

September 2005



Hydrogen in EPACT 05

Debbi L. Smith, National Hydrogen Association



Why Hydrogen?

▶ **ENVIRONMENTAL STEWARDSHIP**

▶ **ENERGY SECURITY**

▶ **ECONOMIC PROSPERITY**





Hydrogen Industries Support EPACT 05

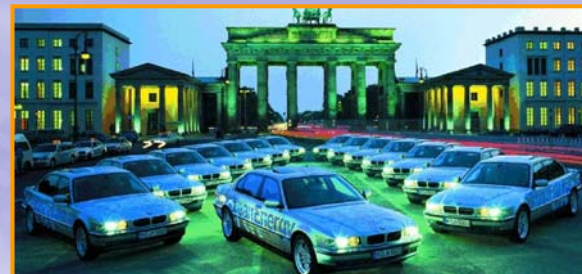
- ▶ **EPACT addresses the three drivers**
- ▶ **EPACT contains flexibility to allow for evolution of technology**
- ▶ **EPACT encourages regional diversity**
- ▶ **EPACT helps stimulate transition to market**



Hydrogen Industries Support EPACT 05

Major Markets are Covered:

- Transportation
- Power Generation
- Uninterruptible / Remote Power Supply
- Portable





EPACT 05 Contains:

REGIONAL DIVERSITY

- **Hydrogen from Renewables**
- **Hydrogen From Coal**
- **Hydrogen from Nuclear**



EPACT 05 Contains:

TRANSITION TO MARKET:

- Industry Interaction
- Infrastructure Development
- Federal Purchase
- Tax Incentives
- Loan Guarantees





EPACT 05 Contains:

Flexibility for Technology Evolution:

- Fuel Flexibility & Dual Fuels and Blends
- Reciprocating Engines and Multiple FC Technology
- Various Delivery Methods





EPACT 05 Contains:

Flexibility for Technology Evolution:

- Continuation of Learning Demonstrations
- R&D Programs
- Coordination of R&D
- State and Regional Demos
- Education
- Safety, Codes and Standards

Flexibility





Significant Challenges Lie Ahead

- ▶ Hydrogen Storage
- ▶ Reliable, Low-Cost Fuel Cells
- ▶ Fueling Infrastructure
- ▶ Safety Codes & Standards
- ▶ Education
- ▶ Funding
- ▶ State Involvement





Hydrogen Fueling Stations





DOE's Hydrogen Program

▶ President's Hydrogen Fuel Initiative

- \$1.2B Hydrogen Fuel Initiative to reverse US's growing dependence on foreign oil
- Lower the cost of hydrogen enough to make it cost competitive with gasoline by 2010
- FY 2004 appropriation: \$156 million
- FY 2005 appropriation: \$225 million
- FY 2006 request: \$260 million
- Advance the methods of producing hydrogen
- Provide R&D for hydrogen storage

