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Dear James,

Review into extending the regulatory frameworks to hydrogen and renewable gases.

The Australian Energy Council (AEC) welcomes the opportunity to respond to the Australian Energy Markets Commission (AEMC) consultation paper *Review into extending the regulatory frameworks to hydrogen and renewable gases*.

The AEC is the industry body representing 20 electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. These businesses collectively generate the majority of the electricity in Australia, sell gas and electricity to over ten million homes and businesses, and are major investors in renewable energy generation.

The AEC acknowledges that the imperative for review arises from the recommendations from the 2019 Hydrogen Strategy to review a range of technical, economic, regulatory and legal barriers to hydrogen uptake. However, there is no apparent urgency to extend the regulatory frameworks for hydrogen and renewable gases that is applicable to immediate or medium-term small consumer outcomes. Therefore, the AEC does not support the current proposed review scope or timing. However, the AEC would support a review timeline to assess first and then potentially enable hydrogen blends into the system as a long-term transitional measure to net zero by 2050 that is tied into Federal and State initiatives/targets as an alternative approach.

The AEC believes the immediate focus should be on assessing technical and economic barriers. In its Issues Paper series, the COAG Energy Council Hydrogen Working Group notes that: *Hydrogen production costs are currently high but do have the potential for reduction...potentially reaching price parity with domestic natural gas markets that are exposed to global markets by 2030.*¹ Given this, there are more immediate priorities for both the AEMC and AEMO where resources which could be utilised in reducing Australia's emissions are allocated to regulatory and legal issues associated with hydrogen. As the NEM continues to decarbonise and transitions to more variable renewable energy (VRE), distributed energy resources (DER), energy storage and declining levels of thermal generation both the AEMC and AEMO are under heavy workloads for the foreseeable future. In our view requiring these organisations to expend resources on review of the regulatory framework is a poor use of scarce resources.

The AEC is not anti-hydrogen. The AEC believes strongly that hydrogen will have a future role to play in Australia for each of:

- Heavy transport;
- Industrial Process Heat and Feedstock, and;
- Gas-powered generation (GPG)

¹ National Hydrogen Strategy, Hydrogen in the gas network, <https://consult.industry.gov.au/national-hydrogen-strategy-issues-papers>

However, in considering hydrogen for use in the gas distribution network for cooking, space heating and hot water (households and businesses using reticulated gas), the AEC doubts that the overall economic benefit will be positive. At this time, hydrogen remains a largely unproven and currently uneconomic approach to decarbonisation. We acknowledge that finding new relevance for existing gas network infrastructure is of interest to stakeholders invested in them, especially as decarbonisation pushes towards electrification. Unfortunately, networks have a history of front-running the kinds of arguments that serve their interest but that end up costing consumers in the long run.²

Finally, the AEC is concerned by the apparent conflation of the Energy Ministers Meeting (EMM) task to the AEMC conduct a review of the National Gas Rules (NGR) and National Energy Retail Rules (NERR) with regard to the regulatory frameworks to include low-level hydrogen blends and renewable gases *and* to develop the initial draft rules for consultation. The consultation seems to bypass the question of the economic and technical feasibility of the proposed blends (and as a consequence the efficiency criteria of the NGO) and leaps to the EMM direction to draft rules. The AEC believes an important step in understanding the impacts of blended gases has been missed.

The AEC supports the initiative taken by the Australian Energy Regulator (AER) which is conducting a concurrent consultation for trial waivers and trial rule change processes. This approach will enable assessable trials assessing technical and economic barriers, the results of which can then better inform any changes required to the regulatory framework of the kind currently contemplated by the AEMC Review. The AEC believe that we should wait, and instead be informed as to any future regulatory requirements if a successful business model that addresses the economic and technical thresholds emerges from such trials for hydrogen blending to households and small businesses.

Our responses to the consultation questions are provided below. The AEC has not provided a response to every single question to the consultation.

