

# Decarbonisation in the mining sector - impact on gas pipelines

Companies in the mining and energy sectors in Australia are increasing their efforts to develop decarbonisation pathways.

Energy companies such as Woodside and Origin Energy are pursuing hydrogen export projects. This is in response to the opportunity for hydrogen exports, initially to Japan which is targeting hydrogen pricing at parity with LNG and other liquid fuels as a cornerstone of its “hydrogen society”.

The mining sector is leading the development of hydrogen and battery systems as part of the solution to the decarbonisation of mining operations in remote areas.

The decarbonisation of the Australian mining sector is being led by FMG and Rio Tinto. FMG is targeting being carbon neutral by 2030. Rio Tinto's goal is to reduce CO2 emissions by 15% by 2030 and to be carbon neutral by 2050.

FMG's decarbonisation pathway includes:

- replacing diesel for use in rail locomotives with green ammonia sourced from renewables, or battery electric locomotives or electrification of the rail network;
- the development of ammonia fuelled ships; and
- renewable generation for mines.

Glencore, which operates mines and a refinery in Queensland's North West Minerals Province, is

targeting a reduction in CO2 emissions of 40% by 2035.

## Impact on gas pipelines

Gas transmission pipelines in Australia typically transport gas to key markets in or near capital cities or major industrial demand centres (e.g. the LNG plants on Curtis Island near Gladstone).

The Carpentaria Gas Pipeline and the Goldfields Gas Pipeline are not typical in that they transport gas to mines in remote areas of Australia. Gas is transported to mines along the routes of these pipelines where the gas is used in power stations and for some mineral processing.

These are the pipelines with the most significant exposure to a reduction in utilisation due to the decarbonisation of the mining sector.

## Copper String 2

The Carpentaria Gas Pipeline is owned and operated by APA and transports gas to Queensland's North West Minerals Province.

The gas transported on the Carpentaria Gas Pipeline is used in power stations at Incitec Pivot's Phosphate Hill mine, Chinova Resource's Osborne mine, South32's Cannington Mine and in Mt Isa.

The electricity generated at the Mt Isa power stations, the largest of which are wholly owned by APA, is predominately for use in mining and refinery operations and for supply to smaller



customers on the Ergon Energy network. Copper String 2 is a proposed electricity transmission line from Townsville to the North West Minerals Province. Copper String 2 will enable consumers to source electricity from the National Electricity Market instead of the gas fired power stations connected to the Carpentaria Gas Pipeline. This will also make it possible for these consumers to Copper String 2 electricity from renewable sources.

This represents a risk that APA's Diamantina and Leichardt Power Stations will become stranded assets if Copper String 2 proceeds. The Leichardt Power Station may have a limited role in the National Electricity Market as a peaking power station.

### Hydrogen as a threat

Hydrogen provides an opportunity for remote power generation at mine sites that are islanded and independent of both gas and electricity transmission grids. Integrated solutions could consist of:

- renewable electricity generation;
- hydrogen electrolyzers and storage; and
- hydrogen for electricity generation and as a replacement for diesel in transport fleets.

Glencore established an integrated wind turbine, battery, hydrogen electrolyser and storage system at it's Raglan mine in Canada in 2015 to

demonstrate the viability of high penetration renewable energy.

The Goldfields Gas Pipeline in Western Australia is owned by APA and Alinta Energy. Along with other smaller pipelines in Western Australia that supply gas for power generation at remote sites, the Goldfields Gas Pipeline has an exposure to reductions in utilisation as remote generation using hydrogen and battery storage technology matures.

### Hydrogen as an opportunity?

The development of pipelines to transport green hydrogen to ports for export may offer a new asset class for pipeline companies to invest in.

However the criteria for identifying Candidate Renewable Energy Zones (REZ) in AEMO's 2020 ISP includes proximity to electricity transmission infrastructure.

Barriers to the development of hydrogen pipelines include:

- the potential integration of generation in a REZ, availability of existing electricity transmission infrastructure and hydrogen liquefaction plants at ports; and
- technical and costs challenges of transporting hydrogen in pipelines.

### About the author

Rod Johannessen has over 20 years experience in the energy sector. Rod advises governments and industry on energy and maritime issues. Rod was the commercial and technical adviser to the Gas Market Reform Group in 2018 for the development of a package of pipeline capacity trading reforms.

During his career Rod has held roles in business development, commercial management, strategy, and risk management with pipeline, upstream oil and gas, power generation and electricity retail companies.

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