SOUTH AUSTRALIA

Government of South Australia

South Australia

A global force in hydrogen

Hydrogen export prospectus

www.hydrogen.sa.gov.au

Foreword

Hon Steven Marshall MP
Premier of South Australia

Hon Dan van Holst Pellekaan MP
Minister for Energy and Mining,
Government of South Australia

Hon Stephen Patterson MP
Minister for Trade and Investment,
Government of South Australia

Shaping a future hydrogen market for South Australia.

The potential for growth in the global hydrogen market is exponential.

South Australia has already taken early steps to harness the potential of our renewable energy resources and more recently, to generate hydrogen for domestic use. Now the State is ready to make the most of the opportunities to expand hydrogen use domestically and for export markets.

The South Australian Government has been an early mover, including the award of more than A$15m in grants and A$25m in loans to three megawatt-scale hydrogen projects across the State.

The South Australian Hydrogen Export Study, Modelling Tool and Prospectus is the next major stride in identifying the market potential for locally produced hydrogen and how the Government can assist in accelerating the development of a South Australian hydrogen industry.

The South Australian Government has identified support mechanisms that can assist the industry to develop and overcome potential development barriers as the world seeks to decarbonise their industrial processes and transport fleets.

As South Australia emerges from the COVID-19 pandemic response, the emerging opportunities, such as hydrogen, provide a new area for growth that has the potential to create future jobs and attract new investment.

Overall, analysts forecast global demand for hydrogen to increase more than eight-fold by 2050, giving South Australia a short time to establish this emerging industry so it can seize a share of what will be a large but competitive market.

The evolution pathway for new hydrogen industries will require strategic thinking and analysis to ensure efficient and effective development. South Australia has played, and will continue to play, an active role in supporting its evolution through investment attraction, development approval processes and regulatory standards that keep pace with the speed of expansion.

The South Australian Government expects this Hydrogen Export Study, Modelling Tool and Prospectus to be a catalyst for international investment, as well as sending a strong signal to overseas markets of the seriousness of our commitment and intent.

There is no doubt that hydrogen production could be a transformative technology. It will challenge industries to rethink their current processing, trigger close examinations of our gas pipelines and ports, and inspire a different mindset on how we fuel our transport sector.

The development and growth of clean hydrogen for domestic and export can, through job creation and increasing investment, be implemented in line with South Australia's international reputation for a clean and green environmental and sustainable future. We have established a Hydrogen Regulatory Working Group (RWG) to deliver a world-class hydrogen regulation framework to ensure the industry develops in a safe, reliable manner.

South Australia has already initiated steps down this pathway through its support for blending green hydrogen into domestic gas networks, and studies into the commercial scale and required capacity to justify clean hydrogen production for export.

Our Electric Vehicle Action Plan encompasses a role for fuel cell vehicles that use hydrogen rather than batteries to power passenger vehicles and the infrastructure that is required to support that addition to the national fleet.

There are substantial advantages for a jurisdiction that moves early to target these economic opportunities. South Australia's abundant wind and solar resources have already attracted massive investment in renewable energy generation and storage.

The investment will assist with the South Australian Government's aspirations to cut emissions by more than 50% of 2005 levels by 2030, to achieve net zero emissions by 2050, as well as to achieve 100% net renewable electricity generation by the 2030s.

This investment has also put South Australia in a strong position to attract further technology and equity partnerships needed to transform its excess clean energy into hydrogen. Hydrogen production can also help to address security and stability issues within the local electricity grid by allowing storage of excess energy during periods of low demand.

Our thanks go to KPMG and WSP for their work in collaboration with the Department for Energy and Mining and the Department for Trade and Investment in developing South Australia's Hydrogen Export Study, Modelling Tool and Prospectus.

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South Australia's hydrogen export highlights

Investment destination focused on innovation

With a highly skilled workforce, cutting edge research and development, competitive labour costs and a superior lifestyle, South Australia provides for a compelling investment opportunity for potential investors.

The State has a rich history of advancing new energy technologies that has resulted in over 50% of the State's energy requirements being supported by clean renewable technologies.

A rising force in hydrogen

Over A$7 billion has been invested into South Australia's world leading renewable wind and solar resources. These resources are well-suited to large-scale green hydrogen production, while the State also has the necessary feedstocks for blue hydrogen.

Multiple investments in hydrogen projects have already been made with Australian Gas Infrastructure Group (AGIG), H2U and Neoen progressing domestic and export projects. Discover more at renewablessa.sa.gov.au.

At the leading edge of hydrogen export

South Australia has the capability to produce clean hydrogen at rates competitive with the lowest global estimates as a result of the world-class resources and their proximity to suitable port locations.

Four optimised supply chain configurations have been identified as favourable routes to market following a detailed assessment of South Australia's resources.

World class government guidance and support

South Australia has seen bipartisan support for the hydrogen industry and has established a Hydrogen Regulatory Working Group (RWG) to deliver a leading hydrogen regulation framework to enable South Australia's safe hydrogen economy.

South Australia has a dedicated case management team that will provide information and help industry to navigate through approvals and identify avenues for State and Commonwealth support.

Explore further...

South Australia has developed a hydrogen export modelling tool to provide insight into potential Free On Board (FOB) cost outcomes of hydrogen produced and exported from South Australia. The tool harnesses the outcomes of a detailed pre-feasibility study to enable users to create specific supply chain configurations. Visit the tool at hydrogenexport.sa.gov.au.

Supported by local industry leaders

"Our HyP SA project will be an Australian first to eventually deliver renewable hydrogen made from water, sunshine and wind, to homes and businesses through our existing gas network. It underlines South Australia's status as a leader in this emerging industry with real potential to deliver jobs and growth for residential, commercial, industrial and export applications."

Ben Wilson
Chief Executive Officer
Australian Gas Networks

"A hydrogen industry for South Australia is incredibly exciting for us and for the state. South Australia has a global competitive advantage as a hydrogen export hub with vast natural gas and solar resources, the lowest-cost carbon capture and storage project in the world at Moomba and excellent port infrastructure at Port Bonython. Natural gas combined with carbon capture and storage is the fastest, lowest-cost pathway to develop a zero-emissions hydrogen industry as solar-generated hydrogen evolves as technology costs are lowered. Hydrogen demand is expected to grow across Asia with the same customers who are already buying Santos LNG, so South Australia is in the box seat to lead the world in developing a hydrogen industry."

Kevin Gallagher
Managing Director and Chief Executive
Santos

"South Australia is making strides in the global hydrogen industry. The export study and infrastructure modelling tool are a great resource to attract investors to lead hydrogen exports from Australia. We are pleased to collaborate with the South Australian Government in advancing their vision to become a fully integrated hydrogen economy."

Attilio Pigneri
Chief Executive Officer
H2U

"Neoen is developing large-scale hybrid renewable energy projects in South Australia due to the State's world-class wind and solar resources and supportive policy environment. Because of SA's unique position, these 100% renewable energy projects will be able to provide 24-hour firm power and we believe this could be an important next step for the production of low-cost, clean hydrogen for both domestic and export applications."

Garth Heron
Head of Development
Neoen Australia

South Australia: The hydrogen investment destination

South Australian overview

South Australia – an investment destination and clean energy powerhouse.

South Australia is the southern central state of mainland Australia. It has a total land area of 983,482 square kilometres (13% of Australia). It shares borders with all other mainland states and territories. Its landscape varies from rugged outback wilderness and desert, to scenic mountain ranges and a coastline that stretches more than 3,700 kilometres.

The State has a population of more than 1.75 million people, 77% of whom live in the capital city of Adelaide and surrounding metropolitan areas. South Australia's rural regions are an integral part of its community and economy, offering diverse work and lifestyle opportunities.

South Australia's capital city, Adelaide, consistently ranks as one of the world's most desirable cities to live. It is a clean, green city, and a national leader for renewable energy uptake.

The commercial centre has advanced manufacturing, technology and research bases. Many of the world's leading companies are represented, including those involved in defence, resources and technology. South Australia also has a large agricultural industry and is a major wine producer (Adelaide is internationally renowned as one of the world's wine capital cities). Health, creative and service industries are also important to the economy, together with education with thousands of international students studying at the city's secondary schools and acclaimed universities every year.

South Australia is committed to growth…

The South Australian Government's role is to foster sector-wide growth by establishing and maintaining a competitive business environment. The State Government has held deep discussions with industry to identify areas of growth and how government can assist in unlocking and accelerating business expansion and job creation.

There has never been a better time to do business in South Australia.

South Australia offers a highly competitive, low-tax environment that promotes economic development and supports investment.

With a highly skilled workforce, cutting edge research and development, competitive labour costs and a superior lifestyle, South Australia provides rich investment opportunity. This is coupled with significant global trade channels, particularly to Asia.

South Australia has also managed its response to COVID-19 to minimise the challenges and disruptions to its health and economy. The South Australian Government now stands ready to advance and accelerate its economic recovery and sees hydrogen as a key opportunity.

In 2019, Adelaide was ranked the most cost competitive city in Australia, in Mercer's 25th Annual Cost of Living Survey.

South Australia Exports, 2018-19 (AUD)

Top 5 Exports

- Copper (incl. ores and concentrates) ($2.50 billion)
- Alcoholic beverages ($2.0 billion)
- Education-related travel ($1.9 billion)
- Personal travel (excluding education) services ($804 million)
- Meat (excl beef) ($734 million)
- Other ($2.6 billion)

South Australia Imports, 2018-19 (AUD)

Top 5 Imports

- Personal travel (excluding education ($2.1 billion)
- Refined petroleum ($1.3 billion)
- Passenger motor vehicles ($921 million)
- Goods vehicles ($516 million)
- Freight transport ($408 million)
- Other ($1.7 billion)

Source: Source: Department of Foreign Affairs and Trade, "Australia's trade by state and territory 2018-19

Key reasons to do business in South Australia

1. South Australia is one of Australia's top resources investment destinations
2. Over 50% of the State's energy requirements are already provided by clean, renewable energy sources
3. It's home to one of the world's leading agriculture industries with acclaimed premium food and wine exports
4. It has a strong and advanced manufacturing base
5. It's at the centre of Australia's high technology naval shipbuilding industry and the build location for the A$50 billion Future Submarines Program
6. With a world-class education system, SA is a leader in research and development, offering a highly skilled workforce

South Australia has been successful in attracting and growing major global companies in key sectors, drawn by its competitive positioning.

