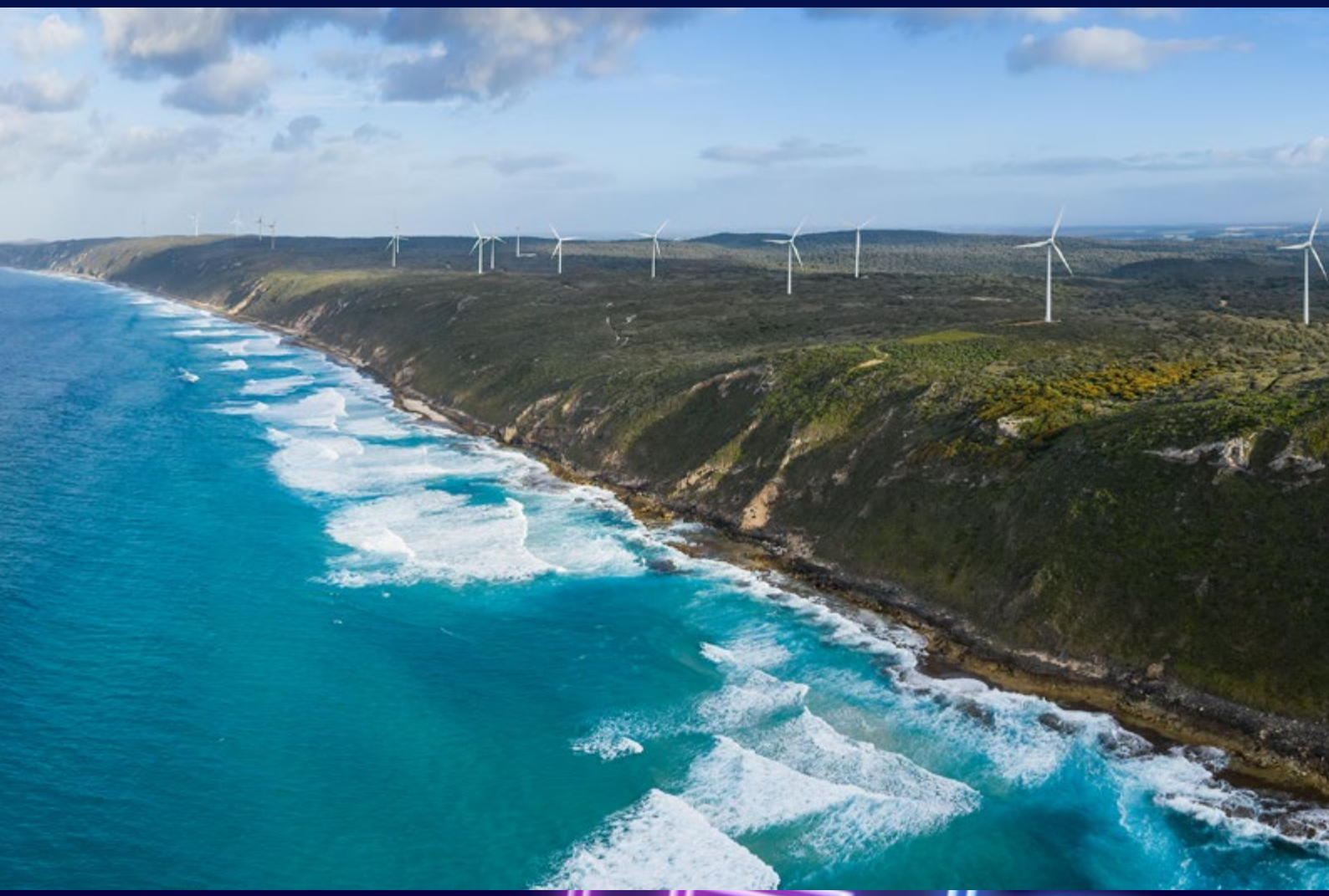
Department of
Jobs, Tourism, Science and Innovation

