



2023-2028 Victorian Gas Transmission System (VTS) Access Arrangement

Submission from BSL to the AER's Draft Determination and APA's Revised Proposal

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1 Introduction

Brotherhood of St. Laurence (BSL) have prepared this submission in line with a joint response made by BSL and Renew to APA's Initial Proposal in February and our earlier response to the AER's consultation on Regulating Gas Pipelines Under Uncertainty. This response is made in the interests of residential consumers, particularly those vulnerable to energy stress.

The circumstances of this reset make the stakes of determining the appropriate level of revenue higher than ever.

In the short term, a rise in network costs will add to an acute cost-of-living crisis. The Essential Services Commission (ESC)'s July forum with the community sector recorded that there was a high and growing volume of energy-related assistance requests, with some households prioritising energy bills over rent.¹ Approving increased network costs will commit consumers to higher baseline energy costs through coming years.

In the longer term, high costs will increase the challenge of safeguarding affordable energy services through the transition away from fossil gas.

APA's Initial Proposal brought up important questions for planning and managing the transition away from fossil gas. The AER supported a broader discussion on these issues through their November Issues Paper (on regulating gas pipelines under uncertainty). The scope of the issues raised by the prospect of the transition will require coordinated planning, rather than isolated proposal to reallocate risk more heavily towards consumers, through the application of accelerated depreciation or similar measures.

Our submission, and the accompanying research conducted by TRAC Partners, has been enabled by an Energy Consumers Australia (ECA) grant. The detailed analysis informing this submission is included as Appendix 1.

2 Summary

1. Efficient expenditure on the fundamental building blocks is essential in this access arrangement, to support affordable energy in the short term, through the current cost-of-living crisis facing Victorians, and through the long term, through the challenges of transition
2. We support the AER's decision not to approve accelerated depreciation. We don't think that the current conditions of this access arrangement warrant the transfer of risk to current consumers. We don't accept that there has been a sufficient effort to mitigate and properly address the risks and costs of stranding risk, and the related challenges of transitioning away from fossil gas and/or the transmission network. We don't support the reversal of this decision in the final determination.
3. We support the AER's decision not to support funding for the proposed hydrogen study. There has been an insufficient demonstration of the benefits of the blending proposal, and an incomplete understanding of the costs. We don't support hydrogen blend spending on the distribution or the transmission network – the broader question of the prudence of

¹ <https://www.esc.vic.gov.au/media-centre/energy-affordability-cost-living-pandemic-financial-impacts-drive-calls-community-support-services>

the hydrogen blend proposal should be directly considered with respect to the question of making a determination on proposed hydrogen expenditure.

4. We note that there were shortcomings in the demand management investigation. Consumer advocates stated a preference that this be properly evaluated before pursuing the SWP expansion (and potentially the WORM).
5. We are concerned about further cost increases to the proposed cost of the WORM
6. We agree with the AER's decision to disapprove Rule 80 Applications and we don't support an adjustment to the rules to allow the return from future Rule 80 applications to be fast-tracked to the current period.
7. We support the rejection of the fixed principle proposal as an unfair, and counterproductive re-allocation of risk towards consumers
8. The exceedance of capex allowance in the current period warrants careful evaluation
9. We support the of AER's draft decision on repex, and recommend that it be maintained
10. We support the AER's decision on the IOT program
11. We support the AER's draft decision on opex step changes
12. We support the application of higher productivity growth

3 Affordability

3.1 Affordable energy is essential for the health and wellbeing of Victorian households

The AER's draft decision reduced the proposed revenue from APA to \$611.5m. APA's revised proposal exceeds its initial proposal of \$644.1m, to request \$695.98m. This is a concerning percentage increase from current rates.

This increase is underpinned by increased building block fundamentals: opex and capex increases, that are likely to lock in higher costs for consumers over coming decades.

Our introductory statement (page 1 of this submission) reiterates the importance of supporting affordable energy through the decisions of this access arrangement:

- In the short term, higher network prices will add to a cost-of-living crisis of which a large component is an energy-affordability crisis. Energy costs are particularly hard to manage for the low-income and vulnerable households we work with.
- In the long term, unnecessary expenditure will increase the challenge of our transition away from fossil gas.

These circumstances, and the stranded asset risk that has been identified for the networks, warrant a higher-than-BAU level of evidence for all spending proposed in this access arrangement.

Careful investment planning is particularly important, in order to support affordability in the near term, as well as through our transition away from fossil gas.

BSL has run a series of focus groups about gas with households as part of the ECA grant that funds our engagement with the present access arrangements. In our initial observations, households are

highly concerned about the cost of energy, particularly certain cohorts who are struggling with bills. These groups often refer to trading off essentials in order to pay their gas and electricity bills, highlighting the importance of ensuring the affordability of gas.

4 Accelerated depreciation

4.1 We support the AER's decision not to approve accelerated depreciation

The AER's draft decision for the recent APA Victorian Transmission System's initial proposal recognises the range of concerns raised by consumers in-regards-to accelerated depreciation.

This finding acknowledged consumer concerns around:

- The assumption that consumers should bear 100% of the stranding risk
- the risk that accelerated depreciation now will be paid out as dividends, for example, and that this would leave the VTS exposed if a reversal was required
- the inefficient signals for decision making, of raising in the short term, and then potentially lowering, prices, where some consumers are planning to transition away from the gas network
- the contradiction between the proposed extensive capex program and the proposal for accelerated depreciation

The AER acknowledged that most advocates did not agree that consumers should bear the full risk of stranded assets - either in principle, or as stated in the National Gas Rules (NGR) and NGO.²

We welcome the AER's decision in their draft determination, and recommend that it should not be subject to any change for the final decision.

4.1 Forecast demand reduction, and consistent network narratives, are not sufficient conditions for approving accelerated depreciation

We stress that the required conditions articulated by the AER, as being necessary to warrant the allowance for accelerated depreciation, are not sufficient to address consumer concerns.

The AER's decision referred to their November Issues Paper.³

'We expressed a preliminary view that some form of accelerated depreciation would be appropriate where there is sufficient evidence to demonstrate and quantify both the pricing risk and stranded asset risk arising from demand uncertainty.'

