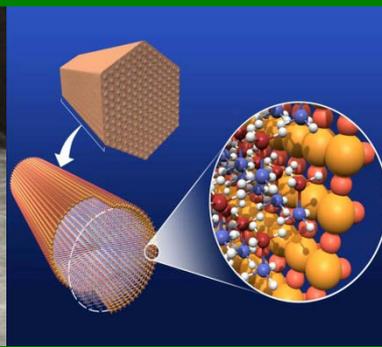




U.S. DEPARTMENT OF
ENERGY



Market Transformation Sub-program - Session Introduction -

Pete Devlin

*2011 Annual Merit Review and Peer Evaluation Meeting
May 10, 2011*

GOALS

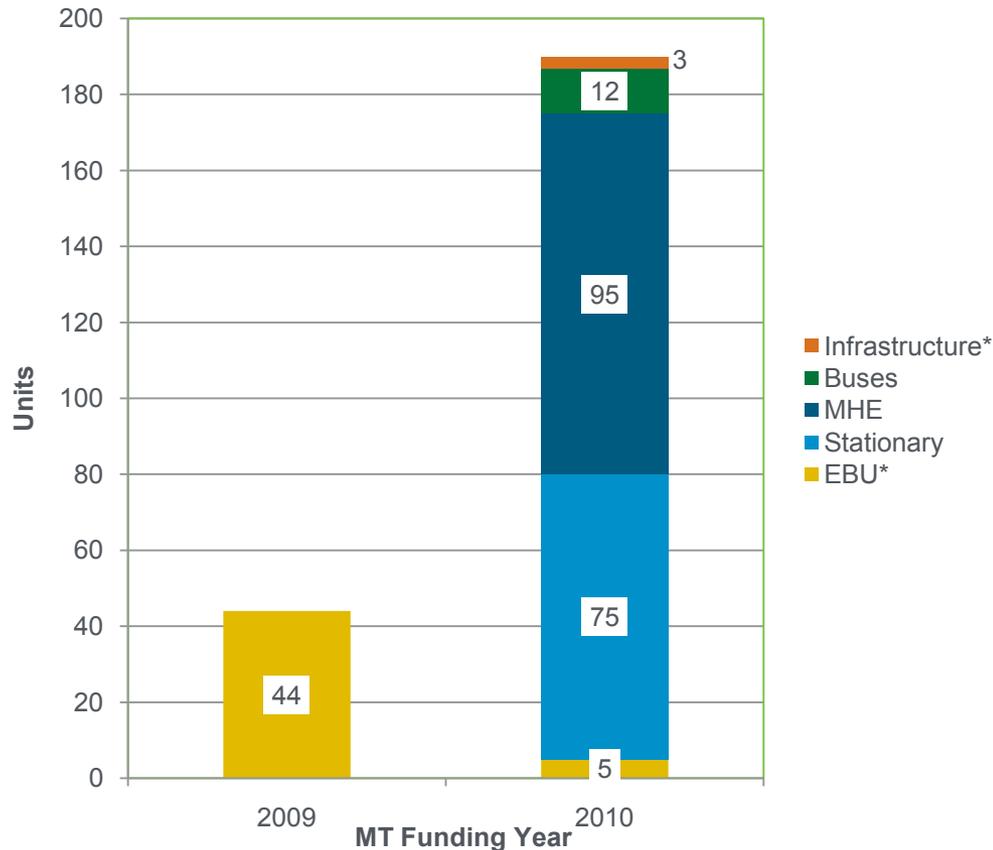
- Ensure continued technology utilization growth for domestically produced hydrogen and fuel cell systems
- Lower life cycle costs of fuel cell power by identifying and reducing non-technical barriers

OBJECTIVES

- Catalyze key implementation projects and partnerships with state and local governments and other stakeholders
- Increase domestic market penetration by standardizing institutional and financial market practices
- Increase data analysis associated with siting and deployment (i.e. insurance, permitting, and installation)
- Develop and launch a transparent energy efficiency and reliability certification program

- To test emerging applications at the Technology Readiness Level (TRLs) 7-9 level to expand user and servicing expertise
- To test new technology applications in user operating conditions to establish baseline energy efficiency and reliability performance and determine commercial viability
- To develop strategies to mitigate commercial risks and develop new approaches to ensure high hydrogen and system utilization and reliability under mass market penetration scenarios
- To develop comprehensive standards for measuring energy efficiency to catalyze private sector financing for fuel cell systems
- To obtain data from operating experience
- To facilitate affordable insurance premiums for hydrogen and fuel cell technologies

Fuel Cell Installations (ARRA Projects Not Included)



