Woodside Energy

GENERAL INFORMATION SHEET

NOVEMBER 2022

PROPOSED H2PERTH PROJECT

OVERVIEW

Woodside Energy (Woodside) is a global energy company, founded in Australia. Our focus is to provide low-cost, lower-carbon energy the world needs.

We are proposing to develop H2Perth — a domestic and export scale hydrogen and ammonia production facility within the Rockingham Industry Zone (RIZ). H2Perth would be built on approximately 130 hectares of vacant industrial land to be leased from the Western Australian (WA) Government (see Figure 1).

H2Perth would be located on the Gnaala Karla Booja (GKB) region of the Noongar Nation. The GKB region refers to the Noongar language or dialectical groups of the Binjareb/Pinjarup, Wilman and Ganean. We acknowledge the connection of Noongar people to that Country, and their Elders — past and present.

H2Perth would be developed in three phases, providing a significant opportunity to establish a new strategic export industry for WA, supply hydrogen to local and international users seeking to lower their emissions, and support the stable transition of our local electricity grid to renewable sources.

Woodside's intention is for H2Perth to be net zero Scope 1 and 2 greenhouse gas (GHG) emissions from the start of operations.

Hydrogen Refueller @H2Perth

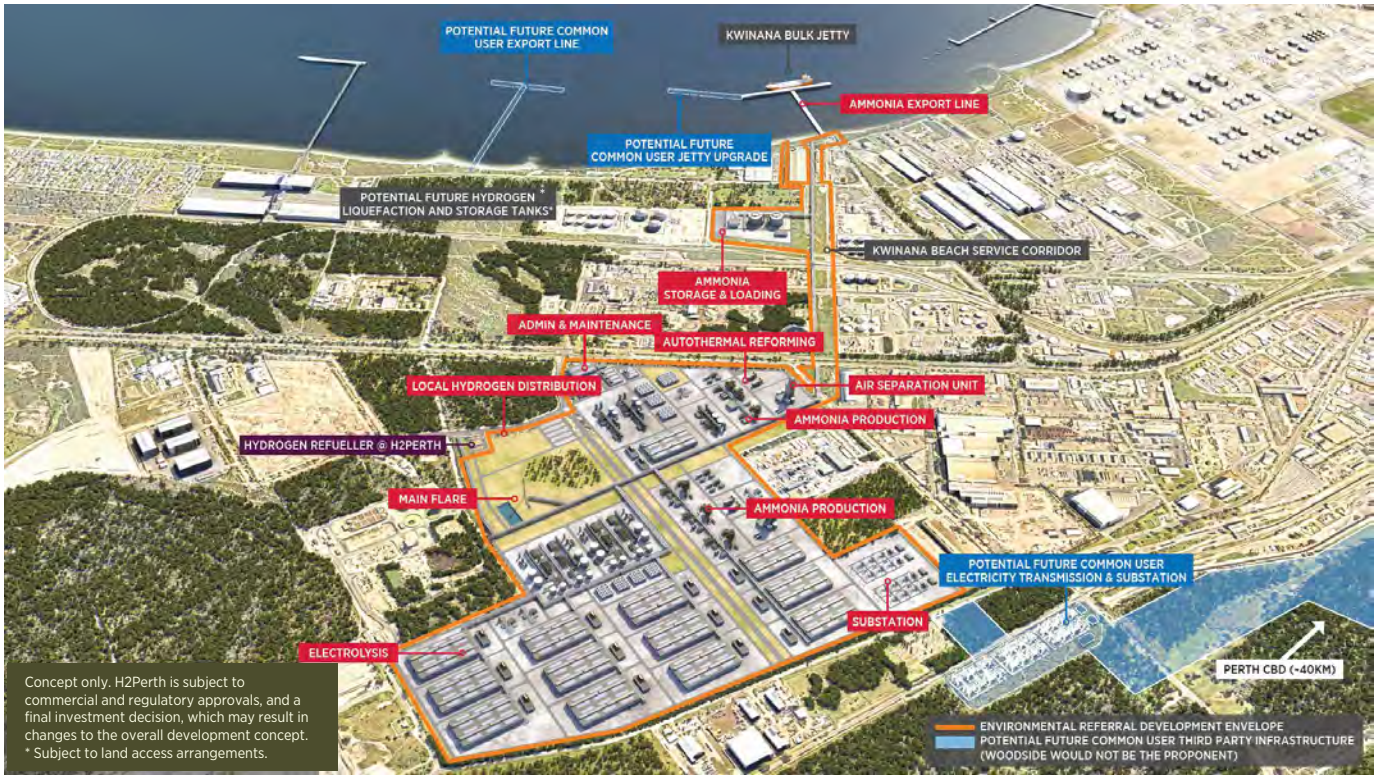
Woodside is also progressing a separate, stand-alone hydrogen opportunity called the Hydrogen Refueller @H2Perth, which was successful in securing funding from the WA Government in August 2022 through the Hydrogen Fuelled Transport Program.

