3 February 2023

Submission: National Energy Performance Strategy

The Australian Pipelines and Gas Association (APGA) represents the owners, operators, designers, constructors and service providers of Australia's pipeline infrastructure, connecting natural and renewable gas production to demand centres in cities and other locations across Australia. Offering a wide range of services to gas users, retailers and producers, APGA members ensure the safe and reliable delivery of 28 per cent of the end-use energy consumed in Australia and are at the forefront of Australia's renewable gas industry, helping achieve net-zero as quickly and affordably as possible.

APGA welcomes the opportunity to contribute to the consultation on developing a National Energy Performance Strategy (NEPS). Energy performance is important in achieving least cost decarbonisation across the economy, but we must be careful to prioritise economically efficient solutions to emissions reduction, rather than energy efficiency at all costs.

APGA supports a net zero emission future for Australia by 2050[1]. Renewable gases represent a real, technically viable approach to lowest-cost energy decarbonisation in Australia. As set out in Gas Vision 2050[2], APGA sees renewable gases such as hydrogen and biomethane playing a critical role in decarbonising gas use for both wholesale and retail customers. APGA is the largest industry contributor to the Future Fuels CRC[3], which has over 80 research projects dedicated to leveraging the value of Australia's gas infrastructure to deliver decarbonised energy to homes, businesses, and industry throughout Australia.

The Ministers' foreword to the consultation acknowledges that improving energy performance is essential in ensuring all Australians are able to access affordable energy, and in supporting Australia's decarbonisation objectives. It is important to recognise that the most energy efficient outcomes are not necessarily the most economically efficient outcomes when seeking least-cost decarbonisation.

The NEPS must prioritise economic efficiency over energy efficiency to ensure lowest total cost of energy for customers. This can be achieved by avoiding sweeping, cross-sectoral energy efficiency requirements. Applying an energy efficiency requirement that is reasonable for one sector to all sectors risks eliminating more economically efficient energy solutions due to their lower relative energy efficiency compared to higher cost solutions. This risk is particularly apparent in decarbonising the use of natural gas.

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[1] APGA, *Climate Statement*, available at: https://www.apga.org.au/apga-climate-statement
[2] APGA, 2020, *Gas Vision 2050*, https://www.apga.org.au/sites/default/files/uploaded-content/website-content/gasinnovation_04.pdf
[3] Future Fuels CRC: https://www.futurefuelscrc.com/

Least-cost gas use decarbonisation

Efforts to pursue decarbonisation solely through energy efficiency, not economic efficiency, come at additional cost to the consumer.

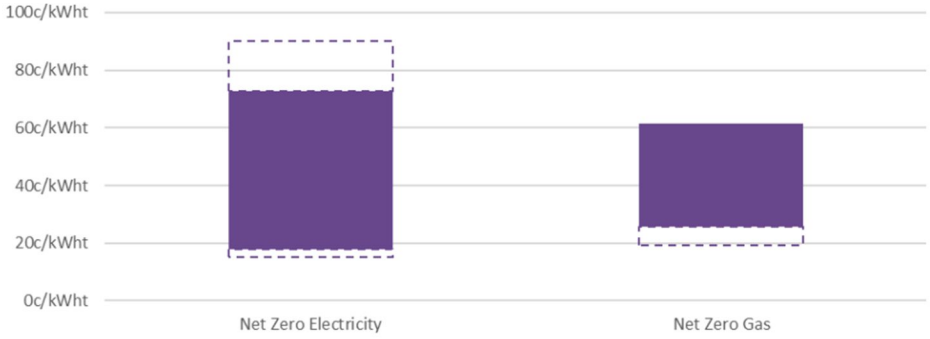
The most energy efficient outcome is not necessarily the most economically efficient outcome – that is, the outcome that delivers the desired result for the lowest cost to customers. This is likely the case for many applications which use energy in the form of gas today, including heat in the home.

Least-cost decarbonisation pathways based upon the cost effectiveness or efficiency of individual *components* of energy supply chains fail to take into account the total cost of those supply chains to the customer. Only when considering the economic efficiency of an entire supply chain does the most economically efficient outcome stand out.

In 2022, APGA undertook a study[4] to examine the costs of these supply chains to providing heat to household consumers. This study considered all aspects upstream of the purpose for which a customer is using energy – including the cost of the appliance, the cost of the energy used, and the efficiency of the appliance using this energy. Considering data for freestanding homes which use gas today in Victoria, APGA demonstrated that gas use decarbonisation for these customers is cost competitive whether achieved via renewable gas or renewable electricity uptake.

Despite electric appliances having vastly greater energy efficiency within this example, the renewable gas pathway displayed comparable economically efficiency to the renewable electricity pathways for gas use decarbonisation in the home.

Figure 1: Customer cost of heat in the home, FY2020-21, for a freestanding house in Victoria.



Source: APGA, 2022, *Supply chain analysis methodology for total customer cost*

Figure 1 displays study results for customer cost of zero emission heat in the home for freestanding homes in Victoria which currently using gas for heat, founded upon 2020-21 financial year price data.

