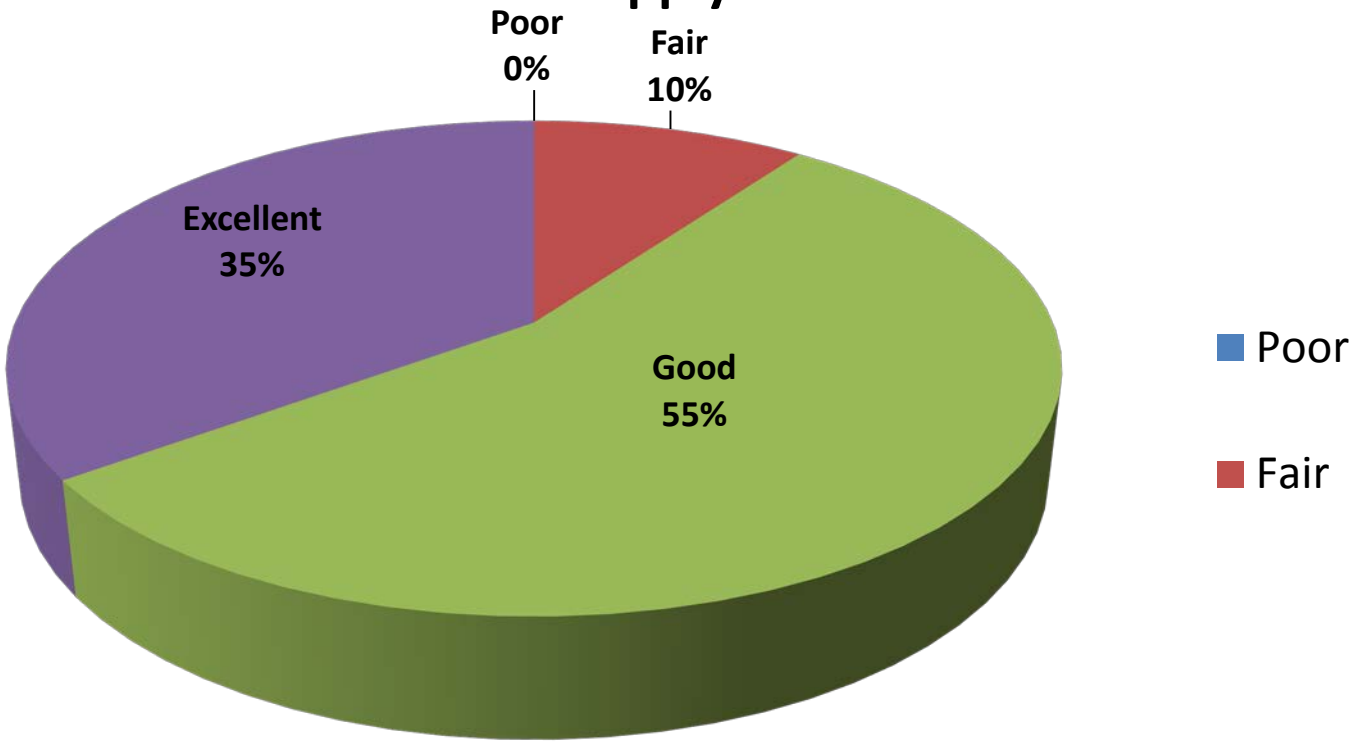


Summary Slide

The Integrated Regional Technical Exchange Centers project is to facilitate the development of a robust supply chain for fuel cell and hydrogen systems that will accelerate mass production, reduce costs, and improve performance and durability of these systems by:

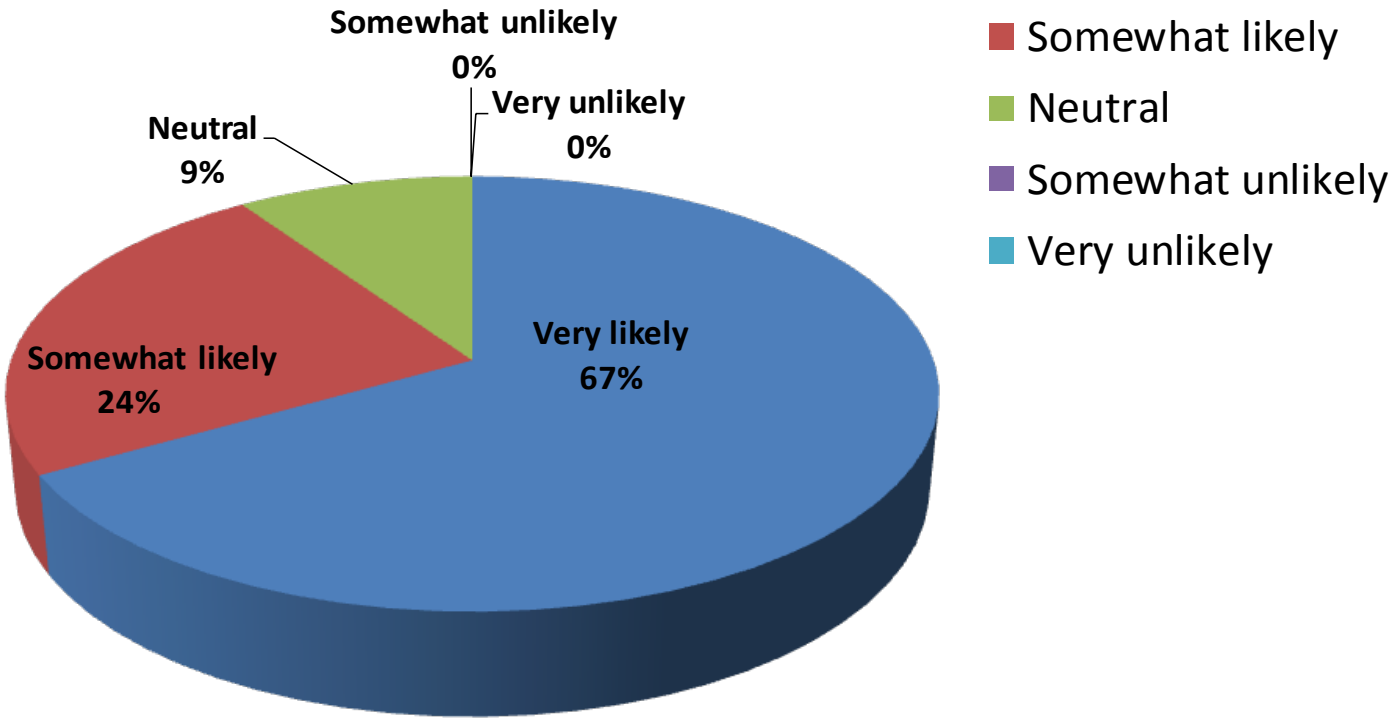
- Establishing regional Technical Exchange Centers to increase communications between OEMs and suppliers.
- Establish a web-accessible database, first regionally, then nationally, containing inputs from suppliers and OEMs with a supplier contact list.
- Standardize component and subsystem specifications.
- Develop strategies to lower cost, increase performance, and improve durability of components and subsystem components.

Usefulness of the information presented at the October 2012 supply chain event:



Data collected from 21 forms

How likely are you to attend the supply chain event again?



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