And:

² AER, 2022. *AER - Draft Decision - APA VTS 2023-27 Access Arrangement - Attachment 4 - Regulatory depreciation - June 2022* <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/apa-victorian-transmission-system-access-arrangement-2023%E2%80%9327>

³ AER 2021 *Issues paper on regulating gas pipelines under conditions of uncertainty* <https://www.aer.gov.au/system/files/AER%20Information%20Paper%20-%20Regulating%20gas%20pipelines%20under%20uncertainty%20-%202015%20November%202021.pdf>

'We stated in our information paper we expected the business to provide compelling evidence to justify the proposed changes to asset lives. We also expected that to demonstrate stranded asset risk, regulated businesses would have to provide plausible future energy scenarios that covers a spectrum of outlooks from the most pessimistic to the most optimistic for their networks, and to estimate the likelihood (probability) of each scenario.'

We agree with the AER's finding, but we stress that limiting the required conditions to 'compelling evidence' of a risk, and even a consistent business narrative has the potential to increase cost and risk for consumers. Stranding risk, and the challenge of a possible network wind-down, requires coordination and planning to properly mitigate risk, and allocate cost fairly. This context is an essential requirement for the consideration of accelerated depreciation.

As we outlined in our submission to the AER's November issues paper, there are considerations within and outside the networks' remit that must be addressed as part of a sufficient plan to respond to the stranding risk identified by the networks. These considerations include, but are not limited to:

- Agreement and cooperation between parties to adopt and manage a particular decarbonisation pathway – for example, adoption of an electrification pathway
- Measures to limit cost and risk of transition. Establishing a demand management mechanism to avoid further augmentation is an example of the kinds of measures that will be necessary in providing sufficient flexibility to manage a potential asset wind-down
- A framework that considers gas transmission and distribution in a coordinated and consistent way
- Measures to overcome transition barriers for all consumers, including low-income consumers and renters (Note: this risk won't be addressed by accelerated depreciation, as networks have suggested (Section 4.2))
- Clarity regarding arrangements for the provision of safe and reliable services as the network winds down
- Measures to address ownership and decommissioning of assets that are depreciated early. Measures to address concerns raised by consumers regarding the provision of services where networks' revenue is reduced
- Measures to establish a fair share of cost and risk between key stakeholders, and to ensure affordability through the transition/asset wind-down

Networks have requested accelerated depreciation as a way to manage their risk associated with an asset wind down. However, the prospect of an asset wind down also raises critical questions for consumers as we have raised in our previous submissions.⁴

⁴ Victorian Community Organisations, 2021 *Submission to AER's Information Paper on Regulating Gas Networks under Uncertainty* <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/apa-victorian-transmission-system-access-arrangement-2023%E2%80%9327>

Given the need for coordinated effort between key stakeholders to manage a successful transition – it is important that the prospect of an asset wind down is approached as a whole, and that networks risks are not mitigated in isolation, through measures such as accelerated depreciation.

4.2 The Victorian Government Gas Substitution Roadmap does not warrant the approval of accelerated depreciation

The Victorian Government's Gas Substitution Roadmap has recognised the advantages for households – and especially new-builds – to forgo a connection to gas.

It removes existing barriers that make it difficult for new developments to avoid gas connection in Victoria and flags an update to energy efficiency subsidies and the introduction of National Construction Code 2022 7-star minimum ratings for new homes.

The Roadmap's announcements do not constitute grounds for the approval of accelerated depreciation.

They do not:

- prevent gas network augmentation
- establish a timeline or process for winding down the gas network.
- preclude continued spending to pursue reticulated hydrogen.
- address the challenges of potentially winding down the network, or
- establish measures to ensure all consumers are able to electrify.
- address the additional requirements, listed in Section 4.1

While the announcements of the Roadmap may have implications for future demand forecasts, this does not constitute grounds for accelerating depreciation.

4.3 Accelerated depreciation may increase risks for consumers

The potential for increased consumer risks imposed by accelerated depreciation are explored in detail in BSL and Renew's submission to the AER's November Issues Paper. In summary:

- Accelerated depreciation will increase prices in the short term – adding to the current cost-of-living burden, the risk of household debt, and the reduced access to essential energy services
- By raising prices, accelerated depreciation may speed voluntary exit from the network. This trend must be accompanied by proper measures to manage the transition
- Accelerated depreciation inefficiently allocates the stranding risk of new assets from networks to consumers, raising the risk of spending. This is particularly concerning in the context of proposed speculative spending on hydrogen, and new augmentation

In these ways, accelerated depreciation has the potential to add to consumer risk, without adequately reducing the risk for consumers (as discussed in Section 2.2).

4.4 Accelerated depreciation won't reduce risk or costs for future consumers

APA has argued that accelerated depreciation will lower costs for future consumers – especially vulnerable consumers that may remain on the network as others leave.

In Crew and Kleindorfer's⁵ work on accelerated depreciation, cited by APA during consultation, competition between the incumbent's tariffs, and the competing technology, is a key determinant to whether the incumbent can recover invested capital.

The paper considers the case in which it is assumed that incumbent pricing is restricted to being equal to, or less than the competitor. The implication is that uncompetitive pricing – above that of the new entrant – should be assumed to trigger the loss of all customers able to exit. According to Crew and Kleindorfer, the 'window of opportunity' for using accelerated depreciation to recover investment must begin well before price parity with the incumbent to be useful.⁶

As many studies show, electrification already delivers a positive NPV to many Victorian households, suggesting we are well outside the window of opportunity for accelerated depreciation.⁷

Importantly though, the gas networks differ from Crew and Kleindorfer's classic example of a telco network, in that a large part of consumer gas tariffs are determined by wholesale prices – these are outside the network's control, volatile and subject to extended spikes (as we are currently experiencing).

Therefore, gas networks can't use accelerated depreciation to deliver stable prices for current and/or future consumers – and avoid driving accelerated exists and spiralling tariffs - because high

⁵ Crew and Kleindorfer, 1992 *Economic Depreciation and the Regulated Firm under Competition and Technological Change* Journal of Regulatory Economics, 1992, vol. 4, issue 1, 61 pages

https://econpapers.repec.org/article/kapregeco/v_3a4_3ay_3a1992_3ai_3a1_3ap_3a51-61.htm

⁶This figure from Crew and Kleindorfer's 1992 paper on accelerated depreciation shows the necessary trajectory for accelerated depreciation. $P(t)X$ is the price competitive with a new entrant. $R(t;r)$ is straight line depreciation and $R(t;s)$ is accelerated, where it is assumed that the business will switch to the competitive rate after the point of intersection (price parity with the new entrant).

