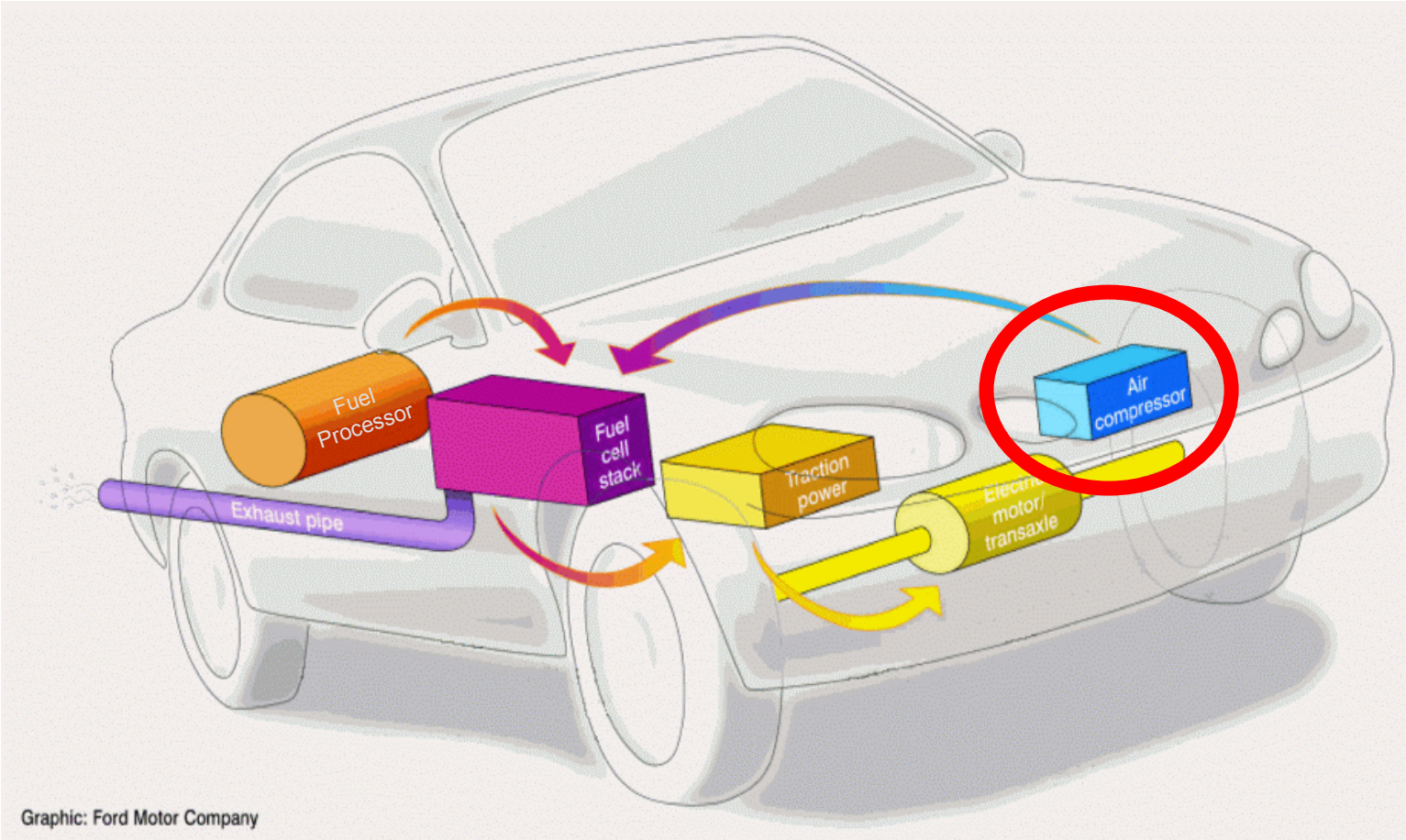
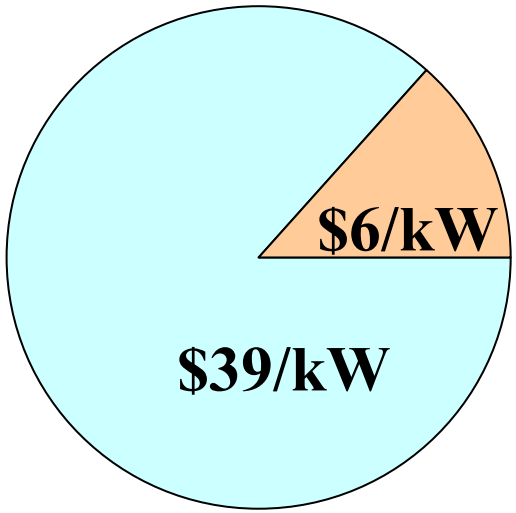
Air Management Subsystems



John Garbak

Barriers
Air Management Subsystem



Air Management
(50-kW System)

Fuel Cell Power System
$45/kW

NEEDS

- Minimize parasitic power consumption
- Reduce weight
- Improve efficiency
- Integrate with fuel cell and fuel processor
- Reduce cost

Status and Proposed Targets

Compressor/Expander for Transportation Fuel Cell System

Characteristics	Units	2003 status	2005	2010
50-kW Unit				
Efficiency at Full Flow	%	<70 (C), <80 (E)	80	80
Volume	L	10-12	8-11	8-11
Turndown Ratio		5	10-15	10-15
Cost	$	600	400	300
80-kW Unit				
Efficiency at Full Flow	%	-	-	80
Volume	L	-	-	15
Turndown Ratio		-	-	15
Cost	$	-	-	400

Projects
Air Management

• Turbocompressor for PEM Fuel Cells	Honeywell
• Hybrid Compressor/Expander Module	TIAX
• Motor Blower Technology for Fuel Cell Automotive Power Systems	UTC
• High-Efficiency, Integrated Compressor/Expander Based on Torroidal Intersecting Vane	Mechanology, LLC

Discussion Points

- Develop compressor/expander units for direct hydrogen systems.
- Need exists for compressor/ expander motor unit for fuel cells larger than 50kW.
- Will larger compressor/expander units be scalable from current work?
- How large a compressor/ expander unit will ultimately be needed?