

***Energy Efficiency and Renewable Energy  
(EERE)  
Fuel Cell Programs***

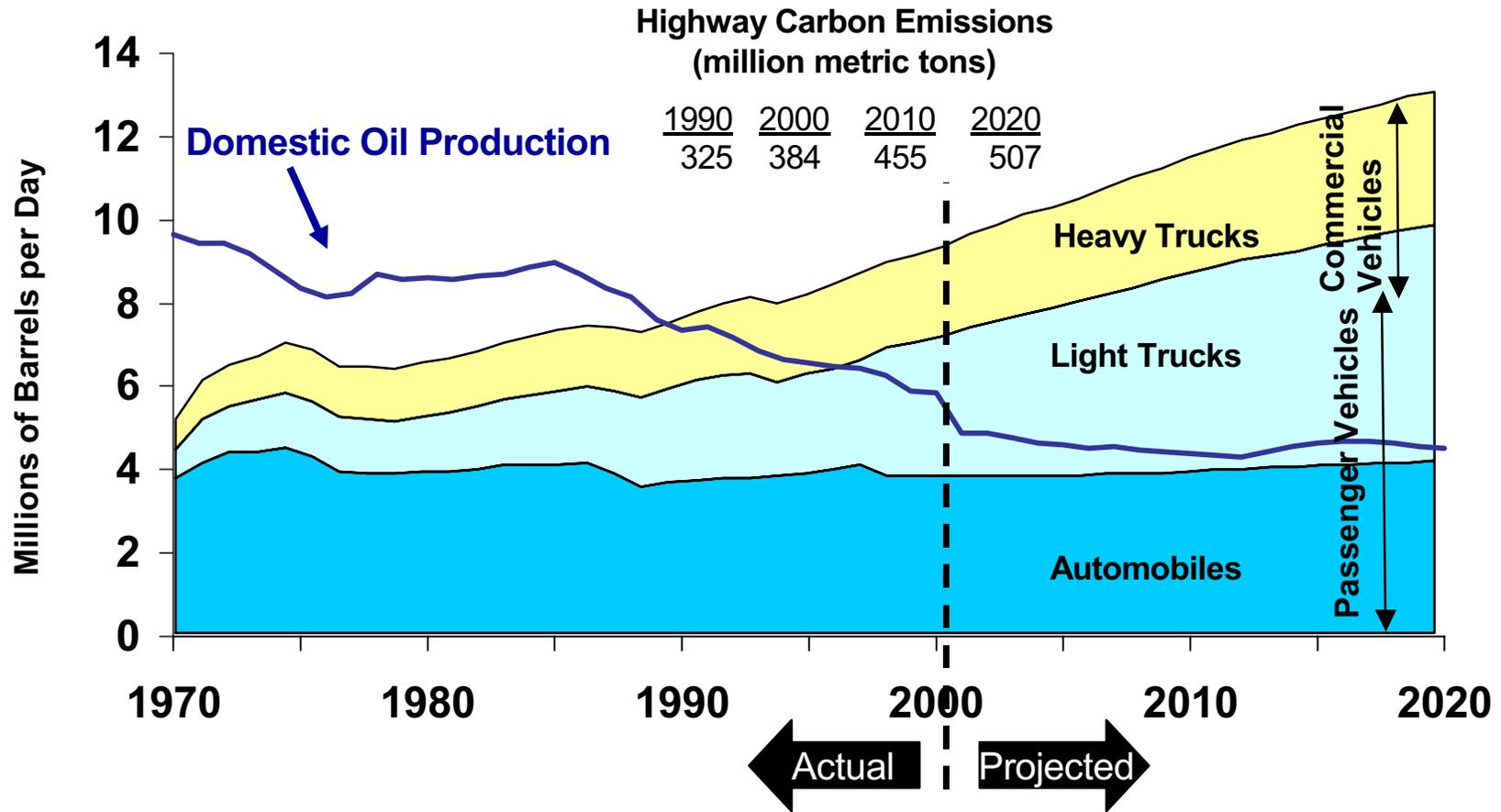


**Fuel Cell Summit VI  
College Park, Maryland  
May 29, 2002**

**Donna Lee Ho  
U.S. Department of Energy**



