



LEGISLATIVE ASSEMBLY
FOR THE AUSTRALIAN CAPITAL TERRITORY

STANDING COMMITTEE ON ENVIRONMENT, CLIMATE CHANGE AND BIODIVERSITY
Dr Marisa Paterson MLA (Chair), Mr Andrew Braddock MLA (Deputy Chair),
Ms Leanne Castley MLA

Submission Cover Sheet

Inquiry into Renewable Energy Innovation in the Australian Capital Territory

Submission Number: 7

Date Authorised for Publication: 25 May 2021

Contents

1. About Master Plumbers – Canberra, ACT	3
2. Inquiry into Renewable Energy Innovation in the ACT	4
3. Recommendations – Summary	6
4. Background	7
<i>Impacts on Consumers – Cost, supply failures, decreased appliance efficiency</i>	<i>7</i>
<i>Impacts on Gas-fitting Industry.....</i>	<i>8</i>
<i>Alternative Fuels/Research and Development.....</i>	<i>8</i>
5. Opportunities to collaborate: The Plumbing Industry Leadership Alliance (PILA)	11
6. References	12

1. About Master Plumbers – Canberra, ACT

Master Plumbers Association ACT (MPA) is the peak association for plumbing businesses and industry stakeholders in the Canberra region, bringing all parties together to underpin best public health, safety, and sustainability outcomes for the community through our collaborative work.

MPA is now in its 45th year, and through our work ensures the Canberra community continues to be serviced by a plumbing industry which is integral in determining the future direction of the sector, is up to date with latest policies, regulations, technologies and products, exhibits outstanding professionalism, is highly qualified, and is ethically accountable.

Our Support for the ACT Community

MPA is an integral part of the broader community, with community-focused activities including:

- Our standout [Consumer Guarantee](#) - the first of its kind nationwide. Our Consumer Guarantee ensures consumers are provided with the highest standard of professionalism from our members, and in the unlikely scenario they have concerns about workmanship, they are protected through our \$5,000 insurance program;
- Provision of *pro bono* plumbing work for consumers on low incomes;
- Supporting Icon Water and Evoenergy in consumer education activities around health/safety and protection of the environment; and
- Working closely with the Canberra Institute of Technology (CIT) Plumbing School, assisting students to access critical information.

Our commitment to Sustainability and Renewable Energy

MPA is committed to sustainability and the transition to the ACT government's policy to reach zero emissions by 2045. Our commitment is evident in recent activities to bring together industry stakeholders to discuss evolving opportunities and challenges emerging across the industry. Stakeholders have included Energy Networks Australia, Evoenergy, property developers, the plumbing contractor sector and government departments such as the Environment, Planning and Sustainable Development Directorate (EPSDD) and our plumbing training organisation, CIT. This work supports effective collaboration and information sharing that is vital to ensuring successful outcomes.

MPA works closely with stakeholders such as the Queanbeyan City Council, Transport Canberra and City Services, and Icon Water to ensure our waterways remain clean and safe, and our resources are used efficiently.

MPA is playing a significant role assisting with the development of green hydrogen skills for workers in all industries across Australia. Our partner MPA organisations across Australasia, together with MPA, have developed a comprehensive Hydrogen Background Paper to provide a snapshot of the sector (MPA ANZ, 2021).

Coupled with our direct contact with customers, our involvement as the umbrella organisation supporting best sector outcomes puts us in a unique position to assist both the government, at a strategic policy level, to support the aims of the government's policy to transition our jurisdiction to zero emissions by 2045, as well as supporting the community in terms of uptake of beneficial programs driven by these policies.

2. Inquiry into Renewable Energy Innovation in the ACT

MPA welcomes the opportunity to present a submission to the Inquiry into Renewable Energy Innovation in the ACT, and fully supports the announced transition to zero emissions by 2045.

The ACT government's '[ACT Climate Change Strategy 2019-2025](#)' (Rattenbury, 2019) places a *“strong focus on reducing emissions from transport and (fossil fuel) gas – the two largest sources of emissions from 2020 once emissions from electricity are zero. Unlike electricity, emission reductions in these sectors are less influenced by Government and will require active participation of the whole community.”*

We recognise there are challenges ahead in working to decarbonise our economy, and are working closely with our Australasian counterparts to tease out some of the challenges and opportunities that lie in our path.

To provide context to this issue, Evoenergy advises that Canberra has 155,000 households that use natural gas, plus around 3,000 commercial customers and another 42 large users. Further advice is that residential use accounts for 87% of total natural gas consumption. With natural gas use accounting for 22% of the territory's total emissions, residential natural gas use is therefore responsible for 19% of ACT's total emissions.

