

Hydrogen is the lightest chemical element, consisting of one proton and one electron. It is the most abundant element in the universe and a fundamental building block of matter. Interest in hydrogen as an energy carrier is increasing due to its abundance and low emissions profile.

Hydrogen is a versatile energy carrier that can store, move and deliver energy.

Hydrogen can be produced using energy derived from a variety of domestic resources, such as biomass, coal, solar and wind.



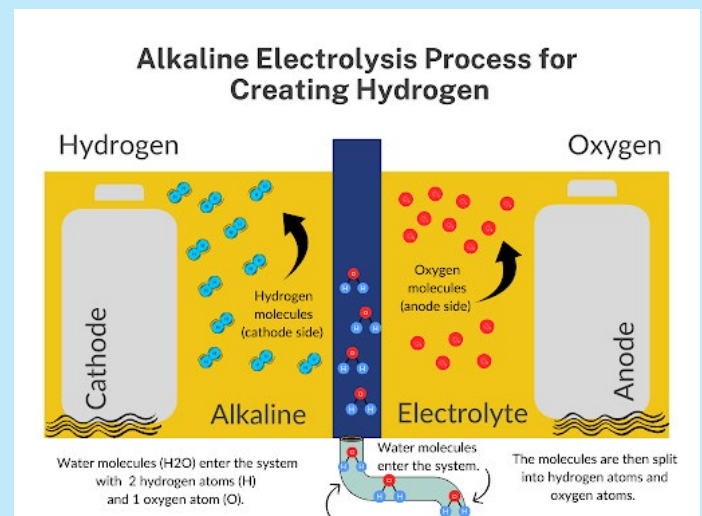
These qualities make it an attractive fuel option for transportation and other applications.



HOW DOES HYDROGEN WORK AS AN ENERGY CARRIER?

Hydrogen functions as an energy carrier by storing and delivering energy produced from other sources. It can be generated through various methods, including steam reforming of natural gas and electrolysis of water, with the latter gaining attention as a cleaner alternative when powered by renewable energy.

In the alkaline electrolysis process, an electric current splits water molecules into hydrogen and oxygen. The captured hydrogen is stored in cylinders of fuel cells for later use in transportation or electricity generation; sometimes, hydrogen is piped directly to a plant. Hydrogen can be used when variable resources are unable to produce energy.



As with all power generation, producing hydrogen and using it for energy **consumes local water** (i.e., the water is not returned to its source, such as a river or groundwater aquifer). There are three phases that use water: water purification, electrolysis and cooling.



In 1966, General Motors introduced the Chevrolet Electrovan, which was the world's first road vehicle powered by hydrogen fuel cells. This milestone marked an important step in the development of hydrogen-powered transportation.