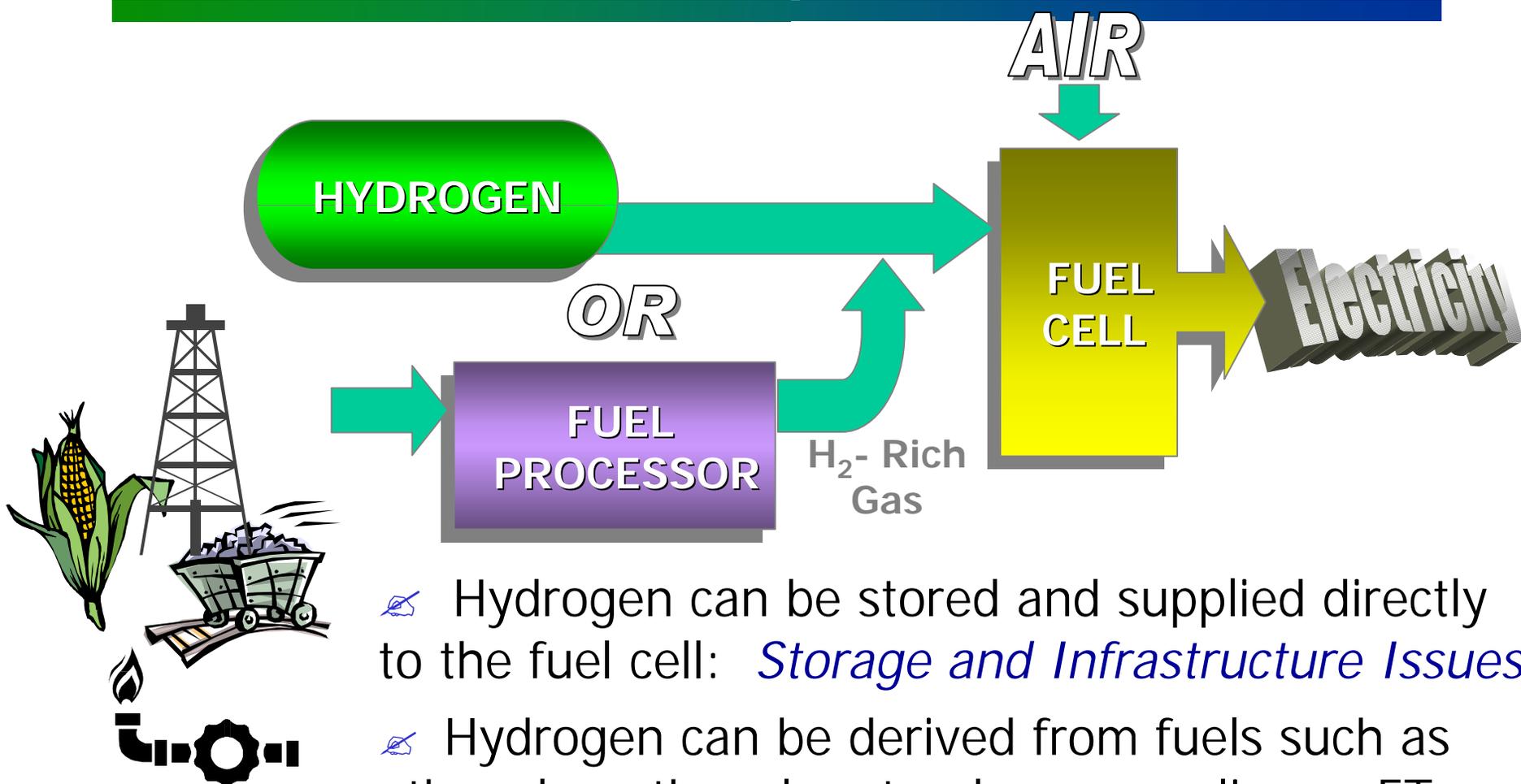
# The “Oil Gap” is Growing



Source: Transportation Energy Data Book: Edition 21, DOE/ORNL-6966, September 2001, and EIA Annual Energy Outlook 2002, DOE/EIA-0383(2002), December 2001