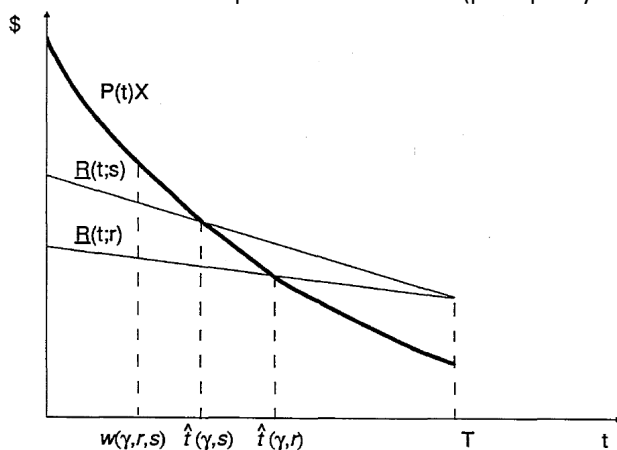


Figure 1. Illustrating WOO

⁷ Crew and Kleindorfer, 1992 *Economic Depreciation and the Regulated Firm under Competition and Technological Change* Journal of Regulatory Economics, 1992, vol. 4, issue 1, 61 pages

https://econpapers.repec.org/article/kapregeco/v_3a4_3ay_3a1992_3ai_3a1_3ap_3a51-61.htm

gas wholesale prices may still drive consumer exits to cause unaffordable network tariffs, even if the networks could otherwise deliver a smooth trajectory of affordable network costs in isolation.

Therefore, accelerated depreciation can't be assumed to deliver lower prices for future consumers – it could just as easily drive underutilisation and cause higher future network tariffs. It's essential that other measures are introduced to properly manage consumer risk. Low-income consumers who are less able to shift will not be protected by accelerated depreciation.

Accelerated depreciation should be understood and discussed as a risk management measure for networks, rather than future consumers. As such, it might only be considered as part of a plan that also addresses consumer risks.

4.5 APA's business narrative does not support the case for accelerated depreciation

The business narrative released by APA in July⁸ reiterates the position put forward by the business through consultation – i.e. that the uncertainty relating to future gas demand, electrification and the deployment mode for hydrogen in a decarbonised economy warrants expenditure that 'keeps options open.'

This narrative makes the argument for the deployment of accelerated depreciation (as a measure to mitigate stranding risk driven by electrification), while also initiating new spending on speculative projects such as hydrogen reticulation.

The narrative document does not contribute to a resolution of the concerns raised by consumers during consultation.

4.6 APA's modelling does not demonstrate a case for accelerated depreciation

As detailed in Section 4.4, Crew and Kleindorfer's WOOPs model assumes that customer costs must be limited to the competitive value (cost parity with the new entrant technology.)

ACIL Allen's modelling⁹ – unlike that prepared by the Victorian distribution networks – does not consider the interaction of costs (and the cost added by accelerated depreciation) and consumer behaviour. This interaction is central to the idea of accelerated depreciation. Instead, the ACIL Allen model assumes customers will leave according to one of AEMO's ISP scenarios – with no sensitivity to cost.

Also, ACIL Allen's modelling does not consider the impact of high gas costs – including extended spikes as we are currently experiencing – on the likely exit rate of gas consumers.

As such, the modelling does not address the concerns raised by consumers in relation to accelerated depreciation – i.e., that this measure is unlikely to manage, or even help, the costs and risks of future consumers (while increasing costs in the short term.) This is why BSL suggests that a wider, coordinated plan is needed to address consumer risk.

⁸ APA, 2022 *Discussion Paper. Victorian Transmission System Business narrative*

⁹ ACIL Allen, 2022 *VTS accelerated depreciation assessment Public Report*

<https://www.aer.gov.au/system/files/20220824%20ACIL%20Allen%20report%20to%20APA%20-%20VTS%20Accelerated%20Depreciation%20-%20analysis%20%28corrected%29%20-%2024%20August%202022.pdf>

4.7 APA's committed augmentation is reason alone not to allow accelerated depreciation

As we detail in Section 6.1 of this submission, APA did not adequately respond to consumer requests to explore demand response alternatives to their proposed augmentation. Instead, the SWP expansion was fast-tracked in response to requests from non-consumer stakeholders.

This demonstrates an unwillingness to cooperate in even minor efforts to minimise stranding risk – therefore, this alone should disqualify APA from consideration of accelerated depreciation in the current access arrangement.

5 Hydrogen expenditure

5.1 We agree with the AER's finding that the Hydrogen Safety Study should not be funded

We agree with the AER's finding that:

'APA has not provided sufficient evidence of its assessment of risk, how its proposed study would mitigate it, or that its proposed costs of completing this study are efficient. It is not clear that APA has considered alternative risk mitigation options to its proposed study, or whether some or all of this expenditure could be prudently deferred to or spread across future periods'.

We welcome the decision not to approve this expenditure. We don't support funding this project at the lesser cost put forward by APA (\$18.9m).

Further to AER's note that sufficient evidence was not provided, we stress that there are additional reasons to disallow this revenue:

- **The AEMC Review does not indicate that hydrogen will be introduced into the Victorian network.** This AEMC Rule Change Review Process makes it clear that individual jurisdictions will be responsible for the particular gases approved for distribution in any given state. Neither the Victorian Gas Substitution Roadmap nor any other Victorian process have determined that a hydrogen blend will be added to the Victorian network. Infrastructure investment is premature before this is conclusively determined.
- **Hydrogen expenditure increases the stranding risks facing Victorian consumers.** As we have argued elsewhere, hydrogen expenditure has the potential to exacerbate the risks for consumers around an unmanaged electrification process (chiefly by increasing the size of the asset base known to be at risk of stranding).
- **Full costs of the blending proposal, and the validity of assumed benefits, have not been adequately assessed or demonstrated**

It is not prudent to approve initial expenditure for accommodating hydrogen, or hydrogen blends, before the total costs are adequately assessed (including the full potential costs for APA's transmission network, given APA's advice that their assets can't be isolated from the distribution line.) An adequate analysis will also consider the cost of hydrogen gas production, for consumers, and the implications for energy affordability.

It is also important to test the high level, assumed benefits of the blending proposal, in driving demand, as a means to lower production costs. These stated benefits have not been assessed in detail. We also note that this stated objective does not benefit residential consumers.