For further information on the South Australian advantage and to view other innovative projects being undertaken in the State, visit invest.sa.gov.au.

Competitive business environment

South Australia offers a range of cost advantages that no other state in Australia can match, with potential to improve your company's bottom line. Private sector labour costs in South Australia are 8.5% below the Australian average as a result of investment favourable tax policies and drivers. Further, the Adelaide market continues to be one of the most cost-competitive city centre markets nationally when considering costs associated with setting up business and leasing office space.

An enviable lifestyle

Our capital city, Adelaide, was ranked in the top 10 most liveable cities in the world in 2019, and in the top five must-see regions by Lonely Planet in 2017. South Australia's high quality of life and low cost of living combines to create high employee retention rates for businesses, providing business stability, continuity and bottom line benefit by minimising staff turnover and re-training costs.

Favourable energy generation policies

South Australia is the national leader in renewable energy with over 50% of the State's electricity provided by renewable assets, with a policy intent to enable this to reach 100% by 2030. Further, a new inter-state electricity grid interconnection is planned to be built in the coming years which will include storage technologies. This will provide significant capability for future hydrogen opportunities to be developed.

Culture of innovation

South Australia is home to numerous, specialised, world-class research and innovation districts. These include the Tonsley innovation district, Techport naval industry hub, the South Australian Health and Medical Research Institute (SAHMRI), the Lot Fourteen innovation precinct and the Waite agricultural research precinct; all of which create high performance, collaborative environments.

Skilled and educated workforce

South Australia prides itself on being the nation's Knowledge State. With two of the world's Top 100 universities, South Australia produces an extensive range of graduates per year, ready to enhance your workforce. South Australia has approximately 102,000 students enrolled in university courses.

Gross State Product

SOUTH AUSTRALIA

GSP per capita (2018-19) **$61,965**

Forecast GSP annual growth rate **3%**

Source: ABS Catalogue number 5220.0 - Australian National Accounts: State Accounts, 2018-19; Growth State, https://www.growthstate.sa.gov.au/vision

Population and households (December 2019)

GREATER ADELAIDE	SOUTH AUSTRALIA	AUSTRALIA
Population **1.36 million**	Population **1.76 million**	Population **25.52 million**

Source: Population, Plan SA, https://plan.sa.gov.au/state_snapshot/population, ABS Catalogue number 3101.0 Australian Demographic Statistics, Dec 2019

The Australian advantage

Australia is one of the safest, low-risk environments for business and investment globally, and has never been more attractive. With one of the most transparent and well-regulated business environments in the world, Australia has political stability and a regulatory framework that provides investors with confidence that their investment will remain secure.

This has been particularly demonstrated over recent months in light of the COVID-19 challenges faced globally. Australia has performed exceedingly well in the face of the economic contractions experienced globally and its economy has rebounded quicker than those of most other developed countries.

A State supporting innovation

South Australia is transforming into a Growth State.

The South Australian Government is determined to foster investment by maintaining a competitive business environment and by proactively targeting key growth sectors. Working with industry, the Government identified nine priority sectors with strong potential to meet increasing interstate and global demand, attract investors and leverage South Australia's comparative advantages.

These sectors include:

- **Energy and Mining**
- **Defence**
- **Space**
- **Hi-Tech**
- **Food Wine and Agribusiness**
- **International Education**
- **Tourism**
- **Health and Medical industries**
- **Creative Industries**

Select industries that will support and underpin development in South Australia have been highlighted to the right, demonstrating the Government's positioning as a national and global leader in innovative and future focused industries.

[1] Repowering South Australia, https://d68ej2dhhub09.cloudfront.net/2401- SC_Repowering_South_Australia_v03_Full_Report_(1).pdf

Energy and Mining

Blessed with rich, natural assets, South Australia has provided high quality minerals and energy resources to the world for more than 150 years.

South Australia has world-class, natural resources that are increasingly attracting investment into large-scale renewable energy generation. In the last 20 years, South Australia's renewable generation has grown to more than 50% of its energy requirements. Additionally, South Australia has access to Australia's largest onshore oil and gas province, the Cooper Basin. The State also has a diverse and resilient mining sector headlined by significant deposits of copper, gold, iron ore, uranium, graphite and mineral sands. South Australia is home to one of the world's biggest copper, gold and uranium mines, Olympic Dam, and one of Australia's most significant copper-gold mines at Prominent Hill.

These vast, natural resource assets are underpinned by a supportive State Government, a highly skilled workforce and a respected regulatory framework creating an environment for low-risk, sustainable investment.

South Australia has:

- 23% of the world's and 80% of Australia's uranium resources
- Key policy settings enabling investment in low carbon energy generation and electricity production by renewable energy sources
- 37% of Australia's total installed wind capacity
- A globally regarded, robust and effective, regulatory framework for oil and gas resources

The State's energy strategy also targets hydrogen export as a key growth initiative to complement South Australia's already advanced clean energy transition strategy.

Defence

Over the next 20 years, South Australia will be home to the largest share of Australia's total in-country defence material spend. Adelaide hosts the headquarters for most of the nation's defence manufacturing capability and technology research, development and investment.

South Australia is home to A$90 billion worth of Australian defence projects including the A$50 billion Future Submarine program and the A$35 billion Future Frigates program. The Future Submarines program is Australia's largest defence investment and one of the world's single largest military contracts. French company Naval Group is delivering the program which will drive vast activity across defence and associated industries, particularly advanced manufacturing, technology and innovation sectors.

The Australian Government's A$230 million Centre for Defence Industry Capability is headquartered in Adelaide and joins up the innovation and expertise of the Australian defence industry. Further, South Australia hosts significant operations of several major defence companies such as Lockheed Martin, BAE and ASC (Australian Submarine Corporation).

Hydrogen has the ability to play a large role in the future of defence by providing fuel to offset the industry's reliance on current fuel sources and provide greater energy certainty to defence forces. The United States for example, is currently trialling hydrogen-fuelled vehicles within their army.

Space

South Australia is Australia's Space State and has a rapidly growing space innovation ecosystem that will become the nation's hub for future space industry development.

Already home to over 80 space-related organisations, South Australia is committed to developing strategies to grow the local industry and to increase research and development collaboration as well as international engagement.

Supported by the Australian Federal Government, the country's first national space agency was launched at Lot Fourteen, South Australia's innovation precinct in 2020. Australia has a target to grow the space agency to create 20,000 new jobs by 2030. The growth of space, and the Federal Government's desire to claim a substantial share of the A$1 trillion space industry market by 2040, places South Australia in prime position to reap substantial benefits.

Similar to hydrogen's future application for defence industries, hydrogen has a key role to play in the continued exploration of space. South Australia will be at the forefront of this development as a leader in both key sectors.

Lot Fourteen

Sitting at the forefront of technology, bold ideas, new ventures and creative thinking, Lot Fourteen is being developed by the South Australian Government into a global innovation neighbourhood of entrepreneurship, research collaboration and cultural activity.

Lot Fourteen, situated on a prime 7-hectare site in the heart of Adelaide, brings together South Australia's leading abilities in space, defence, hi-tech and entrepreneurship in one place and leverages these skills by creating a collaborative ecosystem for future industries and careers to thrive.

Lot Fourteen has already attracted innovative businesses and significant organisations in target sectors to South Australia. More than 6,000 people will ultimately work in the precinct, plus 1,000 students and researchers, exploring solutions to tomorrow's problems.

The Federal Government is providing funding for the development of this site that will culminate in the convergence of multiple, future-oriented industries in the State.

South Australia's clean energy transformation

South Australia is well advanced in its renewable energy transformation, and is now ready to enable other countries to do the same.

South Australia has over 50% renewable energy as part of its total electricity generation mix. By 2030, the State aims to achieve net 100% renewable electricity generation, exporting large volumes of clean energy to other Australian states.

Harnessing excess green energy in electrolyser solutions has the potential to create a green hydrogen industry within the State in the near future. In addition, the State's available natural gas reserves provide a route to hydrogen production via traditional methods such as Steam Methane Reforming (SMR) with Carbon Capture and Storage (CCS).

Timeline Key: South Australia's competitive advantages

- Excellent clean hydrogen resources
- Leader in renewables
- Track record of investment
- World class guidance and support

2000 2016

2000-2007
South Australia is a net importer of electricity and reliant on coal

2008
Introduction of first-of-its kind in Australia rooftop PV feed-in-tariffs

2014
South Australia achieves 100% renewable energy for full working day

2015
Highest per capita rooftop PV installations

2016
Closure of Northern power station – exit of coal production in South Australia

2017 2018

March 2017
South Australia announces $150m Renewable Technology Fund

July 2017
Introduction of fast frequency response or inertia technical requirements for generators

September 2017
Hydrogen Roadmap for South Australia released. World's largest (100MW) lithium battery (Hornsdale Power Reserve) operational

February 2018
More than $15m in grants and $25m in loans committed by the South Australian Government supporting hydrogen projects

March 2018
South Australia announces additional $180m investment in clean energy storage and demand management.