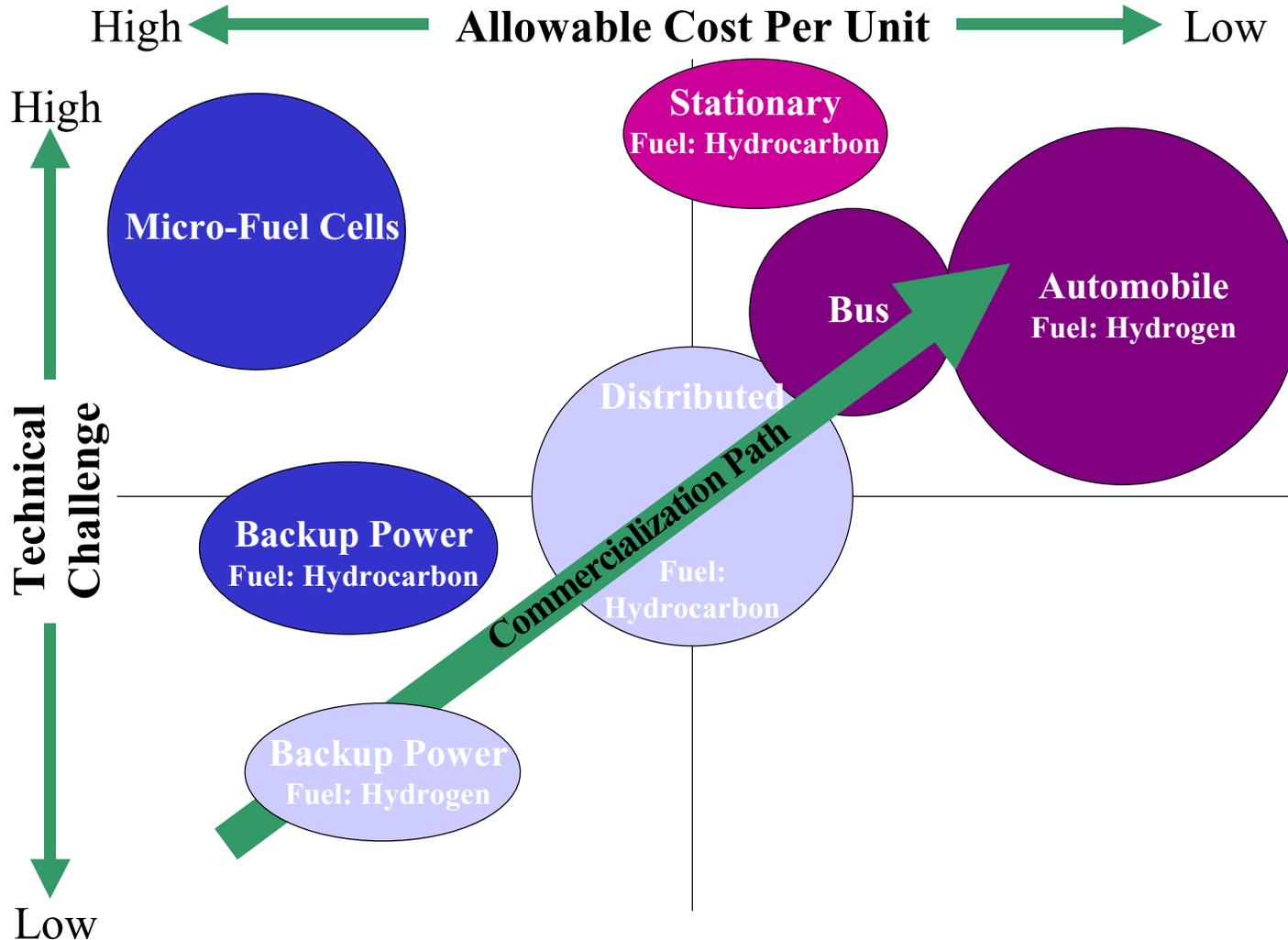
# Two Options to Fuel a Fuel Cell Vehicle



- ✍ Hydrogen can be stored and supplied directly to the fuel cell: *Storage and Infrastructure Issues*
- ✍ Hydrogen can be derived from fuels such as ethanol, methanol, natural gas, gasoline or FT fuels: *Complexity, Cost, and Start-up Issues*



# Fuel Cell Applications



Originally presented by Ballard, subsequently modified by DOE.



