EYRE GREEN IRON

South Australian Government
Green Iron / Steel
Expression of Interest

1 October 2024

EHS Support℠

entX

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Acknowledgment of Country

Eyre Green Iron recognises the First Peoples of this nation and their ongoing connection to culture and country.

We acknowledge the Eyre Peninsula as the Traditional Home of the Barngarla, Nauo, and Wirangu peoples.

We respect these Peoples as the Traditional Owners, Custodians, and Lore Keepers of the world's oldest living culture and pay respects to their Elders past, and present.

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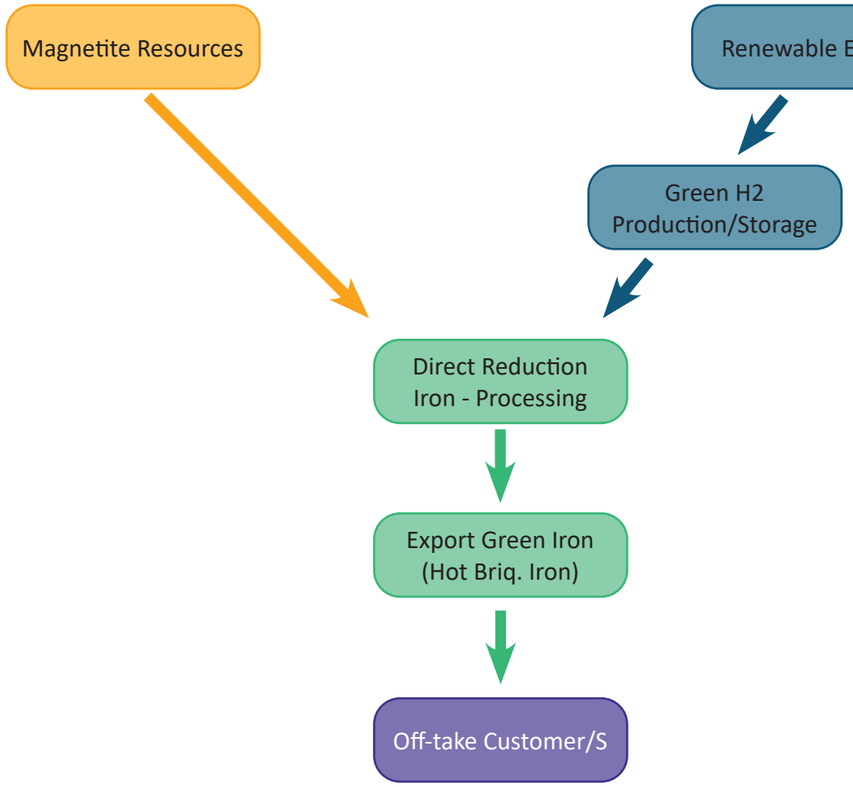
Project Overview

' The Eyre Green Iron Project presents a development concept which is ideally situated and exhibits a range of competitive cost benefits for the development of green iron. At its core, the project seeks to exploit strategically significant salt caverns which allow for the cost-effective long-term storage of hydrogen.

The project is located near proven iron ore deposits and some of the world's best renewable energy resources, with access to existing port and trans-shipment facilities. Additionally, it is serviced by established road, rail, and high-voltage transmission infrastructure.

These characteristics in particular cost-effective hydrogen storage are key elements that green iron producers around the globe are pursuing, and they are all available right here on the Eyre Peninsula.'

To unlock the future value of hydrogen storage caverns, it is essential to develop a strategy that focuses on creating a hydrogen development hub (EGI) centred around the production of gigawatt scale volumes of green hydrogen produced during high periods of renewable penetration and stored in the underlying salt caverns, underpinning a 24-hour supply capability. An overview of the process is below:



Introduction

The Eyre Green Iron (EGI) project concept aims to develop one of Australia's first Direct Reduced Iron (DRI) facilities. The project will leverage low-cost hydrogen salt cavern storage, world class renewable resources, proven magnetite resources, and existing infrastructure corridors.

This strategic initiative will utilise the underlying Polda Basin's unique geological characteristics for scalable storage of hydrogen within engineered salt caverns at a scale yet to be seen in Australia.

