



# GREEN HYDROGEN AND AMMONIA

SCALING UP COMMERCIALIZATION AND EXPORTS

THE HYDROGEN UTILITY™

H2U

AEA 2021 Conference | online 25-26 August 2021

COMMERCIAL in CONFIDENCE

# OUTLINE

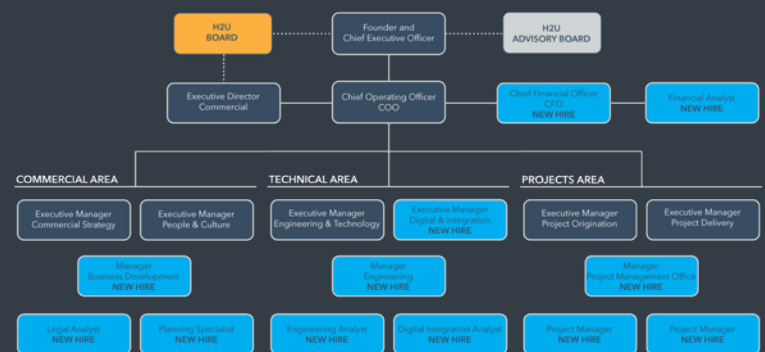
- H2U - the Hydrogen Utility™
- Value Chain Development
- Commercialization Focus
- Project Portfolio
  - Eyre Peninsula Gateway™
  - H2-Hub™ Gladstone



# THE HYDROGEN UTILITY™

H2U is a growing hydrogen infrastructure business

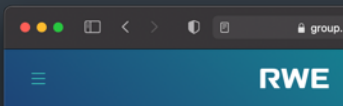
- early mover position, established international profile
- 'pure-play' green hydrogen infrastructure focus
- expertise in renewable energy integration, hydrogen infrastructure and technology commercialization
- established value chain relationships (Japan)
- pipeline of high-quality, scalable industrial green hydrogen infrastructure projects



H2U

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# VALUE CHAIN PARTNERSHIPS



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RWE Supply & Trading GmbH

## RWE and H2U join forces to develop hydrogen trading between Australia and Germany



Future hydrogen site of H2U in South Australia could

Essen/Adelaide, April 15, 2021

RWE Supply & Trading and Australian hydrogen project Ltd (H2U) have joined forces to develop hydrogen trading and therefore signed a Memorandum of Understanding hydrogen produced in Australia to Europe. This is in line with the objective of HySupply, a 24-month German-Australian feasibility study which started December 2020 by the German Academy of Science and Engineering and the Federation of German Industries. RWE Supply & Trading and H2U are contributing to this with their expertise. Furthermore, the planned LNG Terminal in Brunsbüttel, where RWE intends to book capacity, can be an ideal location for the future import of hydrogen into Germany.

RWE

Press release

### RWE and H2U join forces to develop global hydrogen trading between Australia and Germany

- Future hydrogen site of H2U in South Australia could deliver green hydrogen to Germany

