



Towards 2050: Gas infrastructure in a zero emissions economy

City of Melbourne Submission to
Infrastructure Victoria

August 2021

12 August 2021

Infrastructure Victoria project team
enquiries@infrastructurevictoria.com.au
www.infrastructurevictoria.com.au/



RE: TOWARDS 2050: GAS INFRASTRUCTURE IN A ZERO EMISSIONS ECONOMY

The City of Melbourne welcomes the opportunity to provide feedback on Infrastructure Victoria's (IV) interim report *Towards 2050: Gas infrastructure in a zero emissions economy* and recognises the need for a strategic framework to decarbonise the energy system and transition away from natural gas consumption.

Our submission builds on previous submissions the City of Melbourne made to IV's [Draft 30 Year Strategy](#) and DELWP's Gas Substitution Roadmap. It is provided on behalf of the management of the City of Melbourne and is based on endorsed Council policy including [Climate Change Mitigation Strategy to 2050](#) and [Response to the Climate and Biodiversity Emergency](#). Through these strategies Council has committed to a goal of a zero emissions city powered by 100 per cent renewable energy by 2040.

Achieving Council's and the Victorian Government's target of net zero greenhouse gas emissions will require all end uses of natural gas to be substituted with electricity or a zero emissions fuel as rapidly as possible.

IV's Final Report will be an opportunity to inform stronger action to support Victorian communities to make the rapid transition away from natural gas. As such, we fully support development of an evidence base to guide investment in low-carbon infrastructure.

The City of Melbourne's submission is based around three principles:

- 1. The speed of the transition should be prioritised** – urgent action is required to mitigate the impacts of climate change. Action should not be delayed as there are cost effective solutions available today.
- 2. Transition is an economic opportunity** – transitioning from gas presents enormous opportunities to develop the clean energy industry, generate jobs, boost economic productivity, and position Victoria as a leader in renewable technologies.
- 3. The transition must be socially inclusive and equitable** – the transition must be managed to ensure that the benefits are shared equitably and that the costs are not unduly borne by vulnerable communities and those least able to afford it.

The City of Melbourne asks IV to consider the following recommendations in its Final Report:

1. Prioritise energy efficiency and electrification pathways

Adopting the principle of energy efficiency first will reduce the challenge of shifting to zero carbon alternatives. Electric alternatives exist for the majority of gas services and electricity can readily be provided by carbon-free sources.

2. Reserve hydrogen for high value uses and ensure all hydrogen is 'green' hydrogen

Hydrogen produced through methods that generate carbon emissions are incompatible with Victoria's net zero objectives. Use of green hydrogen should be prioritised towards sectors which are difficult to electrify, including heavy transport and industrial processes.

3. Avoid lock-in gas consumption

Planning, building and plumbing regulations should remove mandatory requirements to connect to gas infrastructure so that new developments can achieve zero carbon.

4. Support vulnerable communities in the transition away from natural gas

Issues of social equity and affordability need to be considered to ensure that all communities benefit from the transition off gas.

5. Develop and model 'fast change' and 'step change' scenarios

IV should develop modelling to account for different transition speed scenarios. This should include ambitious decarbonisation pathways required to achieve zero emissions by 2040.

The City of Melbourne looks forward to continuing to work with Infrastructure Victoria. To discuss the points raised on this submission, please contact: [REDACTED]

Yours sincerely,

[REDACTED]

[REDACTED]

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CoM reference: 14805687

1. City of Melbourne Context

The City of Melbourne's [Climate Change Mitigation Strategy](#)ⁱ and [Response to the Climate and Biodiversity Emergency 2020](#)ⁱⁱ outlines the organisation's priorities for achieving net zero emissions for Council operations, and for the municipality. Through these strategies Council has committed to a goal of a zero emissions city powered by 100 per cent renewable energy by 2040.

The City of Melbourne is supporting our community to make the transition away from natural gas and towards a clean energy future. Council's draft [Planning Scheme Amendment C376](#) seeks to establish requirements to ensure that buildings and precincts are designed to facilitate carbon neutral outcomes across construction and operational stages. The amendment will discourage development that incorporates infrastructure which is not aligned to a zero emissions future. This includes a recommendation that developments should not incorporate connections to gas services.

