2008 DOE HYDROGEN PROGRAM REVIEW
INTERNATIONAL STATIONARY FUEL CELL DEMONSTRATION

John Vogel, Plug Power

12 June 2008

Clean, Reliable On-site Energy

Project ID: FC40

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This communication contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, including but not limited to statements regarding our prospects for growth. We believe that it is important to communicate our future expectations to our investors. However, there may be events in the future that we are not able to accurately predict or control and that may cause our actual results to differ materially from the expectations we describe in our forward-looking statements, including, without limitation, the risk that the anticipated synergies of the Cellex Power Products, Inc. and General Hydrogen Corp. (now amalgamated as Plug Power Canada Inc.) acquisitions are not realized; the risk that unit orders will not ship, be installed and/or convert to revenue, in whole or in part; Plug Power's ability to develop commercially viable on-site energy products; the cost and timing of developing Plug Power's on-site energy products; market acceptance of Plug Power's on-site energy products; Plug Power's ability to manufacture on-site energy products on a large-scale commercial basis; competitive factors, such as price competition and competition from other traditional and alternative energy companies; the cost and availability of components and parts for Plug Power's on-site energy products; Plug Power's ability to establish relationships with third parties with respect to product development, manufacturing, distribution and servicing and the supply of key product components; Plug Power's ability to protect its Intellectual Property; Plug Power's ability to lower the cost of its on-site energy products and demonstrate their reliability; the cost of complying with current and future governmental regulations; the impact of deregulation and restructuring of the electric utility industry on demand for Plug Power's on-site energy products; and other risks and uncertainties discussed under "Item IA—Risk Factors" in Plug Power's annual report on Form 10-K for the fiscal year ended December 31, 2007, filed with the Securities and Exchange Commission ("SEC") on March 17, 2008, and the reports Plug Power files from time to time with the SEC. Plug Power does not intend to and undertakes no duty to update the information contained in this communication.

OVERVIEW

Timeline

- Project start – May 2007
- Project end – April 2009
- 80% Complete

Barriers

- Barriers addressed
  - Durability – 40,000 hr system
  - Cost - < $750/kW system cost
  - Performance – η_e = 35%, η_o = 85%

Budget

- Total project funding - $7.1M
  - DOE - $3.55
  - Plug Power - $3.55
- Funding in FY07 - $2.1M
- Funding in FY08 - $1.45M

Partners

- Interactions/collaborations
  - BASF Fuel Cell
- Project Lead
  - Dr. Emory DeCastro