Essen/Adelaide, April 15, 2021

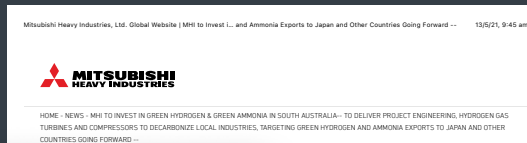
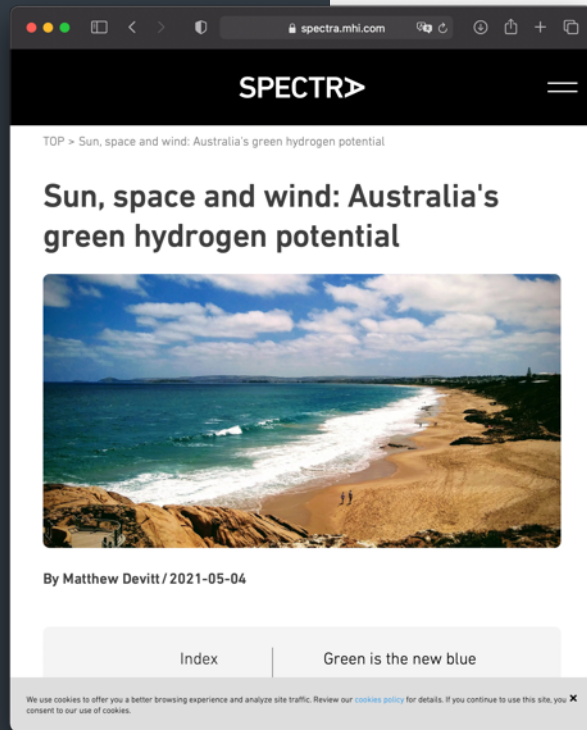
RWE Supply & Trading and Australian hydrogen project developer The Hydrogen Utility Pty Ltd (H2U) have joined forces to develop hydrogen trading between Australia and Germany and therefore signed a Memorandum of Understanding. Together, they aim to bring green hydrogen produced in Australia to Europe. This is in line with the objective of HySupply, a 24-month German-Australian feasibility study which started December 2020 by the German Academy of Science and Engineering and the Federation of German Industries. RWE Supply & Trading and H2U are contributing to this with their expertise. Furthermore, the planned LNG Terminal in Brunsbüttel, where RWE intends to book capacity, can be an ideal location for the future import of hydrogen into Germany.

H2U develops several hydrogen projects in Australia and New Zealand such as the Eyre Peninsula Gateway Project. At the planned location in South Australia, they want to build a 75-megawatt electrolysis plant, which can supply hydrogen for about 40,000 tonnes of ammonia annually. In a second phase of expansion throughout the 2020's H2U wants to extend the capacity to 1.5 gigawatts of electrolysis.

Javier Moret, Global Head of LNG at RWE Supply & Trading, emphasizes: "H2 is the perfect long-term solution to decarbonise industry, aviation and the transport of heavy goods. Australia is one of the countries that has excellent conditions to produce green hydrogen - low cost of production and a stable framework. As a globally active trader of commodities, we have a lot of experience with shipping energy carriers - including Australian LNG - around the globe and see ourselves as a facilitator for global hydrogen trading."

H2U's CEO, Dr Attilio Pigneri: "H2U is pleased to partner with RWE to explore the possibilities for providing affordable green hydrogen and hydrogen derivatives such as ammonia and synthetic methane to power Germany and Europe's future. We see the trading of green hydrogen to Europe being fully decarbonised using green ammonia as the shipping fuel of the future."

RWE Supply & Trading GmbH Corporate Communications & Public Affairs | RWE Platz 6 | 45141 Essen | Germany  
T +49 201 5179-5008 | communications@rwe.com | www.rwe.com/press



## Hydrogen & Green Ammonia in Australia Enabling, Hydrogen Gas Turbines to Decarbonize Local Industries, and Ammonia Exports to Japan Going Forward --

f t in

MHI has agreed to make a capital investment in H2U investments, the holding (H2U), the leading Australian developer of green hydrogen and green ammonia. The agreement also includes MHI's support for H2U's projects and Engineering and Design (FEED) study for H2U's Eyre Peninsula

H2U is now the leading economy globally, in the integration of variable abundant renewable energy resources in the region to produce green hydrogen solutions, the initiatives will help decarbonize mineral processing and locally produced green hydrogen and green ammonia to Japan and other countries.

South Australia is planned to commence commercial production of hydrogen produced by water electrolysis using power derived from renewable energy sources, and to demonstrate hydrogen-based ammonia production.

As part of the FEED study phase, and also by providing key plant engineering. As part of the project, MHI and H2U will investigate synergies with further reduction of total CO<sub>2</sub> emissions in the region.

Midwide to achieve decarbonization, with a target of net zero emissions. Clean energy are now coming sharply into focus: green hydrogen in the production or combustion stages.

