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.

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**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.

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**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.

**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)
- 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.
- 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.