STANWELL HYDROGEN PROJECT

Hydrogen explained

What is hydrogen?

Hydrogen is a clean energy carrier that can be used in transport, power generation and a range of industrial processes. It's already a key input for a range of industries that provide vital products for our mining and agricultural sectors.

How is hydrogen made?

The two most common methods of producing hydrogen are steam reforming and electrolysis.

- **Steam reforming/Gasification** is used in industries to separate hydrogen atoms from carbon atoms in methane (natural gas) or from coal. These processes result in carbon dioxide emissions.
- **Electrolysis** is a process that uses an electrical current to split water and create hydrogen, with oxygen the only by-product. This process enables manufacturers to recover oxygen or heat.

Types of hydrogen

Hydrogen can be produced from a wide variety of energy sources.

- **Green hydrogen** is produced from water electrolysis and renewable energy and is carbon neutral.
- **Blue hydrogen** incorporates carbon capture and storage into the steam methane reformation processes, reducing carbon emissions.
- **Brown hydrogen** is produced from fossil fuels and accounts for around 95 per cent of global production.

Hydrogen uses

Hydrogen is a very flexible energy carrier that can be used as a:

- **grid stabiliser** – hydrogen electrolysers can ramp up and down their load to match the variable output of renewable energy like wind and solar, helping to stabilise the grid
- **natural gas replacement** – hydrogen can be added to natural gas to supplement domestic gas supply
- **transport fuel** – hydrogen fuel cells offer an alternative to batteries for powering electric motors. Hydrogen is especially suited to heavier transport like trucks and trains
- **power generation** – hydrogen can be fed through a gas turbine or fuel cell to generate electricity
- **industrial feedstock** – hydrogen is used to produce industrial products such as ammonia, which is important for farming and mining.

Hydrogen's role in our low carbon future

Hydrogen is set to play an important role in our low carbon future, both globally and in Australia.

Countries like Japan and Korea want to use hydrogen to help decarbonise their economies, and Australia is well placed to become a major hydrogen exporter.

State, federal and international governments are implementing strategies to support hydrogen's development and increased use.

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Stanwell H_2 project

Project concept

Stanwell is undertaking a study into a hydrogen project at Stanwell Power Station near Rockhampton.

The study will assess the technical, commercial and strategic feasibility of a large (10 MW or bigger) hydrogen demonstration plant at Stanwell Power Station. The project would be located approximately 1 km to the north of the existing power station site.

The hydrogen produced through the electrolyser would either be trucked to end use customers, or utilised on-site for secondary production processes such as ammonia, methanation or power generation.

Potential pathways

Three potential pathways for commercialising the project have been identified:

- **Power-to-Ammonia** for fertilisers and as an industrial chemical;
- **Power-to-Gas** for various manufacturing uses; and
- **Power-to-Power** to generate electricity.

During the feasibility study, we will investigate these and other options further to determine a preferred pathway(s).

Opportunities and benefits

By deploying hydrogen electrolysis at large scale, the demonstration plant would help drive down production costs and support the development of new domestic and export markets for hydrogen.

Stanwell is aiming to encourage the growth of a hydrogen export industry in Central Queensland which would drive energy load growth in the region, ease pressure on the electricity network and support the growth of renewable energy.

The project will purchase green certificates from renewable energy projects in the region to deliver a carbon neutral hydrogen product.

Safety

Stanwell has been using hydrogen at Stanwell Power Station for decades as a coolant in the station's generators.

One of the key activities during the feasibility study will be to finalise a detailed design including all safety aspects.

More information

A public consultation process will take place once a pathway decision has been made. In the meantime, if you'd like to let us know what you think about our proposed project or you would like more information, email us at hydrogen@stanwell.com.

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