

HYDROGEN ENERGY SUPPLY CHAIN FAST FACTS

Hydrogen is now recognised as the clean and versatile energy solution of the future. It has the exciting potential to enable an energy transition that will result in a substantial reduction of global carbon emissions.

▶ Hydrogen potential

Hydrogen is a central pillar of the energy transformation required to limit to limit climate change by reducing carbon emissions.

Hydrogen can offer economically viable, financially attractive and socially beneficial energy solutions.

Hydrogen can decarbonise transportation, industrial energy use and building heating. It will enable clean energy generation, increase energy system resilience and storage and provide clean feedstock for industry.

Countries around the globe are positioning themselves to capitalise on the impending boom of the hydrogen market.

The hydrogen economy will create opportunities for sustainable economic growth and jobs.

▶ Hydrogen is

Clean

Hydrogen is identified as a credible solution to the world's energy and climate problems. It is a clean energy carrier, which when burnt, the only emission is water.

Versatile

Hydrogen is the most abundant element in the universe and has the greatest energy density per unit mass of any fuel, making it versatile. Hydrogen can be stored and transported over long distances and used for a range of purposes including mobility, power generation and storage.

Sustainable

Hydrogen produced from brown coal is secure, reliable and affordable. When coupled with carbon capture and storage, it offers an environmentally sustainable solution to global energy needs. It is safe and can be produced by multiple sources, including brown coal and renewables.

Hydrogen use now

Hydrogen has been safely produced, used and handled for a range of industrial processes for more than 50 years.

Hydrogen is used to create hydrochloric acid, to create ammonia for fertilisers, and to make polyunsaturated fats for products like margarine and peanut butter.

NASA has used liquefied hydrogen since the 1970s to launch rockets and its Space Shuttle fleet into orbit. NASA also uses hydrogen fuel cells to power Space Shuttle electrical systems. The crew drinks the clean water produced as a by-product.

In 2015, Japan became the first country in the world to introduce stationary hydrogen fuel cells into households. Today more than 70,000 Japanese homes have a fuel cell installed. Hydrogen demand in transport is growing, with more than 2,000 fuel cell vehicles on the roads in Japan in 2017.

Hydrogen use in the future

\$
The hydrogen market is expected to be worth US \$2.5 trillion by 2050. ('Hydrogen: Scaling Up', Hydrogen Council, November 2017)

Car icon
The IEA has forecast that by 2050 hydrogen will power 30% of all cars sold. By 2050, hydrogen will power 425 million fuel cell vehicles including cars, trucks and buses. There will be over 3,000 hydrogen refueling stations globally by 2025.

Train icon
In December 2018, Germany will trial the first long-distance passenger train powered by hydrogen fuel cells. By 2021 hydrogen trains will replace Germany's diesel fleet.

2020s-2030s

Japan is committed to a clean energy future and is investing in the technology and global supply chain partnerships to become a 'hydrogen society' by 2030. Hydrogen has the potential to replace oil-fired power generation in Japan, sourcing 10% of the country's energy mix. In Australia, hydrogen could be used for decarbonising gas pipelines, energy storage and mobility.