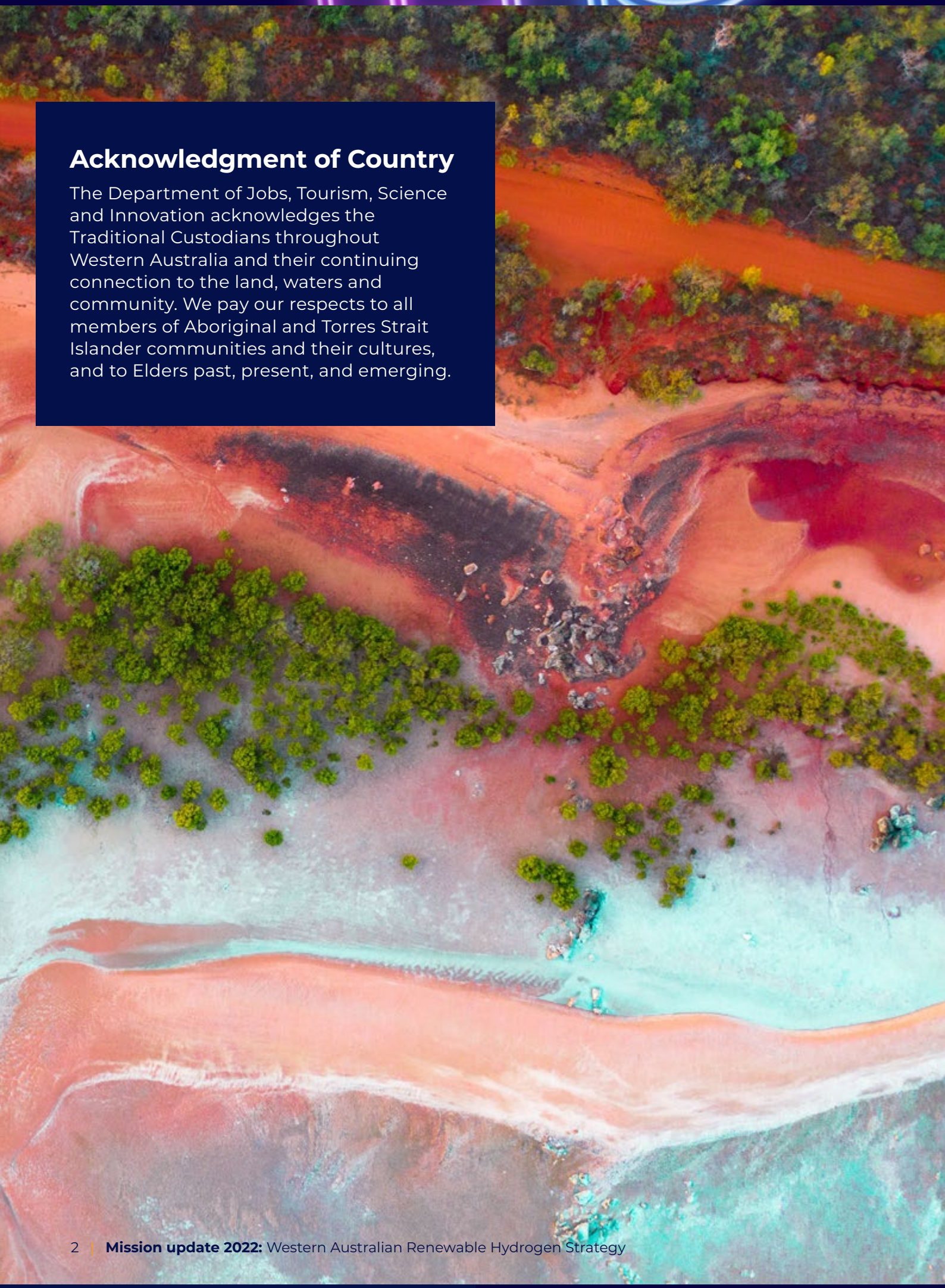
GOVERNMENT OF WESTERN AUSTRALIA

Mission update 2022

Western Australian Renewable Hydrogen Strategy

December 2022





Acknowledgment of Country

The Department of Jobs, Tourism, Science and Innovation acknowledges the Traditional Custodians throughout Western Australia and their continuing connection to the land, waters and community. We pay our respects to all members of Aboriginal and Torres Strait Islander communities and their cultures, and to Elders past, present, and emerging.

Minister's foreword

In less than four years, Western Australia has established itself as a global leader in the emerging renewable hydrogen industry.

This journey began in 2018 when we brought together major international industry players to help shape our understanding of the role we could play in developing a renewable hydrogen industry in Western Australia.

