U.S. Department of Energy Hydrogen Program

Hydrogen from Coal

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Fossil Energy

2008 DOE Hydrogen Program
Merit Review and Peer Evaluation Meeting

June 9, 2008

Goal and Objectives

GOAL: Facilitate the transition to a sustainable hydrogen economy through the clean use of coal, our nation's largest domestic fossil energy resource

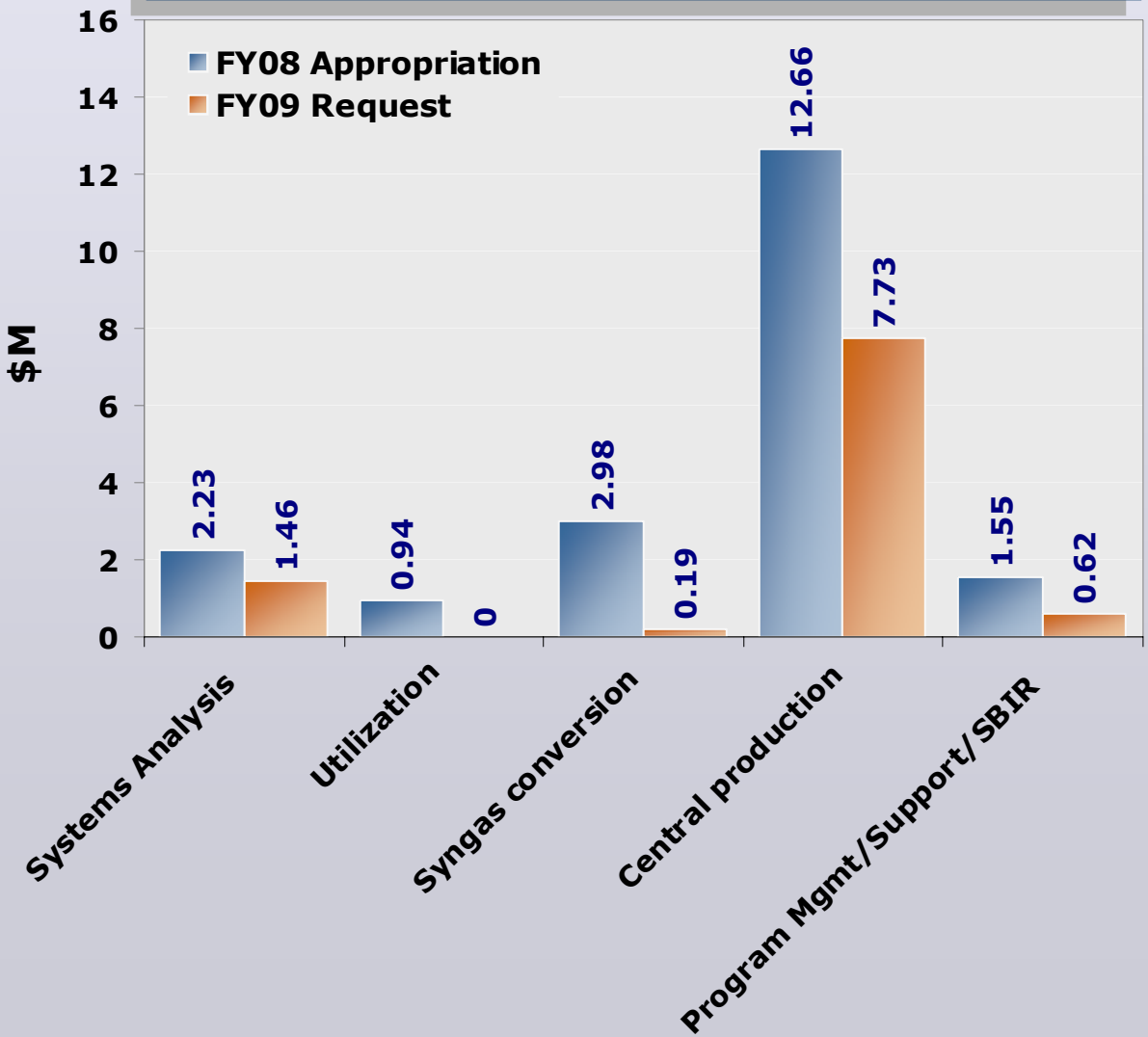
- Central Production Pathway
  - By 2016, prove the feasibility of a near-zero emissions, coal-fueled hydrogen and power co-production facility that reduces the cost of hydrogen by 25% compared to current coal-based technology

- Alternate Production Pathway
  - By 2014, make available an alternative hydrogen production pathway, including a product reforming system, for decentralized hydrogen production from high-hydrogen content liquids and/or SNG

Budget

FY2009 Budget Request = $10M

FY2008 Budget = $20.36M



FY09 Emphasis

Continue to focus efforts on laboratory-scale development of hydrogen separation and purification and systems analysis and explore potential for limited scale-up of technology.

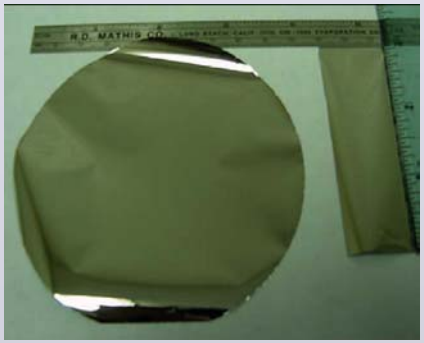
Challenges

Reduce the cost / Improve efficiency

- Clean synthesis gas production
  - Advanced gasification
  - Oxygen production
  - Advanced gas cleaning
- Water-gas shift
- Hydrogen separation & purification
- Process intensification

Capture and sequester carbon

2008 Progress & Accomplishments



- In bench-scale tests, membranes have met nearly all of the DOE 2010 targets (SWRI, Eltron)
- Reduced membrane thickness to 5 microns (SWRI)
- Studies show membrane system is cost-competitive with conventional technology (Eltron)
- Have completed independent verification testing of several membranes (NETL-ORD)
- Studies on impact of S on Pd membranes show two degradation mechanisms and that gas species concentrations throughout membrane must be considered (NETL-ORD)

Future Plans

Near-term

- Continue development of lab-scale separations, process intensification
- Implement testing protocol for hydrogen separation and purification systems
- Update systems analyses for hydrogen from coal production pathways
- Perform high-speed computational science for advanced systems components

Long-term

- Scale-up of advanced technology

For More Information

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