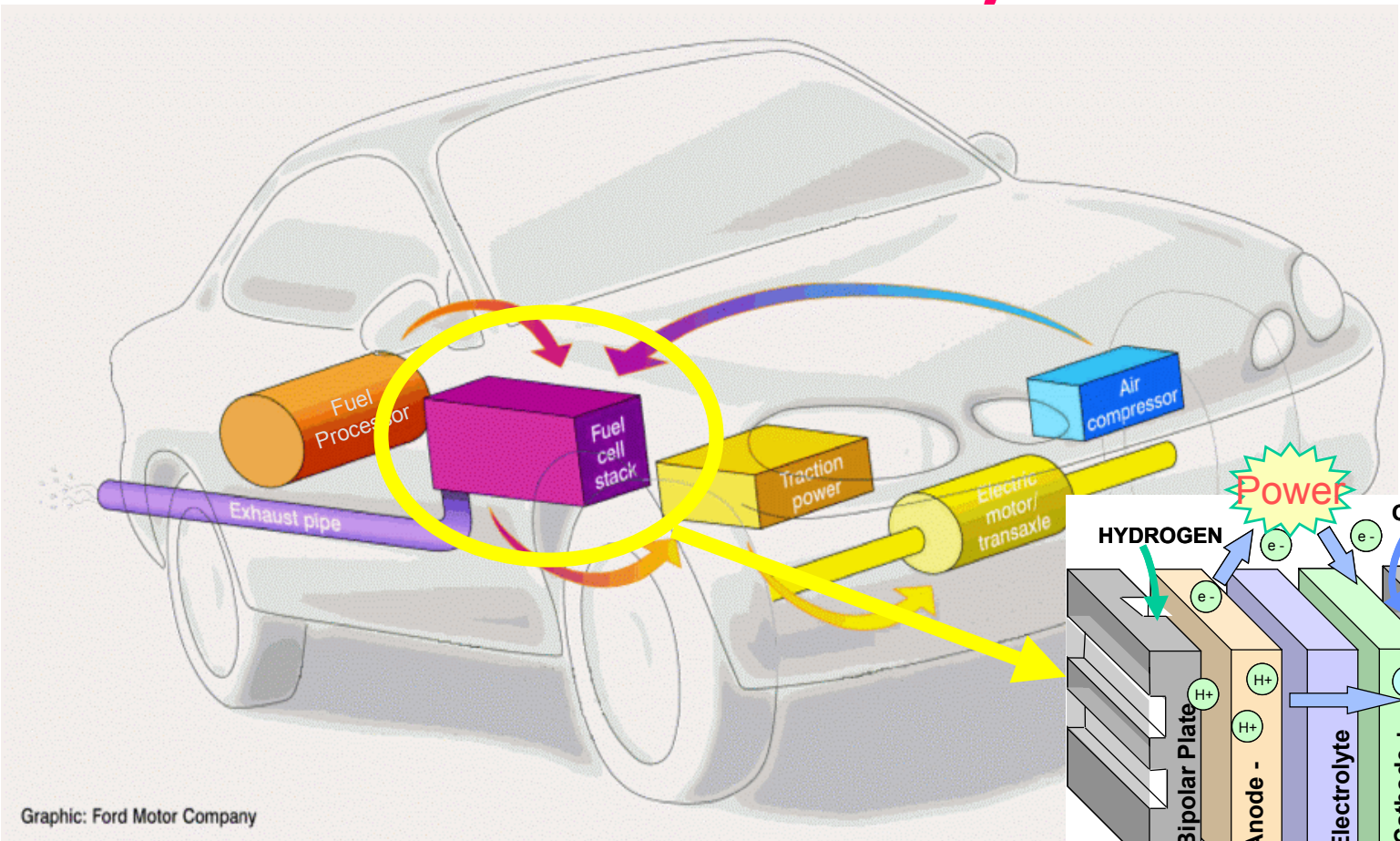
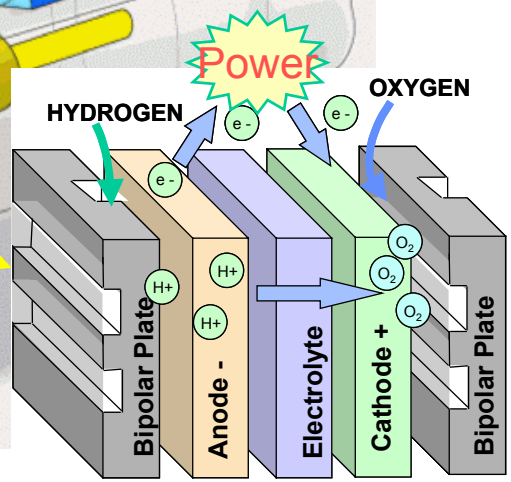
Fuel Cell Stack Components