- **The expenditure to support hydrogen does not meet the requirements of the NGO or the NGL**

As we detailed in our submission to APA's Initial proposal, the proposed hydrogen expenditure does not meet the requirements for conforming expenditure of the National Gas Rules (NGR) (Rule 79), or the principles of the National Gas Objectives (NGO).

- **Our organisation has remaining concerns regarding the safety, cost, technical feasibility, and the inadequacy of the best-case timeline of reticulated hydrogen**

Appendix 1 details concerns regarding the proposal for introducing hydrogen blends, and for 100% hydrogen. These concerns demonstrate that any network expenditure to upgrade the network, on a broad scale, to accommodate hydrogen (including blends) not prudent.

5.2 We believe that a broad, rather than narrow, approach should be applied to the question of whether hydrogen spending is prudent investment

Our organisation has a number of concerns about the proposal to introduce hydrogen blends to the network, and to invest towards reticulating 100% hydrogen. We have provided detail around our concerns in Appendix 1.

We are particularly concerned that there has been no independent evaluation conducted to confirm the assumed benefits of the proposal (described as being a measure to grow demand and thus reduce production cost for green hydrogen), and whether they warrant the costs from a consumer point of view.

We therefore encourage the AER to adopt a broad consideration of the prudence of the proposed spending to accommodate hydrogen, that does not assume the introduction of blends to be inevitable, and that doesn't accept a blending proposal that is imposed without properly considering network costs.

For example, if APA has identified that hydrogen anywhere in the distribution and transmission networks poses a safety risk to their operations – then abandoning the blending project should be considered as an option. It is essential that at a minimum, the costs exposed by the access arrangements are fed back into the decision-making process, so that the cost-benefit assessment of introducing blends is considered realistically.

5.3 Information from current access arrangements must inform the decision on whether to introduce blends.

Recent access arrangements (and other gas infrastructure planning projects) have disclosed important facts to be considered in the decision as to whether to introduce hydrogen blends. The regulatory decision to approve associated expenditure should ensure that this has occurred:

- There will be significant network costs associated with the blend proposal – with the full costs being unclear.

(The Victorian distributors have indicated that blends won't be introduced to the network until 2030 – and that there will be a not-yet-determined sum of funding to support this in the next access arrangement, beyond what they have already requested.) This contradicts the assumption that the hydrogen blend proposal has minimal network costs.

- Victorian distributors indicative timeline to be able to accommodate blends (by 2030) may be incompatible with the proposal's stated intention, as a way to build demand and drive down costs.
- The costs for building blend-compatible pipeline storage for the Kurri Kurri gas peaking plant were cost prohibitive, so that compatibility was abandoned for this project, despite the importance of hydrogen to the project's approval
- APA has said that hydrogen added to the distribution network in Victoria should be assumed to enter the distribution network, with safety implications and unknown but potentially prohibitive costs to address (the suggestion that hydrogen should not be assumed to be isolated between the distribution network and the VTS has been reiterated by Energy Safe Victoria (ESV).¹⁰

Network expenditure to accommodate hydrogen shouldn't be approved until it's demonstrated that any future decision to introduce blends has been made with an evaluation of the facts that have become clear in the access arrangements.

5.4 ESV's statement on network safety underlines the importance to halt all network spending on hydrogen blend accommodation, until the proposal is better understood

The AER has published a response to an information request completed by Energy Safe Victoria (ESV), regarding the implications of hydrogen blends in Victoria's distribution network for the VTS.¹¹

¹⁰ ESV, 2022 *Information Request, Hydrogen Safety*

<https://www.aer.gov.au/system/files/Energy%20Safe%20Victoria%20-%20Response%20to%20AER%20Information%20Request%20Hydrogen%20safety%20-%2017%20March%202022.pdf>

¹¹ Ibid

This statement from ESV broadly supports APA's claim that the proposal to inject hydrogen blends in the distribution network can't be assumed to be isolated from the transmission network.

From a consumer perspective, this information is a strong argument to avoid investment, in the current access arrangement round for distribution or transmission, in hydrogen blend accommodation.

The costs to accommodate the risk of hydrogen in the transmission system (and Victoria's storage assets) are not understood, but have the potential to be prohibitive – as was demonstrated by the Kurri Kurri high pressure storage example cited above.

This finding underlines the importance that the access arrangements serve as a sense check to the hydrogen blend proposal in a broad sense – rather than accepting that the project is likely given the early activity in response to the proposal.

6 Capex

6.1 APA's demand management investigation was insufficient

Throughout their consultation with APA, consumers requested that demand management be properly evaluated as a preferred alternative to the proposed SWP expansion and WORM. This preference was reiterated by AEMO's 2022 GSOO, which states:

'Flexible and scalable solutions that can be developed in stages may avoid over-investment risks while gas sector transformation uncertainties remain. Increasing "peakiness" of gas demand is likely to require flexible solutions that support high, but infrequent, gas demand. Demand response measures, if developed, could potentially play a growing role in managing peak gas demand, as they do at times of maximum electricity demand in the NEM.'

The case for demand management was only increased by 2022 GSOO – which brought forward the expectations of potential supply/demand imbalance to 2023, at the same time as anticipating a faster medium-term demand decline.

APA issued the *VTS Demand Management Report* in March. However, this investigation was high-level and it fell short of our explicit request for a genuine and determined effort to explore alternatives to the South West Pipeline expansion.

Specific shortcomings of APA's March Demand Management report include, but are not limited to:

1. The report reiterated APA's insistence that AEMO is responsible for demand management. From this, APA surmises: 'Our conclusion is that AEMO will consider demand management options in its approach to planning on the VTS, but that to date, demand management has not been a credible option.'¹²

¹² APA 2022 *VTS Demand Management Report*

This attitude is disappointing. Through the Public Forum held in February 2022, and through various submissions, consumers stressed the importance that businesses and market bodies collaborate to ensure this solution was properly assessed.

2. The report limits the scope of its evaluation to realising demand management equal to 100 PJ – and concludes that this volume of response is too difficult to orchestrate (without testing the interest of any large consumers and without attempting to quantify the capacity that could be addressed).

This is not consistent with the GSOO's worst-case peak day shortfall forecast of 36 TJ per day, and the SWP expansion's capacity of 47 TJs.

