GISERA
Gas Industry Social and Environmental Research Alliance

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SOCIAL AND ECONOMIC FACTSHEET

The role of gas in South Australia

This project will provide insights into how natural gas can help meet South Australia's energy needs, accelerate the use of renewable energies, reduce carbon emissions and secure supply while maintaining prices.

KEY POINTS

- South Australia is moving towards eventual zero net emissions, guided by strategies contained in key policy documents.
- The project will clarify the role of natural gas in meeting the state's renewable energy, security, emissions and energy pricing goals.
- This project will provide technical insights into how gas can help deliver a higher share of power from renewable energy with strong security and at least cost.
- Natural gas could potentially play an important supporting role in decarbonising electricity – adding more carbon neutral power sources into the power grid network. It could also help scale up a hydrogen industry.
- Project researchers will use a combination of modelling approaches to determine least cost fuel and technology choices over the medium and longer term.

Conventional gas well head infrastructure near Penola. This project will review the role of gas in future scenarios.

Towards zero net emissions

South Australia has strong policies on renewable energy deployment and access to gas. These are reflected in *Climate Change and Greenhouse Emissions Reduction Act 2007, South Australia's Climate Change Strategy 2015-2050 – Towards a Low Carbon Economy*, and also in the *Hydrogen Action Plan*. Each of these policies has a broad goal but they do not prescribe the types of technology or fuel source required to achieve it.

This project will contribute to implementing these goals by considering the role of natural gas against the backdrop of other fuel and technology options in both the medium and long term. It will outline a technical pathway towards the state's 100% renewable electricity goals at least cost and a hydrogen industry that supports eventual zero net emissions.

The role of gas in a low-carbon future

South Australia is moving towards having more than 50 per cent of its electricity supply generated by renewable energy. But while renewable energies are making up an increasing share of the state's energy generation, their output varies according to environmental conditions. This project will look at how renewables can be supported by other technologies including natural gas. Gas can also provide a relatively low-carbon, cost-effective backup for extended times – perhaps lasting several days – when renewable generation outputs are low.

The project is expected to identify strong synergies between the use of renewables and gas in the medium term, and the union of these sources towards an integrated energy system in the long term. Researchers might also identify technical or economic barriers that may arise.

Research conducted through this project will build on and extend emerging research into renewable integration, focusing particularly on the role of gas in the context of using both renewables and gas as primary energy sources for a new hydrogen industry.

In regard to hydrogen and renewable integration, we will draw on existing work (Alan Finkel) in reviewing hydrogen supply pathways and potential demand for hydrogen exports.

CSIRO · Australia Pacific LNG · QGC · origin · Santos · NSW Government · Australian Government Department of Industry, Science, Energy and Resources · Supported by Government of South Australia · Queensland Government · Northern Territory Government · Pangaea Resources Pty Ltd

Using gas to scale up hydrogen production

South Australia is considering the potential for hydrogen consumption, production and exports. In the long term, it would be ideal if all hydrogen was produced from zero carbon emission sources, but hydrogen produced from renewables is currently too expensive to be attractive to consumers. Using gas with carbon capture and storage may be a more economically viable, short-term option for hydrogen production, allowing consumers to incorporate lower emission hydrogen in their households and businesses. This project will consider how hydrogen that supports emissions reduction can be provided at least cost.

What will this project add to the field?

While a growing body of research, including that done by the CSIRO, is examining many hydrogen energy pathways and very high renewable energy systems, none has sought to pinpoint when gas can best contribute to the process of decarbonising electricity and hydrogen production.

This project will seek new knowledge on integrating renewable energy sources, particularly around the role of gas but also in the context of using both renewables and gas as primary energy sources for a new hydrogen industry.

Method

The project will use a combination of modelling approaches to determine the lowest cost fuel and technology options over the medium and longer term. It will enlist the CSIRO's Aus-TIMES, which models Australia's entire energy system. Aus-TIMES simultaneously models the fuel and technology choices of the electricity, transport, commercial and industrial sectors. Three other modelling systems will also be used.

What is the project timeline?

Mid-October 2020 – October 2021

When will the results be available?

Final reporting is expected in September 2021.
All results will be published on the GISERA website.

Who is funding this project?

The project is co-funded by the Australian Government, the SA Government and CSIRO.

The Hasselgrove 3 conventional natural gas exploration well head near Penola.

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