MPA sees the ACT's future as being a combination of renewable electricity and zero carbon gases that can meet our varied energy needs - from vehicles, to homes, to restaurants, and to generate electricity at peak times. A transition to zero carbon gases would ensure ACT residents can continue to have their instantaneous hot showers and gas cooking appliances in a zero-carbon future.

The natural gas network infrastructure across the ACT (and nearby regional areas) is owned by the Joint Venture distribution partnership of Evoenergy and ActewAGL (ActewAGL, 2021).

MPA is working closely with our members, including ActewAGL and Evoenergy (owners of the natural gas network infrastructure), to investigate zero carbon gas options such as hydrogen and biomethane. We believe that further research and development of these options is essential if we are to maximise the benefits of a zero emissions future, and will allow our community to retain the current benefits of gas.

Table 1 below provides a comparison between 1) transition to 100% renewable electricity & 0% zero carbon gas, with 2) a transition to both renewable electricity and zero carbon gas. Any transition plan would necessarily be supported by a comprehensive training program, with input from the broad range of stakeholders responsible for ensuring the success of a roll-out program. MPA is well placed to lead this work in collaboration with major stakeholders.

MPA is aware of the increasing activity around the hydrogen space, importantly noting that Fistgas Group, New Zealand's largest gas network, has shown that it is possible to develop a viable strategy for converting networks to hydrogen blends, and then 100% hydrogen (Firstgas Group, 2021).

In our submission, MPA is supportive of a transition to renewable electricity plus zero carbon gas, with recommendations and background outlined below.

Table 1: Transition to 100% renewable electricity v transition to both renewable electricity + zero carbon gas (*adapted from* (Firstgas, 2021))

Transition to 100% renewable electricity & 0% zero carbon gas	Proposed Alternative Recommendation to transition to both renewable electricity + zero carbon gas
 High certainty of CO ₂ reductions	 High certainty of CO ₂ reductions
 Avoids risk of new buildings installing heating systems that must be replaced within useful life	 Risks new building systems having to convert to another fuel if renewable gas is not available
 Closes off options to reduce emissions using gas appliances (biogas, hydrogen)	 Preserves options to decarbonise heat using gas appliances (biogas, hydrogen), including the potential to 'go further' with these fuels
 Decreases energy system resilience through over-reliance on electricity networks, which may be costly and difficult to substantially upgrade.	 Provides diversity in energy distribution channels, creating resilience during unforeseen external events
 Likely to increase delivered price of gas and electricity due to network economics	 Risks increasing delivered price of gas by requiring supply of less economic alternatives
 Strands existing assets in gas networks and household plumbing systems that can be repurposed	 Preserves value in existing networks and household plumbing systems
 Risks losing public commitment due to the absence of comparable substitutes for gas appliances	 Preserves public commitment to decarbonisation by enabling consumer choice of appliances
 Closes off options for a just transition based on new gas-based solutions (biogas, hydrogen)	 Retains a viable gas industry to service needs of 'hard to abate' emissions (electricity, process heat)

3. Recommendations – Summary

Recommendation 1

MPA recommends the ACT Government investigate the risks associated with an all-electric energy network in the ACT, including those risks associated with potential network failures.

Recommendation 2

MPA recommends the ACT Government commissions research to fully consider potential costly impacts to consumers, public and private corporations, and the Territory budget of missing the opportunity to ensure there is a diversity of energy sources available across the jurisdiction.

Recommendation 3

MPA recommends the ACT Government fully considers the impacts of the planned phase out of natural gas, coupled with a proposed transition to an all-electric network, on the gas-fitting industry, with a commitment to supporting the industry to successfully navigate the evolving environment.

Recommendation 4

MPA recommends that the ACT government place a much stronger focus on zero carbon gas research and development, with a view to risk minimisation through ensuring a diversity of energy sources and storage systems is available to the ACT Community.

Recommendation 5

MPA recommends the ACT government further investigates the viability of the ACT as a national hub for renewable energy technologies and industries, including an HFCET and other mobility projects.

Recommendation 6

MPA recommends the ACT government joins the Plumbing Industry Leadership Alliance as an active and engaged supporter and participant, and provides seed funding to underpin best outcomes for the ACT community as a result of this collaborative multi-stakeholder initiative.

