How gas-powered generation enables cheaper and more reliable Net Zero

Australia's National Electricity Market (NEM) is moving toward a net-zero emissions future but faces questions about how to transition without threatening the reliability or affordability of electricity.

Gas-powered generation will play a critical role in enabling a net-zero future according to studies from the Grattan Institute and Frontier Economics by unlocking extremely high levels of renewable generation at the lowest cost while also helping ensure a secure and reliable electricity system.

How gas-powered generation makes Net Zero

An electricity network with a high percentage of renewable generation will require dispatchable generation (generation that can be turned on or off when required) to 'firm' the grid during sustained periods of high demand when there is little wind and little or no sunlight available. While renewable generation can be firmed by batteries and pumped hydro, gas-powered generation is able to provide firming for much longer at much lower overall cost, an important consideration during prolonged solar and wind droughts [1]. Using gas-powered generation to firm variable renewable generation can minimise the cost of firming the electricity system and lower overall electricity bills for Australian consumers and industry.

Why Australia should target Net Zero emissions

As renewables grow from 90 per cent to 100 per cent of generation sources, the physical and economic challenge of balancing the electricity system during sustained periods of high demand and prolonged wind and solar drought grows substantially. This is outlined the Grattan Institute's Go for Net Zero report [2]. The report found that *based on today's best estimates, governments should commit only to a net-zero future for the NEM, not zero-emissions or 100 per cent renewables*.

How to achieve a Net Zero future with gas-powered generation

The most efficient way to reach an electricity system with more than 90 per cent renewables is to include from seven to 10 per cent gas-powered generation capacity. Achieving net-zero emissions with gas-powered generation requires carbon offsets to account for emissions. However, even with this consideration, the Grattan Institute identified this approach as being significantly cheaper for Australian consumers and industry as opposed to developing the vast quantities of variable renewable generation and storage otherwise necessary to firm the grid.

Can gas-powered become less carbon intensive?

Research is under way into the decarbonisation of gas-powered generation through the development of renewable gases. This could allow for carbon neutral gas-powered generation and will be explored by APGA through future industry research.

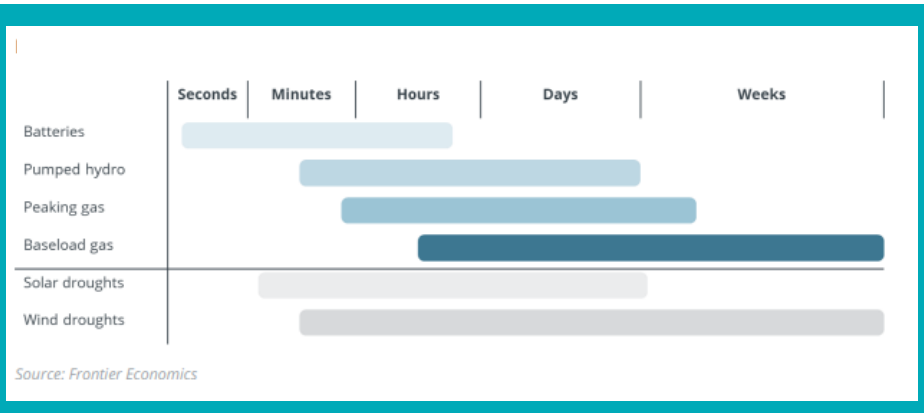

Figure 1: Effective electricity storage comparison

References:

1 210219_potential_for_gpg_to_support_renewables_-_final_report.pdf (apga.org.au)

2 Go for net zero: A practical plan for reliable, affordable, low-emissions electricity (grattan.edu.au)

Chart Data:

a) 210219_potential_for_gpg_to_support_renewables_-_final_report.pdf (apga.org.au)

Referenced APGA Factsheets:

I. The Renewable Gas Ecosystem

For further information

1st Floor, 7 National Circuit, Barton ACT
P: 02 6273 0577
E: apga@apga.org.au
F: 02 6273 0588
W: www.apga.org.au