Total Installations by Type*

2009 Deployments (\$5 M)

- 44 EBU Units

2010 Deployment (\$15 M)

- 5 Mobile Light Stands
- 75 Micro CHP Units
- 95 MHE Units
- 12 HICE Buses
- 1 Electrolyzer
- 1 Mobile Refueler
- 1 Hydrogen Reformer (Landfill Gas)

*Figures include Market Transformation funding only, ARRA and Other are excluded

- Developed a new mobile lighting technology and tested it in real operations (Sandia National Lab)
- Started a first-of-its-kind application to generate hydrogen from renewable energy for transportations fuel and grid management (NRL and HNEI)
- Completed the multi-site award of back up power for DOD, NASA and NPS
- Continuously operated 90 fuel cell powered lift trucks at DOD sites
- Installed and operated H2 buses at 9 DOD and DOE sites
- Started a MicroCHP deployment for light commercial facilities (PNNL)
- Catalyzed an industry fuel cell lift truck project using LFG feedstock (SCRA/ BMW)
- Launched DMFC powered lift truck operations in 4 locations
- Worked with DOD to investigate 3 new uses of fuel cells (aircraft and shipboard APUs and WTE FCs)

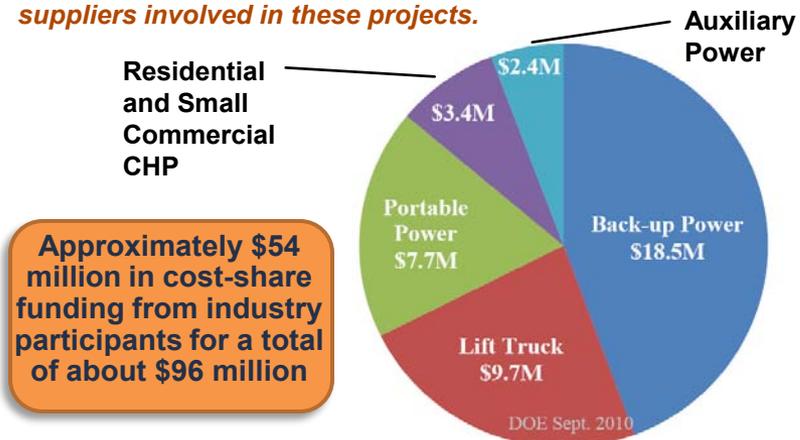
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ARRA Fuel Cell Funding & Budget

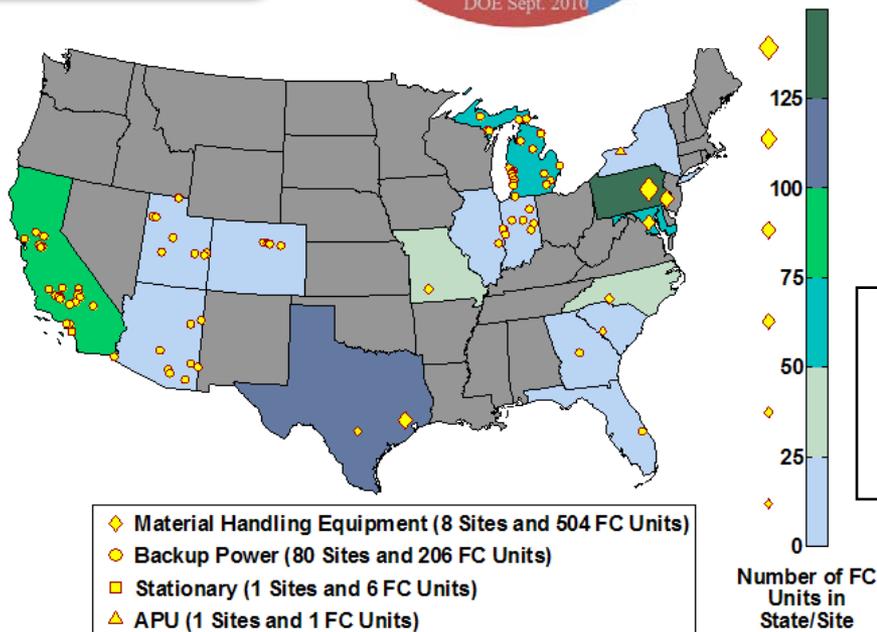
DOE announced more than \$41 million from the 2009 American Recovery and Reinvestment Act to fund 12 projects, which will deploy up to 1,000 fuel cells – to help achieve near term impact and create jobs in fuel cell manufacturing, installation, maintenance & support services sectors

FROM the LABORATORY to DEPLOYMENT:

DOE funding has supported R&D by all of the fuel cell suppliers involved in these projects.