DOE TOPIC 7B/EU FP6 PROGRAM

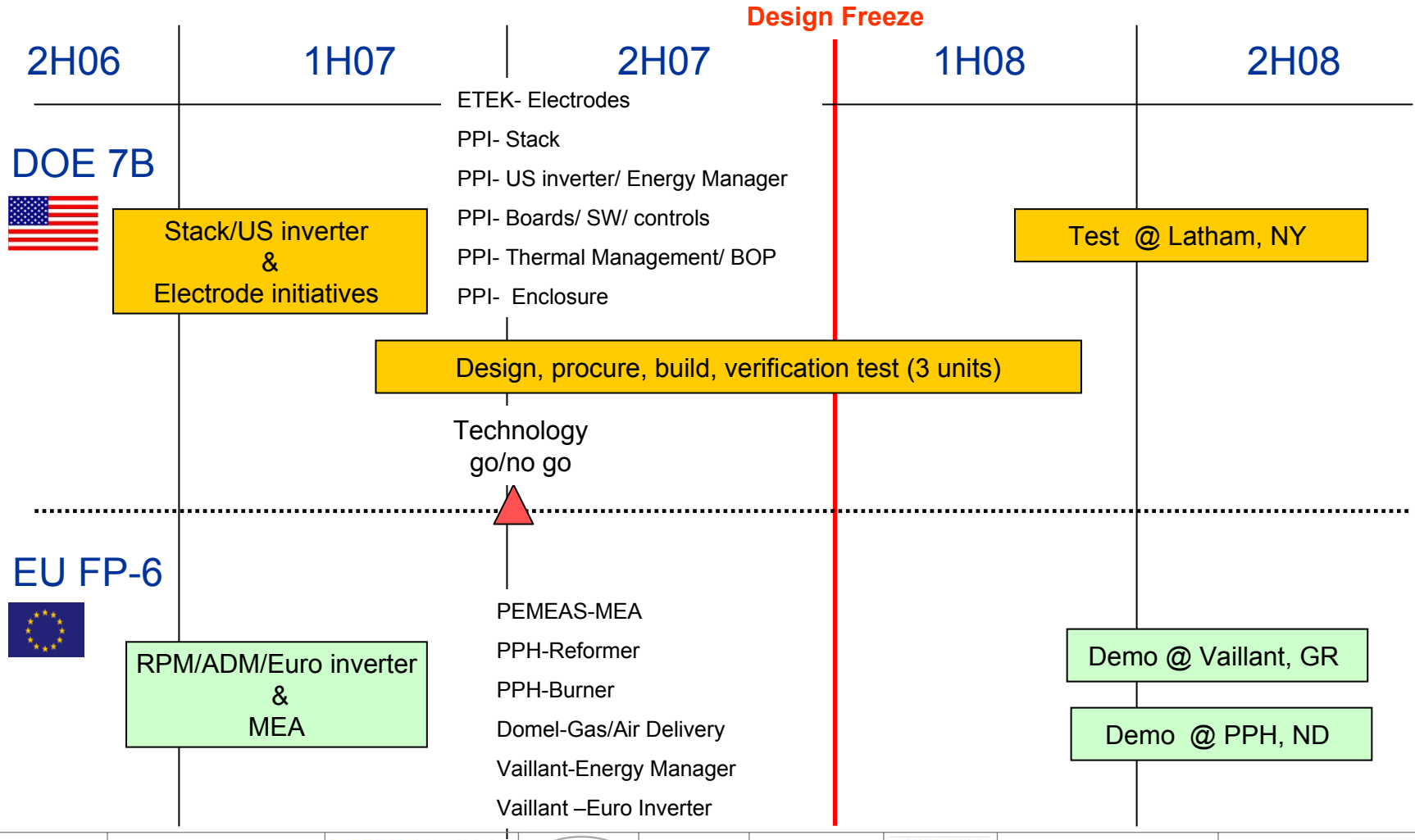
- First of it's kind collaboration between the DOE and the EU
- Goal to develop "high-temperature" (PBI-based) fuel cell heating appliances for residential use worldwide
- Executed through a US/EU consortium:
  - Plug Power (US)/Plug Power (Netherlands)
  - BASF E-TEK US/BASF (Germany)
  - Vaillant (Germany)
  - Domel (Slovenia)
  - Bulgarian Academy of Sciences (Bulgaria)
  - Gaia (Sweden)
  - Imperial College (United Kingdom)