The EGI project is an integrated hydrogen production, storage, and DRI hub centered around the production of green hydrogen produced during high periods of renewable penetration and stored in the underlying salt caverns, underpinning a 24-hour supply capability.

Key benefits

Utilises Australia's largest discovered salt formation suitable for hydrogen cavern storage

Salt cavern storage is the lowest cost method to store hydrogen and will allow the storage of GW scale volumes of hydrogen.

Utilises world class solar and wind resources

EGI will utilise the region's significant co-located wind and solar resources to produce green hydrogen to supply a DRI process creating green iron to be exported to steel mills across Europe and Asia.

Proximity to water rail, and port infrastructure

EGI is well positioned to take advantage of exiting rail corridors and port infrastructure. EGI has identified critical infrastructure corridors which would enable efficient export of green iron.

Utilises existing energy transmission infrastructure

Development enables growth options for existing 132KV transmission line from Yadnarie to Wudinna.

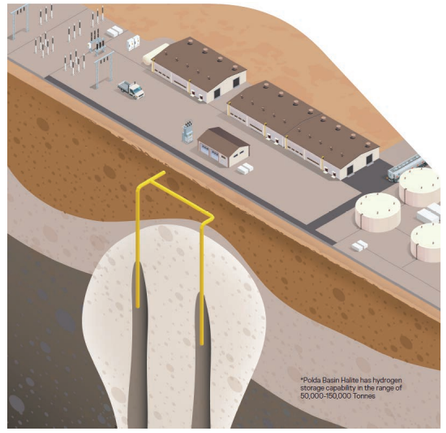
Australia's Largest Salt Cavern Storage Potential

Unlocking South Australia's natural resources by developing salt cavern storage proximal to existing magnetite resources in the Eyre Peninsula.

Energy Storage
Having access to an underlying salt cavern to store large volumes of green hydrogen is a significant economic differentiator to enable globally competitive DRI processed green iron.

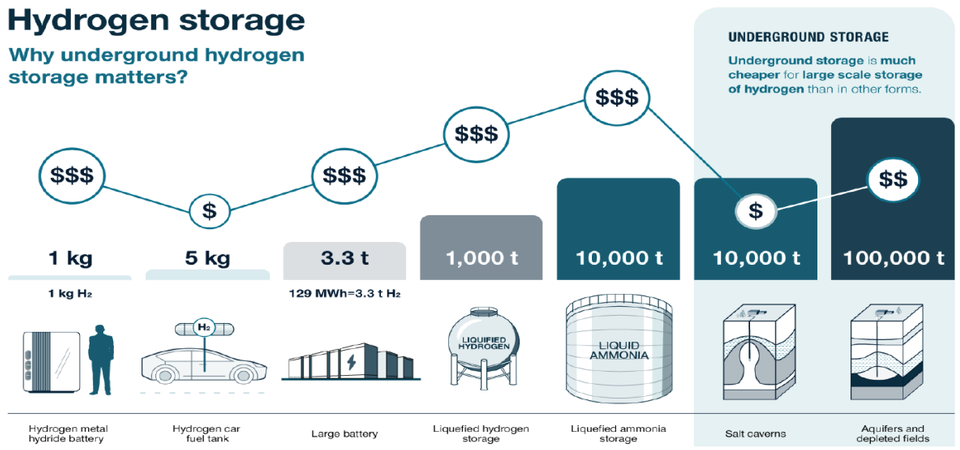
Cost Effective
The levelised cost of hydrogen storage (LCOS) within salt caverns is estimated to be approx. *US$0.23/kg. In comparison, the LCOS hydrogen stored in traditional above ground vessels is approx. US$2.30/kg,* (BloombergNEF, 2022). This provides a significant cost differentiator and enables a high degree of electricity use optimisation, which coincidental with magnetite resources, positions the EGI Project as one of worlds lowest cost location to develop large export scale green iron.

Expanding Storage
Opportunity to expand storage to the Western Eyre coastline with approximately 30-60 Petajoules of prospective gas storage capacity.



Salt Cavern Storage

Current Gaps
De-risking the storage capacity of salt storage caverns through an accelerated exploration program (2025) including drilling of salt structures will provide storage volumetrics to underpin new DRI (Green Iron) production.