By 2041 the City of Melbourne's population is expected to reach 384,000. Much of this growth is slated to occur in the urban renewal precincts of Arden and Fishermas Bend. The City of Melbourne is collaborating with the Victorian Government and the private sector to ensure we have the infrastructure and governance arrangements necessary to support these precincts to target zero emissions.

2. Decarbonisation Pathways

Victoria's *Climate Change Act 2017* sets a target for the state to emit net zero greenhouse gas emissions by 2050, while the City of Melbourne has a 2040 net zero target.

It is critical that Victoria does not wait for all necessary zero-emission technologies to be available before it starts to reduce its greenhouse gas emissions. It is expected that a combination of decarbonisation pathways will be required to achieve a zero carbon future. IV's Final Report should prioritise those opportunities which can be implemented immediately and at scale.

The City of Melbourne agrees with IV that improving thermal performance of buildings as a "no regrets" measure for all scenarios. Adopting a principle of energy efficiency first will reduce energy costs and reduce the challenge of shifting to zero carbon alternativesⁱⁱⁱ.

By far the most established and mature technological alternative to gas is electrification. Electricity can be provided by carbon-free sources and electric alternatives exist for the majority of gas services. This has been strongly demonstrated by international jurisdictions such as the Netherlands which is actively transitioning all 7.7 million dwellings from the gas network^{iv}. Electrifying the heat used in homes and commercial buildings is a huge opportunity for savings. For low temperature heat services, well-developed heat pump technology is commercially available and can significantly outperform existing gas boilers, offering more than three times as much heating or cooling per unit of energy input^v.

There are significant costs associated with maintaining two parallel infrastructure systems (gas pipelines and electrical wires) to distribute and deliver energy to homes and businesses. It is particularly inefficient given that the electrical system is singularly capable of delivering the energy services required for the vast majority of residential, commercial, and industrial use, and all but the most specific high temperature energy services in industry. Whilst acknowledging that there are some redundancy benefits to parallel systems, significant costs savings could be achieved by transitioning to a single electricity network.

The Victorian roadmap should prioritise electrification of gas services as its core strategy. The implementation of this decarbonisation strategy should be undertaken as rapidly as possible as this would ensure that action is not delayed waiting for emerging technological solutions when there are existing cost-effective solutions available today.

Recommendation: Prioritise energy efficiency and electrification pathways

Adopting the principle of energy efficiency first will reduce the challenge of shifting to zero carbon alternatives. Electric alternatives exist for the majority of gas services and electricity can readily be provided by carbon-free sources.

3. Emerging technologies

The future role of hydrogen in the energy system is uncertain and there are significant technical challenges related to its use in replacing natural gas in distribution pipelines. Of particular concern is the round trip efficiency of utilising hydrogen for heating services. Electric heat pumps present significantly improved efficiency and coefficients of performance, while in contrast hydrogen would require five times the wind and solar generation to produce the same amount of heat.^{vi}

The quantities of hydrogen which can feasibly be blended into the network is limited and much of the existing pipelines within the distribution network cannot carry high levels of hydrogen. As indicated in the Doris Engineering Scenario Analysis^{vii} commissioned by IV, significant lengths of pipelines would need to be decommissions and replaced. This constitutes a significant rebuilding of the gas network and contradicts arguments which promote transitioning from reticulated gas to hydrogen as an economically efficient use of the existing gas infrastructure.

The arguments for utilising hydrogen in the gas network are limited and the technical barriers to its deployment are great. Focusing on this alternative has the potential to detract from action in other decarbonisation pathways, lock in gas consumption, and delay action towards net zero.

Where the City of Melbourne believes hydrogen does have a key role to play is in those sectors and processes which cannot be easily electrified. Hydrogen should be reserved for use in high temperature industrial heating and feedstock applications as well as in the heavy transport sector.