Approximately \$54 million in cost-share funding from industry participants for a total of about \$96 million



COMPANY	AWARD	COST SHARE	APPLICATION
Delphi Automotive	\$2.4 M	\$2.4 M	Auxiliary Power
FedEx Freight East	\$1.3 M	\$1.5 M	Lift Truck
GENCO	\$6.1 M	\$6.1 M	Lift Truck
Jadoo Power	\$2.2 M	\$2.6 M	Portable
MTI MicroFuel Cells	\$3.0 M	\$3.6 M	Portable
Nuvera Fuel Cells	\$1.1 M	\$2.2 M	Lift Truck
Plug Power, Inc.	\$3.4 M	\$3.4 M	CHP
Plug Power, Inc.	\$2.7 M	\$2.7 M	Back-up Power
Univ of N Florida	\$2.5 M	\$0.6 M	Portable
ReliOn, Inc.	\$8.5 M	\$9.6 M	Back-up Power
Sprint - Nextel	\$7.3 M	\$17.2 M	Back-up Power
Sysco Houston	\$1.2 M	\$2.0 M	Lift Truck

Deployment Status – April 2011

Fuel Cell Application	Operational Fuel Cells	Total Fuel Cells Planned
APU	0	3
Backup Power	267	539
Material Handling	369	504
Stationary	0	6
Total	636	> 1,000

JOBS STATUS
(April 2011)
48.7 jobs reported on Recovery.gov

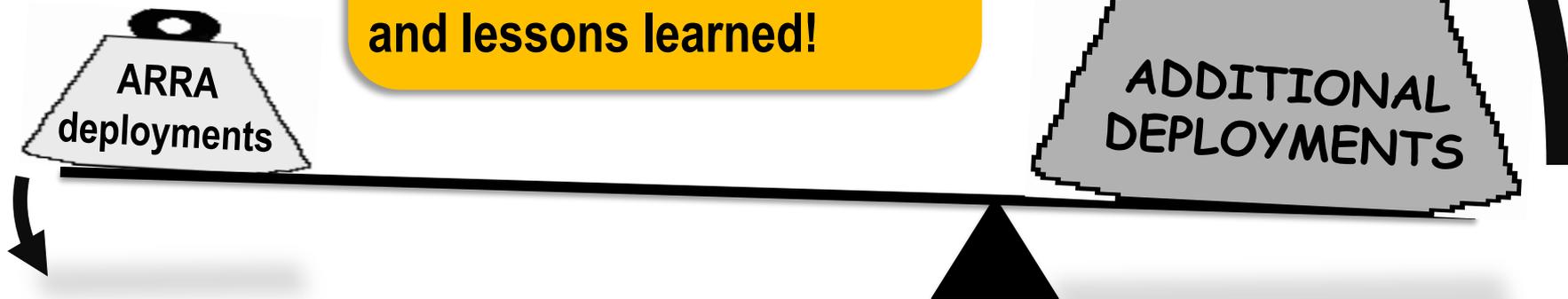
LEVERAGING ADDITIONAL FUEL CELLS DEPLOYMENTS

- Sysco (Corporation) plans to convert an additional 500+ battery powered lift trucks to fuel cell power
- H-E-B Grocery, with Nuvera Fuel Cells, plans to expand their current fleet of fuel cell powered lift trucks by 28 additional lift trucks