World Class Solar and Wind Resources

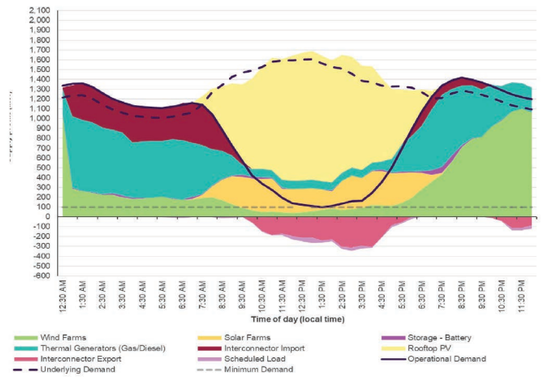
Using the region's abundant renewable energy, the project will convert water into green hydrogen through electrolysis.

The Eyre Peninsula is globally recognised for its renewable wind generation potential, with average wind speeds >8m/sec and capacity factors in the range of 60%. This region has abundant access to low-cost rural land.

The region also has World class irradiance levels comparable with Spain, southern Europe, Northern Africa, and the Middle East (Avg. 18.1 MJ/m2 per day).

Flattening the Curve

By using renewable energy at times of low demand and high levels of renewable generation, the EGI project can assist with flattening demand for electricity during the day.



Note. from South Australia Electricity Report (AEMO, 2023)"

Integrated Renewables

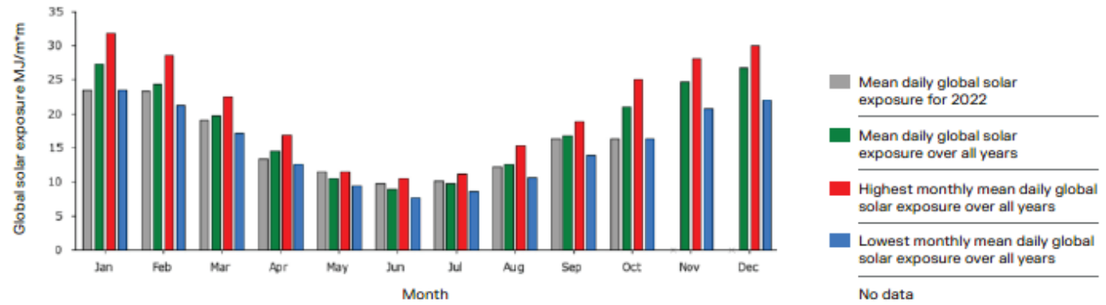
EGI will utilise green energy from:

- Behind the metre
- The grid
- Power purchase agreements
- All energy sourced for the project will be certified green. Green energy demand for the project will drive green energy investment in the region

Current Gaps
Investigate the surrounding region for a release area under the hydrogen and renewable energy act.

Assist with streamlining grid connection. Accelerated approval for renewable projects on the Eyre Peninsula.

Mount Wedge (018056) 2022 global solar exposure



Climate Data Online, Bureau of Meterology Copyright Commonwealth of Australia, 2022

