

Texas A&M



**OVERVIEW OF FUEL CELL RESEARCH
IN
ADVANCED VEHICLE SYSTEMS RESEARCH PROGRAM**

TEXAS A&M UNIVERSITY

for

Prof. M. Ehsani

OVERVIEW OF FUEL CELL RESEARCH AT THE ADVANCED VEHICLE SYSTEMS RESEARCH PROGRAM



FUEL CELL RESEARCH AREAS

- Fuel cell hybrid drive trains
- Fuel cell hybrid power systems
- Advanced fuel cell compressors and pumps
- Hydrogen economy systems
- Fuel cell warm-up

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FUEL CELL HYBRID DRIVE TRAINS (1)

- Architectures
- Drive train design rules
- Drive train control
- Fuel economy considerations
- Operating range considerations

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FUEL CELL HYBRID DRIVE TRAINS (2)

- Fuel cell hybrid automobiles
- Fuel cell hybrid tramways
- Fuel cell hybrid locomotive
- Stationary power

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HYDROGEN ECONOMY SYSTEMS

- Fossil fuel reforming
- Nuclear electricity and water electrolysis
- Biomass
- Municipal waste recycling
- Impact of fuel cell vehicles on World oil supplies

HYDROGEN CARRIERS

Two angles: vehicle system and well-to-wheel

- Ammonia
- Ethanol
- Propanol
- Ketones

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FUEL CELL WARM-UP

For solid oxide and molten carbonate fuel cells:

- Providing a fast warm-up
- Induction heating
- Capacitive heating
- Adapting each heating technique to each technology

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CONCLUSION

Fuel cell research at the Advanced Vehicle Systems Research Group:

- Focus on system aspects: design, integration and system-level control
- Focus on enabling technologies: power electronics and motor drives
- Focus on enabling concepts: hydrogen economy and carriers