August 2018
CSIRO National Hydrogen Roadmap released

November 2018
Hydrogen research and development in South Australia report released

2019 2020

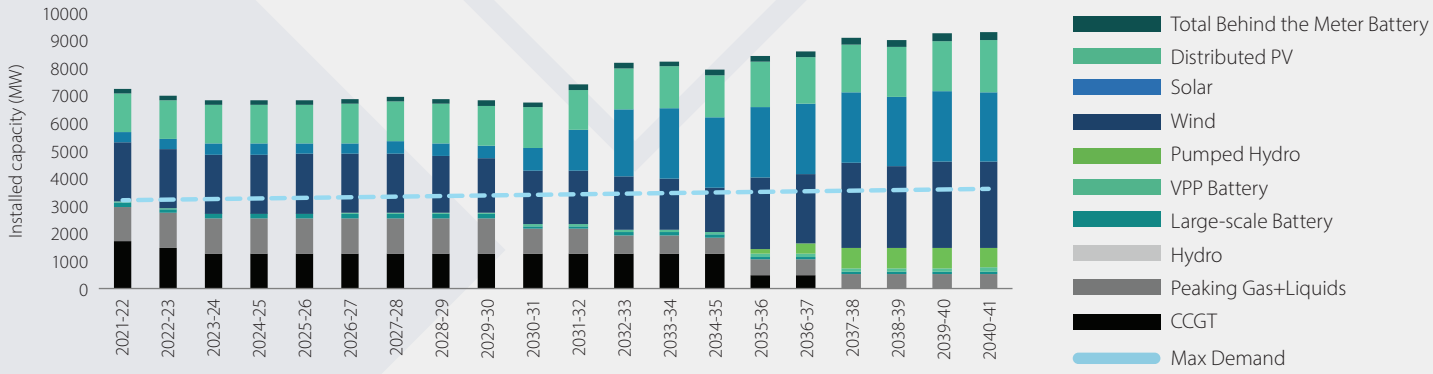
January 2019
South Australia reaches 52% renewable generation

July 2019
South Australia joins Green Ammonia Consortium

September 2019
South Australian Hydrogen Action Plan released

November 2019
National Hydrogen Strategy announced $70 million in ARENA funding announced

Predicted installed capacity and demand for SA 2020-2040



*Capacity and demand estimates are based on AEMO's Central scenario as of 2020

January 2020
Signs a statement of intent with RCAST, University of Tokyo

July 2020
Australia adopts eight international hydrogen standards

September 2020
Hornsdale battery expanded to 150MW SA-NSW Interconnector received federal backing
Hydrogen Park SA commissioned

October 2020
South Australian Hydrogen Export pre-feasibility study concluded

2020-2025
First hydrogen projects come online and start providing clean hydrogen to domestic and international markets.
Development and expansion of the renewable and supporting resources to enable the net 100% renewable electricity before 2030.
Expansion of hydrogen infrastructure in the state.

2025-2030
South Australia achieves the goal of net 100% renewable generation.
South Australia is a world leader in clean hydrogen infrastructure, achieving an FOB of <$5 /kg H_2.
Hydrogen export supply chains are fully established with the required supporting infrastructure to enable export.

2025

2030

2050

Vision of 2050

South Australia is a world leading, clean hydrogen producing region with an integrated hydrogen supply chain exporting internationally and supporting the domestic hydrogen applications.

This leverages the excellent wind and solar resources and favourable port locations to support multi-product, multi-terminal hydrogen export.

South Australia is recognised as a leader and pioneer in hydrogen regulation, safety and development.

The hydrogen export opportunity

The growing demand for hydrogen

The global demand for hydrogen has been forecast to increase to about 650 Mt by 2050, creating a global export market of A$300 billion per year.

Hydrogen creates an opportunity to rethink approaches to energy use and storage. For South Australia, this allows the continuation of the energy transformation from fossil fuels to renewable energy. In addition, with demand from existing uses estimated to grow by ~15% by 2050 and new and emerging industries potentially increasing global demand to ~650 Mt by 2050, South Australia sees the potential to establish itself as a global supplier of clean hydrogen.

Clean hydrogen is either produced using electrolysis with renewable electricity, or, traditional fossil fuels with Carbon Capture and Storage. South Australia seeks to leverage the strong renewable industry and energy export expertise to support other nations in transitioning to a hydrogen supported economy.

South Australia understands the increasing global interest in hydrogen applications, from transitioning existing industries, enabling the emergence of new ones as well as providing increased energy security. South Australia has invested in clean energy historically to ensure the State is positioned to capture this market and is actively promoting the potential and competitive advantages of exporting hydrogen from South Australia with the aim of seeking investors to join the State on this journey.

New technologies will enable hydrogen to replace traditional carbon-based fuels, and South Australia is consciously planning to be at the forefront of the industry.

Uses of hydrogen

ESTABLISHED

Hydrogen is already heavily relied upon as a feedstock and production input across agricultural and industrial industries. Clean hydrogen provides a route to decarbonise through their existing processes.

Industry: Industries such as steel, mining and chemical industries already use hydrogen. This industry is expected to continue to grow and require hydrogen.

Agriculture: Ammonia is traded globally to support the growing demand for food. Clean hydrogen can be used to enable low carbon fertilizers and support emission reductions and resource efficiency in one of Australia's most crucial sectors.

EMERGING

A number of emerging uses of hydrogen will help to decarbonise sectors such as domestic heating, transport and power generation.

Pipeline gas / Heating: Hydrogen is expected to play a key role in decarbonising the gas network and heavy industry. Existing infrastructure may be leveraged to implement blended hydrogen – natural gas solutions for domestic end-use appliances.

Power to gas: Hydrogen, in either a gaseous or ammonia form, can be converted back to electricity through use of either a fuel cell or combustion in turbines. Surplus hydrogen can be stored as a clean energy carrier and produce electricity as required.

Clean industry: Clean hydrogen provides a pathway to the development of clean industry and products, such as green steel and other clean manufacturing.

Transport vehicles: Emerging Hydrogen Fuel Cell Vehicle technology can be utilised across the transport sector. Applications could include private and public transport, heavy industry, freight, shipping and air transport.

South Australia: A rising force in hydrogen

South Australia is primed to be a world leading clean hydrogen export market.

South Australia has the highest renewable energy grid mix in the country, a history of investment in clean energy and strong government support with a leading regulatory framework. This positions South Australia as a major player in the hydrogen market.

Geographic advantages supporting excellent clean hydrogen resources

South Australia is almost 1 million square kilometres, with an extensive coastline providing a route to desalinated water, expansive areas to harness the world-class wind and solar resources that support green and blue hydrogen development.

Solar irradiation levels have been recorded at >23.5 MJ/m^2 with wind capacity factors in excess of 45%. In addition, there is also significant gas reserves enabling opportunities for blue hydrogen.

Driving a hydrogen export industry

South Australia has commissioned a bottom-up supply chain study which demonstrates its capability to produce clean hydrogen at rates competitive with the lowest global estimates.

Four optimised supply chain configurations have been identified and presented in this document as favourable routes to market, following the detailed assessment of South Australia's resources.

Prime port facilities and coastline to support export

South Australia has existing ports and greenfield opportunities that, with development, are suitable to support export growth. A number of existing or greenfield sites are located in nearby proximity (<75km) to high quality renewable energy resources and have the necessary coastline to support indicative hydrogen vessels.

Track record of investment in hydrogen industry development

More than A$15m in grants and A$25m in loans has been invested by the South Australian Government in hydrogen projects to advance the industry. Multiple investments in hydrogen projects have already been made with AGIG, H2U and Neoen progressing domestic and export projects.

Proximity to end use markets with established trade routes

South Australia can deliver clean hydrogen to our trading partners to meet their ambitious plans. Trade offices are established across the globe in Japan, Korea, North East Asia, as well as the United States, China and Europe. These offices provide platforms to promote SA's hydrogen capabilities to international markets and facilitate trade and investment partnerships.

World class government guidance and support

South Australia has a clear policy mandate and efficient regulatory regime with the aim of attracting a substantial share of the A$1.7 billion and 2,800 jobs that ARENA has estimated hydrogen exports could contribute to the Australian economy.

In addition there is a dedicated case management team that will provide information and help investors to navigate through approvals and identify avenues for State and Commonwealth support to further develop the industry in South Australia.

Ideally positioned to produce clean hydrogen

Geographic advantages supporting excellent clean hydrogen resources

South Australia has expansive areas to harness the world-class wind and solar resources. There is an estimated 55GW of potential developable onshore wind resources at indicative capacity factors in excess of 45%.

In addition, the irradiance levels across the State exceed 23.5 MJ/m² comparable to Southern Europe and the Middle East with estimated capacity factors ranging from 25 – 32%.

Alongside the renewable potential of the State, South Australia also has significant gas reserves, with an estimated capacity of 300TJ/day, with high quality Carbon Capture Storage (CCS) opportunities in the Cooper and Otway Basins.

South Australia's expansive coastline provides access to potential desalination options, estimated at ≈$0.05 /kgH2.

These resources allow South Australia to support the development of clean hydrogen and be a world leader in global hydrogen exports.

Optimal location for:

- Wind and/or solar farm
  Predicted wind speed above 7.3 m/sec and DNI greater than 23.5 MJ/m²
- Wind and/or solar farm
  Predicted wind speed above 7.2 m/s
- Wind farm
  Predicted wind speed above 7.3 m/sec
- Solar farm
  DNI greater than 23.5 MJ/m²
- Solar farm
  DNI greater than 20.5 MJ/m²
- Blue hydrogen production
  Available gas/coal reserves

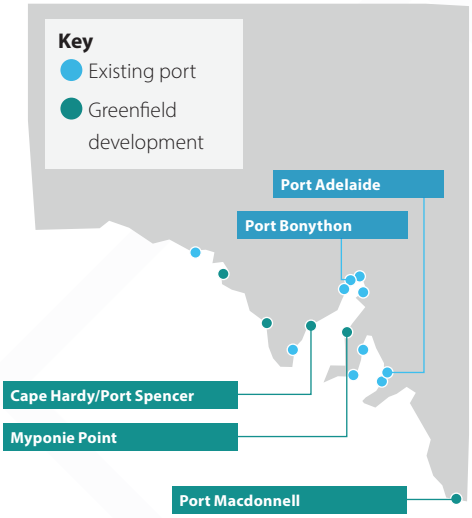
Primed for export

Prime port facilities and coastline to support export

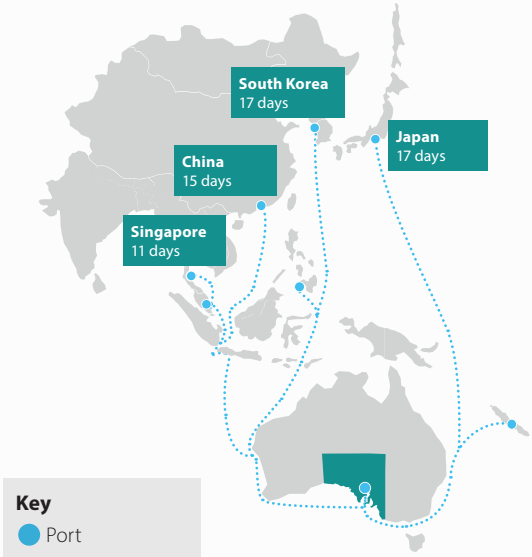
South Australia has multiple potentially favourable export sites. This includes existing ports with the potential for expansion, as well as greenfield developments. 15 ports were assessed through a two stage multicriteria analysis. Five ports have been identified as having excellent potential for the development of a hydrogen export hub. These locations have sufficient developable onshore land, suitable bathymetry and offshore development considerations (marine parks, sanctuaries etc.) and good access to the necessary infrastructure (transmission, water, renewable energy zones, gas networks) to support large scale export.