From there, in 2019 we developed the Western Australian Renewable Hydrogen Strategy and our investment stimulus package and in 2021 created the dedicated Hydrogen Industry portfolio.

We know that renewable hydrogen has a lead role to play in the energy transition to new technologies, especially the decarbonisation of heavy industry. WA could also become a major centre of green metal production.

The Western Australia Government has committed more than $162 million to growing the State's hydrogen industry. Through this investment, we have already achieved a number of key milestones that lay the groundwork for large scale development.

Western Australia is perfectly positioned to become a global producer and exporter of renewable hydrogen.

With a landmass of 2.5 million square kilometres, and an abundance of sun and wind, Western Australia is the ideal location for the renewable energy producing facilities required to produce hydrogen.

The State is home to a range of critical minerals and rare earths needed to manufacture electrolysers, wind turbines, electric vehicles and decarbonised products that service the renewable hydrogen supply chain.

Our infrastructure and workforce have a proven track record and are well positioned to meet the future demands of the growing renewable hydrogen industry.

We are proud to have reached goals outlined in our Renewable Hydrogen Strategy in the 2022. We have already begun taking important next steps for the future. This includes refreshing the strategy to ensure we continue to meet industry's expectations and establish the key enablers that will deliver tangible outcomes for Western Australians.

It has been my pleasure to serve as the inaugural Minister for Hydrogen Industry and I have no doubt that by 2030, Western Australia will be a significant producer, exporter and user of renewable hydrogen.

Hon Alannah MacTiernan MLC
Minister Assisting the Minister for State Development, Jobs & Trade

Western Australia's renewable hydrogen journey

July 2019
» Launch of the Western Australian Renewable Hydrogen Strategy, establishment of the $15 million Renewable Hydrogen Fund and creation of a dedicated Renewable Hydrogen Unit.

October 2019
» Hydrogen Liquefaction & Storage symposium hosted by UWA.

January 2020
» Round 1 of the Renewable Hydrogen fund launched.

November 2020
» Western Australia Renewable Hydrogen Roadmap released.

January 2021
» Round 2 of the Renewable Hydrogen fund launched.

March 2021
» Ministerial portfolio for hydrogen industry created.

May 2021
» Ground break on Australia's first remote renewable hydrogen micro-grid in Denham.

July 2021
» Western Australia joins the Smart Energy Council's Zero Carbon Certification Scheme as a founding partner.

»

September 2021
» Western Australia joins the Future Fuels Cooperative Research Council.

October 2021
» Launch of the $10 million Hydrogen Fuelled Transport Program.

November 2021
» Memorandum of Understanding signed with the Port of Rotterdam, a major hydrogen import hub for Europe.

April 2022
» The Australian Goverment agrees to match the State's funding for the Western Australian Goverment-led Pilbara Hydrogen Hub; $140 million total.

» Australian Goverment agrees to match industry funding for the industry led Kwinana Hydrogen Hub.

May 2022
» Western Australian Government mission to Germany and the Netherlands to discuss growing demand for clean energy, and participates in the World Hydrogen Summit in Rotterdam.

June 2022

» Western Australia's renewable hydrogen investment prospectus published.

July 2022

» Successful Traditional Owners forum held in Perth to support Aboriginal hydrogen stakeholders.

August 2022

» Hydrogen Industry Minister led trade mission to South Korea.

» Western Australian Government commits $10 million in match funding to Woodside Energy's Hydrogen Refueller@H2Perth project under the Hydrogen Fuelled Transport.

September 2022

» ENGIE and Yara Pilbara Fertiliser reach final investment decision for the Yuri Project and Mitsui joins as project partner.

October 2022

» Match funding of $225,000 for a business case for local electrolyser manufacturing in Western Australia with partners ITM Power and Linde Engineering.

» As part of the Mid West Hydrogen Hub, Oakajee Strategic Industrial Area (SIA) land is allocated to 6 renewable hydrogen developers.

» Funding announced of $5.5 million for new planning works and studies for the Mid West Hydrogen Hub, supporting the total $47.5 million State commitment for this hub.

November 2022

» Horizon Power Denham Micro-grid is operational.

December 2022

» ATCO commence blending of hydrogen up to 10% for 2,700 customers in their distribution network.