[4] APGA, 2022, *Supply chain analysis methodology for total customer cost*, https://www.apga.org.au/sites/default/files/uploaded-content/website-content/supply_chain_analysis_methodology_for_total_customer_cost_-_final.pdf
Study summary:
https://www.apga.org.au/sites/default/files/uploaded-content/website-content/supplychainv5.pdf

The solid bars display the ranges of total customer cost of heat, including retail energy and appliance costs in a net zero energy future. Sensitivities are also displayed in Figure 1, represented by the dotted bars:

- The upper sensitivity for renewable electricity represents a reduction to 100 per cent efficient electric appliances;
- The lower sensitivity for renewable electricity represents an increase to 900 per cent efficient appliances with 40 per cent of heating energy coming from rooftop solar;
- The lower sensitivity for renewable gas considers renewable gas wholesale prices approaching $1/kg for renewable hydrogen or $7.50 per GJ for renewable methane alongside removal of the hydrogen infrastructure cost premium should renewable sources of methane become the prevalent renewable gas.

As demonstrated in Figure 1, retail net zero gas is cost-competitive with (and can be cheaper than) retail net zero electricity for heating free standing homes in Victoria which use gas appliances today. This makes renewable gases a viable, cost-efficient option for gas use decarbonisation, even where it may not be the most energy efficient option.

Case Study: National Construction Code 2022

In our response to the consultation process on reforms to the National Construction Code 2022 (NCC2022)[5], APGA identified that the energy efficiency requirements for residential buildings would, in fact, incentivise higher emission households (Table 1).

*Table 1: Comparison of <6 Star Gas Home and <2.5 Star Heat Pump Home (VIC6, EF** = 2.320)*

Home Appliance Composition	NCC 2022 EE* Rating	Average Efficiency	kgCO2e per kWh Input (2019)	kgCO2e per kWh Heat Output
Heat Pump <2.5 Star	2.057	300%	1.02	0.340
Gas <6 Star	3.223	88%	0.186	0.211

* EE = Energy Efficiency Rating; ** EF = regional Energy Factor
Source: APGA, 2021, *Submission: National Construction Code 2022*

Under changes to the NCC2022, the heat pump home is in fact more emissions-intensive than the gas-heated home, but the latter would be required under the Code to install additional solar photovoltaic system to comply with the code because its EE rating of 3.223 is higher than the Victorian region EF factor of 2.320. These figures are hard-coded via undisclosed means within NCC2022 Whole of Home variables set under the scheme. The outcome is considerable additional cost to the consumer with gas appliances which acts as a financial penalty for producing lower emissions.

APGA has highlighted this unintended consequence in its responses to the National Construction Code 2022 (Stage 2 consultation and Regulation Impact Statement

[5] APGA, 2021, *Submission: National Construction Code 2022 public comment draft (stage 2) consultation*, https://www.apga.org.au/sites/default/files/uploaded-content/field_f_content_file/211015_apga_submission_-_ncc_public_comment_draft_stage_2_consultation.pdf

consultation). APGA urges caution in pursuing energy efficiency as the only factor relevant to decarbonisation in the National Energy Performance Strategy.

Options to support economically efficient decarbonisation

It is important that the NEPS recognises the different forms of efficiency – energy and economic – at play in Australia's energy system as it approaches decarbonisation. One of the consultation questions is, "what are key financial and non-financial barriers to the uptake of energy performance improvement opportunities?"

APGA believes that a regulatory preference for electrification pathways, rather than least cost or economically efficient pathways, places unnecessary strain on both the nation's energy system and consumer amenity, and risks achieving decarbonisation goals.

With this in mind, APGA makes two minor recommendations towards economically efficient decarbonisation.

Building fabric upgrades as no-regrets infrastructure

Household energy efficiency programs have been run successfully at the state level for many years. There do, however, remain considerable opportunities to seek additional energy efficiencies in residential and commercial homes. These include upgrades to existing building fabric – insulation, window treatments, lighting, ventilation and other aspects – and also changes to standards for new buildings.

The efficiency of the fabric of a building reduces energy use regardless of its source, making standards relating to this concept truly "no regrets". Investments in the fabric of a building are generally cost effective in comparison to wholesale upgrades to appliances, especially when integrated into the initial design of the building and are much more cost effective that conversion to another form of appliance[6]. This is important when considering the energy efficiency of particularly low-income households, and tenanted households.

The NEPS should consider building fabric upgrades to be a key part of the "supply chain" in national energy performance.

Appliance-relevant efficiency targets

APGA supports the concept of efficiency targets for appliances as a necessary mechanism for improving energy efficiency. However, we do not support blanket, technology-agnostic efficiency targets. For example, a blanket appliance efficiency target of 100 per cent would be unachievable for current and future gas appliances, and thus would unnecessarily rule out renewable gas uptake as a viable approach to gas use decarbonisation regardless of economic efficiency.

Instead, APGA recommends that appliance efficiency targets be considered relative to a "type" as is done today. While 100 per cent efficiency gas appliances are not possible, a 90 per cent efficiency target for gas appliances are.

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[6] Frontier Economics, 2022, *Cost of switching from gas to electric appliances in the home*: https://gamaa.asn.au/wp-content/uploads/2022/07/Frontier-Economics-Report-GAMAA.pdf

An additional target of appliances being “hydrogen ready” by 2028 is also reasonable and feasible, and such targets would provide a strong market signal towards high efficiency gas appliances and the future of the gas industry.

To discuss any of the above feedback further, please contact me on +61 422 057 856 or jmccollum@apga.org.au.

Yours Sincerely,

JORDAN MCCOLLUM
National Policy Manager
Australian Pipelines and Gas Association