With the appropriate level of investment, there is the opportunity to establish multiple deep-water export terminals on the south coast of South Australia. Three of the five are presented as illustrative case studies, whilst Myponie Point and Port Macdonnell also provide alternative development sites. All sites provide an export opportunity for hydrogen and are available to explore in the online tool.

Identified favourable port locations



Proximity to end use markets with established trade routes



It is expected that by 2040, approximately 70% of total global demand for hydrogen will be from Asia and Europe. Japan, South Korea, China and Singapore have all articulated clear hydrogen intentions and requirements.

South Australia is well positioned to supply these markets due to favourable shipping times and existing trade relationships, supporting them in their decarbonisation and clean hydrogen goals.

In addition, European countries are assessing the role of hydrogen in their energy future. Whilst shipping times are longer, around 36 days, the low cost of hydrogen from South Australia may provide a competitive advantage over local supplies and create an opportunity for export to Europe.

Leading export supply chain potential

Driving a hydrogen export industry

As part of South Australia's ambition to be a leading hydrogen export market, the South Australian Government has commissioned a detailed pre-feasibility study of large-scale clean hydrogen production in South Australia to identify the full extent of the State's potential.

The study examined the supply chain infrastructure required to support hydrogen exports from renewable or gas resources. This includes the cost of hydrogen production (via electrolysis or steam methane reformation (SMR)), transport, conversion and storage costs, as well as costs to establish an export terminal and loading onto a vessel within the State. The study analysed South Australia's energy sources and required downstream investment for the State's most prospective regions and potential export port locations. A large number of potential combinations and scenarios have been analysed as part of this study to determine the supply chain configurations and locations which generate the most favourable FOB cost of hydrogen from South Australia for export. This considered the quality of the resource, investment in production, distance from port and associated transportation cost, analysing both product transport and electrical transmission to port for green hydrogen scenarios, and the necessary investment into processing and infrastructure upgrades at the port location.

To date, global estimates of hydrogen export potential have primarily focused on production costs, including the Australian Government's H2 under $2/kg long-term target, with production being the first step in the hydrogen supply chain, excluding any downstream processing or transportation costs. The outcomes of the study indicate that this target may be achievable in South Australia via blue hydrogen, with green hydrogen costs within reach of this target.

The key components of the hydrogen supply chain can be split into production, transport, downstream processing and the export terminal. The analysis has been undertaken for a target first export of hydrogen by 2030, with all cost data provided in 2020 Australian Dollars.

The maturity of the technology varies between the elements of the supply chain and presents a different risk profile to investors across the supply chain. Each element of the supply chain has been modelled separately with associated forecast capital reductions, to approximate the forecast improvement of cost and operating efficiencies to the target of first export in 2030.

Accelerated deployment will continue to drive down the costs of these technologies and, in a competitive sense, these reductions are largely independent of location or jurisdiction.

The study benefits from the current, record low, interest rate environment, reducing cost of capital assumed applicable to the development of the supply chain, varying between a pre-tax nominal weighted average cost of capital (WACC) of 5.8% for the renewable build and 8.95% average across the remaining elements of the supply chain, assuming that the production would be largely contracted. This is indicative only, and potential investors have the ability to set their rate of return requirements in the online modelling tool. The capital costs presented are for the range of configuration outcomes and export volumes, ranging from 30,000 to 250,000 tpa. Other opportunities to commence smaller scale developments at lower total capital costs may also be available.

Due to the current immaturity of the industry and breadth of the study, there are limitations to the overall accuracy of the cost estimates. The accuracy of estimates (both capital and operating) varies across the supply chain. The overall level of accuracy on FOB cost is estimated to be in the order of +/- 40% due to uncertainties in emerging technology capital and operating costs, and the variable nature of gas commodity price inputs.

Domestic market development can help to reduce export costs

The South Australian Government is looking to support a holistic approach to the commercialisation of hydrogen export from the State. AGIG has taken a lead on domestic gas network application, and there are a number of heavy industry applications (such as steel and fertilizers) and other domestic applications that are in suitable proximity to export terminals to allow multiple off-takers and revenues. The South Australian government is looking to assist proponents and export off-takers to help broker third-party off-take relationships.

Thus, through time, export prices could further decline if technology deployment accelerates beyond the assumptions used in the study.

South Australia has the potential to be globally competitive

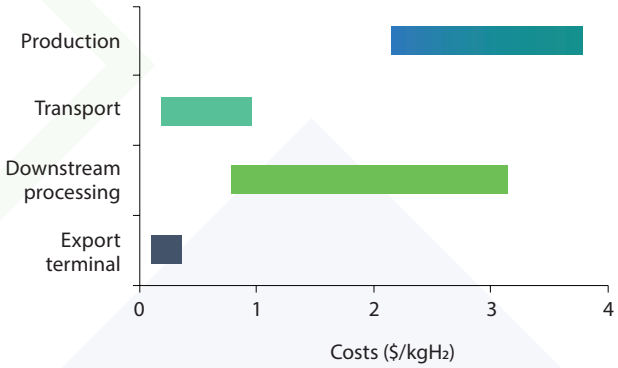
Production: refers to all costs associated with the production of hydrogen.
Green: this includes either the development of dedicated wind and solar renewable energy hubs or electricity supply via Power Purchase Agreement (PPA) and electrolyser costs.
Blue: comprises of gas as a feed-stock, required capital and operational costs of the SMR plant and CCS costs.

Transport: includes cost of electricity transmission for green scenarios, either a private transmission infrastructure or Transmission Use of System (TUoS) charges or the transport of hydrogen or hydrogen products for blue hydrogen configurations.

Downstream process: includes the conversion to hydrogen products e.g. ammonia, liquid hydrogen or liquid organic hydrogen carriers.

Export terminal: includes the costs to develop and operate the port infrastructure to enable loading of the relevant hydrogen product onto a vessel.

Outcomes of supply chain configurations (AUD$/kgH₂)*



The outcomes of the study indicate a range of potential cost estimates depending on the specific configuration:

- **Production:** blue hydrogen represents the low end of production estimates, with green production at the upper bound.
- **Transport:** costs are relatively low due to the proximity of resources to export locations, with renewable resources within 75km of ports.
- **Downstream processing:** LOHC conversion results in lower cost outcome with liquifying hydrogen the upper bound of the range.
- **Export terminal:** costs are consistent across sites and largely driven by scale of export.

*includes upside sensitivities for capex, energy (electricity & gas) and water costs, all other figures are presented without sensitivities

>75% estimated electrolyser utilisation

The potential utilisation of green hydrogen production directly connected to an oversized renewable resource (typical 1:2 ratio of demand:nameplate capacity). The transmission capacity is sized to process load and leads to some curtailment of the renewable resource. Electrolyser capex contributes approx. 20% of FOB.

$38 – $48 /MWh estimated cost of electricity (net of curtailment) in optimal FOB outcomes

Australia already has some of the lowest renewable energy costs globally. Indicative costs in 2030 of a constrained resource is estimated to reach $38/MWh. With an average constraint of between 10-15%. Electricity costs account for 40-50% of FOB depending on product type. South Australia's low electricity costs will ensure a lasting competitive position.

≈$2.5 /kgH2 estimated average cost of blue hydrogen production

Average indicative costs of blue hydrogen, with production and CCS located in the Cooper Basin, are around $2.5/kgH2. Values around the H2 under $2/kg target may be possible with further optimisation through technology choice or cost reductions. Cost of gas accounts for 25-35% of total FOB.

≈$3.5 /kgH2 estimated average cost of green hydrogen production

The potential cost of producing green hydrogen within South Australia by 2030, with opportunity for further optimisation. This is within leading global production estimates due to the high renewable capacity factors and close proximity to export terminals in South Australia.

20 – 40% estimated proportion of FOB for conversion

Conversion of hydrogen products account for a significant portion of FOB mainly driven by capital costs. This is not location dependent and all locations will benefit as the cost of these technologies decline.

<7% estimated proportion of FOB for the export terminal

South Australia has the potential to develop a number of ports. The development potential and required capital investment only account for up to 7% of the total cost /kgH2 depending on the scale of development.

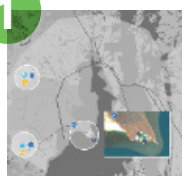
Compelling opportunities

The detailed modelling identified a number of favourable configuration options to develop highly competitive export supply chains within South Australia. The four configurations included are examples of some of the favourable opportunities to create export supply chains in South Australia. Additional supply chains can be explored on the online tool, including those from Port Macdonnell and Myponie Point for a range of export volumes.

The study built the configurations from the ground up, based on the detailed assessment of each supply chain component. As such, there are variations across the configurations due to the specifics of that supply chain. A range of outcomes are presented across different export volumes.

Potential hydrogen export supply chains

1



Large scale green hydrogen at Port Bonython

A potential large-scale hydrogen export terminal harnessing potential wind and solar resources in the Upper Spencer Gulf for green hydrogen production with an indicative transmission distance of renewable resources to the port of 70km.

2

An opportunity in the Cape Hardy/Port Spencer region

A greenfield port opportunity for green hydrogen with excellent bathymetry and the potential for small-scale and large-scale export, linking with renewable resources from the Eyre Peninsula with an indicative transmission distance to port of 60km.

3

Blue hydrogen exported from Port Bonython

Possibility to create a green-blue hub at Port Bonython, using the gas reserves located in the Cooper Basin at Moomba to produce blue hydrogen. Gas is converted to hydrogen at the resource site with the carbon captured and stored in depleted hydrocarbon reservoirs.

