

**U.S. Department of Energy - Energy Efficiency and Renewable Energy
Alternative Fuels and Advanced Vehicles Data Center**

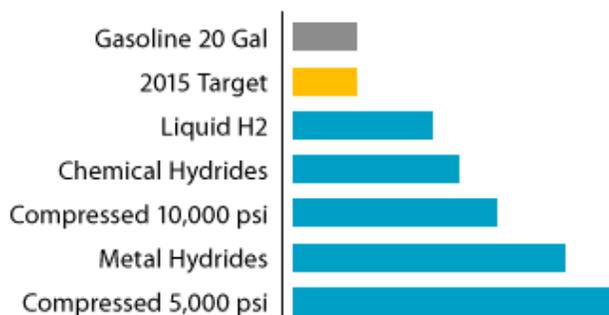
Hydrogen as an Alternative Fuel

The interest in hydrogen as an alternative transportation fuel stems from its clean-burning qualities, its potential for domestic production, and the [fuel cell vehicle's](#) potential for high efficiency (two to three times more efficient than gasoline vehicles). Hydrogen is considered an alternative fuel under the [Energy Policy Act of 1992](#).

The energy in 2.2 lb (1 kg) of hydrogen gas is about the same as the energy in 1 gallon of gasoline. A light-duty fuel cell vehicle must store 11-29 lb (5-13 kg) of hydrogen to enable an adequate driving range of 300 miles or more. Because hydrogen has a low volumetric energy density (a small amount of energy by volume compared with fuels such as gasoline), storing this much hydrogen on a vehicle using currently available technology would require a very large tank—larger than the trunk of a typical car. Advanced technologies are needed to reduce the required storage space and weight.

Storage technologies under development include high-pressure tanks with gaseous hydrogen compressed at up to 10,000 pounds per square inch, cryogenic liquid hydrogen cooled to -423°F (-253°C) in insulated tanks, and chemical bonding of hydrogen with another material (such as metal hydrides). See the fact sheet Hydrogen Storage ([PDF 438 KB](#)). [Download Adobe Reader](#).

Relative Volume Needed for Hydrogen Storage to Achieve > 300 Mile Range



(Source: [Hydrogen.gov](#))

Also see the U.S. Department of Energy's [Hydrogen, Fuel Cells, and Infrastructure Technologies](#) Web site for more information on hydrogen as an alternative fuel.

Most of the few currently operating hydrogen [fueling stations](#) are in California. Visit [Hydroge Fueling Station Locations](#) to see if there are stations near you.

Hydrogen can also be blended with natural gas to create a transportation fuel that can be used in today's natural gas vehicles, with significant decreases in nitrogen oxides (NO_x) emissions. See [Hydrogen/Natural Gas \(HCNG\) Fuel Blends](#).