Australian Institute of Architects

Australian Institute of Landscape Architects

Future Gas Strategy Taskforce

Department of Industry, Science and Resources

13/11/2023

Dear Taskforce Chair,

AUSTRALIAN INSTITUTE OF ARCHITECTS and AUSTRALIAN INSTITUTE OF LANDSCAPE ARCHITECTS JOINT SUBMISISON ON THE FUTURE GAS STRATEGY

Thank you for the opportunity to comment on the future Gas Strategy.

The Australian Institute of Architects (AIA) and the Australian Institute of Landscape Architects (AILA) combined 17,300 members are focused on delivering a low carbon built environment. We support demand side reductions through all electrification of building stock. However the substantial scope 1 and 2 emissions associated with the Australian fossil methane gas industry is negating all the likely gains we will make as more fossil methane is burnt to compress LNG for export than is used for Australia's entire domestic consumption.

In this respect, scope 1 and 2 emissions from Australian fossil methane gas, including under-reported fugitives are placing unfair burdens on the rest of Australian businesses to meet our stated Paris targets and net zero by 2050. This is a mere 27 years away and both the AIA and AILA are highly concerned that the future gas strategy does not seem to reflect the dire position we are currently in.

Our members are also very concerned about the substantial scope three emissions from Australian fossil methane when it is burnt overseas.

Climate change is an existential threat to humanity and the continued burning of fossil fuels is contributing to add to Earths already stretched CO2 budget, and the relentless rise in heat and other impacts.

In 2020 Australia ranked in the top ten for countries with significant economic losses from climate related disasters[1] in which time there was a large prevalence of those effected from bushfires in 2008, 2019 and flooding in 2010 and 2023. In Australia, the increased severity and frequency of natural disasters such as 'hurricanes, floods, bushfires, and droughts[2]' have further exacerbated the housing crisis and impacted economic recovery. Several years after these events, people and communities are still affected through their mental, social, and emotional health.

The overall guiding question for the future gas strategy, should be the rapid reduction in fossil fuels, including no new fossil fuel expansion as required by The Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA)[3]. Gas is not a bridging fuel, nor is it a decarbonisation

[1] The Lancet: Planetary Health: Li, A, Toll, M & Bentley, R. (2023) Health and housing consequences of climate-related disasters: a matched case-control study using population-based longitudinal data in Australia.

[2] Habitat for Humanity Australia (2023) Five ways Climate Change Impacts Housing Insecurity.

[3] International Energy Agency net zero plan. https://www.iea.org/reports/net-zero-by-2050

pathway for the planet, nor has it materially helped our major trading partners reduce their emissions by substituting coal as repeatedly suggested by many in the gas industry[4].

Given Australia is the world's largest exporter of fossil methane gas, this is a major challenge for Australia. If we think to the next few centuries ahead, it will not be gas that defines this future. It will be low carbon technology, which will see fossil gas and all the infrastructure associated become stranded assets. If Australia wishes to become a renewable energy superpower, our overall focus should be on how we consume and export low carbon products.

While the primary focus of our submission is on the use of gas in the built environment, we are also concerned about the overall impact of continued and expanding gas exploration and new field developments.

Our key points for the future gas strategy are as follows:

- We fully support the transition to all electric suburbs. There should be no new gas infrastructure expansion for domestic use and a concerted effort made to assist existing households and small business to switch to all electric. This will enable the re-direction of gas supply to industrial uses, and reduce the need for fossil gas expansion.

- We strongly oppose the expansion of gas exports, as this is causing significant environmental, social, and cultural damage to Australia and the world. This is not in accordance with science and the Paris Agreement. Scope three emissions of Australian fossil methane gas are doing material harm to the planet and Australia by increasing both Australian and planetary emissions, all while generating limited revenue for Australia in comparison to other gas exporters like Qatar.

- We strongly object to the proposal for unproven Carbon capture and storage as this is not a decarbonisation strategy, and will enable fossil fuel expansion that will generate far more greenhouse gas emissions than it will remove. The much promoted Gorgon project for example only captures 2.83% of all its emissions.

- We strongly oppose any proposed blending of hydrogen into gas networks as this is not a decarbonisation pathway due to marginal reductions of between 3-7% of emissions while extending gas usage. It has significant safety implications, high costs and impacts on infrastructure.