Question 1. Do you agree with the Commission's preliminary position on the scope of this review?

As noted above, the scope of the review presupposes that for households and businesses using reticulated gas that the overall economic benefit of hydrogen and renewable gases will be positive, when this remains speculation. To some extent we may be confident that given the AEMC must carry out its assessment against efficiency criteria in the National Gas Objective, and the hurdles relating to allocative, productive and dynamic efficiency, then changes to the regulatory frameworks to enable the use of renewable gases and hydrogen in the distribution networks will be regarded as premature.³ Rule making consistent with the AEMC review processes and objectives should give stakeholders confidence the AEMC is not just a rubber stamping body.

Not only is the review of the regulatory framework premature, it is probably unnecessary. The Australian Energy Regulator (AER) has in a concurrent consultation to this one⁴ outlined the new regulatory sandboxing mechanism that would enable both⁵:

- A trial waiver. This function allows the AER to grant a time limited trial waiver for eligible trial projects, exempting an innovator from having to comply with specified rules for a period of time to allow a trial to proceed. Innovators will be required to submit a form via the sandboxing website explaining the details of their project and how it meets the necessary criteria. Trial waivers will be subject to a number of conditions, including consumer protection measures, reporting requirements and other obligations that may be specific to the trial, and;

² Energy Networks Australia's 2050 Gas Vision sets a vision '*for Australia to turn its gas resources into products and services that will enhance national prosperity while achieving carbon neutrality*'. February 2018.

³ To be clear, the AEC views bio methane as directly substitutable for within specification natural gas and we support its development and use but don't see it as materially different to natural gas and therefore changes to the regulatory regime would not be material.

⁴ AER Regulatory Sandboxing Issues Paper, 10 November 2021, <https://www.aer.gov.au/system/files/AER%20-%20Regulatory%20Sandboxing%20-%20Issues%20Paper%20-%20Final.pdf>

⁵ Ibid, p.2

- A trial rule change process. This function allows the Australian Energy Market Commission (AEMC) to temporarily change existing rules or introduce a new rule to allow a trial to proceed. Trial rule change requests may be submitted via the sandboxing website and will be forwarded to the AEMC to be assessed.

These are the missing steps that could inform the AEMC's preliminary assessment of the scope of its review. The AER consultation represents a compelling case that the AEMC should pause its detailed review of the regulatory framework to the current regulations and wait instead to be informed as to the future requirements for domestic hydrogen blends, assuming that a successful business model emerges at all.

Question 2. Do you agree with the Commission's proposed assessment framework for this review?

The AEC broadly agrees with the Commission's Assessment Framework. In particular we note the requirement to consider efficiency beyond the requirement to encourage a new service or commodity, but also to consider whether the changes will *facilitate the allocation of gas, including natural gas equivalents, to their highest valued uses* (Allocative efficiency). At present future hydrogen pricing is speculative but local studies have sought to establish the requirements for thermal price parity, estimating that hydrogen needs to be in the \$1 to \$1.50 range per kg in order to be at parity with natural gas.⁶

The AEMC must also factor in any implementation considerations: that is *are the proposed changes targeted, fit for purpose and proportionate to the issues they are intended to address*. This is an important consideration because blended hydrogen into the small customer distribution network presumably puts us in a pathway to hydrogen networks. The Clean Energy Finance Corporation (CEFC) Australian Hydrogen Market Study identified that for blended hydrogen in natural gas networks beyond levels compatible with existing appliances (10-20%) and the infrastructure to be viable that:⁷

- Conversion costs of infrastructure and appliances must not be prohibitive;
- Electrification options are not able to supply similar services; and
- The gas network provides significant and valuable energy storage to support renewable electricity deployment.