OBJECTIVES

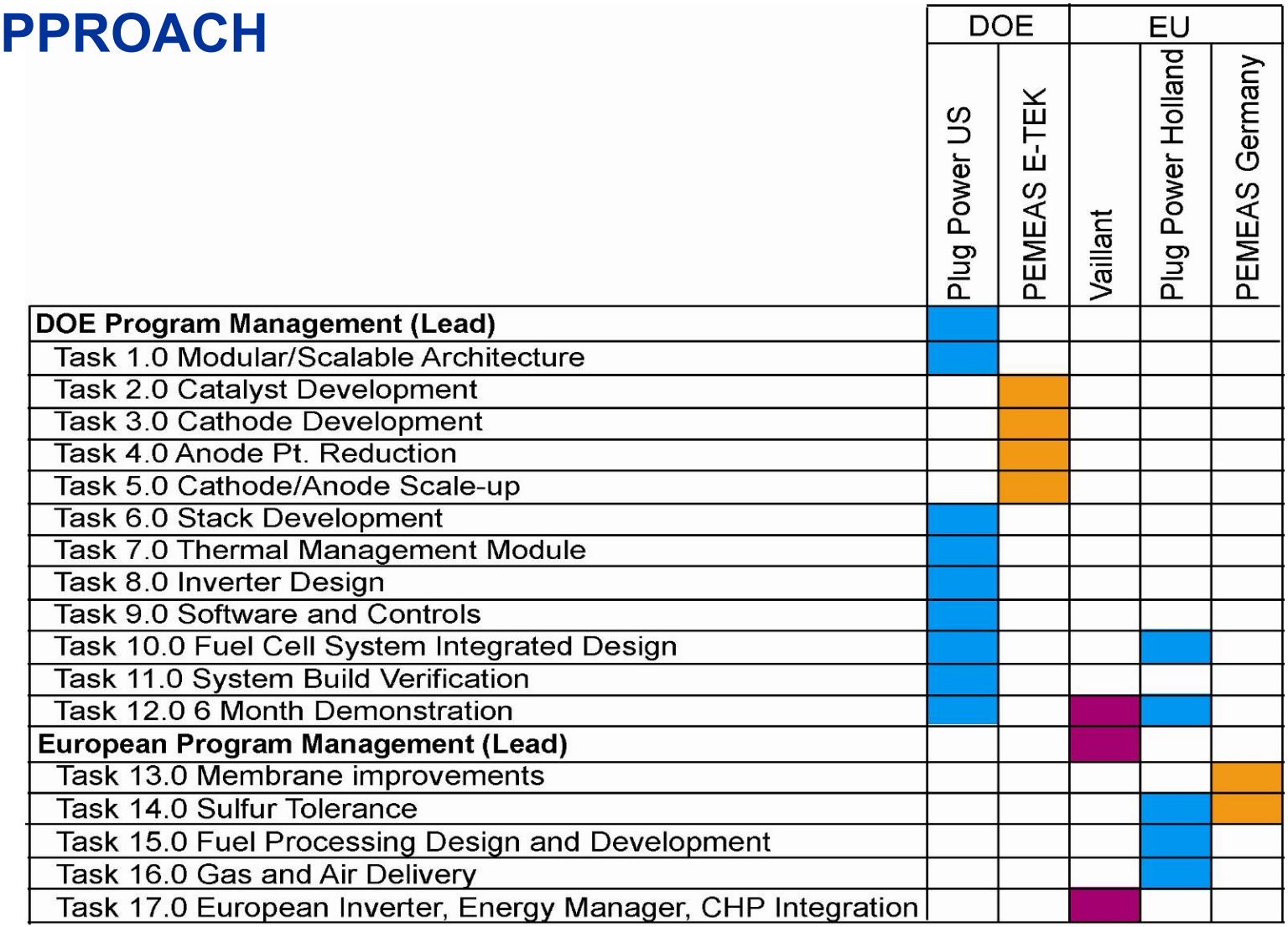
Develop, test and validate a high-temperature PEM, stationary, reformate-based, CHP, fuel cell system as the first demonstration of a modular, scalable design for a worldwide market.

- Total system cost of < $750/kW in production volumes
- $\eta_{electric}$ = 35% (line of sight to 40%); $\eta_{overall}$ = 85%
- System life = 40,000 hours
- Modular and scalable system and CHP hydraulics concepts

MILESTONES


Design Freeze
2H06
1H07
2H07
1H08
2H08
DOE 7B
Stack/US inverter
&
Electrode initiatives
ETEK- Electrodes
PPI- Stack
PPI- US inverter/ Energy Manager
PPI- Boards/ SW/ controls
PPI- Thermal Management/ BOP
PPI- Enclosure
Test @ Latham, NY
Design, procure, build, verification test (3 units)
Technology
go/no go
EU FP-6
RPM/ADM/Euro inverter
&
MEA
PEMEAS-MEA
PPH-Reformer
PPH-Burner
Domel-Gas/Air Delivery
Vaillant-Energy Manager
Vaillant –Euro Inverter
Demo @ Vaillant, GR
Demo @ PPH, ND