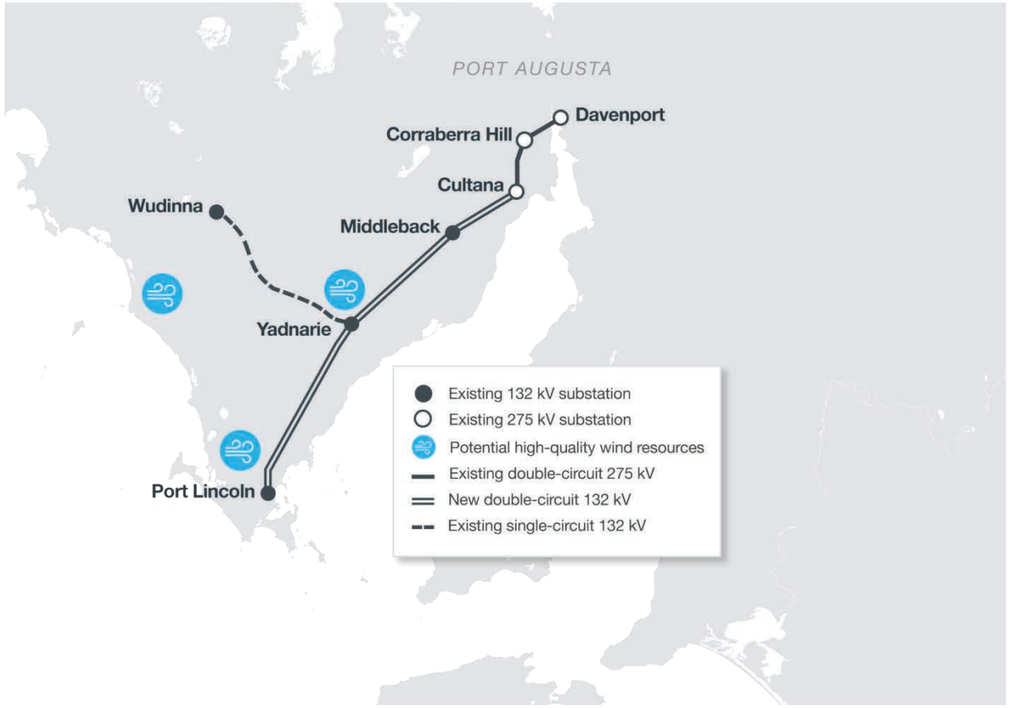
Existing Energy Transmission Infrastructure

The EGI project will utlise up to 1 gigawatt of renewable electricity to both power the DRI facility and operations as well as supply 700MW of electrolysers. The electrolysers will operate 24/7 and generate approximately 270 tonnes of green hydrogen per day, which in turn will be used to feed a DRI process, producing approximately 2.5 tonnes of hot briquette green iron annually.

The EGI project is located proximal to the regional town of Lock , 130 kilometers north of Port Lincoln and 200 kilometres south-west of Whyalla in South Australia. The location is along the existing transmission line and will not require any new transmission easement to be constructed.

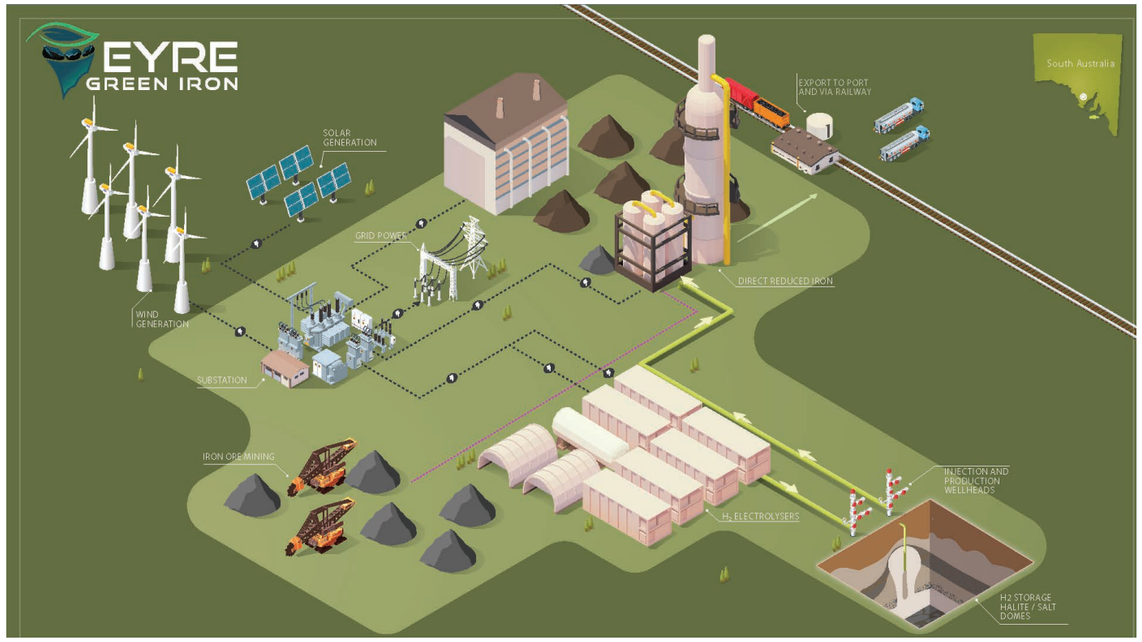
The project adjoins an existing 132kv line.
By minimising the need for new transmission, EGI will minimise transmission costs and losses.