3. There was no consideration of the potential for residential consumers to contribute to demand management. As others have stated¹³, many households have existing reverse cycles installed that they primarily use as air conditioners. Given the marginality and infrequency of potential supply/demand imbalance - there is significant opportunity to develop a program to take advantage of RCAC owners.

6.2 APA's decision to fast-track the SWP upgrade was not in line with consumer input

As detailed in Section 6.1, APA did not conduct an adequate assessment of demand management as an alternative to the proposed augmentation on the SWP, as consumers had requested.

Instead, after the release of the 2022 GSOO, APA announced they were fast-tracking an upgrade to the Winchelsea compressor, to attempt to address potential peak day shortfalls now forecast as a possibility for 2023 (given the delay of the Port Kembla Import Terminal).

We note a number of points about the proposed SWP upgrade:

- The Winchelsea option was previously rejected by APA in favour of the 100 TJ Stonehaven and Pirron configuration promoted in their Initial Proposal - because upgrades at Winchelsea would have been a more expensive way to achieve 100 TJ (the Winchelsea cost is higher per TJ)
- The single-compressor upgrade being pursued now at Winchelsea will only increase the capacity of the SWP by 47 TJ, rather than 100 TJ. (Note that a 47 TJ upgrade *is* enough to address the possible peak day shortfalls anticipated in the 2022 GSOO.)
- At \$60.1m the 47 PJ Winchelsea upgrade has a higher cost per TJ than the Stonehaven and Pirron proposal.
- APA has not guaranteed that the Winchelsea compressor will be in operation by winter 2023, although they have made a commitment to attempt this. But it is an optimistic goal,

¹³ Pears, Alan 2022, *The forgotten fuel* Reneweconomy <https://reneweconomy.com.au/forgotten-fuel-australias-failure-on-energy-efficiency-is-a-global-embarrassment/>

The AER has approved this investment, but it has been done in opposition to consumers' stated preference, and without a proper evaluation of appropriate alternatives such as demand management.

6.3 The SWP upgrade does not resolve the cause of current supply threats

Although consumers are paying higher costs to fast-track the SWP expansion in the face of potential worst-case peak day supply shortfalls in 2023 – we remain exposed to shortfalls caused by interstate and overseas gas exports, which are the current cause of the 'threat to system security' that is expected to remain in place through the rest of winter.

Consumers have been required to pay for the SWP, despite the identified stranding risk, to avoid a worst-case peak-day shortfall – but they remain exposed to shortfalls caused by export arrangements.

We also note that AER has approved an amount of \$60m for this project when the AER's consultants recommends only \$45m.

6.4 We agree with the AER's decision to disapprove Rule 80 Applications

For both the Rule 80 proposal associated with connecting a Geelong import terminal, and also the \$230.6m additional extension of the SWP, the AER has found that:

On the basis of an uncertain demand and supply outlook, the issues relating to constraints with injection capacities, particularly from Iona UGS, and complexities associated with wholesale gas market processes, we do not consider that the proposed augmentation is justified under rr.79(2)(c)(ii) and (iv).

We support this decision, and reiterate our preference for developing alternative solutions to any potential short-term supply-demand imbalance, such as demand management.

6.5 We don't support a mechanism to bring a return on Rule 80 projects into the period of construction

Despite APA's acceptance of the AER's decision on the Rule 80 applications, they have resubmitted their proposal for a mechanism to allow the return on capital for future projects approved through Rule 80 provisions to be brought forward into the period of their construction.

We don't support the case for this adjustment.

As we have argued elsewhere, augmentation should generally be avoided, where possible, where a possible stranding risk has been identified for the VTS. As we have argued with respect to the SWP expansion, we need to develop alternative solutions to building long-term infrastructure at short notice, to address short term imbalances. These are the likely conditions that would apply to any future Rule 80 application, and as such, this mechanism should be avoided wherever possible over the upcoming period.

As such, we don't support an application for rules to bolster the implementation of Rule 80.

6.6 We support the rejection of the fixed principle proposal

Consumers voiced concern regarding APA's proposal that new assets be approved on fixed principle terms.

We welcome the AER's decision to disallow this proposal.

Given the identified risk of stranding facing the network, we think it is important not to increase the proportion of risk borne by consumers, given that consumers, unlike APA, are unable to respond to this risk (for example, by exploring appropriate alternatives like demand management.)

6.7 The exceedance of capex allowance in the current period warrants careful, bottom-up evaluation

Capex spending in the current period has exceeded allowed revenue. A number of factors indicate the value of conducting a close evaluation of current period expenditure, to confirm conformance.

We refer to page 14 of the attached Trac Partners report regarding unresolved questions relating to current-period capex.

6.8 We support the retention of AER's decision on repex

APA's revised forecast of \$103m is a 25% increase on current actuals, while the AER had allowed an 18% increase.

Any increase in repex made on safety grounds must demonstrate why the repex undertaken in the current period was inadequate.

As stated in our submission to the initial proposal, business cases for increased repex should:

- explain the replacement program; and
- analyse the costs and benefits of different types of replacement programs – e.g. run to fail v condition monitoring based replacement.

In addition we note:

- it is not clear why BC 203 & 204 will require 5 years for decommissioning, over which time they will remain in the regulated asset base (and whether decommissioning has been included already in their initial value)
- We question whether and to what extent the additional project (BC331 Pipeline Fracture Resistance - \$1.4m) relates to proposal to reticulate hydrogen. If it does, it should not be supported as conforming capex

6.9 We are concerned about the proposed cost increase for the WORM

APA has requested an additional \$32m to complete the WORM, since their initial proposal to total \$216.7m. The original expenditure approved in 2017 was \$127m (totalling a 70% cost blowout for this project).

This cost increase is significant, given that the APA's core argument for this project is that since it had already been approved in 2017, and construction has commenced, it should not be subject to further consultation.

We question why cost-increase drivers listed by the APA were not able to be identified in the initial project scoping exercise – such as the rocky ground, street works and department of transport requirements. It is not sufficient to claim the increase is “due to matters beyond APA's control as they are all market based cost items”. It is particularly concerning that significant cost increases have been applied at an 8-month interval from the Initial Proposal's estimate.

APA has stated that the security of supply events impacting Victoria's gas through winter 2022 demonstrate the need for the WORM. However, the key driver of the 2022 shortfall was interstate and international export demand – which could be resolved without the need for large infrastructure projects.