4

Localised green production at Port Adelaide

A prospect to utilise the high-quality, existing infrastructure to give a kick-start to the hydrogen economy, using grid connected renewable energy via PPAs.

Large scale green hydrogen at Port Bonython

Port Bonython, located 370km north-west from Adelaide in the Upper Spencer Gulf, is well positioned as a large scale export terminal. It is located 16km from Whyalla and is home to an existing deep-water liquid hydrocarbon export terminal.

Overview

Utilising the high-quality wind and solar resources in the Upper Spencer Gulf, electricity prices in 2030 of around A$40 /MWh (2020 prices) are identified as possible.

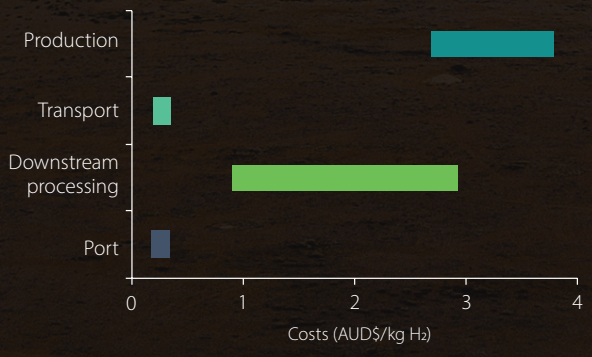
Oversizing the renewable resources by a factor of two and transmitting it via a private network to Port Bonython results in the lowest cost outcomes. Production, downstream processing and shipping infrastructure are all located at the Port.

Development considerations

Port Bonython has the possibility of accessing abundant renewable energy resources, with an estimated 10GW of good quality wind capacity in the Upper Spencer Gulf and 10GW good quality wind capacity in the Eastern Eyre Peninsula, and similarly very large scale solar energy potential.

This surplus capacity could be used to support the scaling of the industry, with potential for additional export volumes. Additional investment in supporting infrastructure would be required to enable greater volumes.

Potential 2030 costs (2020 $/kgH₂)*



*includes upside sensitivities for capex, electricity and water costs, all other figures are presented without sensitivities

Example scenario: Outcomes for 125,000 tpa

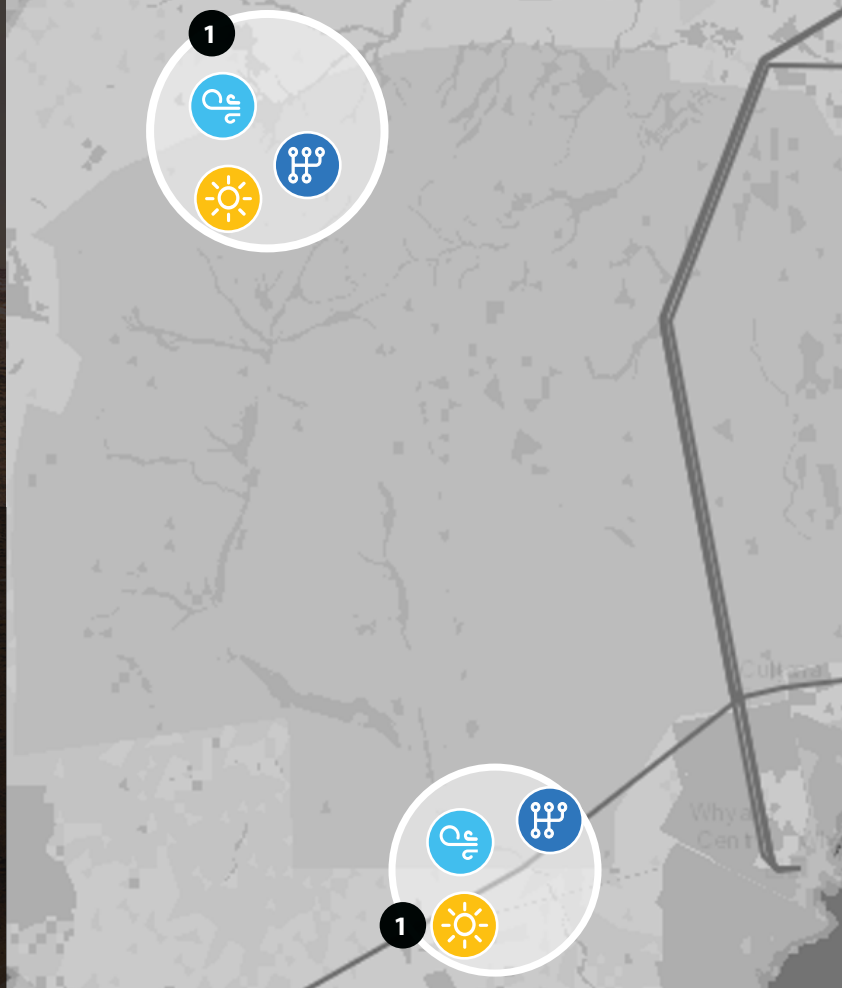
$39 – 45 per MWh
estimated cost of electricity (net of curtailment) in optimal FOB outcomes

2.3 – 3.2 GW
total renewable generation depending on product

Renewable energy generation

The ranges presented below reflect the lower to higher production volumes and account for different export products. These are indicative only and based on optimised FOB analysis.

- **Method**: Wind and solar generation through a new private transmission network to production and processing located at the port
- **Size**: 2.3 – 6.5 GW of additional generation
- **Electricity cost**: $39 – 47 /MWh
- **Contribution to FOB**: 35 – 45% depending on final product type and scale
- **Considerations**: Optimum locations are within the Upper Spencer gulf with additional accessible resources on the Eyre and Yorke Peninsulas and the mid-north. There is potential opportunity to harness the existing transmission infrastructure at smaller scales.



Key

Solar build
Wind build
Transmission
Pipe

Production, processing and export terminal

2

The ranges presented below reflect the lower to higher production volumes and account for different export products. These are indicative only and based on optimised FOB analysis.

- **Volume**: 125,000 – 250,000 tpa
- **Size**: 1.2 – 2.5 GW Electrolyser
- **Electrolyser utilisation**: >71%
- **Port infrastructure**: New fixed jetty structure of approx. 2km in length, either located in parallel to existing or to the east of the existing jetty.
- **Considerations**: Port Bonython has approximately 1,700ha of developable land with up to 100ha estimated to be required to handle the potential volumes based on a single export product.

Liquefaction/conversion

Export terminal

Storage

Green hydrogen production

Desalination plant

CCS site

Blue hydrogen production

An opportunity in the Cape Hardy / Port Spencer region

The potential location of the Cape Hardy/Port Spencer region is 215km west-northwest of Adelaide on the east coast of the Eyre Peninsula. Two deep-sea port developments are proposed with the potential to support capesize vessels.

Overview

Located of the east coast of the Eyre Peninsula, there is an opportunity to harness the strong wind and solar resources of the Eyre Peninsula to develop a new green hydrogen export hub.

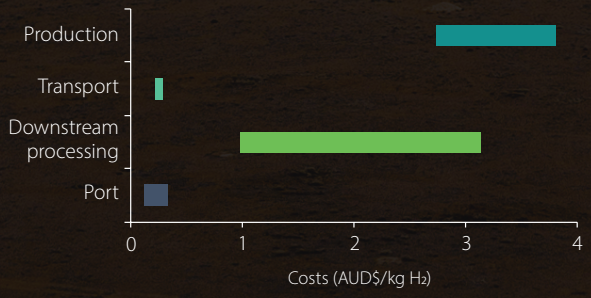
2030 production costs are estimated to have the potential to achieve around A$3.5 /kg$H_2$ (2020 prices). The configuration leverages electricity transmission to the port, to allow for production, processing and storage infrastructure located portside.

Development considerations

Cape Hardy/Port Spencer region has undergone detailed assessments for the potential of a deep-water port for iron ore and grain, with the potential to create a multi-product export terminal. The offshore properties are favourable for larger vessels.

The site is supported by existing road infrastructure and is located in proximity to the Port of Whyalla which is used for receipt of energy infrastructure. There may also be an opportunity for additional renewable volumes due to the strong renewable resources.

Potential 2030 costs (2020 $/kg$H_2$)*



*includes upside sensitivities for capex, electricity and water costs, all other figures are presented without sensitivities

Example scenario: Outcomes for 125,000 tpa

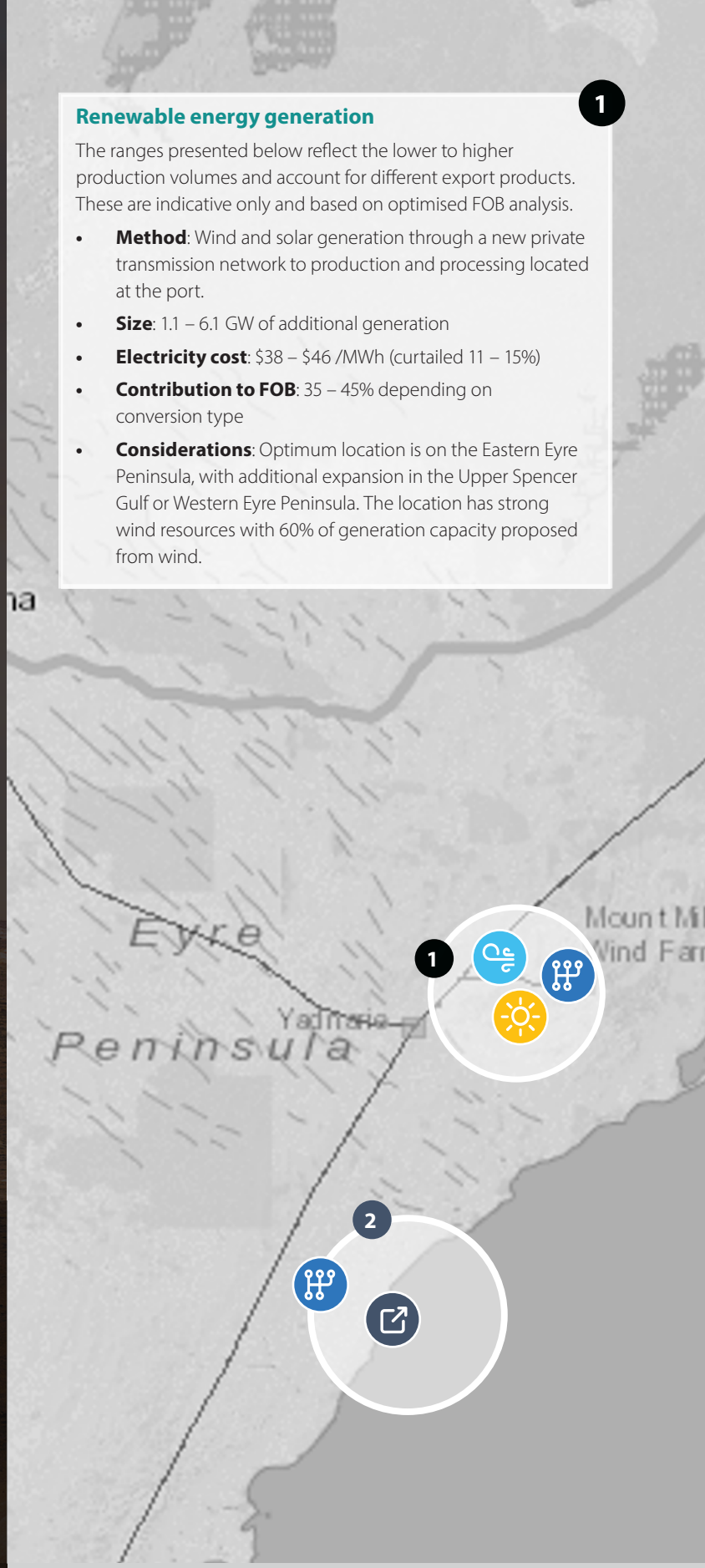
$39 – 46 per MWh
estimated cost of electricity (net of curtailment) in optimal FOB outcomes