Hydrogen Refueller @H2Perth aims to supply low-cost, renewable hydrogen fuel for local customers and stimulate and enable hydrogen demand in WA.

Hydrogen Refueller @H2Perth would be a self-contained hydrogen production, storage and refuelling station adjacent to the main H2Perth project.

For more information, visit the Woodside website at: www.woodside.com

Figure 1. Proposed H2Perth Project



All information is current as at November 2022. H2Perth is subject to commercial and regulatory approvals, and a final investment decision, which may result in changes to the overall development concept.

Why is Woodside progressing H2Perth?

We provide energy the world needs to heat and cool homes, keep lights on and enable industry through our portfolio of quality oil and gas assets.

But the science of climate change is clear: if the world is to limit temperature rise, it will need to change the way that it produces and consumes energy. This process — sometimes called the "energy transition" — has already begun.

As an energy producer, Woodside is investing in the products and services that our customers need, as they too reduce their emissions.

We are progressing a number of hydrogen and ammonia projects to add to our portfolio, including H2Perth.

Production of lower-carbon hydrogen is expected to grow significantly as the world reduces GHG emissions.

This is because hydrogen and hydrogen-based fuels do not release carbon dioxide when they are used.

Hydrogen is also very versatile; it can power everything petrol or gas can, and it can also be stored.

Hydrogen can be produced through a variety of different methods. At H2Perth, Woodside will make hydrogen using both electrolysis and natural gas reforming.

Although hydrogen does not emit carbon when it is used, some methods of making hydrogen do generate emissions. **Woodside intends for H2Perth to be net zero from the start of operations**, using a combination of renewable electricity, offsets and carbon capture, utilisation and storage (CCUS) technologies.

If you would like further information on how Woodside intends to manage GHG emissions from H2Perth, please go to the H2Perth Environment Information Sheet at www.woodside.com/sustainability/consultation-activities

Electrolysis

Hydrogen can be made through electrolysis, where electricity is used to separate hydrogen (H_2) from water (H_2O). Depending on the source of the electricity used, this process can have close to zero emissions.

For the electrolysis component of H2Perth, Woodside is targeting 80% renewable electricity (as defined by the Australian Clean Energy Regulator) from the start of operations, with remaining emissions to be offset.

Natural gas reforming

Hydrogen can be made through natural gas reforming, which converts methane (CH_4) to hydrogen (H_2). Carbon dioxide (CO_2) is also produced as part of this process, however these emissions can be managed, and the hydrogen produced generates no emissions at the point of use.

Woodside is progressing a number of CCUS opportunities around the world. The application of CCUS technologies at H2Perth is currently being assessed. We intend to select a technology that has the potential ability to capture 85% of the CO_2 produced from the natural gas component of the project — once a CCUS opportunity is established, and subject to commercial and regulatory approvals.

Woodside intends to manage emissions that have not already been captured and stored using offsets. Additional GHG emissions avoidance and reduction measures will also be investigated. Natural gas reforming is expected to cease by 2050.

Both electrolysis and natural gas reforming lead to an identical hydrogen product, and are each expected to play a role in the future energy mix.

H2Perth will make hydrogen using both techniques because our customers have different end-use cases, volume and schedule requirements, and price sensitivities. Accordingly, we plan to offer a hydrogen portfolio that is diversified across locations, timeframes, production methodologies, carbon management tools and price points.