The arguments BSL has made in Section 6.1 for the advantages of applying demand management solutions rather than the SWP expansion to address peak day imbalances, also apply to the WORM.

6.10 We support the AER's decision on the IOT program

We support the AER's decision on the IOT program.

We note that the additional information supplied by APA still focuses on performance improvements, which are not endorsed by consumers.

7 Opex

7.1 The nominated opex base year is higher than others in the current period

The AER has allowed a base year of \$156.9m, 6.6% higher than requested by APA in their initial proposal after being updated for forecast 2022 inflation.

The concerns raised by consumers in regards to the nomination of 2020 as the base year, have not been resolved.

In making this allowance, the AER cited APA's higher opex base spending in the prior 2013-2018 period (despite the lower expenditure in most years of the current 2018-2023 period.)

Higher historical base years may not provide a useful comparison where efficient operations have subsequently been demonstrated at a lower cost.

7.2 We support the AER's draft decision on opex step changes

APA reduced the total opex step changes from \$27.6m to \$6m. As our response to the initial proposals stated, there should be a high level of evidence required for the necessity of increasing opex.

We don't support an increase between the draft and final decision. We are concerned about the increase in opex, which would be exacerbated by an increased step allowance.

Transformation of Technology (not approved) –

In relation to their decision not to approve this proposed step change, the AER has stated:

‘Our alternative estimate does not include this step change as we were unable to determine it is prudent and efficient expenditure. We did not receive sufficient information to substantiate that the relevant IT assets have reached the end of their useful life, or to understand what role service improvements played in the decision to migrate to cloud infrastructure. Further, while APA stated the opex forecast for the step change was determined using opex costs derived from third party benchmarking analysis provided by CapGemini, we could not substantiate this using the information provided. APA also indicated the scope of the programs is subject to ongoing assessment and updated opex estimates are expected to be available in the future, including as a result of information obtained from vendors through request for proposal responses. This information from vendors would help to substantiate the efficiency of the proposed costs.’¹⁴

We agree that there is a need to demonstrate the necessity of the proposal with respect to these aspects, and that service improvements are not a consumer priority. As we have stated throughout this submission, the identification of stranding risk warrants a higher-than-BAU level of proof for prudent revenue.

WORM and SWP opex (reduced)

We agree with the AER's ruling on this, and we are not satisfied that APA's arguments for greater usage are valid.

Peak day usage are the grounds on which the project has been justified and these are the usage conditions under which consumers should be charged. Where the compressor is run in lieu of the other Winchelsea unit (or other assets), there should obviously be an equivalent opex saving for the existing unit.

We disagree that the unit will be run more often for the consumer-focused peak day usage for which it has been built over the upcoming period. In the short term, it is Longford's flexible peak day supply that is in doubt, which has been the justification for the SWP expansion project.

If the additional expected usage is related to the export of gas from Iona to meet interstate/international demand (as has been the case through 2022, leading to security of supply events), Victorian consumers should not be charged for this operation.

SOCI (reduced)

We appreciate the need for confidentiality for this expenditure, and support the AER's decision to determine a revised estimate.

Property taxes (not approved)

¹⁴ AER, 2022, *AER - Draft Decision - APA VTS 2023-27 Access Arrangement - Attachment 6 - Operating Expenditure - June 2022* <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/apa-victorian-transmission-system-access-arrangement-2023%E2%80%9327>

We welcome the AER's finding on property tax: 'In its revised proposal, APA may provide further information if there are clear legislative or policy changes driving property tax increases. In this case, it should also provide evidence of the basis for the cost increases being efficient and that the increases only relate to properties used for regulated purposes.'

We agree that evidence of legislative changes is necessary to qualify this spending as a step change.

Carbon offsets (not approved)

We welcome the AER's decision not to approve step change funding for ACCUs to offset fugitive emissions. We strongly oppose this proposal, and do not expect that it will be possible to demonstrate its qualification as a step change, or show that it should be funded through revenue.

Passing the cost of offsets onto consumers undermines the incentive function of offsets, which should encourage real emissions reductions. We don't accept the logic of APA's argument (in their revised proposal) that the fact that their fugitive emissions are calculated, rather than measured, means that they can only be addressed through offsets, rather than true reduction. APA's employment of this argument demonstrates the shortcomings of the method used to calculate fugitive emissions.

It is important that this access arrangement does not establish a precedent in charging customers through regulated revenue for offsets.

7.3 Higher productivity growth should be applied

The AER has included an annual average productivity growth of 0.5%.

This is an improvement on APS's proposal, but we note this is lower than the commercial average of 1%.¹⁵

Ongoing productivity gains are an essential component in determining efficient network costs. They allow the return of savings achieved through investment to be transferred to customers. They also provide an imperfect mechanism to balance the positive step changes that are regularly identified by network businesses at each access arrangement, given that negative step changes are not identified.

We encourage ambition in this area.

8 Tariff structures

8.1 Consultation on tariff structures is warranted

The AER's draft finding acknowledges the stakeholder feedback on the complexity of APA's tariffs. We have also questioned the continued suitability of a declining block structure in the context of high gas wholesale prices and declining supply.

¹⁵ BSL 2021 *Victorian Consumer Organisations Submission to the Victorian EDPR*
<https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/jemena-determination-2021-26>

The draft decision defers consultation on tariff structures to the 2028-2033 access arrangements.

We acknowledge that there is little remaining time available through this access arrangement – but we also argue that in the context of rapid transformative change, that is currently being experienced by Victoria's gas services, it is not adequate to wait five years to determine that tariffs are fit-for-purpose.