The Australian Government, the Government of South Australia and the cooperation of renewable energy projects.

with the Government of New South Wales to propose a range of

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H2U



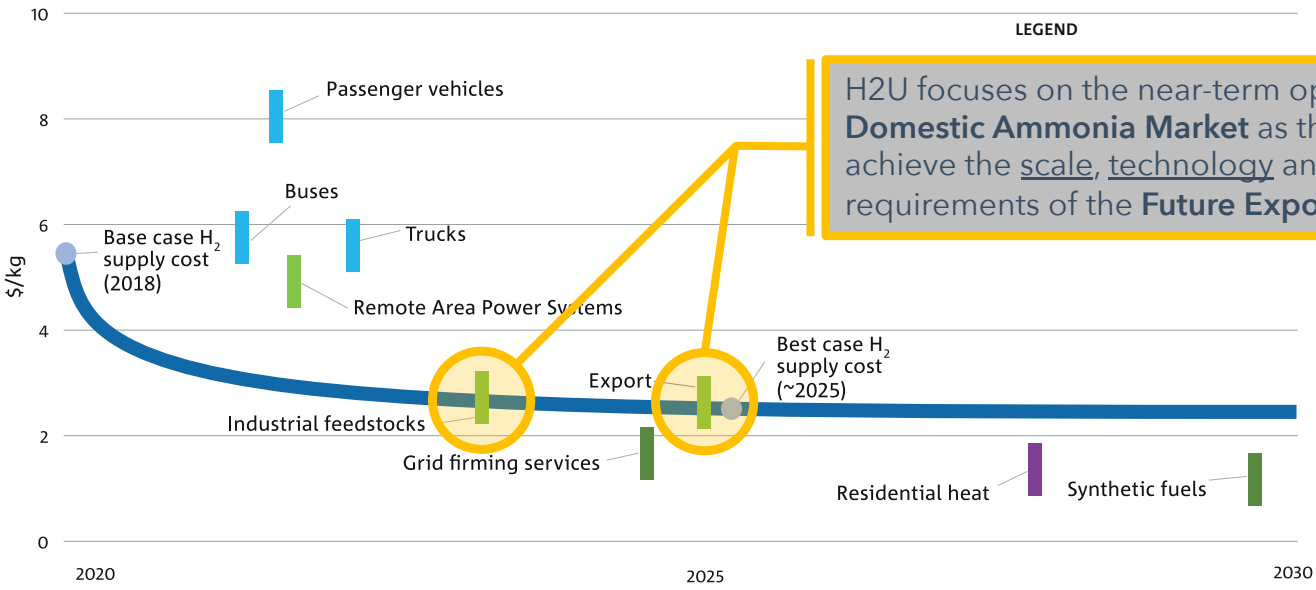
COMMERCIALIZATION FOCUS

H2U

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# COMMERCIALIZATION FOCUS | GREEN HYDROGEN AND AMMONIA

Hydrogen competitiveness in targeted applications



SOURCE: CSIRO

MULTIPLE MARKET APPLICATIONS, DECLINING COST TRAJECTORY



# GREEN AMMONIA

## UNIQUE SPRINGBOARD FOR MARKET ENTRY

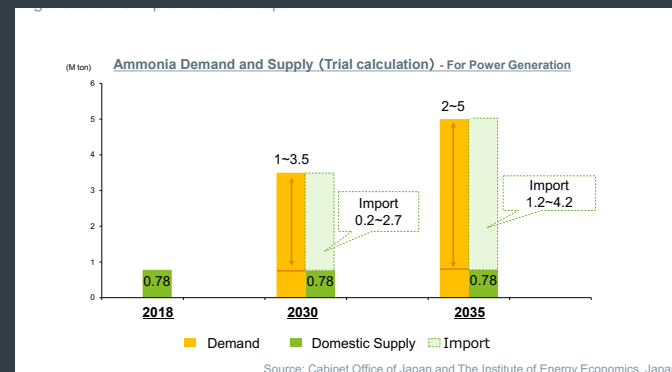
- established trade (~18 mtpa trade)
- easily transportable
- multiple industrial applications
- a major user of hydrogen today
- size/capability comparable to future export market