This last point might be seen as support for blended hydrogen, but the CEFC notes that viability needs to be assessed first. The same report further assesses that the blending of hydrogen into natural gas networks is only considered to have moderate dependence on hydrogen for decarbonisation, with a rating of 5 out of 10. It notes that other alternatives, such as electrification and 100% hydrogen networks, are likely to be more important.⁸

The AEC is confident that the assessment framework for the review is able, and moreover required, to consider amongst other things matters of efficiency, necessity and decarbonisation. The AEC stresses consideration of these as being of particular importance.

Question 3. Do you think that any additional guidance is required in the NGR to deal with connections by suppliers of natural gas equivalents or constituent gases, or are the new draft interconnection rules sufficient? If you think additional guidance is required, please set out what guidance you think is required.

The AEC queries the use of the term "natural gas equivalents" (NGE) when referring to hydrogen blends. An example of equivalence is one mile is equivalent to 1.60934km. To one decimal place this would be 1.6km. Hydrogen blends are not equivalent to natural gas. Table E.3 in the AEMC's, *Review into Extending the Regulatory Frameworks to Hydrogen and Renewable Gases – Consultation paper* identifies that a 10%

⁶ Australian Hydrogen Market Study, Clean Energy Finance Corporation, Advisian, 24 May 2021, p. 93
<https://www.cefc.com.au/media/nhnhw1xu/australian-hydrogen-market-study.pdf>

⁷ Ibid, p.67

⁸ Australian Hydrogen Market Study, Clean Energy Finance Corporation, Advisian, 24 May 2021, p. 68

hydrogen blend has 93.21% of the energy content of pure methane.⁹ Referring back to the distance analogy, the 'mile equivalent' would be 1.500066km (ie, approximately 100 metres short).

In light of these changes additional guidance would be required. Today, Gas Reference Service Agreements (RSA's) place the onus for gas quality is on the purchaser/ shipper/ retailer. Connections by suppliers of NGE's would reasonably require this be removed from the RSA and the responsibility for any gas (incl NGE) be upon the party responsible; being either the producer or the party allowing the injection.

Biomethane on the other hand is to our understanding a genuine equivalent to natural gas. When it is injected into networks no modifications are required and it has the same properties as natural gas. Hence, it should simply be captured under the definition of natural gas.

Finally, the AEC does not support resources being expended on future proofing regulation for 'other gases' that are even further removed from natural gas than low level hydrogen blends. These other gases are likely to require substantial capital expenditure on gas infrastructure and associated costs to consumers. On this basis the AEC believes they should not be included as part of the proposed review.

Question 6. Do you think service providers should be required to publish information on where connections by suppliers of natural gas equivalents or constituent gases would be technically feasible, or should this just be left to negotiations?

The AEC sees no reasonable assurance that a DNSP will negotiate in good faith, or that a third party will be able to monetise all of the benefits available between, for contrast, a ring fenced affiliate of the network and the network itself even where connections of NGE's were even technically feasible. To address the problem of negotiating with a monopoly with its own ring fenced alternatives, we suggest a model like electricity distribution where networks publish a distribution annual planning report (DAPR) each year.

The DAPR includes detailed information on the DNSP's forecasting, details of system limitations and proposed network investments, characteristics of the network and a summary of any joint planning activities. As only networks have knowledge and insight in contestable commercial opportunities associated with their regulated activities, it would seem prudent and equivalent to require gas distribution service providers to provide comparable information to that of the DAPR to inform suppliers of NGE's.

Question 7 Do you think that any specific rules are required in the NGR to deal with the risk that service providers may favour their own natural gas equivalents or constituent gas facilities by curtailing other facilities ahead of their own, or do you think this should be dealt with through ring-fencing arrangements?

The AEC is aware of planned small-scale trials of hydrogen blended gas projects in discrete networks.¹⁰ These projects reflect the need to test if the concept is worth proceeding further with, and it would appear do not require changes to the NGL, NERL and Regulations to undertake them.

