The Power of Commitment

GHD recognises and understands the world is constantly changing. We are committed to solving the world's biggest challenges in the areas of water, energy and urbanisation.

We are a global professional services company that leads through engineering, construction and architectural expertise. Our forward-looking, innovative approaches connect and sustain communities around the world. Delivering extraordinary social and economic outcomes, we are focused on building lasting relationships with our partners and clients.

Established in 1928, we remain wholly owned by our people. We are 10,000+ diverse and skilled individuals connected by over 200 offices, across five continents – Asia, Australia, Europe, North and South America, and the Pacific region.

Find out more about us at ghd.com

90+ years in operation
135+ countries served
200+ offices worldwide
2.2B AUD revenue 2021
5 global markets
10K people
50+ service lines

Providing engineering, environmental, advisory, architecture, digital and construction services

Technical authority is at our core

Advisory
Air & Noise
Aquatic Sciences
Architecture, Interior and Landscape
Asset Management
Automation
Aviation
Bridges
Building Sciences Engineering
Construction Contracting
Contamination Assessment & Remediation
Dams
Data Sciences
Decommissioning Closure & Rehabilitation
Digital Design
Emergency Response
Engagement Communications & Communities
Food and Agribusiness
Forensics and Building Sciences
Geology
Geotechnical
HSE Systems & Industrial Hygiene
Hydrocarbons & Chemicals
Hydrogeology and Hydrodynamics
Impact Assessment & Permitting
Integrated Water Management
Investment, Policy & Economics
Maritime & Coastal Engineering
Materials Process & Plant Engineering
Mining Engineering & Geosciences
Natural Resources
Power Distribution & Industrial
Power Generation
Project & Construction Management
Railways
Risk & Assurance
Road Systems
Security & Communication Systems
Spatial Sciences
Structures
Tailings (Mines & Residue)
Transportation Planning & Traffic Engineering
Tunnels
Urban Planning & Land Development
Waste Management
Wastewater & Stormwater Collection Systems
Wastewater Treatment & Recycling
Water Transmission & Distribution
Water Treatment & Desalination

Planning Approval in South Australia a Case Study

→ Development Approval Overview

SA and Commonwealth Legislation Overview

- Aboriginal Heritage Act 1988
- Environment Protection Act 1993
- Environment Protection (Air Quality) Policy 2016
- Environment Protection (Water Quality) Policy 2015
- Environment Protection (Noise) Policy 2007
- Heritage Places Act 1993
- Landscape South Australia Act 2019
- National Parks and Wildlife Act 1972
- Native Vegetation Act 1991
- Petroleum and Geothermal Energy Act 2000
- Planning Development and Infrastructure Act 2016
- Environment Protection and Biodiversity and Conservation Act (EPBC) 1999 (Commonwealth)
- Native Title Act 1993 (Commonwealth)
- Crown Lands Management Act (Commonwealth)

Planning Roles in South Australia

State Commission Assessment Panel

- State Planning Commission Member
- State Commission Assessment Panel Member

Attorney General Department

- Executive Director, Planning and Land Use Services
- Unit Manager Development Assessment
- Team Leader Metropolitan and Outer Metropolitan Development
- Senior Planner
- Planner
- Development Officer

Council

- General Manager Development
- Manager Development Services (Planning Manager)
- Team Leader
- Strategic Planner
- Senior Development Officer
- Development Officer

Planning Consultant Multidiscipline

- Business Group Leader Planning
- Service Line Leader
- Technical Director
- Senior Planner
- Planner

Planning Consultant Single Discipline

- Director
- Associate Director
- Principal Consultant
- Senior Consultant
- Consultant

Environment Resources and Development Court

- Commissioner of the Environment Resources and Development Court

Supporting Disciplines

Ecologist
- Flora and Fauna Assessment

Design Engineer
- Panel / BESS Layout
- Cross Sections

Architect
- Landscape and Visual Impact Assessment

Archaeologist
- Cultural Assessment
- Heritage Assessment

Traffic Engineer
- Traffic Impact Assessment

Landscape Architect
- Landscaping Plan

Environmental Scientist
- Environmental Impact Assessment

Stormwater Engineer
- Stormwater Management Plan
- Detention Calculations
- Flow Paths

Social Scientist
- Social Impact Assessment

Other Considerations

Approval Pathways
- Code Assessed
- Crown Development
- Environmental Impact Statement

Government Sponsorship
- Engagement with Regulators at an early stage

Fees
- $300,000+

Land Tenure
- Can be multiple land owners
- May be options to lease or purchase

Easements
- Can include rights of way land access or encumbrances

Mining Exploration Licences
- Can include extraction or only exploration

Community Perception
- Engage with community
- Engage with council

Network Planning
- Is there capacity on the network?