» ATCO Hydrogen Refueller is commissioned.

» Australian Hydrogen Conference (West) held in Perth.

2022 Strategic Focus Areas

We are proud to have reached the goals outlined in our Renewable Hydrogen Strategy in 2022 across the 4 strategic focus areas.

Export

2022 Goal

Approving a project to export renewable hydrogen from Western Australia

Remote applications

2022 Goal

Renewable hydrogen is being used in a remote location in Western Australia

Hydrogen blending in natural gas networks

2022 Goal

Renewable hydrogen is being distributed in a Western Australian gas network

Transport

2022 Goal

A refuelling facility for hydrogen vehicles is available in Western Australia

Goal delivered by 2022

The Yuri Renewable Hydrogen to Ammonia Project

In September 2022, project partners Yara and ENGIE announced they had completed the financial investment decision on the project. All project approvals have been received, with construction commencing in 2022 and completion planned for 2024.

It will deploy Australia's largest electrolyser (10 MW), powered by 18 MW of solar PV and supported by an 8 MW battery energy storage system. The hydrogen will be converted and exported through the hydrogen carrier, renewable ammonia, at Yara Pilbara Fertilisers' liquid ammonia plant in Karratha, Western Australia.

The ammonia plant is one of the largest in the world, representing 5% of the global traded market. As well as serving Australian demand the renewable ammonia will be exported to Korea, Indonesia and other South East Asian markets.

It received $2 million from WA's Renewable Hydrogen Fund and $4.75 million from ARENA.

Strategic Focus Area

Export

Approving a project to export renewable hydrogen from WA

The 2022 Export Goal is to have a project approved to export renewable hydrogen.

WA's export opportunities for hydrogen are substantial, with abundant solar and wind energy resources, pipeline and export infrastructure and proximity to demand markets in Asia.

In addition to achieving our 2022 Export Goal, we have laid foundations for a thriving export market to emerge, including:

- **Approving the Oakajee Strategic Industrial Area (SIA) land allocation,** subject to negotiation of terms, to six proponents: Blue Diamond Australia, BP, Copenhagen Infrastructure Partners (CIP), Fortescue Future Industries (FFI), Green LOHC and Kinara Power. These companies demonstrate the pipeline of export projects WA has as well as providing hydrogen for domestic use in manufacturing, transport and power.
- **Supporting a Future Energy Exports Cooperative Research Centre (Fenex CRC)** to investigate and prepare for hydrogen export value chains.
- **Supporting research into metal hydrides,** through the state's investment in Fenex CRC.
- **Assessing the green iron,** iron ore and steel export opportunity for WA through the Green Steel Challenge run by Mineral's Research Institute of Western Australia.

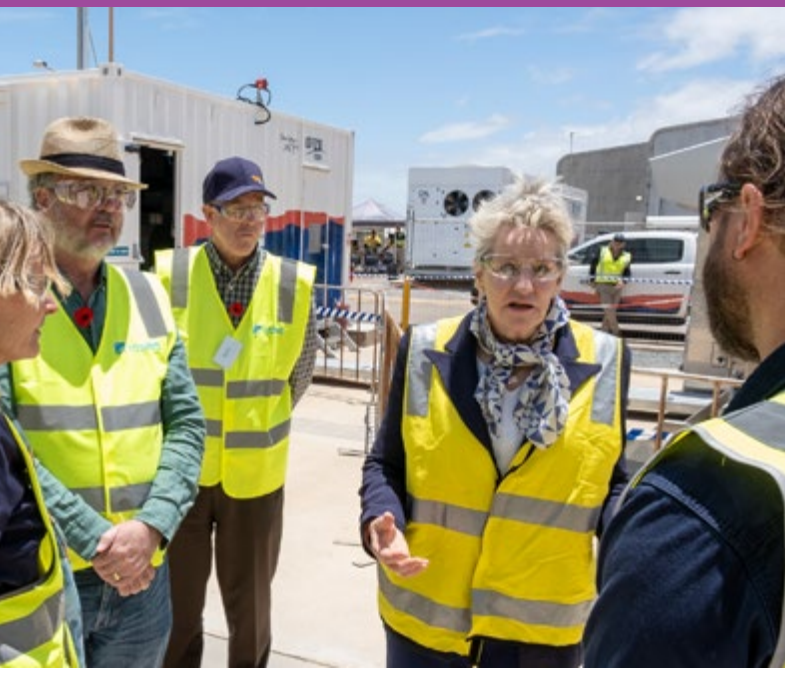
Goal delivered by 2022

Denham Hydrogen Demonstration Plant

Horizon Power, the Western Australian regional and remote power provider, is commissioning a renewable hydrogen demonstration plant in the small coastal town of Denham on the Shark Bay coastline, in regional Western Australia.