# Fuel Cell and Hydrogen Program Focused on Removing Barriers



## Fuel Cells:

- Cost (platinum)
- Durability
- Start-Up Time (transportation)
- Air/Thermal/Water Management
- Codes & Standards



## Hydrogen:

- Storage
- Hydrogen Fuel Cost
- Fuel Infrastructure
- Codes & Standards





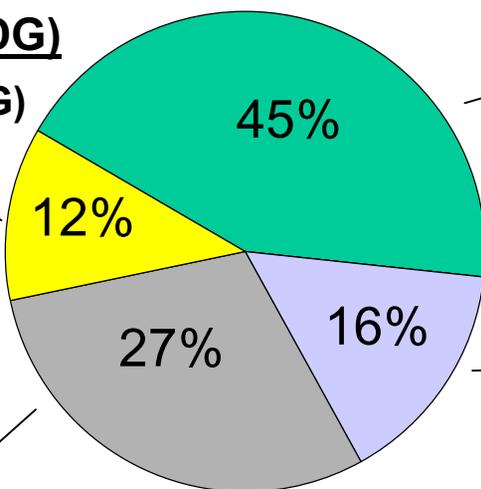
# FY02 EERE Fuel Cell Programs (Interior)

Programs Focus on Removing High Risk Technical Barriers

FY 2002 Budget = \$47.425M

## Distributed Generation (DG)

- Reforming Technology (NG)
- Critical Components
- Codes and Standards



## Transportation Fuel Processing Subsystem

- On-Board Fuel Processor R&D
  - Gasoline, methanol, diesel

## Transportation System

- Modeling/Validation
- Cost Analyses
- Ancillary Components (Compressors, Sensors)

## Transportation Fuel Cell Stack Subsystem

- Catalyst Loading Reduction
- MEA/Bipolar Plate Manufacturing
- Durability Studies



*R&D is carried out by industry suppliers, national labs and universities.*

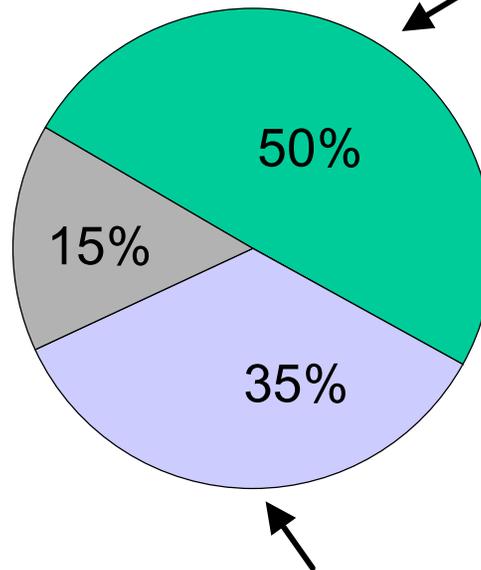


# FY02 EERE Hydrogen Program (Energy and Water)

FY 2002 Budget = \$29.183M

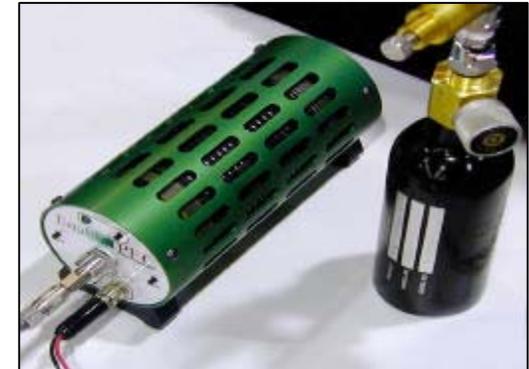
## Analysis and Outreach

- Codes and Standards
- Educational Training
- Tank Standards



## Core R&D

- Storage technology
- Hydrogen generation



## Technology Validation

- Hydrogen refueling station demonstration
- Development of Power Parks concept





# FreedomCAR



January 9, 2002  
Secretary Abraham  
Announces  
the FreedomCAR  
Partnership

✍ The CAR in FreedomCAR is for  
**C**ooperative **A**utomotive **R**esearch

✍ The Partners are:

- U.S. Department of Energy
- U.S. Council for Automotive Research

(USCAR is a cooperative endeavor of DaimlerChrysler, Ford & General Motors to conduct pre-competitive research)



# Energy Security Through FreedomCAR Technology

## *America's Transportation Freedoms*

-  **Freedom from dependence on foreign petroleum**
-  **Freedom from pollutant emissions**
-  **Freedom to choose the vehicle you want**
-  **Freedom to drive where you want, when you want**
-  **Freedom to obtain fuel affordably, conveniently**