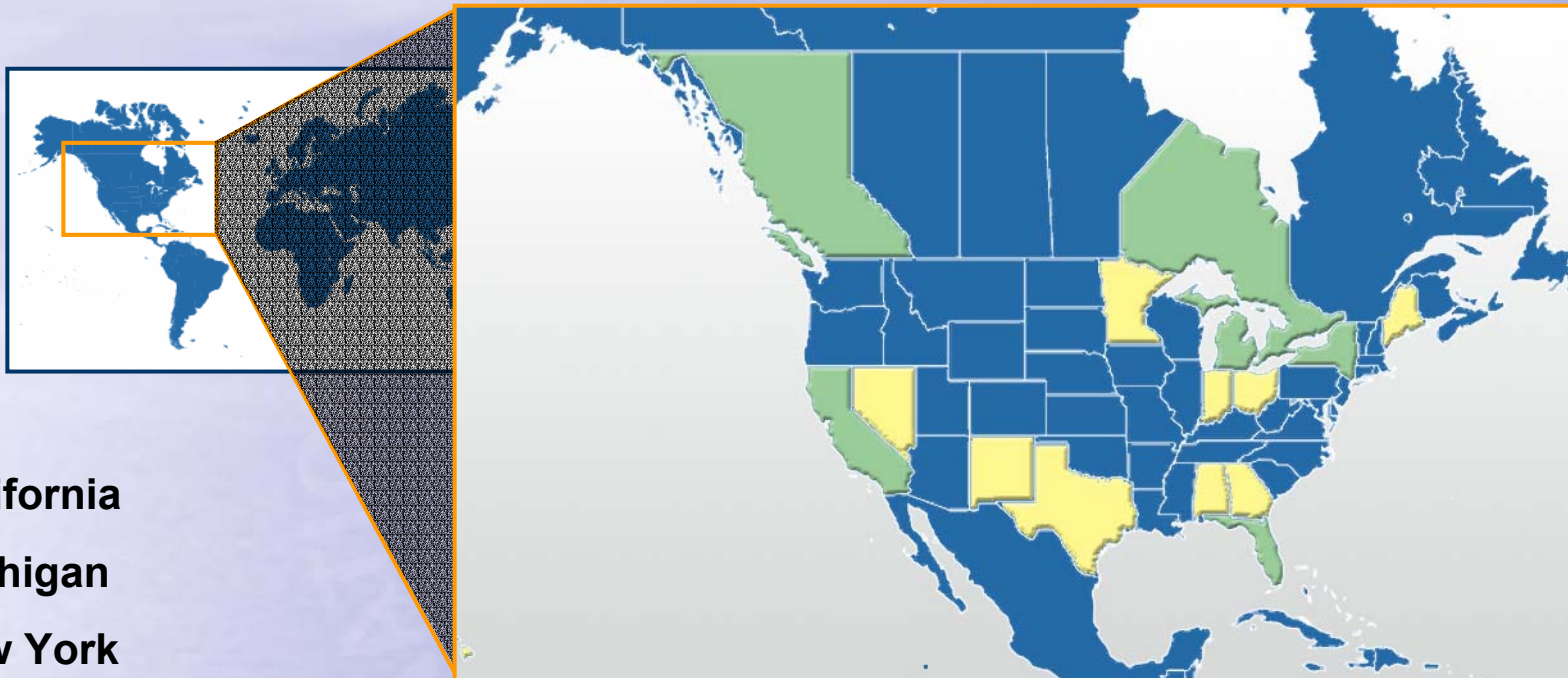


US Department of Energy, "Hydrogen, Fuel Cells & Infrastructure Technologies Program: President's Hydrogen Fuel Initiative", May 2005





States/Provinces Leading Local Initiatives

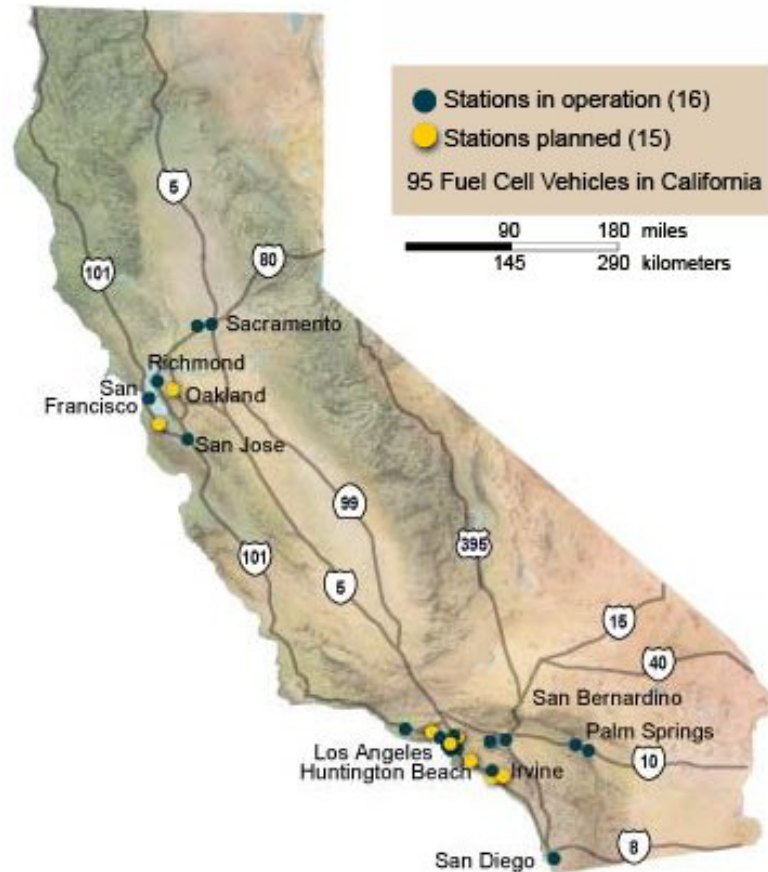


- ▶ **California**
- ▶ **Michigan**
- ▶ **New York**
- ▶ **Florida**
- ▶ **British Columbia**
- ▶ **South Carolina**