APPROACH

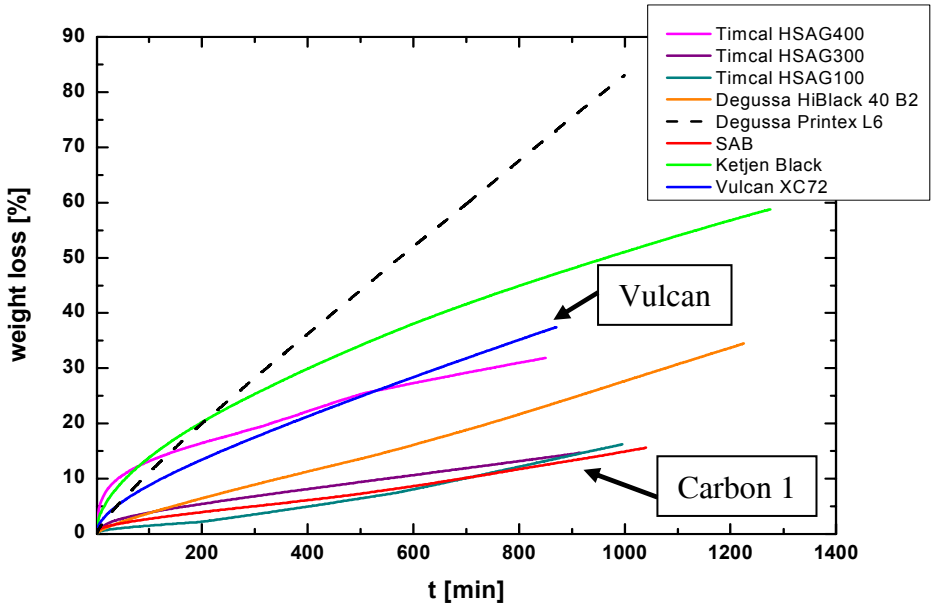

DOE
EU
Plug Power US
PEMEAS E-TEK
Vaillant
Plug Power Holland
PEMEAS Germany
DOE Program Management (Lead)
Task 1.0 Modular/Scalable Architecture
Task 2.0 Catalyst Development
Task 3.0 Cathode Development
Task 4.0 Anode Pt. Reduction
Task 5.0 Cathode/Anode Scale-up
Task 6.0 Stack Development
Task 7.0 Thermal Management Module
Task 8.0 Inverter Design
Task 9.0 Software and Controls
Task 10.0 Fuel Cell System Integrated Design
Task 11.0 System Build Verification
Task 12.0 6 Month Demonstration
European Program Management (Lead)
Task 13.0 Membrane improvements
Task 14.0 Sulfur Tolerance
Task 15.0 Fuel Processing Design and Development
Task 16.0 Gas and Air Delivery
Task 17.0 European Inverter, Energy Manager, CHP Integration

APPROACH

	DOE		EU		
	Plug Power US	PEMEAS E-TEK	Vaillant	Plug Power Holland	PEMEAS Germany
DOE Program Management (Lead)	■				
Complete — Task 1.0 Modular/Scalable Architecture	■				
Complete — Task 2.0 Catalyst Development		■			
Complete — Task 3.0 Cathode Development		■			
Complete — Task 4.0 Anode Pt. Reduction		■			
Complete — Task 5.0 Cathode/Anode Scale-up		■			
70% — Task 6.0 Stack Development	■				
Complete — Task 7.0 Thermal Management Module	■				
90% — Task 8.0 Inverter Design	■				
40% — Task 9.0 Software and Controls	■				
Complete — Task 10.0 Fuel Cell System Integrated Design	■			■	
35% — Task 11.0 System Build Verification	■				
0% — Task 12.0 6 Month Demonstration	■		■	■	
European Program Management (Lead)			■		
Task 13.0 Membrane improvements					■
Task 14.0 Sulfur Tolerance				■	■
Task 15.0 Fuel Processing Design and Development				■	
Task 16.0 Gas and Air Delivery				■	
Task 17.0 European Inverter, Energy Manager, CHP Integration			■		

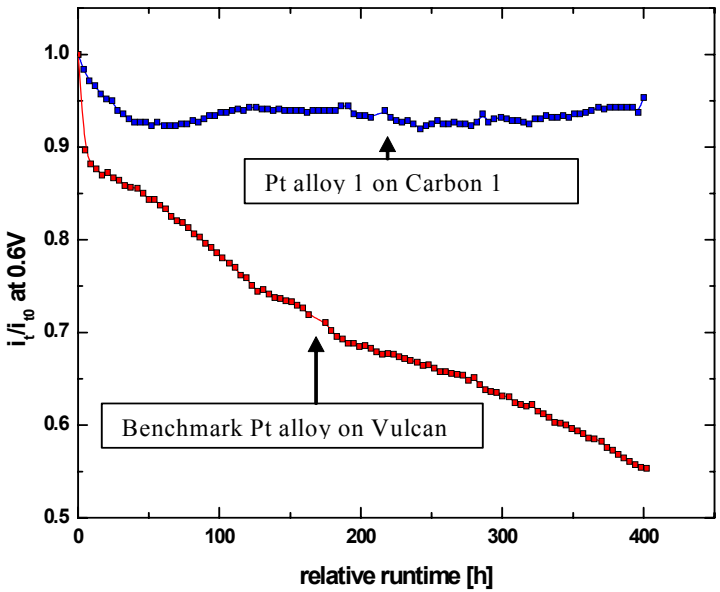
TECHNICAL ACCOMPLISHMENTS – Cathode Development

Carbon Support Selection



- Corrosion rates in Wt% at 180C, 1.0 volts
- Varying graphite content
- Two supports selected