The project is integrating renewable hydrogen into a microgrid with solar and diesel to demonstrate the ability to provide firm capacity from renewable energy sources equivalent to the average load of 100 residential houses in regional Western Australia. It is a proof-of-concept trial which could be replicated in other regional communities.

The Western Australian Government has provided ongoing support to this initiative including a $1 million grant through the Renewable Hydrogen Fund. This project has also received $2.6 million from ARENA.



Strategic Focus Area

Remote applications

Renewable hydrogen is being used in a remote location in WA

Western Australia has a number of established remote communities. Utilising hydrogen in remote locations can provide energy independence, offer new skilled jobs, as well as reducing carbon emissions and air pollution which improves quality of life.

In addition to achieving our 2022 Goal for remote applications, we have laid foundations for a prosperous export market to emerge, including:

- **Horizon Power** is examining the feasibility of producing renewables-based hydrogen in the Esperance region of Western Australia to support regional decarbonisation.
- **The Western Australian Government Renewable Hydrogen Fund has awarded funding for the Hybrid PV –** Battery-Hydrogen System for microgrids project of Murdoch University. The study is investigating a renewable-based stand-alone microgrid with hybrid hydrogen-battery-based energy storage for an indigenous community in the Pilbara. If successful, this could be implemented on over 100 communities, displacing diesel and reducing greenhouse gas emissions.

Goal delivered by 2022

ATCO Clean Energy Innovation Hub

ATCO is injecting hydrogen blends into a portion of their natural gas distribution network. The areas of Calleya Estate, Treeby Estate and Glen Iris in the City of Cockburn, Perth will receive the lower carbon gas.

The project is the first of its kind in Western Australia and with 2,700 customers it is the largest hydrogen blending taking place in Australia.

The renewable hydrogen is produced via electrolysis at ATCO's Jandakot Operations Centre, where the Clean Energy Innovation Hub is located.

Strategic Focus Area

Hydrogen blending in natural gas networks

Renewable hydrogen is being distributed in a WA gas network

Western Australia has a vast gas reticulation network. Hydrogen blending into gas distribution and transmission networks in Western Australia supports decarbonisation and the State's transition to a sustainable, net zero economy.

In addition to achieving our 2022 Blending Goal, we are considering how hydrogen blending could support further market activation, including:

- **The Western Australian Government continues to work closely with AGIG,** to understand if the Dampier to Bunbury Natural Gas Pipeline can support hydrogen blending through a feasibility study.
- **A review is also underway through the National Gas Review,** the project is exploring how the application of relevant gas laws, could be amended to enable gas blending.

Strategic Focus Area

Transport

A refuelling facility for hydrogen vehicles is available in Western Australia

Due to Western Australia's expansive size, heavy vehicles are significantly utilised to manage supply chains. Fuel Cell Electric Vehicles offer a pathway for decarbonising WA's freight transport as well as buses and coaches. Use of hydrogen in this sector would replace diesel and achieve significant greenhouse gas emissions reductions.

The Western Australian Government continues to work closely with ATCO on the construction and operation of WA's first Hydrogen Refuelling Station in the south of Perth.