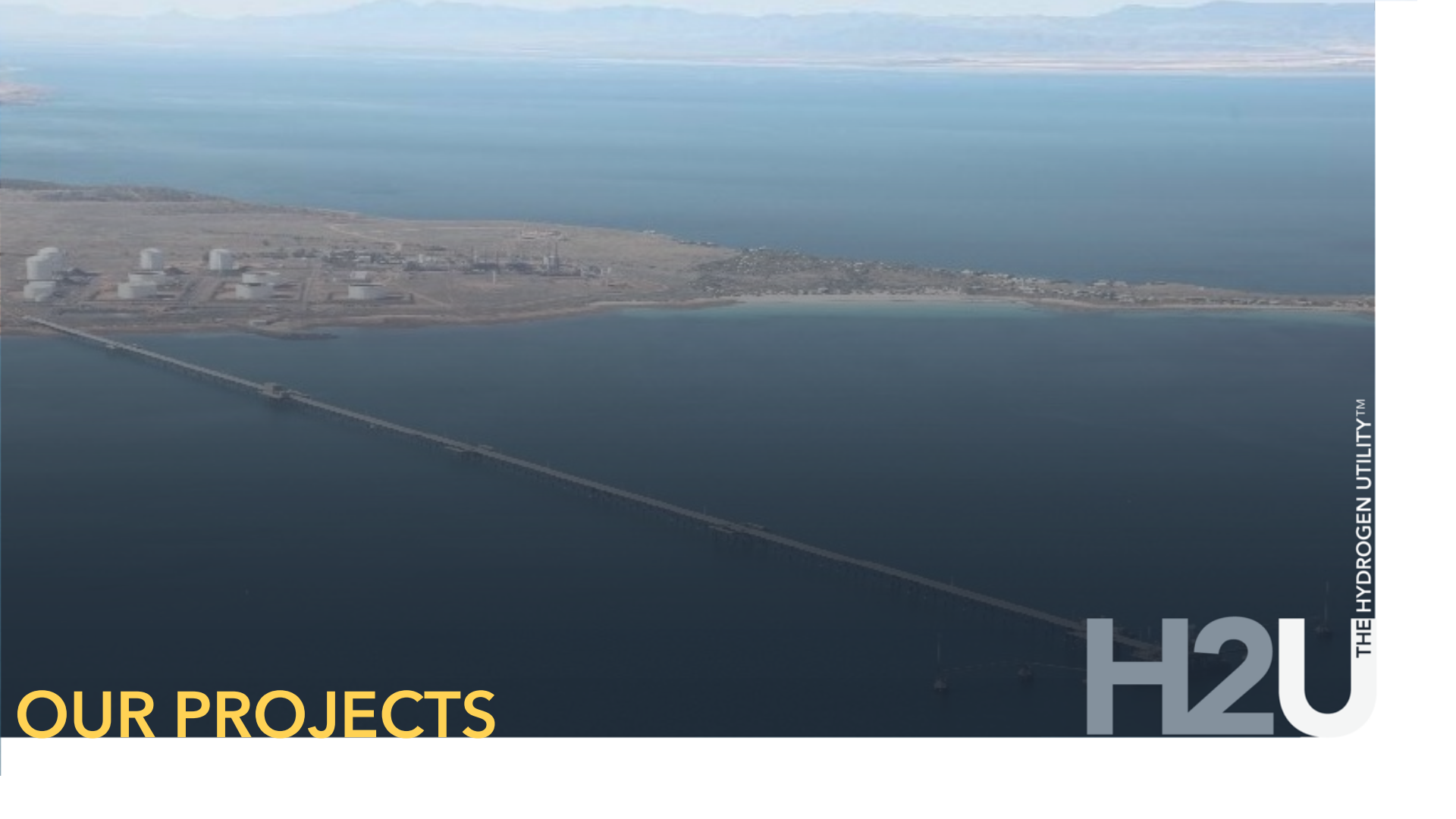
## DOMESTIC IMPORT SUBSTITUTION OPPORTUNITY