9 References

Advisian. 2021 *Australian Hydrogen Market Study* <https://www.cefc.com.au/media/nhnhwlu/australian-hydrogen-market-study.pdf>

AER, 2022. *AER - Draft Decision - APA VTS 2023-27 Access Arrangement - Attachment 4 - Regulatory depreciation - June 2022* <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/apa-victorian-transmission-system-access-arrangement-2023%E2%80%9327>

AER 2021 *Issues paper on regulating gas pipelines under conditions of uncertainty* <https://www.aer.gov.au/system/files/AER%20Information%20Paper%20-%20Regulating%20gas%20pipelines%20under%20uncertainty%20-%2015%20November%202021.pdf>

AER, 2022, *AER - Draft Decision - APA VTS 2023-27 Access Arrangement - Attachment 6 - Operating Expenditure - June 2022* <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/apa-victorian-transmission-system-access-arrangement-2023%E2%80%9327>

APA, 2022 *Discussion Paper. Victorian Transmission System Business narrative*

BSL 2021 *Victorian Consumer Organisations Submission to the Victorian EDPR* <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/jemena-determination-2021-26>

APA 2022 *VTS Demand Management Report*

COAG Energy Council. 2019. *Australia's National Hydrogen Strategy* <https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf>

Crew and Kleindorfer, 1992 *Economic depreciation and the regulated firm under competition and technological change* <https://econpapers.repec.org/RePEc:kap:regeco:v:4:y:1992:i:1:p:51-61>

ESV, 2022 *Information Request, Hydrogen Safety* <https://www.aer.gov.au/system/files/Energy%20-%20Safe%20Victoria%20-%20Response%20to%20AER%20Information%20Request%20-%20Hydrogen%20safety%20-%2017%20March%202022.pdf>

Fraunhofer IEE, 2022 *Limitations of Hydrogen Blending in the European Gas Grid* https://www.iee.fraunhofer.de/content/dam/iee/energiesystemtechnik/en/documents/Studies-Reports/FINAL_FraunhoferIEE_ShortStudy_H2_Blending_EU_ECF_Jan22.pdf

GPA Engineering, 2019. 'Hydrogen Impacts on Downstream Installations and Appliances' <https://www.industry.gov.au/sites/default/files/2021-09/hydrogen-impacts-on-downstream-installations-appliances-report-2019.pdf>

Hy4Heat 2021 *Safety Assessment: Conclusions Report (Incorporating Quantitative Risk Assessment)*
<https://www.hy4heat.info/wp7>

Victorian Community Organisations, 2021 *Submission to AER's Information Paper on Regulating Gas Networks under Uncertainty* <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/apa-victorian-transmission-system-access-arrangement-2023%E2%80%9327>

Wright, Madeliene and Alistair Lewis, 2022. *Emissions of NOx from blending of hydrogen and natural gas in space heating boilers* University of California Press
<https://online.ucpress.edu/elementa/article/10/1/00114/183173/Emissions-of-NOx-from-blending-of-hydrogen-and>

10 Appendix 1 – Consumer-centric concerns regarding investment to accommodate hydrogen in the gas networks

10.1 Hydrogen may be deployed in a way that won't need broadscale reticulation

Green hydrogen is at a trial-stage in Australia, but most studies expect this technology to play some role in a decarbonised economy, especially for industry and heavy freight.

However, there are many ways to deploy green hydrogen that don't require reticulation through a broad-scale network as is currently used for gas.¹⁶ The industry's development is at too early a stage to understand which mode of deployment is most likely (although there have been clear disadvantages identified for broadscale reticulation, as discussed below.)

For example, hydrogen may be used primarily in fuel cells, or it may be generated and reticulated locally, via small, isolated networks. It may be used primarily to generate electricity, so that it would be reticulated via transmission lines.¹⁷

Given the significant uncertainties about the configuration of a future green-hydrogen economy, investment in gas networks to accommodate hydrogen is premature.

10.2 Reticulated hydrogen would compete directly with the electrification for residential loads

The proposal to introduce hydrogen blends into the network, and to develop the network for 100% hydrogen does not complement the alternative pathway identified for residential electrification – it competes directly, and increases the challenges of the electrification transition.

Network spending to develop hydrogen will increase gas costs – and all else being equal, should be expected to drive customers faster, to leave the network.

As discussed in the body of our submission - in the absence of an adequate transition plan to manage a migration off the network, the prospect of the networks becoming underused poses risks for consumers remaining on the network.

Pursuing a reticulated hydrogen pathway is likely to delay the development of an adequate plan to manage electrification and migration off the network – at the same time that it may speed this migration and increase the asset base at risk of stranding.

Therefore, the proposal to introduce blends and develop reticulated hydrogen competes directly with the proven and cost-efficient residential electrification pathway, and should not be pursued in concert.

¹⁶ Advisian, 2021. *Australian Hydrogen Market Study* <https://www.cefc.com.au/media/nkmljvkc/australian-hydrogen-market-study.pdf>

¹⁷ Advisian, 2021. *Australian Hydrogen Market Study* <https://www.cefc.com.au/media/nkmljvkc/australian-hydrogen-market-study.pdf>

10.3 There are unresolved safety concerns for households regarding the prospect of reticulated hydrogen (blends and 100%)

Hydrogen and hydrogen blends pose the following safety concerns for households:

- Hydrogen increases the explosion risk by a factor of four (equipment required to mitigate explosion risk, like excess flow valves, have a limited impact, and will introduce an as-yet unquantified cost)¹⁸
- Hydrogen blends (and pure hydrogen) emit higher levels of NO_x than methane. This will increase the respiratory health risk associated with domestic gas and contribute to air pollution¹⁹
- Hydrogen blends may cause damage to existing heaters (through embrittlement) and increase the risk of internal failure and carbon monoxide poisoning (such long-term aspects of safety have not been addressed by current compatibility testing)²⁰

10.4 There are unresolved technical concerns regarding the long-term impacts of hydrogen blends

Current Australian research and trials are progressing to demonstrate the proposition to add hydrogen blends to the network.

However, these do not resolve the long-term implications that hydrogen poses on the range of modern equipment the blended gas will be in contact with, which remains uncertain.²¹

10.5 The full costs of adding hydrogen blends or hydrogen to the network are not known

The Victorian distribution networks have indicated that they aim to be ready to accommodate blends by 2030.

This implies that there will be work in the next access arrangement to complete the transition.