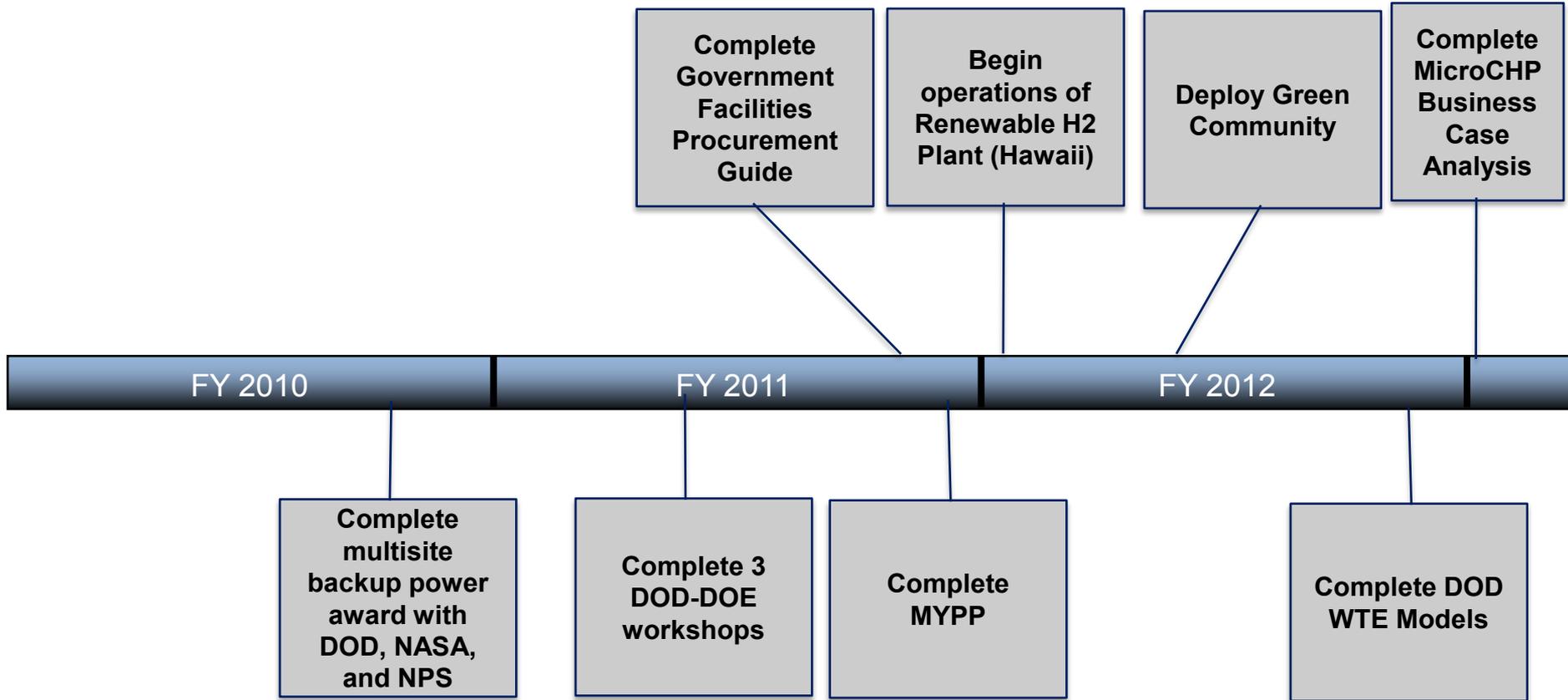
NREL ARRA Data Collection Snapshot

ARRA Material Handling Equipment Data	As of 12/31/2010
Hydrogen Dispensed	> 18,500 kg
Hydrogen Fills	> 38,800
Hours Accumulated	> 307,400 hrs

Additional fuel cell lift truck deployments taking place based on ARRA experience and lessons learned!



Key milestones & future plans



Market Transformation

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**Market Transformation presentations in salon E – Crystal City Marriott Hotel
Tuesday, May 10th at 2:30 PM – 5:45 PM**

- This is a review, not a conference.
- Presentations will begin precisely at the scheduled times.
- Talks will be 20 minutes and Q&A 10 minutes.
- Reviewers have priority for questions over the general audience.
- Reviewers should be seated in front of the room for convenient access by the microphone attendants during the Q&A.
- Please mute all cell phones, BlackBerries, etc.
- Photography and audio and video recording are not permitted.

- Deadline for final review form submittal is **May 20th at 5:00 pm EDT.**
- ORISE personnel are available on-site for assistance. A reviewer-ready room is set up in *The Boardroom* (next to Salon A) and will be open Tuesday –Thursday from 7:30 am to 6:00 pm and Friday 7:30 am to 2:00 pm.
- Reviewers are invited to a brief feedback session – at 6:15 PM today, in this room.

- Fuel Cell Technologies Program Opportunities Available
 - Conduct applied research at universities, national laboratories, and other research facilities
 - Up to five positions are available in the areas of hydrogen production, hydrogen delivery, hydrogen storage, and fuel cells
 - ❑ Applications are due June 30, 2011
 - ❑ Winners will be announced mid-August
 - ❑ Fellowships will begin in mid-November 2011



**Postdoctoral fellowships in
hydrogen and fuel cell research ▶**

www.eere.energy.gov/education/postdoctoral_fellowships/

Market Transformation

Industry

Boeing
BMW
Excel Energy
First Energy
Ford Motor
GM
HELCO
Price Choppers
Walmart

Other Federal Agencies

Army - CERL
Environmental Protection Agency
Federal Aviation Administration
Federal Transit Administration Navy - ONR
Defense Logistics Agency - TARDEC
NASA
U.S. Department of Transportation
U.S. Department of Defense
U.S. Department of Interior - National Park Service
U.S. Department of Commerce

Federal Labs

ANL
LANL
LLNL
NREL
ORNL
SNL

State Governments

California
Connecticut
Hawaii
New York
South Carolina

NGOs

American Gas Association
Electric Power Research Institute
Fuel Cell and Hydrogen Energy Association
Green Communities
US Clean Heat and Power Association