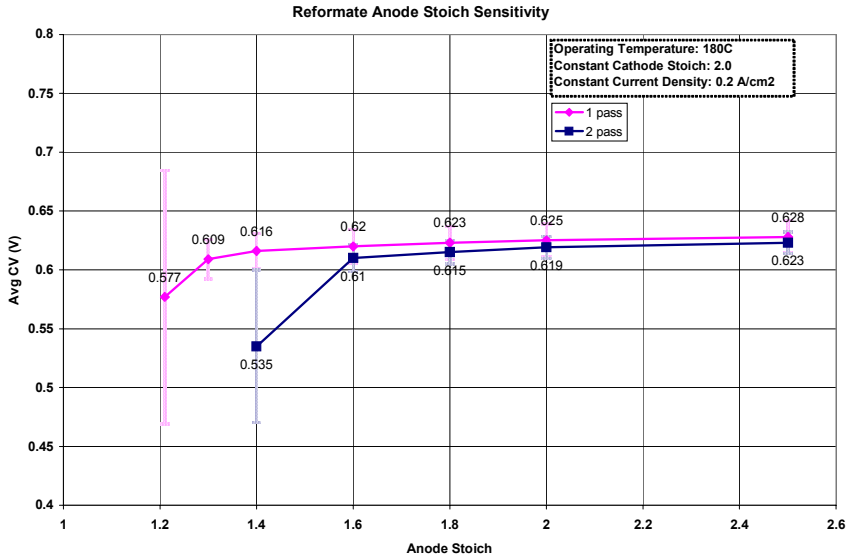
Pt Alloy Selection



- Performance under potential cycling
- Various alloys evaluated
- Scale-up tradeoffs

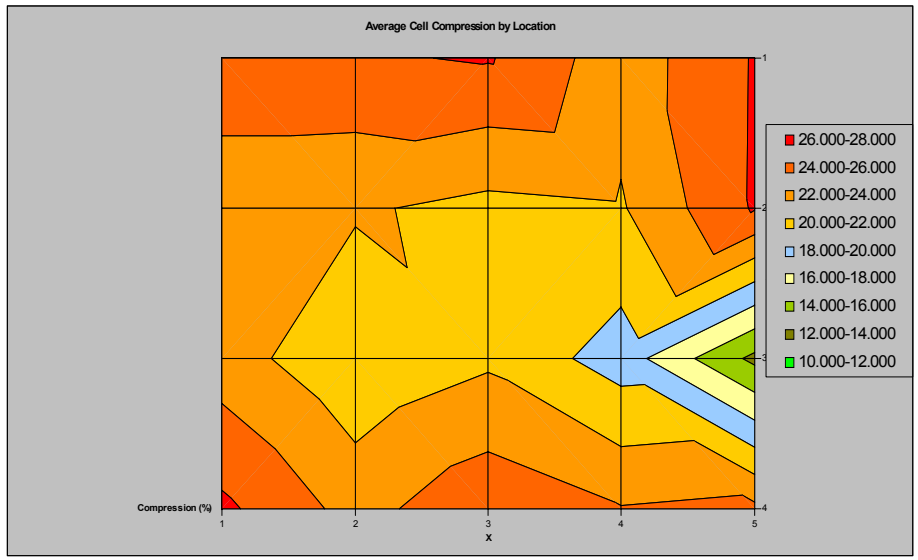
New cathode has improved resistance to corrosion and is robust to load cycling.

