

Renewable Gas Cheapest Path to Domestic Decarbonisation

Australia must decarbonize all carbon emission sources supplied to residential, commercial, and industrial users to reach its interim climate action goals by 2030 and net-zero by 2050. Presently, natural gas makes up approximately 24 per cent of all domestic energy use. In order to decarbonize, Australia will have the opportunity to repurpose existing gas infrastructure to supply customers with renewable gases or install new electricity infrastructure to support the electrification of domestic gas demand. While both pathways have significant cost implications for all energy users, renewable gases can help provide energy security, reliability, and the lowest cost pathway toward decarbonization. Most Australian households and businesses receive energy through a combination of electricity and gas networks, both of which have

varying levels of carbon emissions. To understand the cost implications of decarbonizing Australian gas demand, the Australian Pipelines and Gas Association (APGA) commissioned a report by Frontier Economics [1]. The report looked at three decarbonization scenarios:

1. **Electrification:** All natural gas is replaced by converting all gas appliances to electricity for residential, commercial and industrial users.
2. **Renewable Fuels:** All natural gas is replaced with hydrogen that is produced from renewable electricity (via an electrolyser).
3. **Zero-carbon Fuels:** All natural gas is replaced with hydrogen that is produced using steam methane reforming (SMR) from natural gas, where the carbon dioxide released in this process is captured and stored.

The scenarios were compared to the status quo for the gas and electricity sectors.

Both scenarios that use the existing gas network infrastructure represents the lowest cost for Australian consumers and industry. As seen in Figure 1, this is because significant generation and infrastructure capacity needs to be developed under the electrification scenario. The difference between the Renewable Fuels and Zero-Carbon Fuels scenarios is due to the cost of producing hydrogen from electrolysis as opposed to steam methane reforming circa 2020.

The gas network consists of thousands of kilometres of pipelines which can provide energy transport and storage. This readily available energy storage system is why less electricity generation capacity is required in the Renewable Fuels scenario. Using existing gas infrastructure for sector-wide decarbonisation avoids the higher costs of building new electricity transmission and storage infrastructure to deliver cheap, reliable energy to domestic and industrial users. Even if new gas infrastructure is required, the transport of energy is far cheaper via pipeline than powerlines even when accounting for renewable gas use.

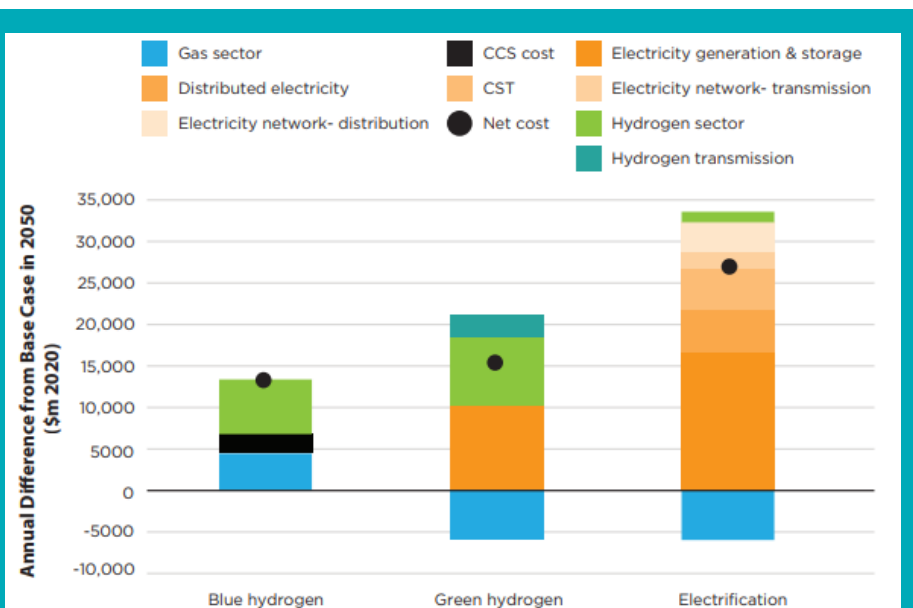


Figure 1: Net cost of decarbonising gas by scenario (\$2020)

References:

- 1 Gas Vision 2050: Delivering a Clean Energy Future, Australian Pipelines and Gas Association September 2020
https://www.apga.org.au/sites/default/files/uploaded-content/website-content/gasinnovation_04.pdf

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