- high domestic gas prices challenge incumbents
- long-term pricing advantage for green ammonia

## SUSTAINED, DIVERSIFIED GROWTH OPPORTUNITY

- Power Generation (Japan's Green Ammonia Consortium/METI)
- Zero-emissions Shipping (IMO 2050, Getting to Zero Coalition)





OUR PROJECTS

H2U

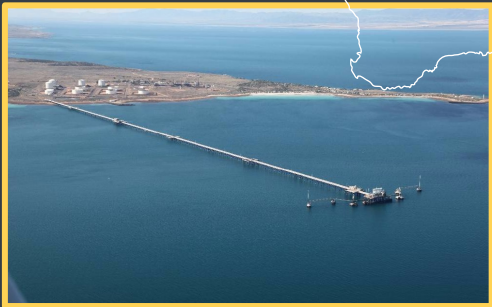
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# NEAR-TERM PROJECT PORTFOLIO

2020-25 Implementation

DOMESTIC MARKET OPPORTUNITIES  
STRATEGIC PORT-BASED LOCATIONS

Eyre Peninsula Gateway™



up to 1.5 GW electrolyzers  
up to 2,400 tpd ammonia

H2-Hub™ Gladstone



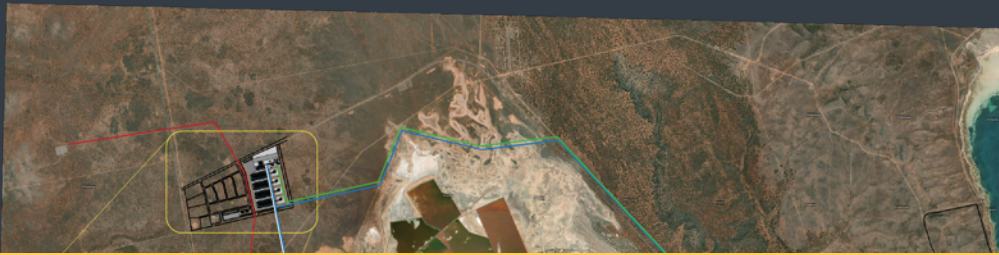
up to 3 GW electrolyzers  
up to 4,800 tpd ammonia



# EYRE PENINSULA GATEWAY™ | DEVELOPMENT MASTER PLAN

INFRASTRUCTURE  
CORRIDORS

- POWER
- HYDROGEN
- OXYGEN
- AMMONIA



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DEMONSTRATOR STAGE (CY 2023): 100 MW Electrolysis, 2x60 tpd Ammonia  
EXPORT STAGE (CY 2025): 1.5 GW Electrolysis, 4x600 tpd Ammonia



# EYRE PENINSULA GATEWAY™ | RECENT UPDATES

premier.sa.gov.au

STEVEN MARSHALL  
PREMIER OF SOUTH AUSTRALIA

SOUTH AUSTRALIA Government of South Australia

World-leading \$240 million hydrogen project launched, supported by \$37 million upgrade to Pt Bonython jetty

News > Media releases >  
World-leading \$240 million hydrogen project launched, supported by \$37 million upgrade to Pt Bonython jetty

upcoming 2020/21 State Budget, to upgrade the Port Bonython jetty as part of our ambitious plans to become an exporter of green energy to world markets.