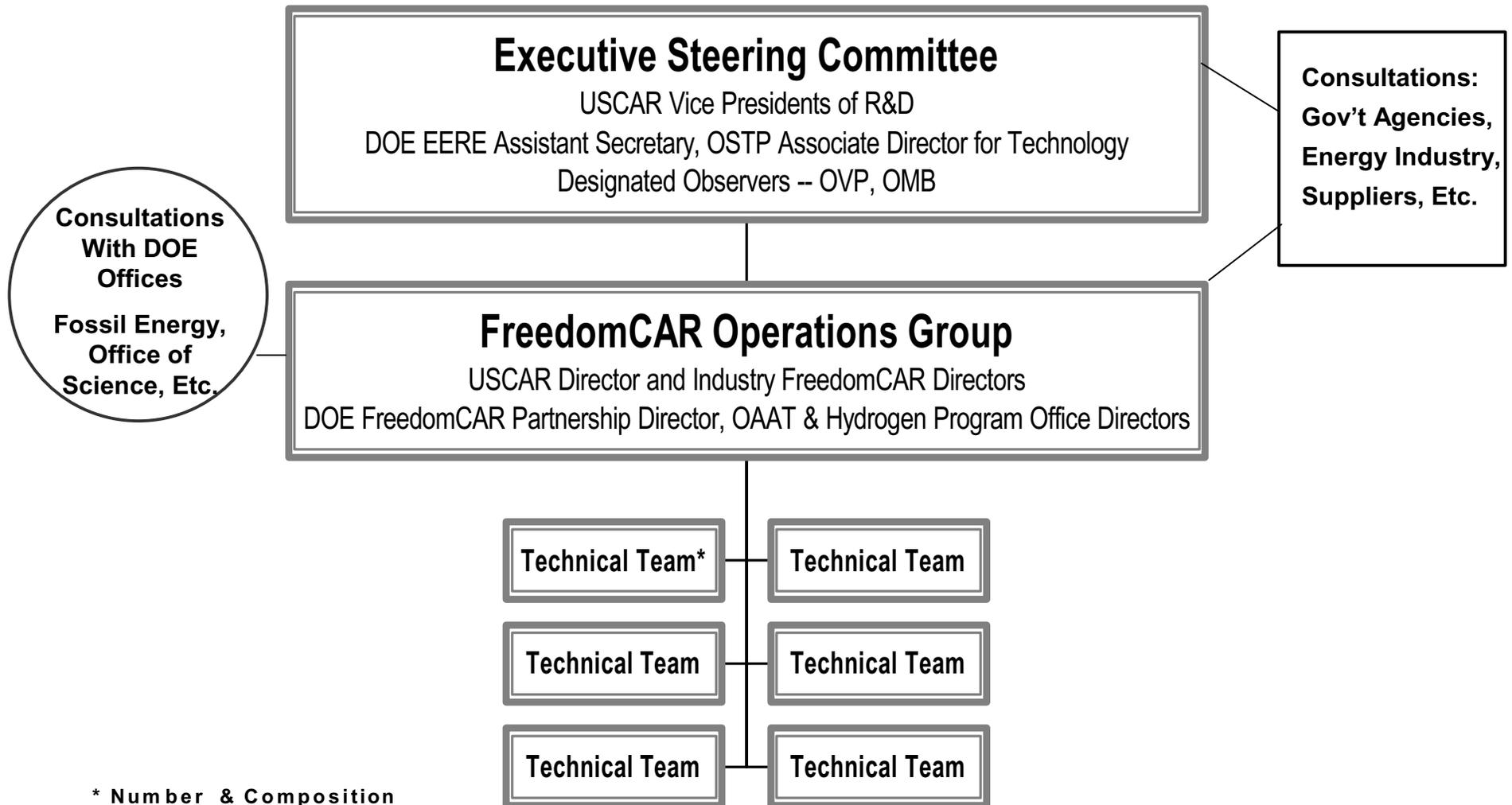


# Strategic Approach

- **Develop technologies to enable mass production of affordable hydrogen-powered fuel cell vehicles and assure the hydrogen infrastructure to support them.**
- **Continue support for hybrid technologies and advanced materials that can dramatically reduce oil consumption and environmental impacts in the nearer term.**
- **Develop technologies applicable across a wide range of passenger vehicles.**



