

**Getting From Here To Hydrogen:
Making America Energy Secure
While Protecting the Environment**

Facts for energy security and independence

- 20 million barrels of petroleum used per day, 54% foreign
- More than 2/3 of petroleum used for transportation

Goals:

- Reduce dependence on foreign oil now
- Eliminate dependence on foreign oil over the long term

How?

- Use alternative fuels such as compressed natural gas (CNG) and liquefied natural gas (LNG). No matter how fuel-efficient a gasoline or diesel vehicle is, it still relies 100% on petroleum.

Fact for the environment

- Tailpipe emissions from petroleum-based (gasoline and diesel) vehicular fuels account for more than half of overall pollution (50% of all hazardous air pollutants and 60% of all carbon monoxide pollution)

Goals:

- Reduce usage of petroleum-based vehicular fuels overall

How?

- Use alternative fuels, primarily CNG and LNG

Best alternative fuel options now and near-mid term (through 2015-2020):

- Light-duty vehicles – CNG- and hybrid gasoline/electric-powered vehicles
- Heavy-duty vehicles – CNG- and LNG-powered vehicles

Best alternative fuel option in the long term (post 2020):

- Hydrogen may be the best in the long-term, when we have learned to produce and distribute it cost-effectively, and when hydrogen-fueled vehicle technology is perfected.



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Recent Federal action – Hydrogen Research Initiative

Secretary of Energy Spencer Abraham announced \$350 million in funding on April 27, 2004 for science and research projects to promote hydrogen transportation, FreedomCAR. That \$350 million represents almost a third of President Bush's \$1.2 billion commitment in research funding to hydrogen and fuel cell technology.

Recent California action – Hydrogen Highway

Governor Schwarzenegger announced the Hydrogen Highways Network on April 20, 2004 to build a hydrogen highway in California by 2010 to support the transition to a clean hydrogen transportation economy in California. It calls for 200 hydrogen-fueling stations along major highways by the end of the decade.

Bumps in the road to Hydrogen

The Federal Government, vehicle manufacturers and California are beginning to support hydrogen transportation development – vehicles and infrastructure.

Hydrogen-fueled vehicles are on the way, but won't be commercially available until 2015-2020 or later, according to Department of Energy Secretary Spencer Abraham. Until that time, he advocates natural gas-fueled vehicles, hybrid-electric vehicles, high-efficiency petroleum-fueled vehicles and other alternative fuel vehicles in a balance of use.

"Every gallon of ethanol, biodiesel, propane or natural gas used to power a vehicle is one gallon of petroleum we don't have to import," stated Abraham. (*Natural Gas Fuels Magazine, May 2004*).

Natural Gas: Pathway to the Hydrogen Highway

Natural gas is the most efficient feedstock for the production of hydrogen as America focuses on the eventual use of hydrogen in transportation.

Expanding the natural gas fueling infrastructure today will have long-term value since natural gas stations can be easily converted to hydrogen delivery due to their common properties.

Natural gas vehicles now produce between 93-95% less overall toxics when compared with gasoline and diesel vehicles, according to the Department of Energy.

Natural gas vehicles are available today and being deployed widely. 22% of all new transit buses on order nationwide now are natural gas powered.