4. Background

Impacts on Consumers – Cost, supply failures, decreased appliance efficiency

- The planned shift to 100% renewable electricity by 2045 overlooks the opportunity to decarbonise the gas network through the use of biomethane, or ultimately making the transition to hydrogen gas. As Chief Minister Barr noted *“We cannot heat this city, in our bitterly cold winters, with electricity alone. We do not have the sufficient infrastructure, and there is no question that Canberrans who currently have gas would be forced off gas ahead of when they are ready to do so.”* (Barr, 2020).
- If failures among electricity systems (including renewable) become increasingly common, situations such as those which arose during the 2016 South Australian blackout (Wikipedia, 2021), the 2003 Canberra bushfires (Wikipedia, 2021) or damaging hailstorms in early 2020, coupled with an over-reliance on electricity could lead to overwhelming effects throughout the region. This is particularly the case if back-up energy systems such as zero emissions gas are unavailable.



“The damage to property after the hailstorm passed over Canberra was extensive, and smashed many rooftop solar panels” (ABC News, 2020)

- A transition 100% away from zero carbon gas leaves consumers and/or the network owner/ACT government in a quandary over the potential waste of the existing gas network infrastructure, at a loss of approximately \$380M (Evoenergy, 2021). This cost does not include the expense of disconnecting and decommissioning the network, which could be at least \$115M (Evoenergy, 2021 – based on disconnection and meter removal cost of \$750 incl gst across 155,000 households).
- MPA is concerned that electricity may not be a viable alternative to gas in all ACT climates. In our colder weather, electrical heating systems such as heat pumps are not as effective as gas systems (both in terms of energy usage and time to heat up a home); and in an extreme climactic conditions this difference matters even more.

- MPA agrees with the recent statements from the ACT Council of Social Services (ACTCOSS) highlighting the *“importance of ensuring that the transition away from fossil fuel gas does not lead to higher costs or inequity for people on low incomes or other vulnerable individuals.”*

“For renters and people on low incomes, upgrading their appliances may not be an option. These Canberrans are already spending a greater portion of their income on energy bills than the average household and are most likely to be impacted by cost increases.

“It is important that we do not end up with vulnerable people stranded on the gas network, paying an increasing premium for basic human needs such as hot water, meals, or to heat their houses. This is a real danger unless we have a comprehensive energy transition strategy.” (ACTCOSS, 2021)

- **MPA recommends the ACT Government investigates the risks associated with an all-electric energy network in the ACT, including those risks associated with potential network failures.**
- **MPA recommends the ACT Government commissions research to fully consider potential costly impacts to consumers, public and private corporations, and the Territory budget of missing the opportunity to ensure there is a diversity of energy sources available across the jurisdiction.**

Impacts on Gas-fitting Industry

- According to [Access Canberra data](#), there are currently around 1,700 gas-fitting and gas appliance licenses, held by both individuals and companies, in operation in the ACT. There will be immense negative impacts that phasing out natural gas will have on this industry, including the immeasurable adverse financial consequences on these businesses. Financial guidance, as well as a framework of support for retraining gasfitters would be welcomed.
- Already, the beginnings of financial stress and strain as a result of the overall message of the ACT government are starting to show, with MPA in the process of distributing a survey to obtain feedback from the industry on this aspect. Furthermore, with more research and development, the gas-fitting industry can continue to function at its current levels whilst producing zero net carbon emissions.
- **MPA recommends the ACT Government fully considers the impact of the planned phase out of natural gas, coupled with a proposed transition to an all-electric network, on the gas-fitting industry, with a commitment to supporting the industry to successfully navigate the evolving environment.**

Alternative Fuels/Research and Development

- Alternative gaseous energy sources such as biomethane and green hydrogen are potential substitutes for natural gas that meet the ACT government’s requirements for carbon-neutral fuels. A number of initiatives are already underway that are seeking to bring these fuels to market, with a range of Australian government and industry announcements detailed below:
 - *“Clean hydrogen as a fuel is now poised to become a reality. Around the planet the pace of research, demonstrations, product development and pilot projects is*

accelerating, seemingly by the day. For the anxious, progress is too slow, but look back a few decades from now and history will record the hydrogen industry as an overnight success” said Dr Alan Finkel AO, Australia’s Chief Scientist (COAG Energy Council, 2019).