Current Gaps
Ensuring that connection points are available on the substation. Facilitating partnerships with industry to project a long-term vision for transmission infrastructure on Eyre Peninsula.



Existing Rail and Port Infrastructure

The EGI project is centrally located within the Eyre Peninsula Iron Ore Zone with an economically demonstrated Magnetite resource of approximately 3.5 billion tonnes. EGI will explore a hub model where DRI grade magnetite can be aggregated, processed, and shipped via existing port facilities across the Eyre Peninsula on behalf of mine operators.



Activating Rail Corridors
The Eyre Peninsula Freight Study recommended refocusing transport infrastructure spending on roads rather than rail. EGI is an opportunity to revisit infrastructure planning on the peninsula to support safe cost-effective transport.

Eyre Peninsula Magnetite
EGI will capitalise on the globally significant magnetite resources of the Eyre Peninsula. EGI has commenced preliminary concept discussions with a number of major resource licensees located within the Eyre Peninsula Iron Ore Zone.

Roads
Transport investigations to ensure existing capability of road networks is sufficient to support nodal routing from mine to EGI and on to port locations.

Current Gaps
A new export facility may be required, facilitating approvals and investigations will be critical.

A safe and secure, well maintained road network will facilitate the transport of iron ore. Interactions with other users will need to be considered.

Supports the Economic Development

The EGI Project will require the construction of a DRI plant; hydrogen production facility; magnetite handling, storage, and loading bunkers; and upgrades to multi-modal transport corridors leading to port infrastructure. These works on what will likely become common user infrastructure will support not only existing industries, but also grow a new local workforce and deliver new levels of economic complexity, and prosperity supporting regional growth.

Supporting the green economy
As demand for green steel increases, low cost hydrogen will play a key part in the energy transition.

Supporting the growth of regional communities
Eliston District Council is projected to experience the lowest growth of Eyre Peninsula local government areas. The EGI project aims to create skilled long term employment opportunities within the region.

Environmental Impact
Preliminary *investigations by DEM* highlight negligible to low constraints in the project area.

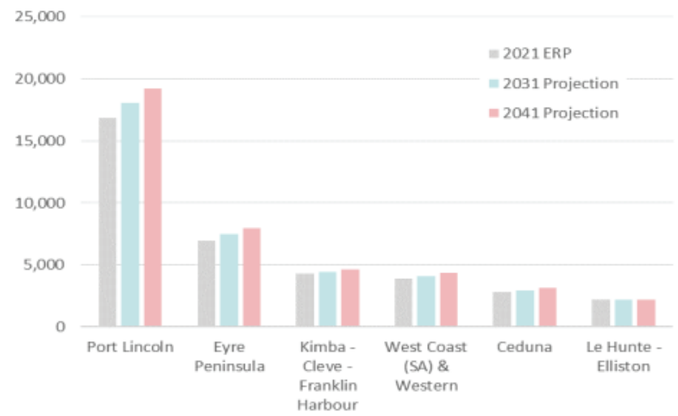
DEM Constraints Map

Current Gaps
Support managing licensing and approvals for waste streams.

Support with workforce. Accommodation and growth planning with local government.

Support to work with traditional owners to maximise benefits to communities.

Figure 13: Eyre Peninsula and South West population 2021, 2031 and 2041 by SA2



Note. from Local Area (SA2 and LGA) Population Projections for South Australia, 2021 to 2041 (PlanSA 2024)"

Leveraging Australian Government Support Mechanisms to Accelerate South Australia's Green Iron Sector

The Australian government has recently implemented a range of support mechanisms aimed at bolstering the green critical minerals sector, which includes the production and export of materials such as green iron. These initiatives are designed to support the transition to a low-carbon economy while enhancing Australia's global standing as a key supplier of critical minerals essential for renewable energy technologies.