2.3 – 3.3 GW
total renewable generation depending on product

Renewable energy generation

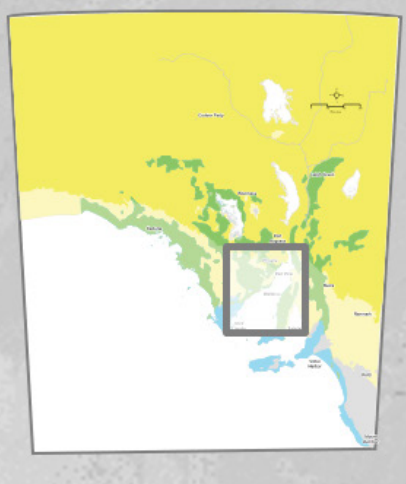
The ranges presented below reflect the lower to higher production volumes and account for different export products. These are indicative only and based on optimised FOB analysis.

- **Method**: Wind and solar generation through a new private transmission network to production and processing located at the port.
- **Size**: 1.1 – 6.1 GW of additional generation
- **Electricity cost**: $38 – $46 /MWh (curtailed 11 – 15%)
- **Contribution to FOB**: 35 – 45% depending on conversion type
- **Considerations**: Optimum location is on the Eastern Eyre Peninsula, with additional expansion in the Upper Spencer Gulf or Western Eyre Peninsula. The location has strong wind resources with 60% of generation capacity proposed from wind.



Key

- Solar build
- Wind build
- Transmission
- Pipe



Production, processing and export terminal

2

The ranges presented below reflect the lower to higher production volumes and account for different export products. These are indicative only and based on optimised FOB analysis.

- **Volume**: 60,000 – 250,000 tpa
- **Size**: 0.6 – 2.6 GW Electrolyser
- **Electrolyser utilisation**: >71%
- **Port infrastructure**: New single berth fixed jetty at approx. 0.5km from the shoreline. Potential opportunity for multiple jetties as volumes increase.
- **Considerations**: The two sites have been approved as potential export terminals. Identified area around Cape Hardy/Port Spencer region has at least 600ha of developable land, depending on chosen site. There may be opportunities for nearby synergistic hydrogen use and additional hydrogen markets e.g. green steel.

Liquefaction/conversion

Export terminal

Storage

Green hydrogen production

Desalination plant

CCS site

Blue hydrogen production

Blue hydrogen exported from Port Bonython

A proposed blue hydrogen supply chain harnessing the existing natural gas resources in the Cooper Basin, located 900km north east of Adelaide and exported via Port Bonython.

Overview

Existing onshore hydrocarbon reserves in the Cooper Basin, which have been exported for many decades, have the potential to produce significant quantities of hydrogen with the potential also for Carbon Capture and Storage of the resulting carbon in the depleted gas fields or saline aquifers of the basin.

Products are transported via a new pipeline to the export terminal, with Port Bonython identified as a likely terminal, with production costs estimated to reach around A$2 /kgH2 in 2030 (2020 prices) with scale a contributing factor to the potential cost outcomes.

Development considerations

Blue hydrogen is a potential route for large scale low carbon hydrogen with the current technology able to produce at scale available today. As such, cost outcomes today may be comparable to those 2030 values presented in this study.

Careful selection on desired product outcomes to identify the optimum product pipelines and processing plant location. An existing liquids pipeline may provide an accessible transport corridor.

Port Bonython has the potential for green and blue hydrogen production which may create additional opportunity for production synergies and export volume.

Potential 2030 costs (2020 $/kgH2)*

*includes upside sensitivities for capex, electricity and water costs, all other figures are presented without sensitivities

Example scenario: Outcomes for 125,000 tpa

$8 /GJ
estimated cost of gas

24,000 – 25,000 TJ
total gas required, depending on product

2

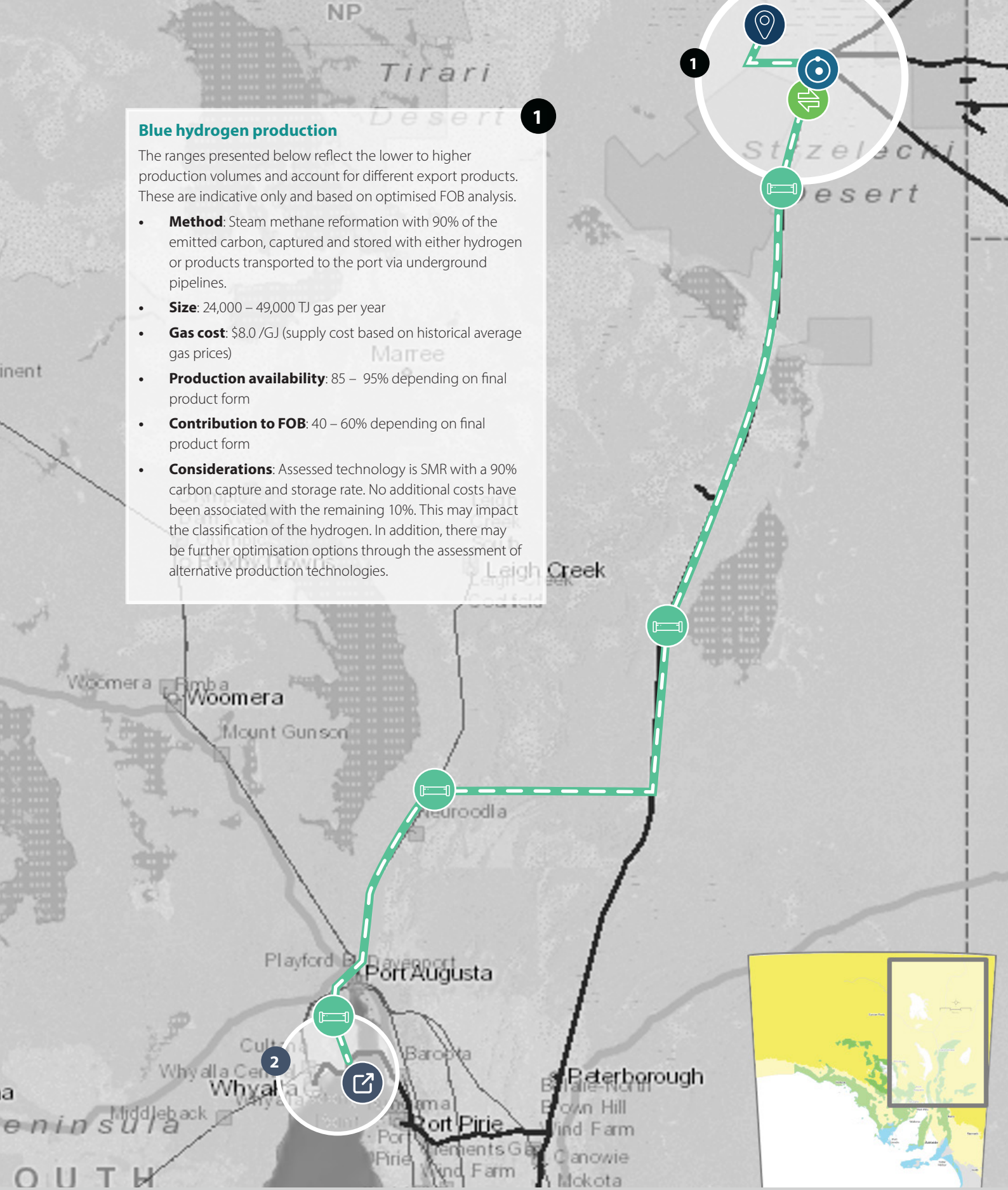
Processing and export terminal

The ranges presented below reflect the lower to higher production volumes and account for different export products. These are indicative only and based on optimised FOB analysis.

- **Volume**: 125,000 – 250,000 tpa
- **Generation requirements**: 10 – 760 MW
- **Electricity cost**: $40 /MWh via renewable PPA + up to $20 /MWh Transmission Use of System (TUOS) charges and locational demand charges
- **Port infrastructure**: New fixed jetty structure of approx. 2km in length, either located in parallel to existing or to the east of the existing jetty.
- **Considerations**: Depending on the final export product e.g. LH2, NH3 or LOHC, the specific location of the processing plant may vary due to the different cost, planning and development considerations of the different product pipelines.

Key

- Solar build
- Wind build
- Transmission
- Pipe



Blue hydrogen production

The ranges presented below reflect the lower to higher production volumes and account for different export products. These are indicative only and based on optimised FOB analysis.