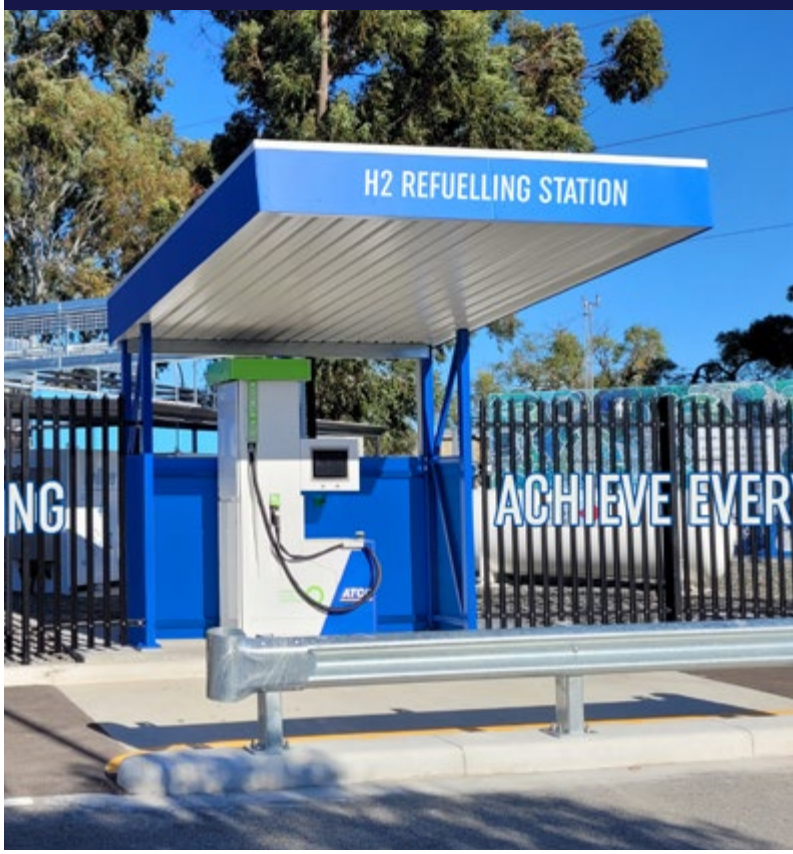
Goal delivered by 2022

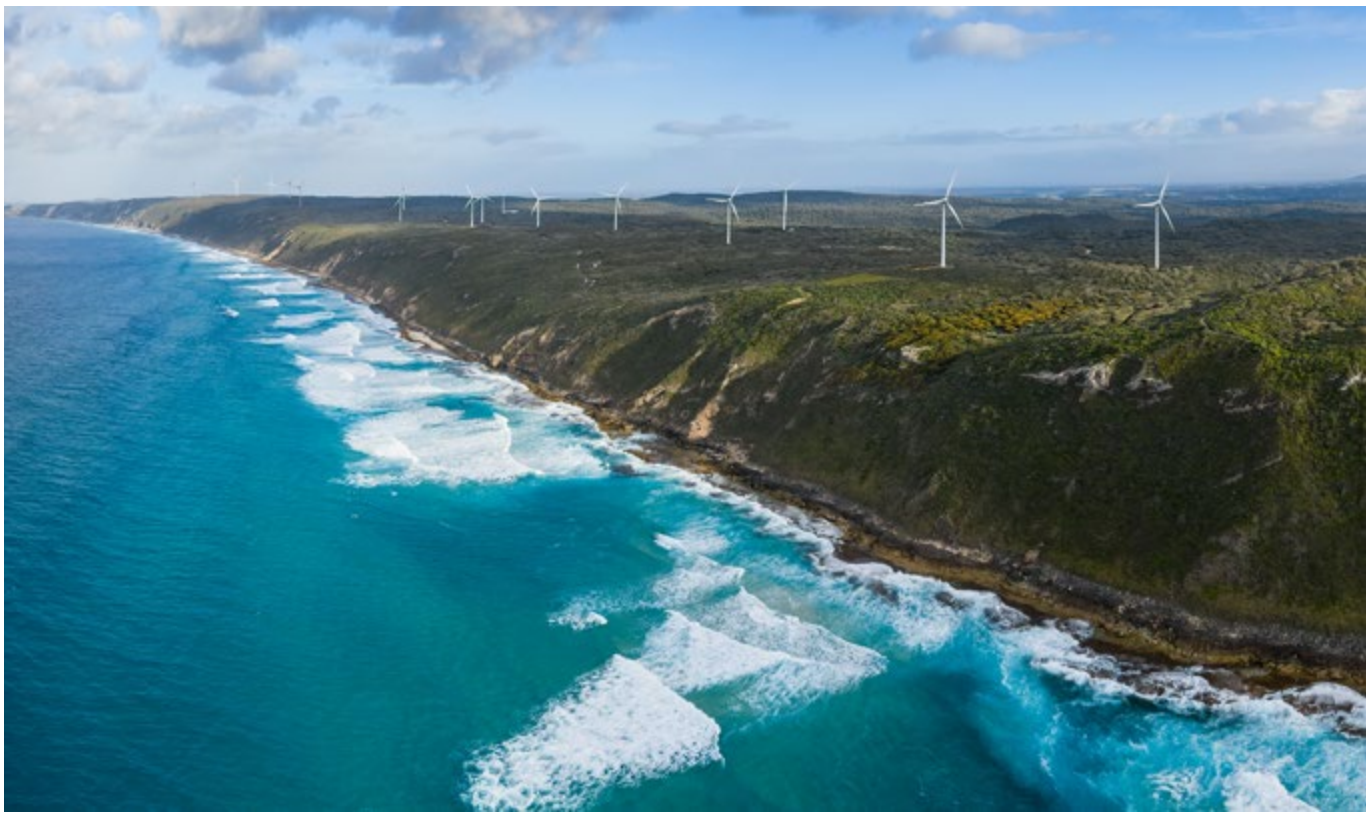
ATCO Hydrogen Refuelling Station

ATCO and Fortescue Future Industries recently collaborated on the construction and operation of WA's first Hydrogen Refuelling Station, located at ATCO's Jandakot Operations Centre, the Clean Energy Innovation Hub.

The refuelling station was awarded $1 million from the WA Government's Renewable Hydrogen Fund.

ATCO will use its existing electrolyser to produce the hydrogen to supply the refuelling station which will fuel up to 15 passenger vehicles.





2022 Goals

- Approving a project to export renewable hydrogen from Western Australia.
- Renewable hydrogen is being used in one remote location in Western Australia.
- Renewable hydrogen is distributed in a Western Australian gas network.
- A refuelling facility for hydrogen vehicles is available in Western Australia.

Learning for the future

» Planning, environment, water, energy government departments at State and National level understand what is required to see a project approved.

» The Western Australian Government will reduce barriers to entry to support more hydrogen projects.

» Learning from hydrogen microgrid in remote locations will be transferred to mining operations, with new use cases in mining vehicles, machinery, and mineral processing.

» Broader sector demand stimulation is required to support industry growth.

» A network of refuelling stations will develop first on major trunk routes to support road freight.

Looking towards 2030

Success in achieving our 2022 goals for hydrogen puts us on track for growth to 2030 and has laid the foundations for the transformation of the energy system and economy.