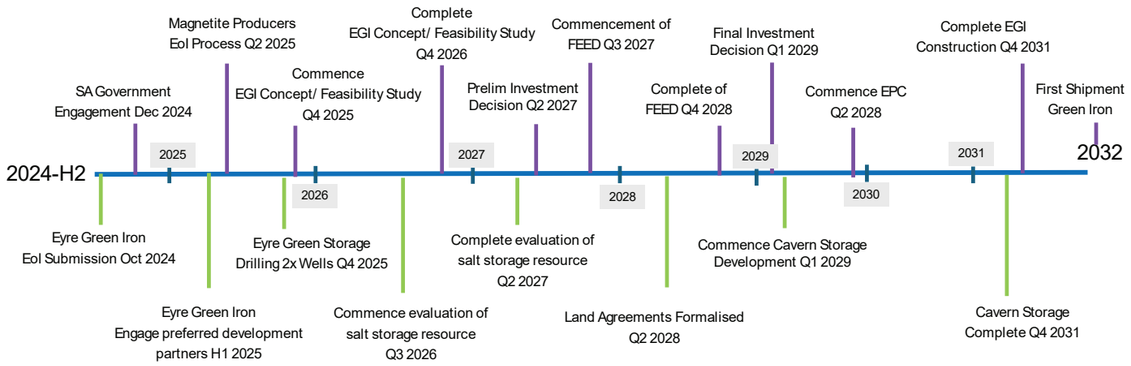
Key Support Mechanisms

1. Critical Minerals Strategy 2023
2. National Reconstruction Fund (NRF)
3. Australian Critical Minerals Research and Development Hub
4.Export Finance Australia (EFA)
5 Critical Minerals Facility

These measures reflect the government's commitment to decarbonising industrial processes, enhancing Australia's green energy exports, and positioning the country as a leader in sustainable resource supply for global markets.

Eyre Green Iron Pathway Forward

Conceptual timeline to accelerate development pathway to green iron export



Key Project Performance Indicators

The following Evaluation Criteria has been developed to highlight key project performance indicators. Given the complexity of hydrogen generation and storage, it is critical that hydrogen generation, storage, and use cases are considered in the EOI.

Evaluation Criteria	***Response***	
Capability, Experience, and viability	Project proponents (see Page 13) supporting this submission have been identified based on their global experience and geographical proximity to the EGI Project. entX alongside Stegra has strong experience in the development and production of hydrogen. Stegra is also globally recognised for its experience in building green iron and steel projects, and has recently commissioned a plant in Boden, Sweden. Port operator T-Ports and Flinders Ports both have direct experience in operating export facilities in the region and ANZ Bank is a longstanding financial facility provider to the energy and resource sector.	8
Technology Maturity and deployability	The EGI Project will utilise proven electolyser, storage, DRI, and generation technology currently deployed globally.	8
Local Industry participation and opportunities	The project will create direct employment opportunities while supporting iron ore and energy suppliers and the logistics and supply chain within the region	9
Whole-of-Life Cost/ Price and Value for Money	By producing green energy and hydrogen on-site and storing hydrogen cost effectively, energy transmission and storage costs are minimised.	7
Project feasibility, risks, and uncertainty	Salt caverns are a proven, safe, cost effective hydrogen storage medium	8
Environmental Impact and Governance	The project is in the negligible to low constraints area from the Renewable Energy Resources and Constraints map. Water can be sourced from groundwater or the northern water project.	8
Energy storage and transmission costs	EGI will utlise existing transmission infrastructure and allow the storage of hydrogen at $x.x, as electricity will be utlised onsite no grid connection to supply electricity will be required	7
Project Innovation	The EGI project will be one of the first green iron projects in Australia and will bring together some of the world's leading industry innovators to South Australia.	8

Project Evaluation Criteria

10	9	8	7	6	5	4	3	2	1	0
Superior			Acceptable			Marginal		Fail		

Supporting Local and International Organisations with Capability

Eyre Green Iron has the opportunity to leverage the capability of local and international organisations to develop a feasibility that will allow funding for a FEED for the project.

Organisations supporting capability

Stegra
stegra.com

T-Ports
tports.com

Flinders Ports Holdings
www.flindersports.com.au

ANZ
www.anz.com.au

entX Limited
www.entx.com.au

EHS Support
ehs-support.com

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