Grid Connection
- GPS and regulator agreement

Vegetation Removal
- Offsets may be required
- Flora and fauna may be federally protected

South Australian Government Strategy

→ Hydrogen?

South Australia's Hydrogen Action Plan

renewable hydrogen potential

South Australia is Australia's leading mainland state for renewable energy.

By 2025, it is predicted that 90 per cent of the state's electricity could be generated from renewable sources based on Australian Energy Market Operator (AEMO) data.

South Australia is almost 1 million square kilometres, four times larger than the United Kingdom, with expansive areas available for renewable energy generation projects.

South Australia can harness its renewable energy to produce renewable hydrogen, and the Government of South Australia is currently working with investors to realise the State's first suite of pilot and demonstration renewable hydrogen production projects.

The map on the right shows areas of South Australia with optimal conditions for wind, solar and co-located wind and solar generation – ideal for achieving high utilisation rates for electrolysers powered entirely by low-cost renewable electricity.

South Australia currently has...

1 in 3 homes with rooftop solar

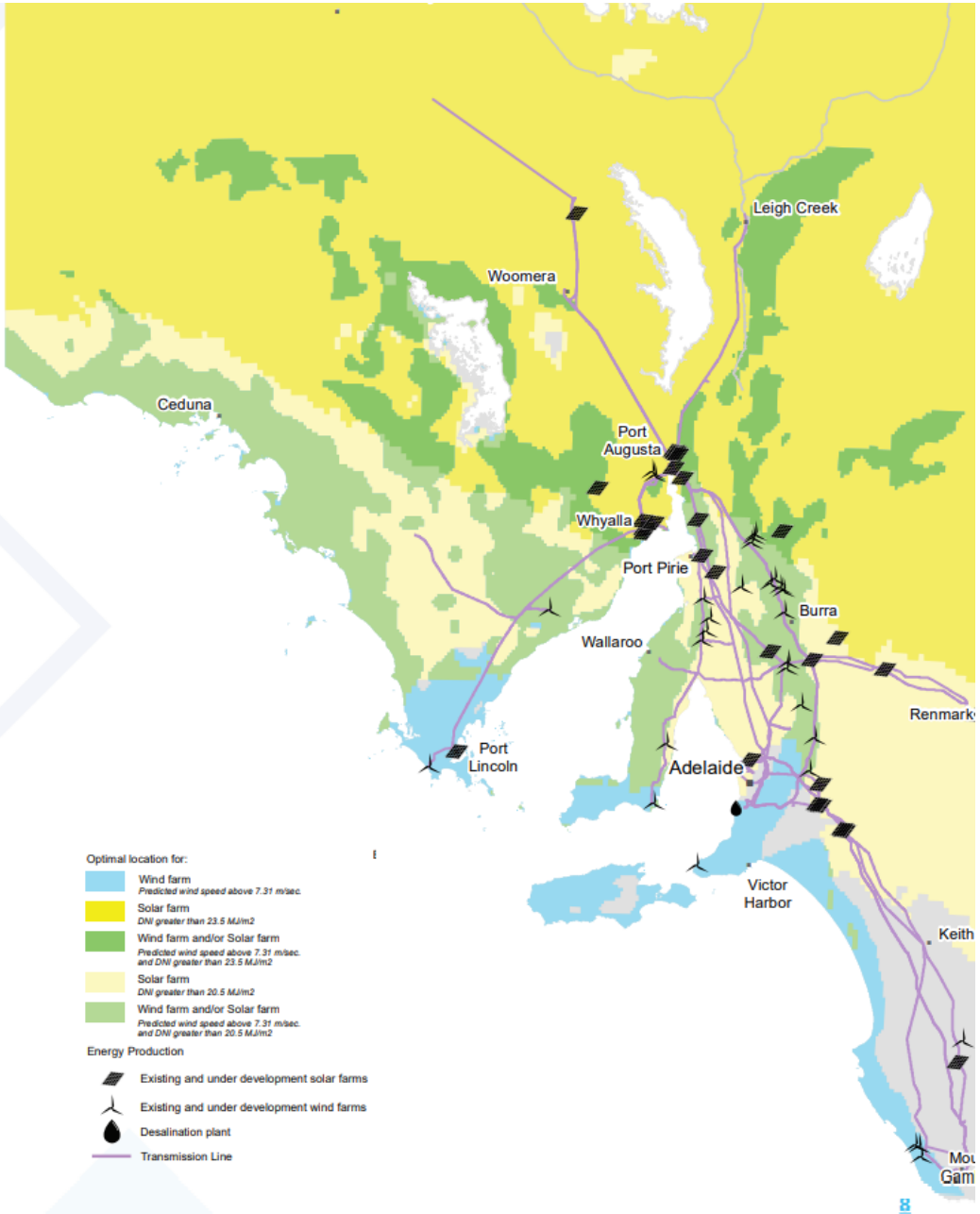
Over $7bn invested in renewable energy with over $20bn in the pipeline

A world class regulatory regime

The worlds biggest lithium-ion battery

22 large scale wind farms currently operating

14 GW of renewable energy generation and storage projects in the pipeline



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South Australia Hydrogen export prospectus

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)*

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.