Example shown is for acidic electrolytes

Nancy Garland

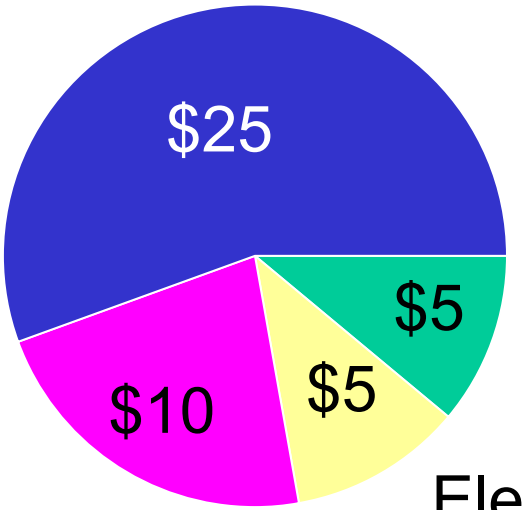
Targets

Fuel Cell Stack Components

Component	Characteristics	Units	Target
Membranes	Cost	$/kW	5
	H_2 Crossover	mA/cm^2	<1
	O_2 Crossover	mA/cm^2	<3
Electrodes	Cost	$/kW	5
	CO Tolerance (steady state)	ppm	500
	CO Tolerance (transient)	ppm	1000
	Durability	hours	5000
MEA	Cost	$/kW	10
	Performance on H_2	mA/cm^2	400 @ 0.8 V
	Performance on O_2	mA/cm^2	500 @ 0.75 V

Barriers
Stack Components

Fuel Cell Power Systems
$45/kW



Other

Membranes

Electrodes

Bipolar Plates

BARRIERS

- Stack material cost/manufacturing
- Durability
- Electrode performance
- Thermal and water management

Stack Component Projects (oral)

• High Temperature Membranes	CWRU
• Microstructural Characterization of PEMFCs	ORNL
• Electrodes for PEMFC Operation on H_2/Air or Reformate/Air	LANL
• New Electrocatalysts for Fuel Cells	LBNL
• Low-Platinum and Platinum-Free Catalysts for Oxygen Reduction at PEM Fuel Cell Cathodes	Naval Research Laboratory
• Low-Platinum-Loading Catalysts for Fuel Cells	Brookhaven National Lab
• Scale-Up of Carbon/Carbon Composite Bipolar Plates	Porvair Corp.

Stack Component Projects
(oral, continued)

• Integrated Manufacturing for Advanced MEAs	De Nora North America, Inc.
• Advanced MEAs for Enhanced Operating Conditions	3M
• High-Temperature Polymeric Membranes and Improved Cathode Catalysts	UTC Fuel Cells
• High-Performance, Low-Pt Cathodes with New Catalyst and Layer Structure	Superior MicroPowders
• Ultra-Thin Composite Membrane for High-Temp. Operation in PEMFCs	Fuel Cell Energy
• Design and Installation of a Pilot Plant for High-Volume Electrode Production	Southwest Research Inst.

Stack Component Projects (Posters)

• Carbon Composite Bipolar Plates	ORNL
• Cost-Effective Surface Modification for Metallic Bipolar Plates	ORNL
• Carbon Foam for Fuel Cell Humidification	ORNL
• High Temperature Proton Exchange Membranes	Virginia Polytechnic Institute
• Inorganic Solid State Proton Conducting Systems	Colorado School of Mines

Discussion Points

- High Temperature Membrane Working Group
- Non-Platinum Catalysts – workshop/future work
- Cost Reduction (Pt and membrane)
- Possible interest in expanding bipolar plate work for cost reduction