

What is green hydrogen?

Although its supply is virtually infinite, hydrogen is not commonly found in its pure form in nature. It can be produced through a process called electrolysis. This process requires electricity and when using renewable energy resources like solar, wind, hydropower, or geothermal energy, the result is green hydrogen.

Hydrogen is widely produced and used in industry today, including for use in fertiliser production and as an industrial chemical. NASA has used hydrogen to fuel its space shuttles since the 1960s. Many of hydrogen's emerging future uses (such as in fuels for vehicles and to replace fossil fuels in industrial processes) have recently begun trials.

Is green hydrogen safe?

Green Hydrogen, like other fuels, is highly flammable. Given this combustible nature of all conventional fuels, there is a degree of risk associated with their production, transportation, storage, and use. Using any fuel safely relies on preventing the occurrence of an ignition source (spark or heat), an oxidant (air), and fuel at the same time. With proper information, regulations, education and engineering expertise, fuel systems can be designed to avoid this.

Although hydrogen has different combustion characteristics to natural gas, its overall risk is similar. Compared with natural gas:

- Hydrogen is lighter, it rises six times faster than natural gas. Therefore, if it leaks from a pipe or appliance, it will disperse much more quickly and is not as likely to collect in confined spaces, reducing the risk of gas explosion.
- Hydrogen ignites at a wider range of concentrations to air, with its flammability range between 4%-75%, compared to between 5%-15% for natural gas. However, due to how quickly hydrogen disperses, it is more difficult for it to remain concentrated enough to be flammable.
- Hydrogen flames have a lower radiant heat than other typical fuel sources. This makes them less likely to cause harm and escalate.
- Hydrogen flames are more difficult to see and has no odour, so it is harder to detect
- Hydrogen is considered to be non-toxic

The requirements for the safe production, storage and use of hydrogen in tested applications are widely understood. Applicable industry codes and standards and best practice guidelines will be followed by Fortescue.

One of Fortescue's core values is safety and will be a key consideration when we are ready to produce, store and transport green hydrogen. Fortescue follows the principle of inherently safer design which attempts to eliminate hazards where possible, reduce them through substitution or to control them through engineering solutions.



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How is green hydrogen stored?

Hydrogen can be stored as either a gas or a liquid. Storage of hydrogen as a gas usually requires high-pressure tanks. Storage of hydrogen as a liquid requires extremely low temperatures. Hydrogen can also be converted to other "carriers" such as Green Ammonia to facilitate more efficient storage.

As with all fuels, there are hazards relating to hydrogen storage. Hydrogen reacts differently with metals, and it can cause certain metals to become brittle and crack. Given this, hydrogen is stored (and transported) in specifically designed tanks.



How is green hydrogen transported?

Green hydrogen can be transported using a variety of commonly used industrial methods:

- As a compressed gas and sent by pipelines, truck or rail transport
- Liquefied at a very low temperature and sent as liquid green hydrogen in marine tankers, trucks or rail
- Converted into ammonia, synthetic hydrocarbons or liquid organic hydrogen carriers (LOHCs) or methyl cyclohexane (MCH) and sent by chemical tanker ships.

How does Fortescue manage risks to our people and communities?

The health and safety of our people and communities is Fortescue's highest priority. Processing facilities, storage areas and transportation routes will all be built and operated in accordance with applicable standards and located safe distances away from adjacent communities.

Fortescue produces a number of fact sheets. To find out more about the green industry, go to fortescue.com/what-we-do/green-energy-research

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