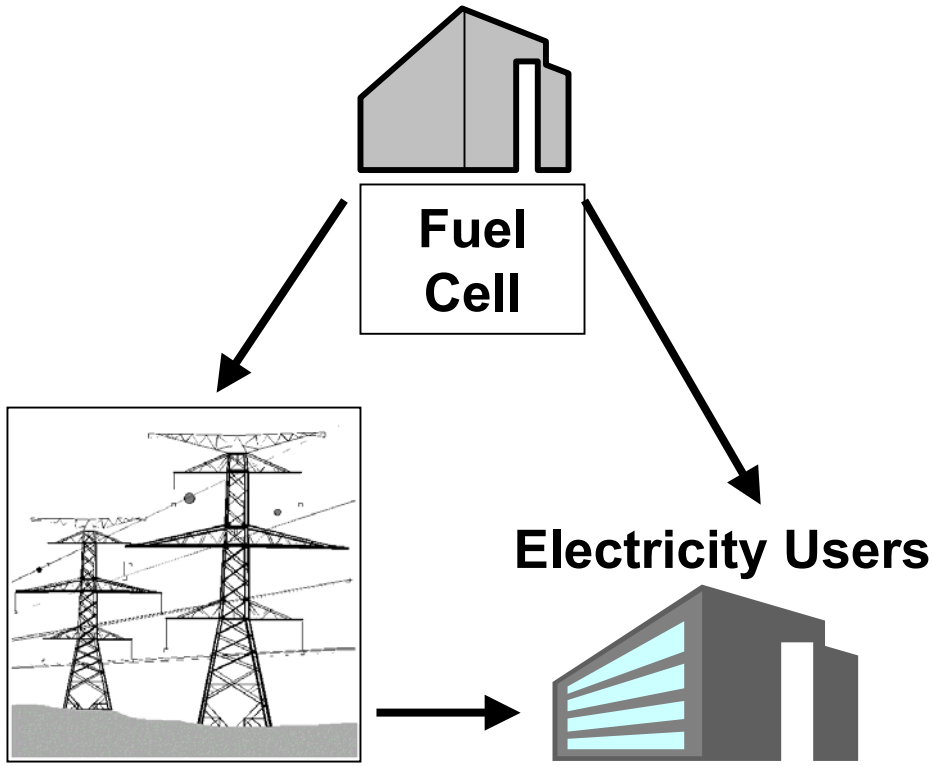
Distributed Energy Fuel Cells



Kathi Epping

Objectives & Barriers

Distributed Energy

OBJECTIVES

- Develop a distributed generation PEM fuel cell system operating on natural gas or propane that achieves 40% electrical efficiency and 40,000 hours durability at $400-750/kW by 2010.

BARRIERS

- Durability
- Heat Utilization
- Power Electronics
- Start-Up Time

Targets and Status

Integrated Stationary PEMFC Power Systems

Operating on Natural Gas or Propane Containing 6 ppm Sulfur

Characteristics	Units	2003 status	2005	2010
Small (3-25 kW) Systems				
Electrical Efficiency	%	30	32	35
Cost	$/kWe	3,000	1,500	1,000
Durability	Hours	>6,000	30,000	40,000
Large (50-250 kW) Systems				
Electrical Efficiency	%	30	32	40
Cost	$/kWe	2,500	1,250	750
Durability	Hours	15,000	30,000	40,000

Projects
Distributed Energy

• Proton Exchange Membrane Fuel Cell Power System on Ethanol	Caterpillar
• Ultra-thin Composite Membrane for High Temperature Operation in PEMFCs	Fuel Cell Energy
• Fuel Cell Distributed Power Package Unit: Fuel Processing Based On Autothermal Cyclic Reforming	General Electric
• Proton Conducting Membranes	Iowa State University

Solicitation Status

Solicitation for "Research and Development for Fuel Cells for Stationary and Automotive Applications"

- Solicitation issued on 24 January 03, closed on 27 Mar 03
- Solicitation focuses stationary fuel cell R, D, and D, including cross-cutting stationary and automotive R&D.
- Selection of up to 20 awards is expected Summer 03
- Awards will have a term up to 5 years
- Total Estimated government funding is approximately $70M
- Cost Share varies from 20-50%, depending on the topic, based on risk (with the exception Economic Analysis Topic)

Future Direction/ Discussion Topics

SOLICITATION TOPICS

- Development of Stationary PEM Fuel Cell Power System
- Development of Back-up Fuel Cell Power System
- Development of Materials for High Temperature Membranes and PEM Stack Durability for Stationary & Transportation Applications
- Fuel Processing Technology for Stationary Applications
- Stationary Fuel Cell Demonstration
- Platinum Recycling Technology Development
- Non-Precious Metal Catalyst Development
- Water and Thermal Management
- Economic Analysis of PEM Fuel Cell Systems