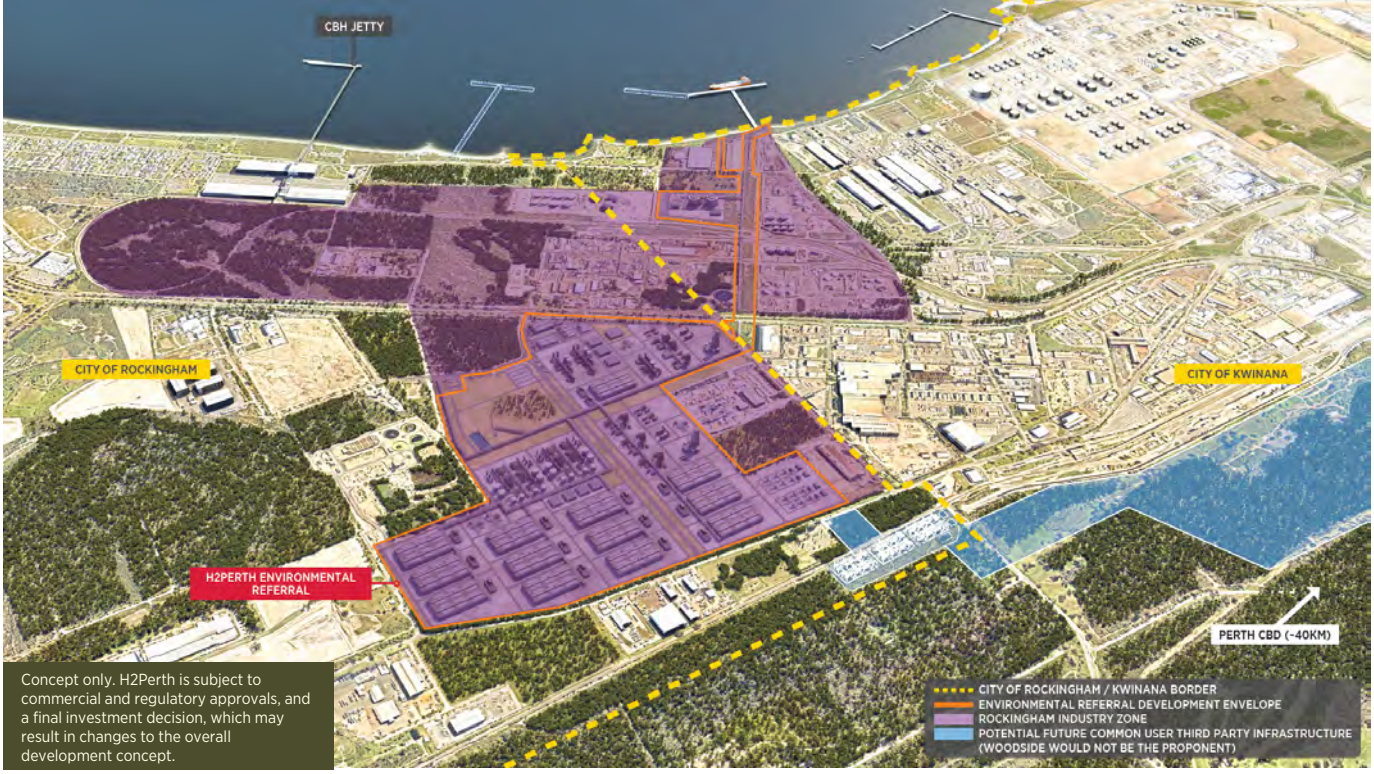


Figure 2. Location of H2Perth within the Rockingham Industry Zone (RIZ)

Locating H2Perth within the RIZ

As well as potential local customers and users, we think the location of H2Perth within the RIZ (see Figure 3) has many of the key ingredients to scale up to export, which could offer WA a head start in a globally competitive hydrogen market:

- **Power:** Kwinana is a vital node in WA's electricity network. It is expected that hydrogen electrolysers can help stabilise this network because they can be operated flexibly (by being switched on and off quickly) and assist with network electricity supply and demand. This will be increasingly important when more renewables, which are variable in their output, are added to the electricity grid.
- **Water:** Water is a significant input to hydrogen production. Locating H2Perth in the RIZ means we have the potential to re-use wastewater at our facility, which would help to ensure no impact on residential water supply and no need for seawater desalination.
- **Gas:** The Dampier to Bunbury Natural Gas Pipeline is only 2 km away from proposed site. Woodside will use natural gas reforming from project start up, targeted to commence in 2027, expected to cease by 2050 or earlier.
- **Export:** The RIZ is part of a wider strategic industrial area with a functional deepwater harbour and a vision for export expansion.
- **Land:** The RIZ offers room to grow and delivery of lower cost hydrogen by scaling operations.
- **Workforce:** The proposed site is located near a residential community with the ability to collaborate on workforce development.
- **Existing economic activity:** Local industry and business capabilities are nearby. There may be the potential for local manufacturing and maintenance, including for electrolysers.

Project approvals

H2Perth will be subject to a range of Local, State and Commonwealth Government approvals.

The first step in the approvals process will be a referral to the WA Environmental Protection Authority (EPA) under the *Environmental Protection Act 1986 (WA)* and the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*. These government departments will consider the project and stakeholder feedback, to set appropriate levels of assessment for an opportunity of this type and scale.

We are working through a program of environmental studies, including flora and fauna, greenhouse gas management, heritage, groundwater sampling, discharge modelling, air, noise, air emissions, traffic modelling and visual impact assessments. Key objectives of the H2Perth environmental studies program are to establish environmental baselines, help guide the concept designs and operational planning, inform mitigation strategies and support the referral process. Further details on these assessments will be included in the referrals to EPA and DCCEEW, both targeted for submission by the end of 2022.

Providing feedback and further information

If you would like further information or to comment on H2Perth, please contact Woodside by email to feedback@woodside.com or call toll free 1800 442 977. There will be many opportunities to engage and provide feedback across all phases of the project.

www.woodside.com

Woodside Energy