What these trials also indicate is that ring-fencing will clearly require further consideration as the trials demonstrate that networks can be both the producers and distributors, and that customers are paying for these networks trial through regulated charges. What has been seen in electricity networks is that DNSPs have responded to technological advances in small scale generation (particularly solar) and other distributed generation and storage devices by exploring opportunities for growth in revenues and substitutes to traditional network investments. The AEC believes that amendments to the NGR to address the emerging problem of networks attempting vertical integration will require close consideration to avoid favour.

Question 42 Do the identified issues in the NGR and changes required cover all necessary changes to facilitate the trade of natural gas equivalents in the DWGM and STTM?

The AEC believes that additional clarification around how capacity would be allocated to participants and also how hydrogen or renewable gases facilities would be treated in the operational and market schedules,

⁹https://www.aemc.gov.au/sites/default/files/documents/consultation_paper_-_review_into_extending_the_regulatory_frameworks_to_hydrogen_and_renewable_gases_-_emo0042.pdf

¹⁰ <http://www.renewablessa.sa.gov.au/topic/hydrogen/hydrogen-projects-south-australia/hydrogen-park-south-australia>

including impacts on prices is required. Specifically, the DWGM will require further consideration on the capacity credits mechanism coming into effect in 2023.

Question 49 Are there any issues the AEMC should consider in relation to retail competition and consumer choice as a consequence of the introduction of natural gas equivalents?

Hydrogen has a difficult narrative for consumers. It's more volatile, corrosive, expensive and unproven against natural gas. The AEC's understanding is that hydrogen is more explosive than natural gas and has a higher permeation coefficient in both steel and polymer pipes (3 times higher in the former and 4-5 times higher in the latter).¹¹ It is also currently more expensive and its effects on appliances and pipelines are not well understood, the latter being highlighted by the United States National Renewable Energy Laboratory who found that:

“Any introduction of a hydrogen blend concentration would require extensive study, testing, and modifications to existing pipeline monitoring and maintenance practices (e.g., integrity management systems). Additional cost would be incurred as a result, and this cost must be weighed against the benefit of providing a more sustainable and low-carbon gas product to consumers.”¹²

If history is any guide, the opposition to relatively benign smart meter installation on the grounds of alleged health hazards should inform us as to how critical communications with consumers on hydrogen blends will be. Gas users have the right to know exactly what they are purchasing, and categorising hydrogen blends as natural gas equivalents may appear as an attempt to obfuscate the true nature of a product that is inferior to what they are currently purchasing (ie, natural gas). Explanations as to how any blended hydrogen is valuable to all customers must therefore avoid euphemism, with a positive compliance obligation on NGE distributors to explain, for example, the change in blend for what it actually is, the consumer impact for what it is, and where possible, the mitigations a customer might take if required.¹³

In the AEC's view, changes that assist consumer comprehension will be required and the adoption of the descriptor for a 10% hydrogen blend as H10 may assist consumer comprehension as this is how 'equivalent' 10% ethanol petrol blends are labelled (ie, E10). This would better inform consumers of the nature of the product and clearly identify the fact it contains hydrogen.

Finally, given the absence of proven trials, and the significant complexities of blending, the AEC believes that any end-to-end review of the regulatory frameworks should not be rushed. Once proven in trials, a long-term implementation approach and a communication strategy which explains the concept of “blending” to consumers should be implemented to ensure that any concerns are correctly addressed. Avoiding unintended consequences (especially regarding technical and safety issues) and protecting consumers in line with the NGO must remain the priority.

Please contact the undersigned at David.Markham@energycouncil.com.au should you wish to discuss.

Yours sincerely,

David Markham
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¹¹ <https://www.nrel.gov/docs/fy13osti/51995.pdf>

¹² Op cit.

¹³ Article: If you're going to raise prices tell customers why. [Utpal M. Dholakia](https://hbr.org/2021/06/if-youre-going-to-raise-prices-tell-customers-why), Harvard Business Review, June 2021
<https://hbr.org/2021/06/if-youre-going-to-raise-prices-tell-customers-why>