

Hydrogen: a safe and green energy

The Port Kembla Power Station

Australian Industrial Power is proposing to develop the Port Kembla Power Station; Australia's largest hydrogen capable power station.

With an anticipated final nominal capacity of 635MW, the project will initially leverage natural gas from the new Port Kembla Energy Terminal and then aim to transition to 100% green hydrogen by 2030 to deliver sustainable energy to NSW.

Depending on the rate at which coal-fired power exits the market, there may be a need for the power station to commence as a smaller scale (435MW) open-cycle unit to provide short-term dispatchable peaking capacity, before potentially moving to the final full 635 MW combined cycle design.

The project will also involve the construction of a short (approx. 16km) transmission line to connect the proposed power station to the broader electrical system.

What is green hydrogen?

Hydrogen is the most abundant element in the universe. In nature, hydrogen is often bound to other elements. For example, water is a molecule comprised of hydrogen and oxygen. Hydrogen can be separated from these other elements and used as an energy source.

Green hydrogen is pure hydrogen produced using renewable energy sources, such as wind, solar and hydro power.

Green hydrogen is one of several potential low-carbon fuels that could take the place of fossil fuels such as coal, oil, diesel or natural gas.

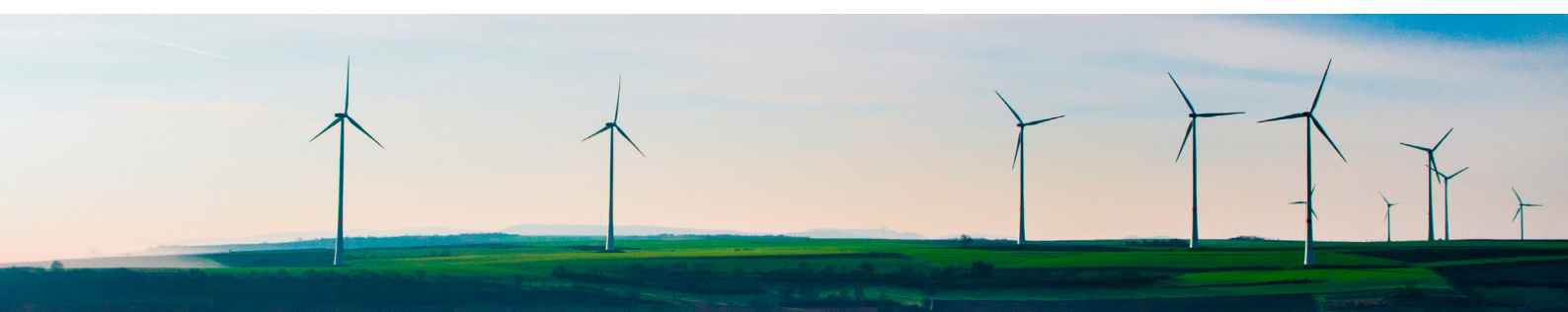
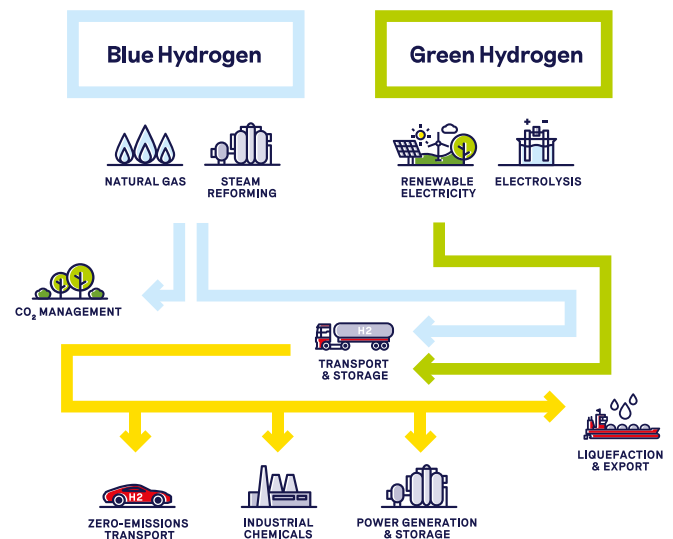
One of the most common techniques used to produce hydrogen is the electrolysis of water. During this process, water is separated into hydrogen and oxygen using electricity. The hydrogen that is produced is collected for

use. If the electricity used during electrolysis comes from renewable sources and leads to no carbon emissions, then the hydrogen produced is called **green hydrogen**.

How can hydrogen be used?

Hydrogen has many potential uses as we transition to a net zero carbon emission future.

- Hydrogen, either pure or blended with natural gas, can be used as a fuel source for power generation.
- Hydrogen can be used as a fuel in vehicles for transportation.
- Like natural gas, hydrogen can be used to generate heat in homes and businesses, as well as in industrial processes.
- Hydrogen can be used to replace coal in steel production as well as a feedstock to produce chemicals such as ammonia.



3 FACTSHEET

How will hydrogen be used in the power station?

As the hydrogen supply market develops, Port Kembla Power Station will have the ability to operate on a fuel blend of hydrogen and natural gas, with an ultimate aim of operating on 100% green hydrogen fuel.

At 100% hydrogen, the power station will need approximately 800 – 850 tonnes of green hydrogen a day.

Hydrogen has been made safely in Port Kembla for more than 30 years. However, 800+ tonnes a day of green hydrogen will require a significant upsizing in local industry capabilities.

It is hoped the potential demand for green hydrogen from the Port Kembla Power Station will help drive the development of a new industry in the Illawarra.

Is hydrogen a safe fuel source?

Hydrogen is one of the cleanest and safest fuels to use and is safer to handle than many fuels more commonly utilised.

Hydrogen is non-toxic and disperses rapidly if it is released to atmosphere as it is much lighter than air. The risk of secondary fires is also lower than fossil fuels as hydrogen has a lower radiant heat.

However, as hydrogen can ignite more easily than natural gas or petrol, additional engineering controls such as leak detection, ventilation and special flame detection are utilised in design of safe hydrogen systems.

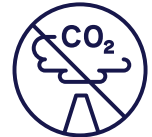
In addition, some metals can become brittle when exposed to hydrogen, so selecting appropriate materials is important to the design of safe hydrogen systems. Hydrogen has a lower impact on the environment than fossil fuels if combusted, spilled or leaked.

Ultimately using green hydrogen will help NSW work towards achieving the sustainability goal of net zero carbon emissions.

What are the benefits of using hydrogen?

Sustainable

It does not emit polluting gases during its production.



Versatile

Green hydrogen can be used in electricity production as well as being used for domestic, commercial, industrial or mobility purposes.



Easy to store

This allows it to be used for other purposes and at a later date other than simply when it is produced.



Transportable

Green hydrogen can be transported by vehicle, ship or pipeline to end users.

