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Victoria needs a clear roadmap to a future that does not include a role for natural gas that is consistent with physical, economic, and environmental reality.

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Response to the Consultation Paper issued by the Victorian Government's Department of Environment, Land, Water and Planning, "Gas Substitution Roadmap".

There are no restrictions on publication of this submission or requirements for anonymity. The submission contains no personal information of third-party individuals.

1 Summary

Over the last 50 years, natural gas has made a valuable contribution to Victoria's domestic energy and chemical industries. In common with other governments in Australia, Victoria is now committed to an objective of net-zero emissions. The extraction and combustion of natural gas, at least without widespread, cost-effective, and comprehensive CCS or the use of offsets, is inconsistent with this objective¹.

The Government's initiative to consider the future of gas in the transition to net zero is the right strategic decision, as is consideration of the role of government in developing a roadmap through the transition.

The transition will impact producers, asset owners and consumers. The role of gas is important enough that the Victorian Government should play a key role in how the transition is managed, as it did in the sunrise period of the industry.

A roadmap is needed that incorporates scenarios based on economics and technology consistent with plausible international and domestic climate change policies. It should begin with a clear emissions reduction policy, state-based in the absence of national policy, and consistent with the government's policy.

The role of gas in industry for process heating and feedstock can be replaced with alternatives such as electricity, hydrogen, and concentrated solar thermal energy. The costs and commercial maturity of these alternatives are mixed, and some form of direct incentive or support may be necessary in absence of an emissions reduction obligation.

Gas is likely to play a small but important role in balancing wind and solar in the National Electricity Market in coming years². This role should be framed and determined through the NEM governance arrangements, wherein Victoria is a key participant.

The Government should do the analysis to develop a clear view on the long-term economic alternatives to replacing the role of gas for household and commercial uses with electricity, hydrogen, or biogas. The argument for electrification in other states is powerful and also seems strongest in Victoria, although far from simple. The roadmap should be based on this analysis and lead to consideration of the consequences of following it.

Government's primary involvement in mitigating risks in a sunset industry should be around managing the distributional impacts of the inevitable costs of decline – for example, protecting vulnerable households, and assisting users who can't otherwise afford to transition away from gas.

¹ <https://grattan.edu.au/wp-content/uploads/2020/11/Flame-out-Grattan-report.pdf>

² <https://grattan.edu.au/wp-content/uploads/2021/04/Go-for-net-zero-Grattan-Report.pdf>

2 Recommendations

- Undertake a comprehensive economic analysis of the alternatives to natural gas for household and commercial energy assume zero emissions by 2050.
- Based on the conclusions of this analysis, develop the Gas Substitution Roadmap, and identify the strategies and actions that will be necessary to deal with the consequences of the preferred alternative.
- Identify the role for the government in implementing and following the Roadmap.
- In the continued absence of national climate policy, consider a form of White Certificate scheme to reduce emissions in the commercial sector.

3 Background

This submission is made by Tony Wood, of the Grattan Institute. It responds to the Consultation Paper issued by the Department of Energy, Land, Water and Planning and Resources on 26 June 2021. This paper was framed in the context of the Victorian Government's targets to reduce the state's greenhouse gas emissions by 28 to 33 per cent by 2025 and 45 to 50 per cent by 2030 and its commitment to achieve net zero emissions by 2050.

Grattan Institute is an independent think-tank focused on Australian domestic public policy. It aims to improve policy outcomes by engaging with both decision-makers and the community.

This submission covers the broad objective of the Consultation Paper and issues identified with recommendations. It does not address all the key questions raised. It draws heavily on Grattan Institute's recent report, *Flame out: the future of natural gas*³, and the details in that report are not repeated here.

³ <https://grattan.edu.au/report/flame-out-the-future-of-natural-gas/>

4 Introduction

Government investment in gas infrastructure played a key role in the early development of the natural gas industry and was instrumental in supporting the early exploration and development of the first gas fields such as the Gippsland Basin. Upstream gas developments were also granted authority to jointly market their gas in recognition that the benefits of risk sharing outweighed the risk of less competition.

By the late 1990s, the market had dramatically matured, governments had privatised the government-owned pipelines and distribution networks, and the authorisations were being wound back. Investment in new infrastructure was being made by the private sector and, in contrast with electricity, gas pipelines were not subject to economic regulation.

The depletion of traditional gas fields, opening of the east coast to international markets and the priority to address climate change all point towards the prospect of a declining industry. The direction and end point are clear, but the timing and the nature of the transition across multiple gas applications are far from clear.

5 Key issues

Although there are challenges with replacing the role of natural gas in process heating, feedstock and power generation, the big issue is its role in household and commercial energy supply. Most

small consumers would be financially better off if they were using electricity today. The sunk cost in gas networks and the impact of electrification on the electricity network need to be fully understood as would the costs associated with a transition to either electricity or hydrogen.

The alternatives identified in the Consultation are electrification, hydrogen, or biogas. Keeping options open until a clearer picture emerges is an expensive choice and any decisions taken today carry future risks.