NEW CULTANA/PORT BONYTHON LOCATION

NOVEMBER 2020

worley.com

Worley  
energy | chemicals | resources

KICK-OFF OF FEED STUDY (DEMONSTRATOR)

MARCH 2021

H2U selects Worley to engineer large-scale green hydrogen and green ammonia project

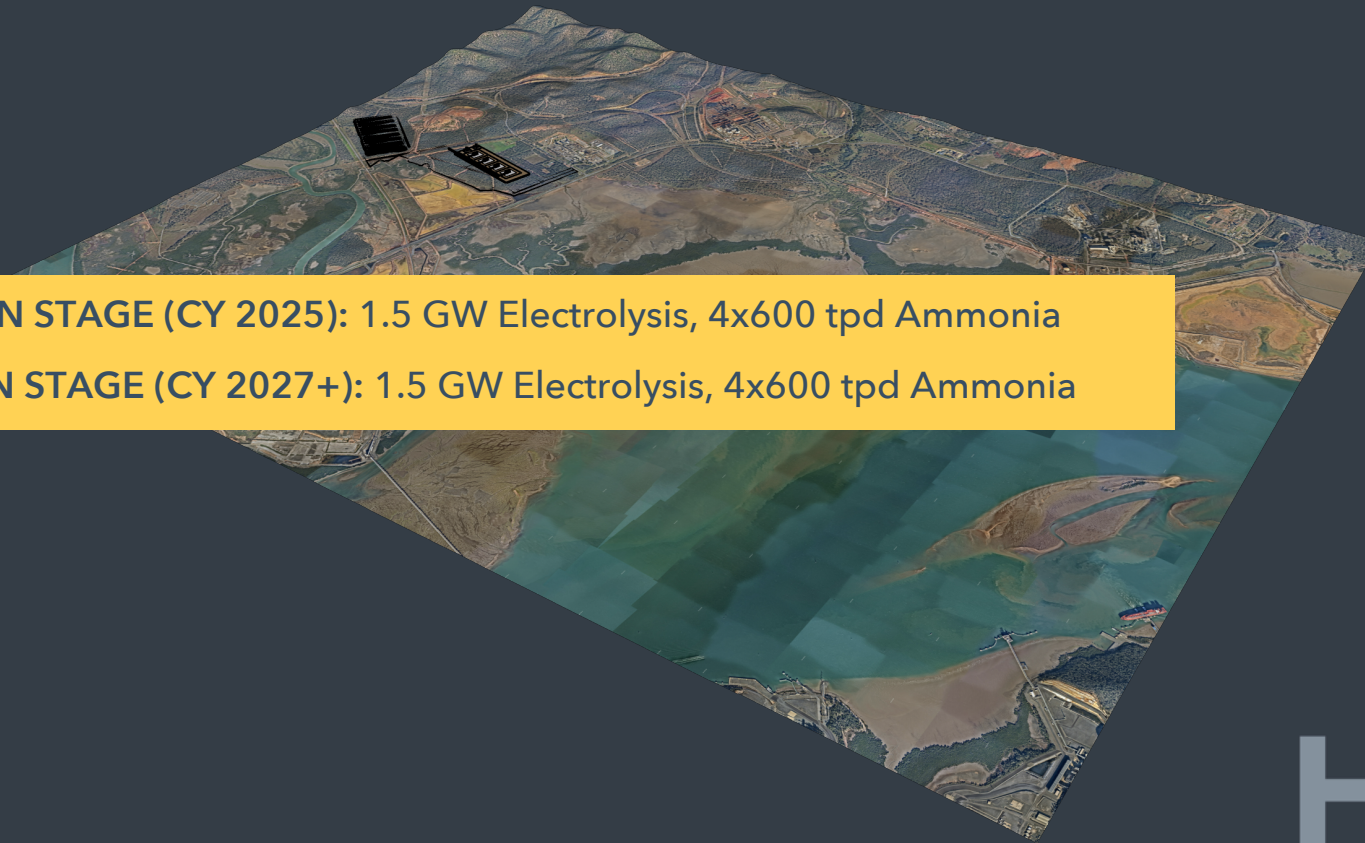
WE'VE BEEN AWARDED THE ENGINEERING SERVICES CONTRACT, BY H2U GROUP, FOR THE FRONT-END ENGINEERING AND DESIGN (FEED) PHASE OF THE GREENFIELD DEMONSTRATOR STAGE OF THE EYRE PENINSULA GATEWAY™ PROJECT, LOCATED IN SOUTH AUSTRALIA.