# FreedomCAR Organization

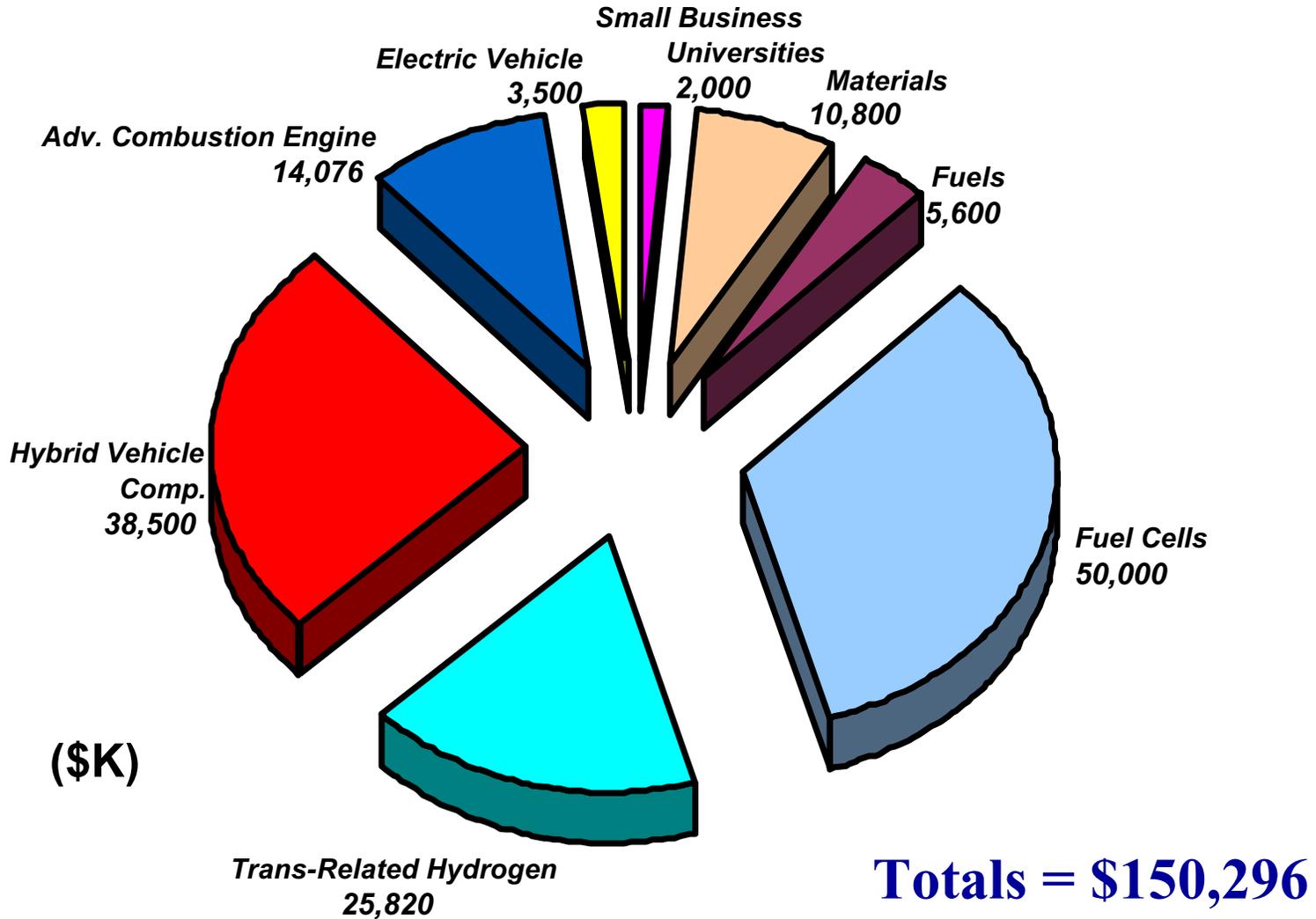


\* Number & Composition of Technical Teams TBD

February 5, 2002



# FreedomCAR FY03 Budget Request Reflects Fuel Cell and Hydrogen Priorities





# Fuel Cell Report to Congress

*FY02 Interior Appropriations Bill H.R. 2217*

*Enacted November 5, 2001*

**Full Report:** “Report... within twelve months... on the technical and economic barriers to the use of fuel cells. ...recommendations on program adjustments...needed for the commercial use of fuel cells ... by 2012.”

**Interim Report:** “Within six months...an interim assessment that describes the need for public and private cooperative programs to demonstrate the use of fuel cells.”

## Preliminary Findings (Vehicles)

## Potential Demonstration Program

2001

2004

2008

2012

Feasibility  
Demonstration

Controlled Fleet  
Demonstrations

Commercial  
Fleet  
Demonstrations

Commercialization  
Phase



# Summary

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***Through its current fuel cell and hydrogen activities, DOE is working in partnership with industry to improve our nation's energy security.***