Biogas

Biogas is both limited in supply and expensive as a replacement for natural gas in the Australian situation. It is feasible that it could have role in areas where few, if any, alternatives exist today, the most obvious being as a basis for aviation fuel.

Hydrogen

The advantage of a shift to hydrogen compared with electrification is ongoing use of the investment in the gas network.

Zero-emission hydrogen, i.e., from renewable energy, is an expensive form of energy. The Commonwealth's stretch target of \$2 per kilogram would represent an energy price of around \$15 per gigajoule.

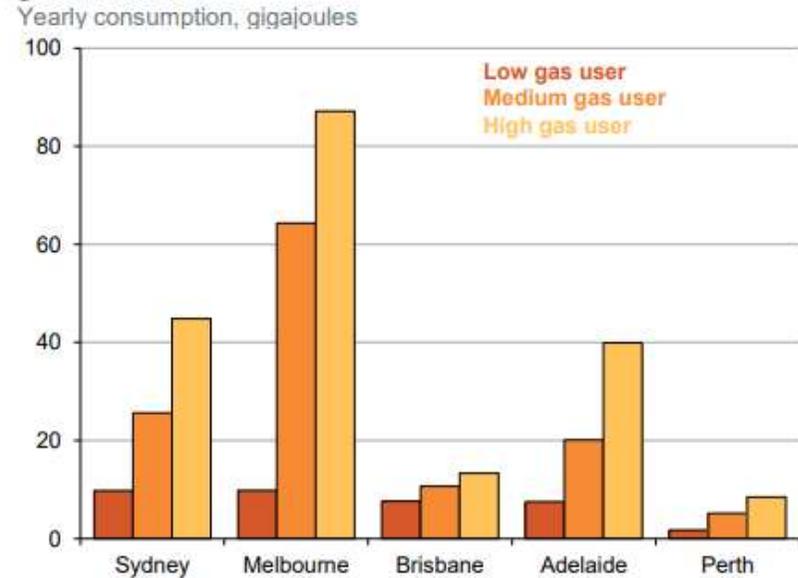
As Australia's heaviest household users of natural gas, Melbourne consumers have faced the highest price rises in recent years⁴.

⁴ <https://grattan.edu.au/report/gas-at-the-crossroads-australias-hard-choice/>

Most Melbourne households are affected, as 83% are connected to mains gas, compared with about 75 per cent in Adelaide, 50 per cent in Sydney and only 20 per cent in Brisbane. About 80 per cent of Perth households are connected, but, as with Brisbane households, consumption is low.

The following chart divides households in each city into three categories: low, medium, and high gas users, displaying the average consumption for each. A low gas user is a household in a small dwelling (one or two bedrooms) using gas for cooking and maybe hot water; a medium gas user is a household in a standard sized dwelling (three bedrooms) that has gas for cooking and hot water; and a high gas user is a household in a large dwelling (four or more bedrooms) using gas for cooking, hot water, and home heating.

Figure 9: Large households with gas heating consume much more gas than others



Source: ABS (2012)

Assuming wholesale gas prices today of about \$8 per gigajoule, a medium gas user in Melbourne can expect a yearly bill increase of about \$450 from a shift to hydrogen if they do not change their consumption. A high gas user in Melbourne can expect a hit of more than \$600.

Replacing natural gas with hydrogen would be a significant undertaking, more onerous than the shift from towns gas to natural gas last century. All gas burners would need to be replaced, as would parts of the distribution network made from

metals incompatible with hydrogen. New infrastructure would be required for the production and delivery of hydrogen to the distribution network.

Other relevant considerations are that the hydrogen supply chain is likely to be less efficient than electrification and issues such as safety and indoor air quality, including the production of small amounts of nitrogen oxides from hydrogen combustion.

Electrification

Victoria's large household winter gas heating load means that switching small-user gas loads would have significant effects on its electricity system. This shift would move peak electricity demand from summer to winter and could increase it by as much as 40 per cent.

Accommodating this load would require significant but technically straightforward investment over the next couple of decades. The development should be accompanied by revisiting the case for more cost-reflective network pricing for electricity.⁵

Beyond an economic assessment of the full costs of the alternatives, electrification would lead to significant consequences that would require planning and communication:

- Consumers on higher incomes are already well-placed to make a financial decision on switching from gas to electricity. For others this is not so simple, and the government would need to consider some form of financial support.
- The gas distribution network is owned by the private sector, although subject to economic regulation. There is a question whether some form of financial compensation would be sought by the owners of the assets who could argue that the implicit social contract did not include such market risk.
- The transition would almost necessarily involve some form of commercial arrangement to deal with the progressive loss of volume through the gas network and the implication for cost recovery. Compromising public safety would be unacceptable.

The transition from natural gas is one of the biggest energy policy issues facing the Victorian Government and ranks with privatisation and support for renewable energy.

The imperative is for emissions reduction and that should be based on the best economic alternative. Its planning and implementation involve a range of social and distributional/equity issues, some of which have been discussed in this submission. How they are addressed will be critical to a successful transition.

⁵ <https://grattan.edu.au/wp-content/uploads/2014/07/813-fair-pricing-for-power.pdf>