[4] https://www.accr.org.au/research/facts-over-fiction-debunking-gas-industry-spin/

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DEMAND SIDE - FOSSIL METHANE GAS AS A HEAT SOURCE IN HOMES AND SMALL BUSINESSES.

Moving Australian communities and small business to all electric appliances. Both the AIA and AILA fully support the transition to all electric appliance for both homes and small business. Gas in homes has considerable health impacts including asthma[5] and all of the functions of gas in these markets can be substituted with far more efficient electric alternatives. This includes heat pumps and induction cooking. We strongly support the initiatives being undertaken by Government here such as the $1.3Billion household energy upgrades fund[6].

Not adding to the problem by continued new gas connections. In tandem with moving Australia to all electric is the commensurate need to halt all new gas connection infrastructure. It is not compatible with our net zero future, and it will lock in decades of gas usage and emissions. There is already a ban on new connections in Victoria and the ACT, and all remaining states should follow suit. Removing gas as an underground utility has the added benefit of providing much needed underground space in the footpaths for street tree planting root zones, essential to help create cool green cities

Helping Australian households and businesses to switch to all electric. It is a substantial challenge for many households to switch to all electric and quite complicated for others like renters and strata units. Part of these complications come from costs, others are from the need to have multiple trades for any switch over, eg gas fitter and electrician. It is estimated that there are up to 11million buildings that need to be updated[7] so we need increased funding from the current $1.3M budget amount of only 110,000 households. Rewiring Australia has proposed that a funding amount of about $12Billion[8] would drive down electric appliance costs to parity with gas appliances.

We support the strategies and proposals outlined by Rewiring Australia.

Ensure that replacement electric appliances such as heat pumps have low Global warming potential refrigerants. Heat pumps are extremely efficient as they source up to 75% of energy from the atmosphere. They all work using refrigerant gasses. It is essential that the refrigerants used have a low global warming potential (GWP), such as Butane (uses in refrigerators) or CO2, which have a GWP of 4 and 1 respectively. Some common refrigerants like R143A have a GWP of 4470 more than that of CO2. [9] This means that 4470 heat pumps (equivalent of a small suburb 's worth) using CO2 as refrigerant such as Reclaim energy's hot water heat pump[10], will have the same overall GWP as a single heat pump using R143A.

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[5] https://www.climatecouncil.org.au/resources/gas-habit-how-gas-harming-health/#mr

[6] https://ministers.treasury.gov.au/ministers/jim-chalmers-2022/media-releases/helping-australians-save-energy-save-energy-bills

[7] https://www.cefc.com.au/where-we-invest/special-investment-programs/household-energy-upgrades-fund/

[8] https://www.rewiringaustralia.org/savings-in-the-suburbs

[9] https://www.dcceew.gov.au/environment/protection/ozone/rac/global-warming-potential-values-hfc-refrigerants

[10] https://reclaimenergy.com.au/why-co2-heat-pumps/

The refrigerant used in heat pumps is often obscure and only available in technical literature, and then requires a comparison chart (like DCCEEW), making it hard for consumers to understand the real impact of their purchase decisions. It is important that the government mandate the notification of GWP on products – like a star rating

Ideally all heat pump manufacturers should be required by law to use a refrigerant with a GWP of less than five, as these are so low that they are exempt from the Montreal Protocol.

Hydrogen blending is not a decarbonisation pathway and should not be considered. There has been discussion and potential trials of blending hydrogen into fossil gas networks in Victoria. The AIA and AILA are strongly opposed to any use of Hydrogen blending or Hydrogen replacement for domestic purposes. A review of over 32 independent studies in the UK show that this idea is expensive and impractical, along with safety concerns. [11]

The main issue with hydrogen blending are that the maximum amount is between 10-20% by volume before there are significant embrittlement issues. Due to the different densities of methane and hydrogen, a 20% blend is only about a 7% actual emissions reductions, meaning that there are still 93% of emissions. So this is not a pathway that will lead to net zero, let alone 43% by 2030. This makes hydrogen blending a complete non-starter. A recent study by the Spanish Gas Association highlighted the significant cost associated with even low amounts of blending[12].

There has also been talk of existing methane pipe networks being converted to Hydrogen. This again is a complete non stater as a significant number of components need to be replaced including seals, compressors, valves, and pipes that make it economically unviable[13].