Through funding and support of demonstration and small scale projects, that reach across the hydrogen value chain, we have tested our readiness and identified where further action is required to support the hydrogen industry. Action will be needed over a broader range of end use sectors than the 4 Strategic Focus Areas.

Looking ahead to the end of the decade, we now also need to scale up to realise our potential.

With technological change over the last few years and market growth, we are ready to pivot our strategy to reflect Western Australia's renewable hydrogen role in a global context. Working with industry and communities, early next year we will embark on a Strategy Refresh to best position the state for the future.

2030 Goals

- Western Australia having market share in global hydrogen exports similar to its share in LNG.
- Renewable hydrogen is widely used in mining haulage vehicles.
- Demand stimulation measures which could include a broader renewable hydrogen target and certification scheme.
- Renewable hydrogen is a significant fuel source for transportation in regional Western Australia.

Investment and project support

The Western Australia Government will actively support industry efforts to accelerate the development of the industry to meet its goals, through:

- Access to a one-stop-shop for incoming trade and investment enquiries
- Identification and facilitation of access to industrial land
- Project approvals facilitation services to help you navigate our project approvals process efficiently and effectively
- Introductions across the supply chain
- Identification of relevant Western Australian and Australian Government funding opportunities when they become available

The Western Australian government has committed over $170 million to support the development of the renewable hydrogen industry in Western Australia, and is proud to have reached the goals outlined in our Renewable Hydrogen Strategy in the 2022.