- ActewAGL has just opened the nation’s first hydrogen re-fuelling station, located in Fyshwick.
- Evoenergy has built Australia’s first hydrogen test facility at CIT in Fyshwick. *“Testing to date has confirmed that polyethylene and nylon pipe and their respective jointing techniques can contain 100% hydrogen at pressures used for natural gas. Testing has also confirmed that current installation work practices on polyethylene and nylon pipe and joints are suitable for hydrogen service.”* (Gaykema, 2019)
- The New South Wales government has committed to achieving a 10% hydrogen contribution to the state’s gas supply by 2030, an initiative supported by the gas industry.
- The Australian federal government’s clear support, as well as their establishment of initiatives such as the National Hydrogen Strategy (Department of Industry, Science, Energy and Resources, 2019), helps to bolster public confidence in the future of the zero carbon gas industry.
- The federal government’s recent announcement of a \$1B deal with South Australia includes funding for ‘priority’ areas such as hydrogen (Heynes, 2021).
- *“Welcome to WA’s new gold rush”* (Australian Financial Review, 2021)
- *“For Australia to achieve its goal of becoming a global leader in low emissions technology, and for corporations to meet their targets of net zero emissions within a couple of decades, hydrogen must be in the nation’s energy mix.”* (Australian Financial Review, 2021).
- An example of hybrid battery units is about to enter the Australian market: Lavo. Lavo FAQ’s indicate these batteries have longer life and are more efficient and environmentally sustainable than traditional batteries (Lavo, 2021)
- With the breadth of work taking place across our nation alone, hydrogen technology and cost to market will inevitably become cheaper, making it competitively advantageous as a future fuel resource. *“...green hydrogen is getting cheaper, and demand is rising”* (Australian Financial Review, 2021). In this article Associate Professor Zhenguo Huang who leads the hydrogen energy program at University of Technology Sydney says that he sees *“a very significant role for hydrogen in the longer term, particularly for energy storage – eventually overtaking conventional batteries for many applications.”* He adds that *“hydrogen will also play a role as an energy carrier in Australia’s renewable energy landscape, as current grids are unable to cope with the peaks of production during lengthy periods of sunny weather.”*
- Jemena estimates that the NSW network alone has a natural gas storage capacity of about 80 GWh – equivalent to 12.5 million PowerWall batteries – more than one for each Australian household. The storage capacity in the network is sufficient to provide natural gas for around 4 days to NSW customers (Energy Networks Australia, 2021).

- The ACT's gas network is connected to a significantly larger network of transmission and distribution pipelines across eastern Australia. When transitioned to 100% hydrogen, this vast network will contain many hours of energy storage capacity for those connected to it. The map supplied by the Australian Energy Regulator below indicates the existing size of the eastern gas network that the ACT is connected to.



- MPA met with Mr Alan de Reuck from Alstom regarding potential to run an H2 powered train (Hydrail - HFCET) on the Sydney-Canberra rail link. Alstom is currently rolling out HFCET's in Europe. Mr De Reuck reported it was highly likely the Sydney-Canberra rail link would accommodate an HFCET, and would be able to confirm this once detailed data has been provided to Alstom engineers.

The ACT government (via ActewAGL) recently opened Australia's first Hydrogen Refuelling Station (HRS), and it is less than 1km from Canberra's current train refuelling depot. Upgrading this hydrogen refuelling capacity so closely co-located should be under serious consideration, noting Jemena is also building a new hydrogen plant in Western Sydney.



Such a transport project would fit within the Federal Government's National Hydrogen Strategy as a springboard to larger scale projects. In addition, it is likely this would encourage development of H2 infrastructure for the Sydney-Canberra and Sydney-Melbourne road corridors.

The location of Canberra's HRS is in an industrial area surrounded by distribution facilities that could benefit from its proximity. The synergies could be [similar to those achieved by the Don Quichote facility](#) operated by the Colruyt Group in Brussels (Don Quichote, 2021).

- With the temporary shutdown of Denmark's primary gas supply source – The Tyra complex in the North Sea – the country reports that biomethane injected into the gas system is expected to account for 20% of Danish gas consumption by 2020, 63% in 2030 and 100% in 2040 (EnergiNet, 2020).
- **MPA recommends the ACT government place a much stronger focus on zero carbon gas research and development, with a view to risk minimisation through ensuring a diversity of energy sources and storage systems is available to the ACT Community.**
- **MPA ACT supports further investigations into the viability of the ACT as a national hub for renewable energy technologies and industries including an HFCET and other mobility projects.**

5. Opportunities to collaborate: The Plumbing Industry Leadership Alliance (PILA)

- Our ongoing collaborative endeavours underpin a valuable connection between MPA and significant sector stakeholders both inside and outside the ACT.
- Prior collaborations have brought together experts from the plumbing and gas-fitting industry, construction industry, energy sector and government, and have included regulators, educators, and representatives from CSIRO and Energy Networks Australia.
- Our efforts have helped build knowledge and strengthen relationships across local, national and international stakeholder groups.
- MPA is currently in the process of developing a Plumbing Industry Leadership Alliance (PILA) on behalf of the plumbing industry, to act as a forum to support and accelerate industry leadership and knowledge transfer across policy development, evolving technologies, and training needs.
- **MPA recommends the ACT government joins the Plumbing Industry Leadership Alliance as an active and engaged supporter and participant, and provides seed funding to underpin best outcomes for the ACT community as a result of this collaborative initiative.**