Expenditure on hydrogen should not be started until there is a full and representative (high-confidence) understanding of the full costs of the transition. A recent German report found that

¹⁸ Hy4Heat 2021 *Safety Assessment: Conclusions Report (Incorporating Quantitative Risk Assessment)*
<https://www.hy4heat.info/wp7>

¹⁹ Madeleine Wright and Alistair Lewis, 2022. *Emissions of NO_x from blending of hydrogen and natural gas in space heating boilers* University of California Press
<https://online.ucpress.edu/elementa/article/10/1/00114/183173/Emissions-of-NOx-from-blending-of-hydrogen-and>

²⁰ GPA Engineering, 2019. 'Hydrogen Impacts on Downstream Installations and Appliances'
<https://www.industry.gov.au/sites/default/files/2021-09/hydrogen-impacts-on-downstream-installations-appliances-report-2019.pdf>

²¹ Fraunhofer IEE, 2022 *Limitations of Hydrogen Blending in the European Gas Grid*
https://www.iee.fraunhofer.de/content/dam/iee/energiesystemtechnik/en/documents/Studies-Reports/FINAL_FraunhoferIEE_ShortStudy_H2_Blending_EU_ECF_Jan22.pdf

adding 20% green hydrogen to Europe's distribution networks would increase end-user costs by up to 43%, while cutting greenhouse gases by just 6-7% (considering network costs alone).²²

It's also important to consider the costs that hydrogen production would imply to consumers, in determining whether network costs are prudent

10.6 APA has stated that hydrogen introduced to the distribution network will impinge on the VTS

APA has stated that the low-pressure sections of the VTS mean that it can't be isolated from gases in the distribution network – and that preparing the VTS for hydrogen blends is therefore a necessary safety measure if it is to be included in the distribution network.

This raises many concerns around safety and cost.

APA has told stakeholders that without the proposed safety study, it is not known whether hydrogen will be compatible with their pipeline at any pressure. They have suggested that without this study, a cost estimate to accommodate blends would not be possible to prepare.

They have also suggested that hydrogen blends may require pressures to be lowered, with the potential to drive augmentation, or to impact operations.

10.7 The network's timeline to accommodate blends is inconsistent with transition requirements

The Victorian distribution networks have indicated that they aim to be ready to accommodate blends by 2030.

This is inconsistent with the stated purpose for introducing a hydrogen blend to the network. The blending proposal has been advanced with the intention to force the growth of local demand – on the assumption that this will drive down production costs, according to a learning-rate model.²³

Victoria has committed to reduce emissions by 45 – 50% of the 2005 level by 2030.

It's likely that the hydrogen industry will need to develop between now and 2030, to serve the identified high priority applications (such as industry and heavy freight), so that growing an artificial demand through blending after 2030 is unlikely to assist cost trajectories for these sectors, and is more likely to compete with these high-priority applications.²⁴

²² Fraunhofer IEE, 2022 *Limitations of Hydrogen Blending in the European Gas Grid*
https://www.iee.fraunhofer.de/content/dam/iee/energiesystemtechnik/en/documents/Studies-Reports/FINAL_FraunhoferIEE_ShortStudy_H2_Blending_EU_ECF_Jan22.pdf

²³ DISER 2019 *Australia's National Hydrogen Strategy* <https://www.industry.gov.au/data-and-publications/australias-national-hydrogen-strategy>

²⁴ Fraunhofer IEE, 2022 *Limitations of Hydrogen Blending in the European Gas Grid*
https://www.iee.fraunhofer.de/content/dam/iee/energiesystemtechnik/en/documents/Studies-Reports/FINAL_FraunhoferIEE_ShortStudy_H2_Blending_EU_ECF_Jan22.pdf

10.8 The proposal to introduce hydrogen blends doesn't benefit consumers

As discussed, the proposal to introduce hydrogen blends into the network has been put forward as a way to grow the local industry and reduce production costs.²⁵

Independent studies identify hydrogen as important for industrial uses. There is also an expectation that hydrogen will be developed as an export industry.

Residential consumers require access to affordable energy services to fuel essential heating, cooking or hot water. Network tariffs, therefore, should not be used as a source of capital to grow a new sector that will chiefly benefit industry, and exporters.

This is especially the case given the stranding risk identified for these networks, and the potential for new hydrogen expenditure to increase this risk.

The proposed hydrogen spending, and the project to grow Australia's hydrogen industry, does not align with any of the prescriptions for compliant spending listed in the NGR, rule 79.

10.9 The greenhouse impacts of green hydrogen will limit its use in a net-zero economy

Green hydrogen has an associated global warming potential (GWP).

1. Hydrogen released fugitively has GWP of 11 CO₂e. This is lower than the value for methane – but hydrogen should be expected to escape at greater volume, given its leaky characteristics. (This is particularly an argument against reticulating hydrogen in a low-carbon scenario)²⁶
2. Hydrogen releases NO_x when burnt. The climate impacts of NO_x depend on local circumstances²⁷
3. Under some conditions (particularly lean burns implemented to reduce NO_x pollution), hydrogen combustion can release the very harmful greenhouse gas N₂O²⁸

The greenhouse impacts of reticulated hydrogen have not so far been included in least-cost modelling exercises undertaken by AEMO (the ISP), the Victorian Government, Infrastructure Victoria or the networks.

²⁵ DISER 2019 *Australia's National Hydrogen Strategy* <https://www.industry.gov.au/data-and-publications/australias-national-hydrogen-strategy>

²⁶ Nicola Warwick, Paul Griffiths, James Keeble, Alexander Archibald, John Pyle, University of Cambridge and NCAS and Keith Shine, University of Reading, 2022. *Atmospheric Implications of Increased Hydrogen Use* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1067144/atmospheric-implications-of-increased-hydrogen-use.pdf

²⁷Wright, Madeline, 2022 Emissions of NO_x from blending of hydrogen and natural gas in space heating boilers <https://online.ucpress.edu/elementa/article/10/1/00114/183173/Emissions-of-NOx-from-blending-of-hydrogen-and>

²⁸ Colorado, Andres 2016 *Direct emissions of nitrous oxide from combustion of gaseous fuels* <https://www.sciencedirect.com/science/article/abs/pii/S0360319916329548>

Given the high marginal cost to offset additional residual remaining emissions in a net-zero economy, hydrogen's emissions will limit the total volume of green hydrogen optimal.

In particular, given the leakiness of hydrogen, its emissions will limit the case for reticulated hydrogen networks in an optimal decarbonisation pathway.

10.10 Decisions regarding hydrogen should not be deferred to interested parties

The Victorian Gas Substitution Roadmap suggests that the decision on whether to introduce a hydrogen blend to the network will be dependent on the outcome of a feasibility assessment conducted by the Australian Hydrogen Centre.

The Australian Hydrogen Centre is an AGIG-led project. AGIG's Initial Proposal released in July has stressed the existential importance of hydrogen to the future of their network – and as such, they are not a disinterested party.

Similarly, the Gas Appliance Manufacturers Association of Australia's report emphasising the high cost for households to electrify should not be considered an independent study.