Integrating a 75 MW electrolysis plant, and a 120 tonnes per day (tpd)

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# H2-HUB™ GLADSTONE | MASTER PLAN



ACTIVATION STAGE (CY 2025): 1.5 GW Electrolysis, 4x600 tpd Ammonia

EXPANSION STAGE (CY 2027+): 1.5 GW Electrolysis, 4x600 tpd Ammonia



# H2-HUB™ GLADSTONE | RECENT UPDATES

Queensland Government

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The Queensland Cabinet and Ministerial Directory

### Eye on Gladstone for proposed gigawatt-scale green hydrogen and ammonia development

Published Thursday, 27 February, 2020 at 07:00 AM

**Minister for State Development, Manufacturing, Infrastructure and Planning**  
The Honourable Cameron Dick

Gladstone has been selected as the location for The Hydrogen Utility's (H2U) latest project, H2-Hub™ Gladstone, a proposed multi-billion chemical complex for the production of green hydrogen and ammonia at industrial-scale.

Minister for State Development Cameron Dick said this was great news for the Gladstone community, as it could potentially create over 100

Site Acquisition

February 2020

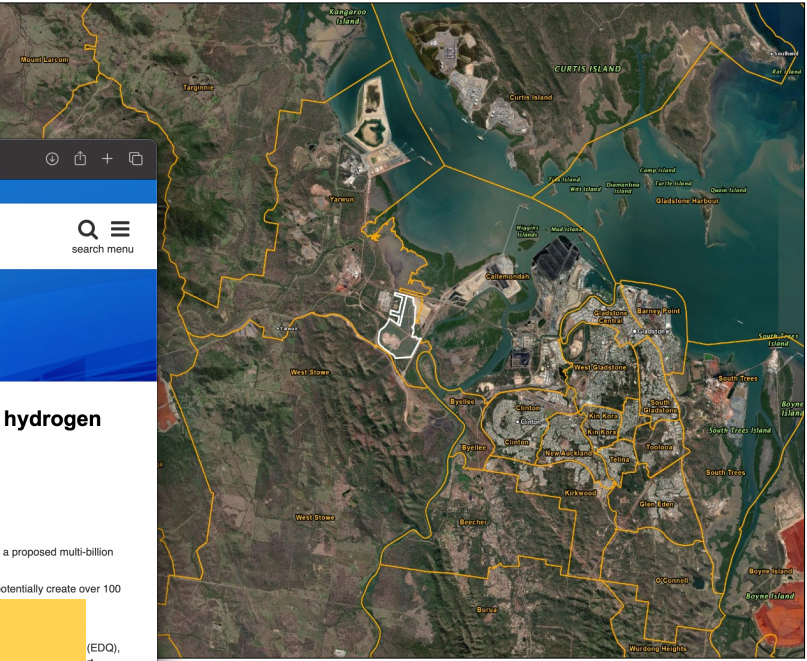
Dr Attilio Pigneri CEO and Founder of H2U said "H2-Hub™ Gladstone will be built in stages to integrate up to 3 GW in electrolysis plant, and up to 5,000 tonnes per day ammonia production capacity."

"The integration of mature technologies – such as electrolysis and ammonia synthesis – at industrial scale, powered by 100 per cent

### H2-Hub Gladstone

Localities and Population Centres (1:100,000)


23°44'20"S 151°19'20"E



Legend

- Locality
- Cities and Towns


Printed at A3  
Scale: 1:100000  
Datum: Geocentric Datum of Australia 1994  
Projection: Web Mercator EPSG:382605  
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Queensland Government

Department of Natural Resources, Mines and Energy


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