- **Method**: Steam methane reformation with 90% of the emitted carbon, captured and stored with either hydrogen or products transported to the port via underground pipelines.
- **Size**: 24,000 – 49,000 TJ gas per year
- **Gas cost**: $8.0 /GJ (supply cost based on historical average gas prices)
- **Production availability**: 85 – 95% depending on final product form
- **Contribution to FOB**: 40 – 60% depending on final product form
- **Considerations**: Assessed technology is SMR with a 90% carbon capture and storage rate. No additional costs have been associated with the remaining 10%. This may impact the classification of the hydrogen. In addition, there may be further optimisation options through the assessment of alternative production technologies.

Liquefaction/conversion
Export terminal
Storage
Green hydrogen production
Desalination plant
CCS site
Blue hydrogen production

Localised green production at Port Adelaide

Leveraging the existing infrastructure of Port Adelaide, there is an opportunity to create a green hydrogen production site 25km north west of Adelaide central.

Overview

Port Adelaide is an existing multi-product export terminal with the potential for an expansion to establish a hydrogen export terminal. The existing electricity infrastructure has the capacity for ≈800MW of additional load.

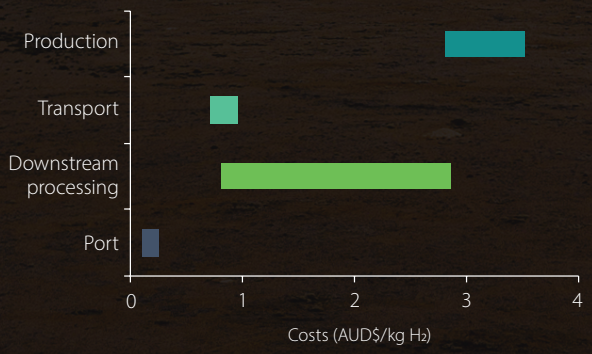
Harnessing this infrastructure to create a port side production and process infrastructure through a renewable power purchase agreement could result in 2030 production costs of around A$3.5 /kgH2 (2020 prices).

Development considerations

As an existing and established port, the total level of investment required is lower than other potential developments and there is high level of existing infrastructure, including electricity transmission, access to water and access to natural gas.

Proximity to Adelaide provides access to a highly skilled and capable workforce as well as the potential for domestic hydrogen use as the industry develops.

Potential 2030 costs (2020 $/kgH2)*

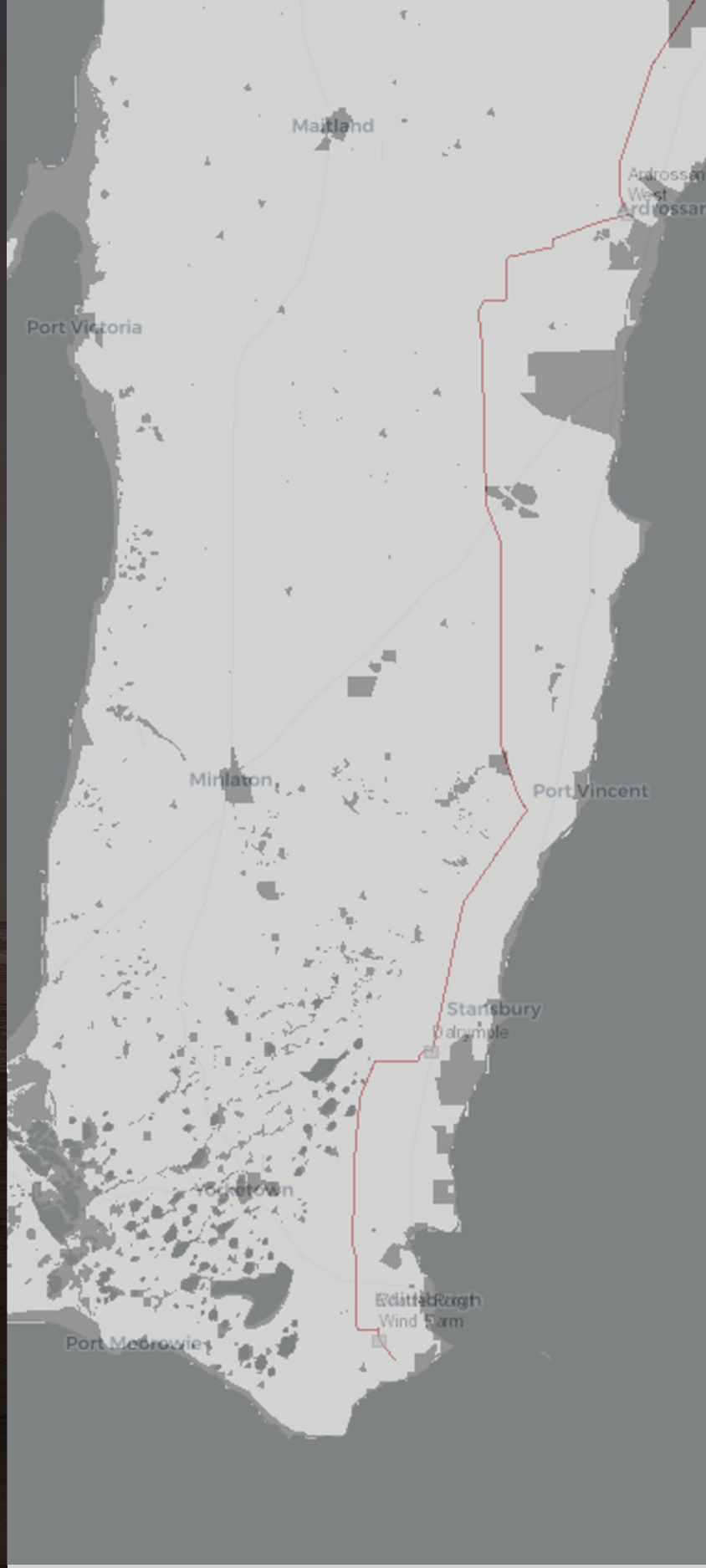


*includes upside sensitivities for capex, electricity and water costs, all other figures are presented without sensitivities

Example scenario: Outcomes for 60,000 tpa

$40 per MWh
estimated cost of electricity based on PPA

0.4 – 0.5 GW
total renewable generation depending on product



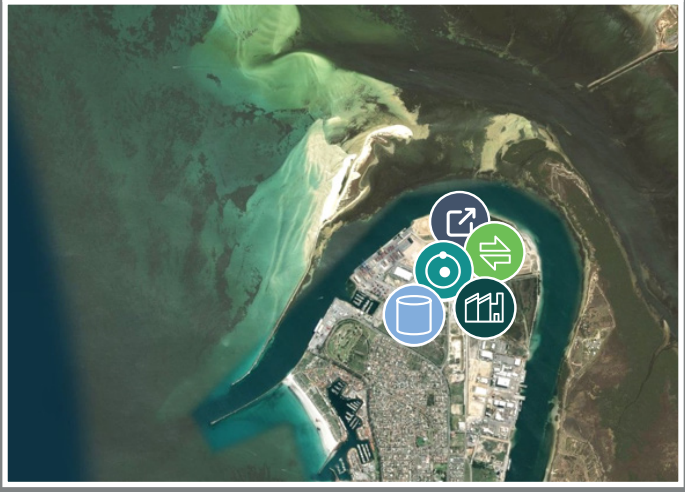
Key

Solar build
Wind build
Transmission
Pipe

Production, processing and export terminal

The ranges presented below reflect the lower to higher production volumes and account for different export products. These are indicative only and based on optimised FOB analysis.

- **Method**: National grid connected electrolysis with required generation secured through a PPA via the 275kV transmission system.
- **Volume**: 30,000 – 80,000 tpa
- **Generation requirements**: 200 – 800 MW
- **Electricity cost**: $40 /MWh via renewable PPA + up to $20 /MWh Transmission Use of System (TUOS) charges and locational demand charges
- **Production contribution to FOB**: 40 – 60% depending on volume and product type
- **Port infrastructure**: New fixed jetty structure potentially located on the outer harbour of Port Adelaide. There is an estimated 40ha of land that could be utilised.
- **Considerations**: This configuration leverages the strong existing infrastructure at Port Adelaide assuming the current transmission network can support up to 800MW of additional generation. Alterations to the balance of generation in the network may require transmission upgrades.



Liquefaction/conversion

Export terminal

Storage

Green hydrogen production

Desalination plant

CCS site

Blue hydrogen production

Investing in South Australian projects

Regulatory and legislative considerations

To facilitate hydrogen investment, the South Australian Government has established a Hydrogen Regulatory Working Group (RWG) to deliver a world-class hydrogen regulation framework and enable South Australia's hydrogen economy.

South Australia leads the nation in renewable energy generation and welcomes renewable energy companies and investment. A key contributor to this growth in renewable energy is the State's investor-friendly, regulatory and legislative frameworks for development that are widely seen as the benchmarks at a global level.

The South Australian Government, over the past decade has worked cohesively with private investors and developers to drive an energy transition resulting in over 50% of the State's energy requirements being supported by renewables. This has resulted in over A$7 billion invested in South Australia and substantially more in the pipeline.

To progress a major hydrogen development in the State, there will be regulatory and legislative instruments developed by the State Government to facilitate these investments that will need to be considered by potential developers.

Regulatory development

The South Australian Government seeks to deliver best-practice hydrogen regulations that are simple and efficient, building community and investor confidence. The regulations will be based on the following principles:

- **Certainty** – clear and unambiguous regulatory objectives and expectations for industry to meet
- **Openness** – equitable and competitive access to resources and inclusive communication with stakeholders
- **Transparency** – clear and understandable regulatory objectives
- **Flexibility** – adoption of appropriate and latest technologies to deliver regulatory objectives and meet community expectations
- **Efficiency** – minimisation of red tape and regulatory inefficiencies.

Hydrogen Regulatory Working Group

The Government has pre-emptively established the RWG to support investors in managing the regulatory framework and undertake landmark opportunities within South Australia.

The Hydrogen RWG is a dedicated taskforce convened by the Government of South Australia to streamline the development process and facilitate prospective hydrogen developments.