TECHNICAL ACCOMPLISHMENTS – Stack Development



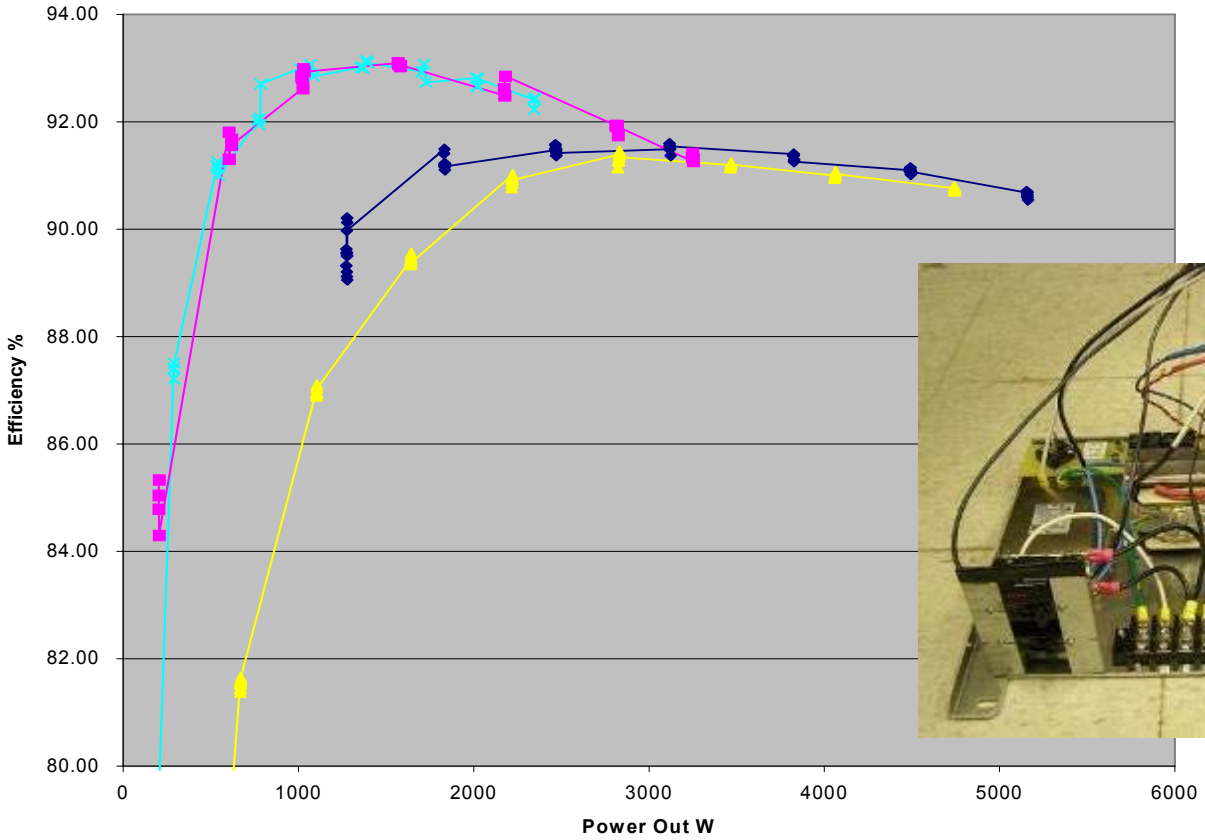
- Single vs. double pass flowfield analyzed
- Single pass design is more robust to noise

- MEA compression distribution analyzed
- Design not robust to manufacturing tolerances
- Design and manufacturing process changes



Improved stack design and component manufacture should lead to better performance and life. Testing underway.

TECHNICAL ACCOMPLISHMENTS – Inverter Development



- Prototype inverter ~93% peak efficiency

New inverter design is highly efficient, compact and low cost.

TECHNICAL ACCOMPLISHMENTS – System build

- Two systems “E1” and “E2” currently built.
- E1 in final stages of debug at PP Latham
- E2 displayed at Hannover Fair in Germany
- E3 currently being built

FUTURE WORK

- Complete system build, debug and commissioning – 2Q08
- Complete design verification testing at PP Latham – 3Q08
- Ship E2 and E3 to PP Apeldoorn and Vaillant – 3Q08
- Complete six month test in Europe – 1Q09
- Finish stack design upgrade with demonstrated performance improvements in systems – 1Q09
- Complete controls development – 3Q08

SUMMARY

- Through a very successful trans-Atlantic collaboration between the US DOE and the EU:
  - A high temperature PEM, stationary, reformate based, CHP fuel cell system has been developed based on commercial requirements
  - Enabling MEA, stack, reforming and power electronics technologies have been explored, down selected and developed
  - Progress has been made toward achieving DOE technical targets; especially performance and system durability
  - Design verification testing against commercial requirements is under way

plug power

HEADQUARTERS
968 Albany-Shaker Road
Latham, New York 12110
Phone: (518) 782-7700
Fax: (518) 782-9060

WASHINGTON, D.C.
499 South Capitol Street, SW
Suite 606
Washington, D.C. 20003
Phone: (202) 484-5300
Fax: (202) 554-2896

EUROPE, MIDDLE EAST & AFRICA
7301 BC Apeldoorn
P.O. Box 880
The Netherlands
Phone: 31 55 53 81 000
Fax: 31 55 53 81 099

www.plugpower.com