6. References

1. ABC News. (2020, January 21). Retrieved from <https://www.abc.net.au/news/2020-01-21/solar-panels-damaged-1/11886316?nw=0>
2. ACTCOSS. (2021, April 30). *ACTCOSS EDM*. Retrieved from <https://www.actcoss.org.au/civicism/mailling/view?reset=1&id=596>
3. ActewAGL. (2021). *ActewAGL Joint Venture*. Retrieved from <https://actewagljv.com.au/>
4. Australian Financial Review. (2021, April 6). Retrieved from <https://www.afr.com/companies/energy/hydrogen-is-wa-s-new-gold-rush-20210404-p57geu>
5. Australian Financial Review. (2021, March 29). *Blue Skies for Green Hydrogen Demand*. Retrieved from <https://www.afr.com/companies/energy/blue-skies-for-green-hydrogen-demand-20210323-p57dg0>
6. Barr, C. M. (2020, September 29). Retrieved from <https://reneweconomy.com.au/act-labor-takes-swipe-at-greens-over-crazy-gas-phase-out-plan-21216/>
7. COAG Energy Council. (2019, November 22). *Australia's National Energy Strategy*. Retrieved from <https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf>
8. Department of Industry, Science, Energy and Resources. (2019, November). *Australia's National Hydrogen Strategy*. Retrieved from <https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf>
9. Don Quichote. (2021). *Wind Energy, Hydrogen, Forklifts and Smart Grid*. Retrieved from <https://www.don-quichote.eu/>
10. EnergiNet. (2020, 12 18). *Is biomethane significant to the gas supply in Denmark?* Retrieved from <https://en.energinet.dk/About-our-news/News/2020/12/18/IS-BIOMETHANE-SIGNIFICANT-TO-THE-GAS-SUPPLY-IN-DENMARK>
11. Energy Networks Australia. (2021). *Energy Storage: We can be happy underground*. Retrieved from <https://www.energynetworks.com.au/news/energy-insider/energy-storage-we-can-be-happy-underground/>
12. Environment ACT. (2020). *ACT Greenhouse Gas Emissions Inventory Report 2019-20*. Retrieved from https://www.environment.act.gov.au/__data/assets/pdf_file/0008/1679075/ACT-Greenhouse-Gas-Emissions-Inventory-Report-2019-20.pdf
13. Firstgas. (2021). Retrieved from <https://masterplumbersact.asn.au/wp-content/uploads/2021/04/Firstgas-Group-Low-carbon-gas-pathway.pdf>
14. Firstgas Group. (2021). Retrieved from Firstgas Group: https://firstgas.co.nz/wp-content/uploads/Firstgas-Group_Hydrogen-Feasibility-Study-Summary_A4_web.pdf
15. Gaykema, E. e. (2019). Assessing the Viability of the ACT natural gas distribution network for reuse as a Hydrogen distribution network. *International Conference on Hydrogen Safety*. Adelaide: https://openresearch-repository.anu.edu.au/bitstream/1885/202737/2/01_Gaykema_Assessing_the_Viability_of_the_2019.pdf.
16. Heynes, G. (2021, April 19). Retrieved from <https://www.h2-view.com/story/morrison-1bn-energy-deal-with-south-australia-includes-funding-for-priority-areas-such-as-hydrogen/>

17. Lavo. (2021, April 30). *Lavo - Frequently Asked Questions*. Retrieved from <https://lavo.com.au/faq/>
18. MPA ANZ. (2021, April 30). *Hydrogen Background Paper - Opportunities and Challenges for the Industry*. Retrieved from <https://masterplumbersact.asn.au/wp-content/uploads/2021/04/Hydrogen-BACKGROUND-PAPER-Opportunities-and-challenges-for-the-industry.pdf>
19. Rattenbury, M. (2019). *ACT Climate Change Strategy 2019 2025*. Retrieved from https://www.environment.act.gov.au/__data/assets/pdf_file/0003/1414641/ACT-Climate-Change-Strategy-2019-2025.pdf/_recache
20. Wikipedia. (2021). *2003 Canberra Bushfires*. Retrieved from https://en.wikipedia.org/wiki/2003_Canberra_bushfires
21. Wikipedia. (2021). *2016 South Australian blackout*. Retrieved from https://en.wikipedia.org/wiki/2016_South_Australian_blackout