Insufficient quantities of Biomethane make it an impractical alternative and should be considered for localised industrial purposes, not domestic residential use. Biomethane has been suggested as a blending option into the existing gas network. This doesn't have any of the complications of Hydrogen as it is the same gas (methane). The biggest impediments are cost and lack of feedstock supply. While biogas has opportunities for specific industrial uses where a reliable source can be found – such as sewerage sludge, where the energy could be used to power the sewerage plant, but not added back into the residential network.

[11] https://www.theguardian.com/environment/2022/sep/27/hydrogen-is-unsuitable-for-home-heating-review-concludes

[12] https://www.hydrogeninsight.com/production/gas-grids-can-already-cope-with-20-hydrogen-blends-that-simply-isnt-true-says-new-report-from-network-operator/2-1-1551369

[13] https://www.linkedin.com/pulse/hydrogen-replace-natural-gas-numbers-paul-martin/

Recommendations:

- Undertake a rapid transition of all Australian communities and buildings to all electric.
- That all new gas connections to homes and small business in Australia be immediately banned as they are adding to our emissions problem, impacting Australians health, and will eventually become stranded assets.
- Provide financial support for existing home owners to replace their fossil gas appliances at end of life with a low GWP electric alternative.
- Work with Rewiring Australia towards all electric suburbs.
- Build trade training for combined gasfitter/ electricians who can work on cooktop replacements.
- Quadruple the Household Energy Upgrades Fund to help drive down the cost of electric alternatives.
- Develop an education campaign just as we have with bushfire or flood evacuation plans, to start Australians planning for the replacement of fossil fuel appliances at end of life. If a gas heater dies in the middle of winter, home owners should be ready with their planned electric alternative, rather than simply ordering a new gas heater in the rush.
- Develop a ratings system to educate people about the GWP of the refrigerant used in their new efficient heat pump.
- Mandate that manufacturers must have a maximum GWP of 5 for refrigerants in heat pumps. Rapidly phase out high GWP refrigerants in heat pumps.
- Prohibit hydrogen blending in the fossil gas network and do not replace methane with hydrogen, or waste time and energy on trials.

ABOUT THE AUSTRALIAN INSTITUTE OF ARCHITECTS

The Australian Institute of Architects (AIA) is the peak body for the architectural profession in Australia. It is an independent, national member organisation with around 14,500 members across Australia and overseas.

The Institute exists to advance the interests of members, their professional standards and contemporary practice, and expand and advocate the value of architects and architecture to the sustainable growth of our communities, economy and culture.

The Institute actively works to maintain and improve the quality of our built environment by promoting better, responsible and environmental design. The Australian Institute of Architects recognises the unceded sovereign lands and rights of Aboriginal and Torres Strait Islander peoples as the First Peoples of these lands and waters.

This recognition generates acknowledgement and respect for Aboriginal and Torres Strait Islander Countries, Cultures and Communities, and their ways of being, knowing and doing. Caring for Country practices including architecture and place shaping have existed on this continent since time immemorial.

The Institute recognises a professional commitment to engage and act meaningfully through reciprocal partnership and relationships with Aboriginal and Torres Strait Islander peoples. Together we will support and develop the emergence of new possibilities for our shared future.

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ABOUT THE AUSTRALIAN INSTITUTE OF LANDSCAPE ARCHITECTS

The Australian Institute of Landscape Architects (AILA) is the peak national body for Landscape Architecture. AILA champions quality design for public open spaces, stronger communities and greater environmental stewardship. We provide our members with training, recognition and a community of practice to share knowledge, ideas and action.

With our members, we anticipate and develop a leading position on issues of concern in landscape architecture. Alongside government and allied professions, we work to improve the design, planning and management of the natural and built environment.

In operation since 1966, AILA currently represents over 2,800 landscape architects and promotes excellence in planning and designing for life outdoors. Committed to designing and creating a better Australia, landscape architects have the skills and expertise to improve the nation's liveability through a unique approach to planning issues via integrated design solutions. In doing so, landscape architects contribute towards better environmental, social and economic outcomes for all Australians.

The built environment contributes up to 40% of greenhouse gas emissions and much of that is embodied up front in construction form day one. There is a significant need to reduce embodied emissions in concrete, steel, aluminium, glass, as well as electrify truck transportation and construction machinery.

AILA is currently asking its members to pursue not just a net zero target, but a climate positive target for their projects. This is where our projects sequester more greenhouse gases than they emit over their lifetimes. See our Climate positive design on our website. We have set our members the target of 75% reduction in emissions by 2030.

Feel free to contact us if you require further information or clarification.

Yours Faithfully

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