California Hydrogen Highway

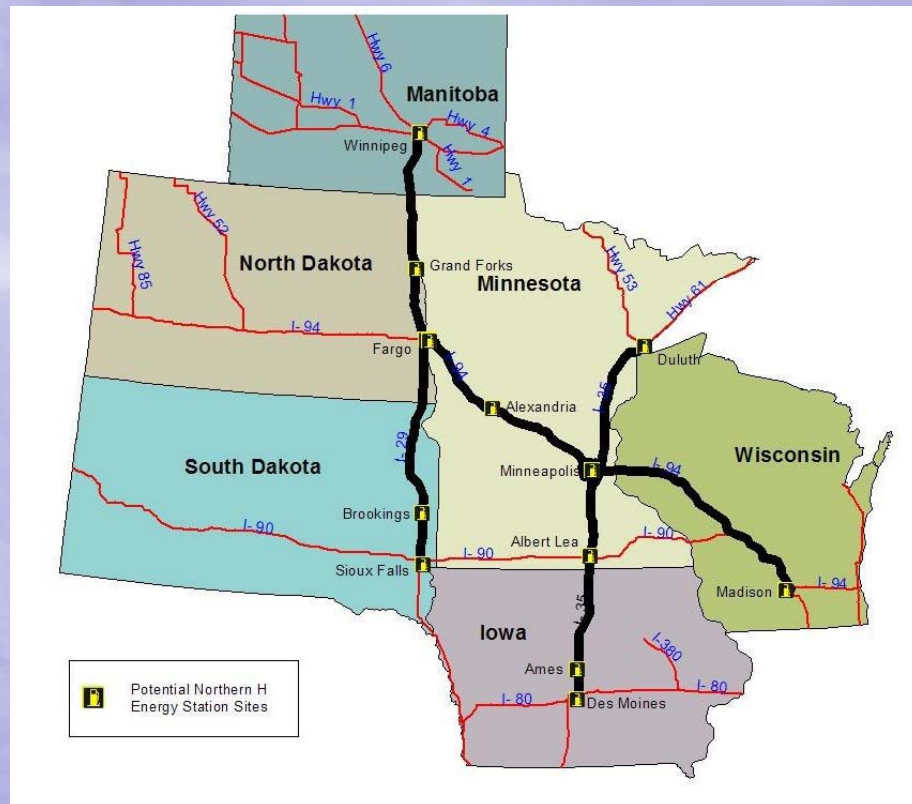
- (+)AC Transit Hydrogen Energy Station – Oakland
- AC Transit Hydrogen Energy Station – East Bay
- AC Transit Hydrogen Energy Station – Richmond
- BMW of North America – Oxnard
- Burbank Station
- Camp Pendleton Station
- (+)City of LA for Honda FCX Fleet
- (+)City of SF for Honda FCX Fleet
- Chino Station
- (+)Chula Vista Station
- CSU LA Station
- (+)Honda Home Energy Station - Torrance
- (+)Honda Hydrogen Refueling Station - Torrance
- Huntington Beach Station
- LA H2 Pipeline - Torrance





Northern H Project

- ▶ Establish a multi-fuel hydrogen network in the upper Midwest
- ▶ Produce and provide hydrogen made from wind, biomass, solar, hydro and coal resources
- ▶ Place 9 or 10 stations 125 miles apart
- ▶ Stations would link urban centers along Manitoba, the Dakotas, Minnesota, Iowa and Wisconsin and link up with the Illinois Hydrogen Highway
- ▶ Project still not funded



Northern H Project Hydrogen Highway





States/Provinces Leading Local Initiatives

<http://www.hydrogenassociation.org/stateInits.asp>

National Hydrogen Association - Microsoft Internet Explorer

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Address <http://www.hydrogenassociation.org/stateInits.asp> Go

 State and Regional Hydrogen Initiative Resources

INDUSTRY INSIDER JOINING NHA STUDENTS & EDUCATORS NHA HOME

About NHA
NHA Members
Hydrogen Events
Publications
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Hydrogen Facts
H2 FC Safety Report
Codes & Standards
Contact Us
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Below you'll find hydrogen initiatives, listed alphabetically and by state. If you have questions about initiatives in your area, please email info@hydrogenassociation.org.