In addition, the State has committed:

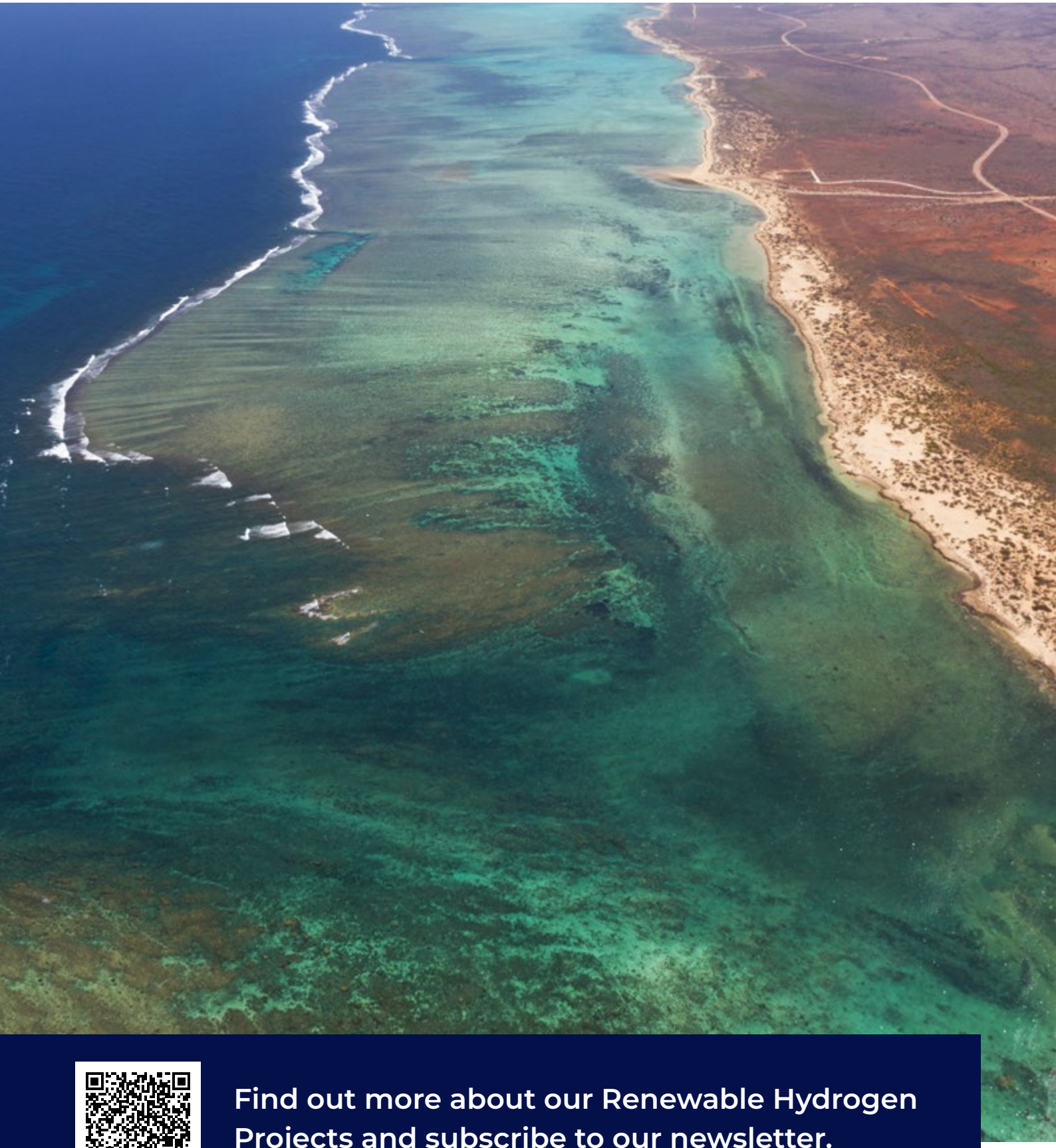
- $750 million to a Climate Action Fund which includes $206 million for renewable energy initiatives and $118 million for investment in future climate related initiatives
- $100 million for an Investment Attraction Fund
- $50 million to an Industrial Land Fund to help unlock strategic industrial sites.

A great place to work and live

Western Australia is a great place to live, work, do business and explore. We have an enviable climate, pristine coastline, unique wildlife, natural wonders, as well as globally significant biodiversity. Western Australia's capital city Perth consistently rates as one of the most liveable cities in the world.

Contact us

Please contact the Invest and Trade Western Australia team at **investandtrade.wa.gov.au**



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