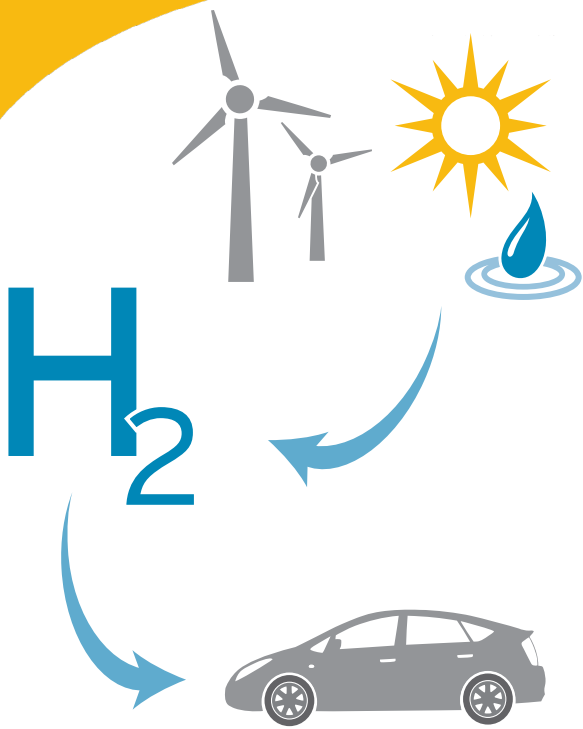
HSU HYDROGEN FUELING STATION AND HYDROGEN VEHICLES



Frequently Asked Questions

How does the hydrogen fueling station work?

The station uses electric power to split water into hydrogen and oxygen gases. The hydrogen is compressed to 6,000 pounds per square inch (psi) and is stored for dispensing to hydrogen-powered vehicles. A second compressor allows dispensing at 10,000 psi to completely fill our fuel cell vehicle tanks so we can make longer trips.

How many vehicles can it serve?

The station is designed to produce sufficient fuel for a fleet of three to four hydrogen vehicles. It can produce up to 2.5 kilograms (kg) of hydrogen per day and store up to 12 kg of hydrogen in the stationary storage tanks. One kg of hydrogen has approximately the same energy content as one gallon of gasoline.

How much does the fuel cost?

The station requires approximately 80 kWh of electricity to generate, compress and dispense one kg of hydrogen fuel. Based on the average cost of industrial electricity in the U.S. of 6.2 cents/kWh, the energy cost of hydrogen is about $5.00/kg. Since the mileage of our fuel cell vehicles is almost 60 miles/kg, the fuel costs per mile are less than for gasoline-powered cars.

Does the station use renewable energy to make hydrogen?

The station uses electricity supplied by the utility company. As utility companies increase their use of renewable resources, hydrogen made from grid power will get cleaner and greener.

Who designed and built the fueling station?

The fueling station began with an award-winning conceptual design by a team of HSU engineering students. The detailed design and construction were carried out by Schatz Energy Research Center (SERC), with support and assistance from HSU Plant Operations staff and a number of project partners.

How much did it cost to build the station?

The original cost to design and build this station was $676,690. An additional $241,000 was used to upgrade the station in 2012 for higher pressure fueling. The land is provided by HSU.

How do the hydrogen fuel cell powered cars work?

The Toyota FCHV-adv vehicles based at this station use fuel cells combined with batteries, in a configuration similar to gasoline-powered hybrid cars. The fuel cell in each vehicle uses hydrogen to generate electricity, which is then used to drive the car's electric motor. Hydrogen is stored on board in high pressure tanks. The traction battery in the vehicle is charged by the fuel cell and can provide additional power as needed for acceleration. The battery also stores energy when the car is braking.

How far can you go on a tank full of gas?

The FCHV-adv vehicles have a driving range of 400 miles on a full (10,000 psi) tank. For around-town driving, we fuel the cars from the lower pressure (5000 psi) dispenser,

giving the cars about half this driving range.

Can I buy one of these vehicles?

The FCHV-adv is currently in pilot testing at a number of locations but is not available for sale. Toyota has announced plans to have its FCV-R fuel cell car on sale to the public by 2015. Other car manufacturers also plan to begin selling fuel cell vehicles in the coming years.

How long does it take to fuel the vehicle?

At this station, fueling takes approximately ten minutes for a normal fill. High pressure fills for extended driving range take approximately 45 minutes. Many new hydrogen stations are equipped with a hydrogen cooling system, which allows high pressure fueling in 3-4 minutes, similar to gasoline fueling times.

Is hydrogen safe? What if a hydrogen-powered car is involved in an accident?

Hydrogen is as safe as or safer than ordinary vehicle fuels. Like all fuels it must be handled properly. The FCHV-advs are designed for safety in the event of a collision. They have been crash-tested by Toyota, and their tests demonstrate that the hydrogen storage tanks and fuel system perform safely in a collision.

Do the vehicles emit any pollution?

Fuel cell vehicles are zero emission; they emit only water from their tailpipes. Some

pollution is associated with generating the electricity used to produce hydrogen; this varies depending what resources the utility employs.

Can hydrogen cars solve our oil addiction problem?

Dependence on petroleum for fuel has many downsides. It is a non-renewable resource that causes air pollution and climate change. Hydrogen cars can contribute to solving this problem by allowing us to make vehicle fuel locally using clean energy. Hydrogen is not a magic solution to our energy problems, but as part of a palette of strategies including renewable energy and energy efficiency, it is a promising alternative.

Are there other hydrogen fueling stations and vehicles in the area? How about in other locations?

This is the first and so far the only fueling station on the North Coast. As of October 2012, the California Fuel Cell Partnership lists 23 hydrogen stations operating in California, with 14 more in the planning or construction phases. At this time there are no other hydrogen powered cars in our area, but we are working to create a local fleet. With the 2012 upgrade, several of these stations are now within driving range of HSU.

Why was this station built?

HSU and SERC are committed to bringing clean and sustainable energy technologies to Humboldt County and the world. Building this station and acquiring hydrogen vehicles are early steps toward

a secure, environmentally responsible transportation system for the 21st century.

This project is a collaboration of:
Schatz Energy Research Center
Humboldt State University
Chevron Technology Ventures
California Air Resources Board
California Department of Transportation
North Coast Unified AQMD
O&M Industries

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