Alphabetically [\[View by State\]](#)

Agency	State
California Fuel Cell Partnership	CA
California Hydrogen Business Council	CA
California Stationary Fuel Cell Collaborative	CA
Clean Energy States Alliance (CESA)	CT, IL, MA, MN, NJ, NY, OH, OR, PA, RI, WI
Connecticut Clean Energy Fund	CT
Florida Department of Environmental Protection	FL
Fuel Cell South	SC
Fuel Cells Texas	TX
Hydrogen Energy Center	ME, CT, NY, MA, NH, VT

start

Internet

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Hydrogen Safety

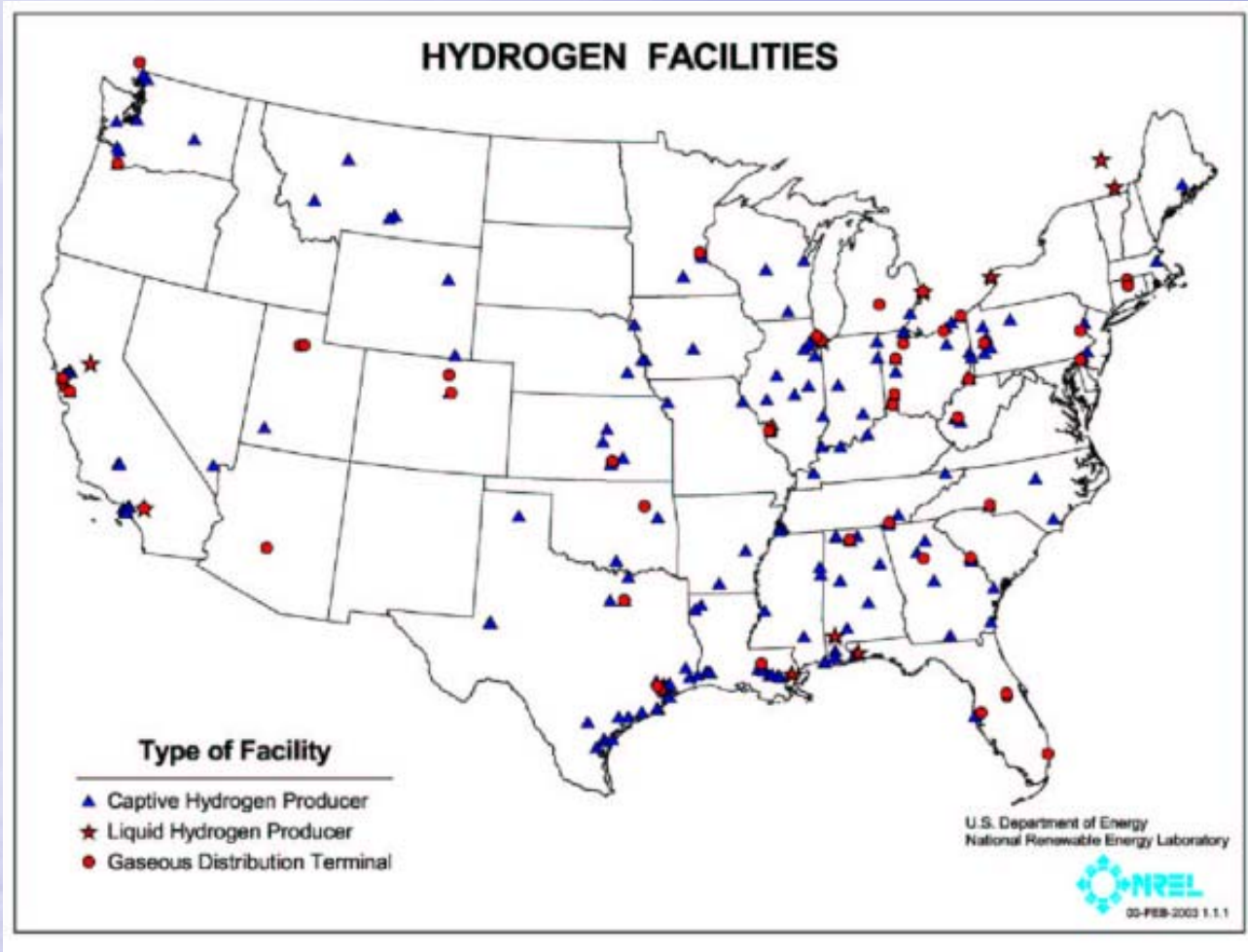


Photo from a video comparing an intentional hydrogen tank release and a small gasoline fuel line leak. After 60 seconds, the hydrogen flame has begun to subside, while the gasoline fire is intensifying. After 100 seconds, all of the hydrogen was gone and car's interior was undamaged (the maximum temperature inside the back window was 67F). The gasoline car continued to burn for several minutes and was completely destroyed.

Dr. Swain, University of Miami



Hydrogen Production





Where To Find the NHA

On the Web: www.HydrogenAssociation.org

Conference Information: www.HydrogenConference.org

Safety, Codes & Standards Info: www.HydrogenSafety.info

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