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.

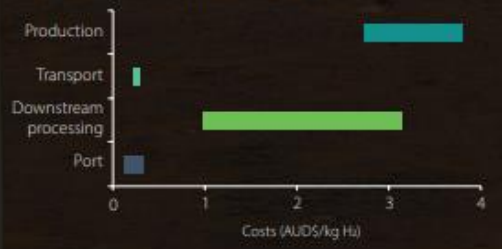
2030 production costs are estimated to have the potential to achieve around A$3.5 /kgH₂ (2020 prices). The configuration leverages electricity transmission to the port, to allow for production, processing and storage infrastructure located portside.

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 $/kgH₂)*

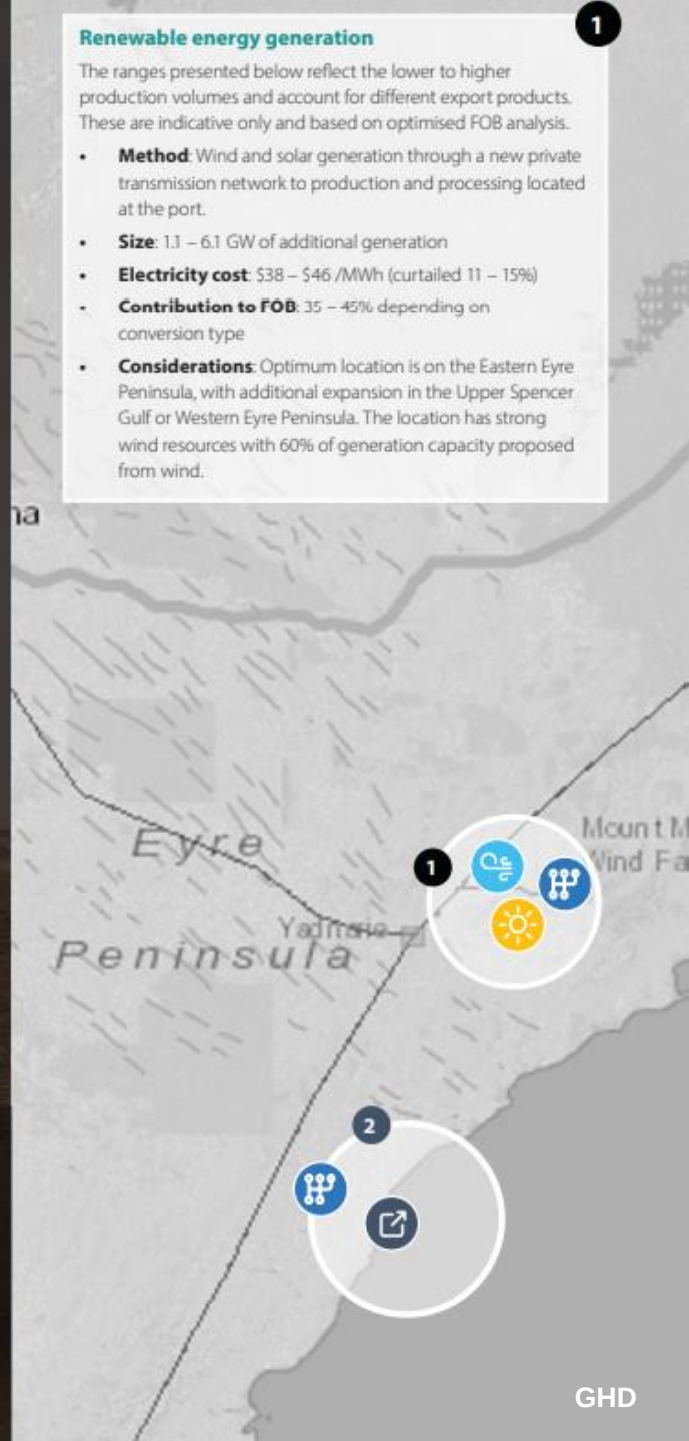


*includes upside sensitivities for capex, electricity and water costs.

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.



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Callum Little
Senior Planner
Level 4, 211 Victoria Square Adelaide SA 5000 Australia
P +61 8 8111 6587
E callum.little@ghd.com