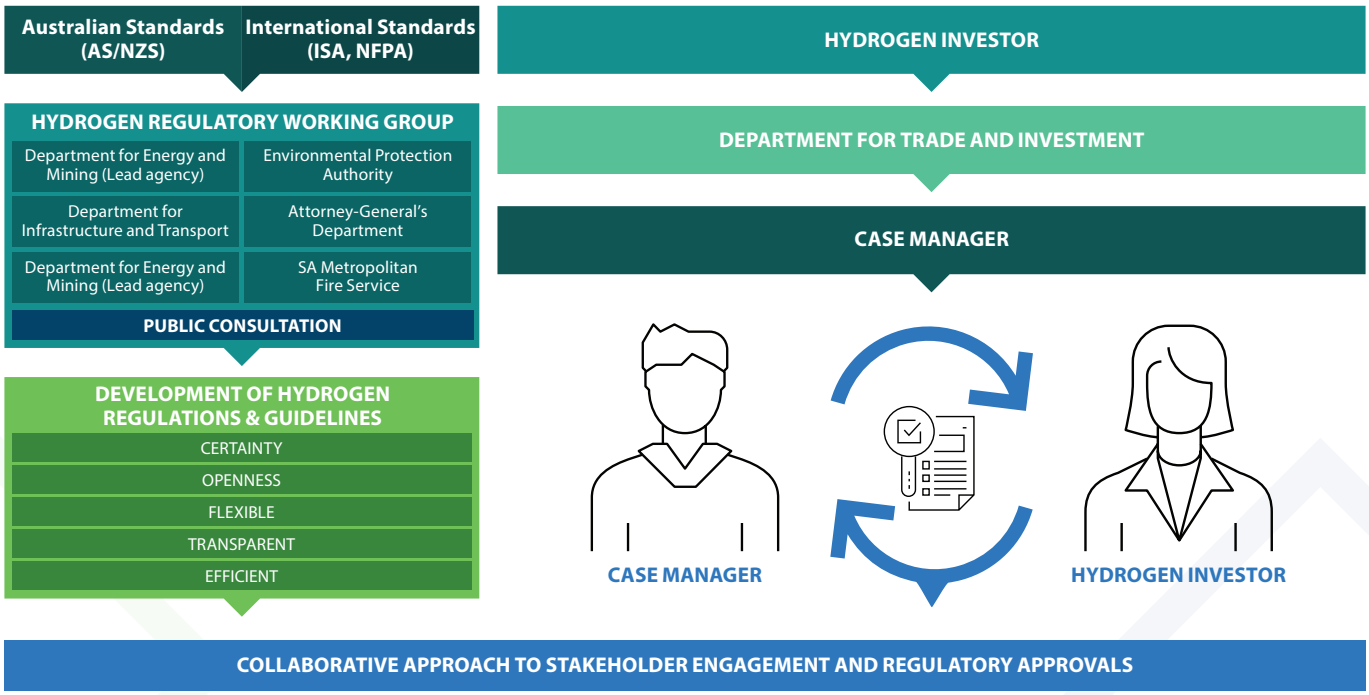
Across the South Australian Government, key officials that administer the relevant legislation and regulations required in the development and planning process will meet regularly as part of this RWG and discuss project status and development providing detailed advice and feedback on applications. This will support proponents through the process, in turn saving investor's time and money.

The South Australian Government is committed to hydrogen and the opportunities that will arise, now and into the future. The RWG has the mandate of their respective agencies to accelerate and drive forward projects.

In addition, South Australia is a member of HySAFE, an international organisation committed to collaborating in the development of hydrogen safety related issues.

Indicative regulatory framework & pathway

The following chart provides an outline of the key regulatory pathway for a major hydrogen development and the key agencies that will work across the South Australian Government that will facilitate the regulatory approval process.



Government guidance and support

The South Australian Government's investment team has been established to support inbound investment for the State, including hydrogen projects.

The South Australian Government has been proactive in providing and maintaining a competitive, certain and expeditious investment environment. To continually drive the speed and simplicity of investment within the State, the Department of Trade and Investment (DTI) has a dedicated team that works with private proponents to facilitate investments. The team provides tailored support to help facilitate development in South Australia.

The experienced business development managers have strong commercial acumen and understand business requirements and priorities. They are able to provide investors with unparalleled access to Government decision makers and can connect potential investors to key individuals within the private and public sectors.

To assist potential investors, the investment management team will:

- Provide a dedicated point of contact for all project requirements
- Ensure proponents have the best support to expedite projects within South Australia
- Simplify dealings with government and other partners to streamline the investment pathway
- Provide policy and regulatory assistance to manage this process (see following page)
- Help potential investors to access the skilled South Australian workforce to secure the best available talent
- Link potential investors to key technologies or industries that may have adjacent skills or linkages to create synergies

The South Australian Government wants to hear from you about your interest in Hydrogen in South Australia by registering your interest through The Department for Trade and Investment. All individuals are welcome to discuss the potential opportunities for hydrogen in the State.

To register interest in these world-first hydrogen projects, please directly contact:

Mr Wayne Emery
Director Minerals & Energy
wayne.emery@sa.gov.au

Ms Edit Mucsi
Business Development Manager
Fuels & Hydrogen
edit.mucsi@sa.gov.au

Further information about investing in the Minerals & Energy Sector in South Australia can be accessed at invest.sa.gov.au/sectors/energy-and-mining while information on investing or establishing a new business in South Australia can be found at invest.sa.gov.au.

For further information on the Department of Trade and Investment, visit dti.sa.gov.au

Online modelling tool

The South Australian Government welcomes the opportunity to speak to prospective hydrogen investors about the opportunities and assistance required to deploy projects within South Australia, including those contained within this document.

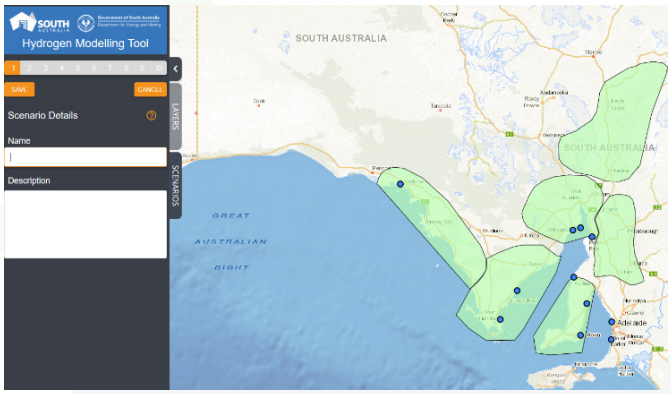
Interested parties can use the various investor resources to access additional information on opportunities within the State, this includes resource and infrastructure maps as well as an online hydrogen export supply chain modelling tool. The online modelling tool harnesses the detailed analysis undertaken as part of the pre-feasibility study to assess the impacts of certain inputs across multiple configurations in South Australia. The tool provides insight into potential FOB outcomes of hydrogen produced and exported from South Australia.

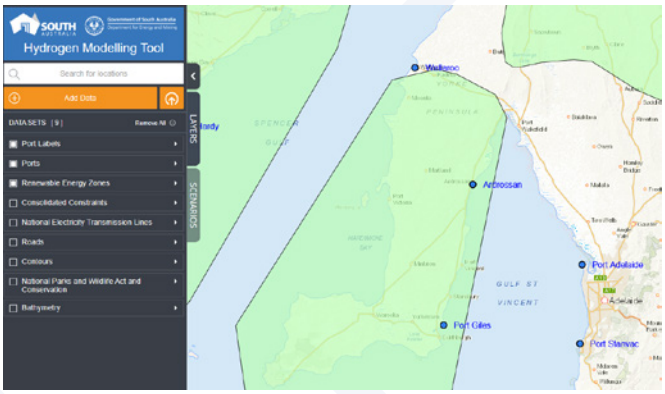
Users have the flexibility to assess different supply chain configurations based on the optimal identified options resulting from the pre-feasibility study.

This includes an ability to test different sensitivities to align results with expected inputs including:

- Cost of electricity or gas
- Capital cost of electrolysers
- Export volume
- Export product
- Cost of capital

The online tool allows modelling, saving and creation of different configurations resulting in a comprehensive report of the outcomes, including the breakdown of costs by supply chain.





The online modelling tool is administered by the South Australian Government. While the tool is public and free to use, access to detailed modelling scenarios and outputs requires registration, with permission granted to select parties who have genuine hydrogen export development interest in the State.

The State retains the right to not grant any individuals or organisations access to the tool, as it determines appropriate.

To access the hydrogen export online modelling tool, visit hydrogenexport.sa.gov.au.

Acknowledgements

The South Australian Government wishes to thank KPMG and WSP for their contribution to the study. In addition, we would like to thank the following organisations for their engagement and input:

AGIG
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ENGIE
Epic Energy
EPS Energy
Flinders Ports
GFG Alliance
Green Ammonia Consortium
H2U
IHI
Iron Road
JGC
Kallis & Co
Kawasaki Heavy Industries
Leigh Creek Energy
Mitsubishi Corporation
NAB Asia
NEOEN
NYK
RCAST Renewable Hydrogen Consortium
SA Water
Santos
SIMEC Energy
Sumitomo Corporation
Sumitomo Electric
Tokyo Gas

Next steps

The South Australian Government welcomes the opportunity to speak to prospective hydrogen investors about the opportunities and assistance required to deploy projects within South Australia.

Interested parties can use the various **investor resources** to access additional information on opportunities within the state, this includes resource and infrastructure maps as well as a hydrogen export supply chain modelling tool. The Online Hydrogen Modelling Tool harnesses the detailed analysis undertaken as part of the pre-feasibility study to assess the impacts of certain inputs across multiple configurations in South Australia. The ground-breaking tool provides insight into potential Free On Board outcomes of hydrogen produced and exported from South Australia.

Users have the flexibility to assess different supply chain configurations based on the optimum identified options resulting from the pre-feasibility study.

To access the Online Hydrogen Modelling Tool, visit **hydrogenexport.sa.gov.au**.

To register your interest in any hydrogen projects, please directly contact:

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Image courtesy of Iron Road and H2U

Important Notice

For further details visit www.hydrogen.sa.gov.au

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