Additionally, whilst hydrogen can be produced through syntheses from natural gas or paired with carbon capture and storage (CCS) to produce 'blue' hydrogen, the use of these methods would only continue the production of carbon emissions and increase opportunity costs relative to green hydrogen. CCS technology has not been proven to work at scale and runs significant risks of not working cost effectively. Producing brown or blue hydrogen is inconsistent with the Victorian governments net zero commitments and likely to expose Victorian industries to carbon tariffs in the case of international exports.

Recommendation: Reserve hydrogen for high value uses and ensure all hydrogen is 'green' hydrogen

Hydrogen produced through methods that generate carbon emissions are incompatible with Victoria's net zero objectives. Use of green hydrogen should be prioritised towards sectors which are difficult to electrify, including heavy transport and industrial processes.

4. Victoria's Planning System

Immediate action is required to prevent the installation of new gas assets and prevent future gas consumption from being locked in across the multi-decade lifecycle of these assets. The installation of natural gas in buildings locks in higher energy costs and higher cumulative carbon emissions. Continued installation of new gas assets and infrastructure is not compatible with net zero emissions targets. Furthermore, it runs the risk of some infrastructure becoming underutilised or 'stranded' before the end of their useful life.

To enable residential and commercial buildings to be fit for purpose in a zero carbon future, planning, building and plumbing regulations need to reduce reliance on fossil fuels. Assets reliant on natural gas for space and water heating and cooking may experience steeply declining value as renewable electricity displaces gas as the most cost effective and zero emissions energy source.

Melbourne is one of the fastest growing municipalities in Australia and this requires large-scale urban renewal across many precincts. The major precinct renewal programs at Fisherman's Bend and Arden-Macaulay being delivered by the Victorian Planning Authority (VPA), Victorian Government, and the City of Melbourne, both have zero emissions commitments. Installing renewable-ready grid infrastructure in the urban renewal phase is far cheaper than retrofitting infrastructure including gas networks in existing suburbs. A prudent approach would be to avoid installing new natural gas distribution in major urban renewal precincts and ensure new electricity infrastructure is be renewable-ready.

Outside of urban renewal areas the City of Melbourne draft planning scheme Amendment C376 establishes environmentally sustainable design requirements to ensure that buildings are planned and designed to facilitate carbon neutral or carbon positive outcomes across construction and operational stages. The amendment will discourage development that incorporates infrastructure which is not aligned with a zero emissions future. This includes a recommendation that developments should not incorporate connections to gas services or other non-renewable energy.

The City of Melbourne supports changes that will ensure new buildings and urban renewal precincts are not locked into natural gas infrastructure. Planning, building, and plumbing regulations need to remove mandatory requirements to connect to gas infrastructure. These requirements should instead require zero emissions infrastructure and for new developments to be free of gas.

Recommendation: Avoid lock-in gas consumption

Planning, building and plumbing regulations should remove mandatory requirements to connect to gas infrastructure so that new developments can achieve zero carbon.

5. Equity issues in gas decarbonisation

In planning for a gas-free transition, issues of social inclusion, equity and affordability need to be considered. It is foreseeable that as more people disconnect from the gas network, the ongoing costs of operation and maintenance of the network will fall to households who are less able to afford the upfront costs of disconnection.

A just transition is vital to ensure that those who can least afford to transition away from gas are not saddled with increasing gas and infrastructure costs. The Victorian Government's roadmap should provide clear market signals to encourage gas distribution companies to write down asset value in a staged manner, and ensure the costs of the transition are spread equitably across the community.

The upfront capital cost of replacing appliances should be subsidised to ensure vulnerable communities are not left behind. The City of Melbourne recognises that the Victorian Government are already investing in programs such as the Household Energy Savings Package to improve the energy efficiency of homes for low income and vulnerable Victorians. The City of Melbourne supports programs such as these and recommends their ongoing expansion.

Targeting funding programs to low income households would reduce the upfront cost of gas retrofits for vulnerable households and would help ensure that the costs of any transition are borne equitably. Well-designed retrofit programs should be developed that create demand for gas-free retrofit services, enable supply chains to develop and mature, and generate employment opportunities for socially disadvantaged Victorians.

Recommendation: Support vulnerable communities in the transition away from natural gas

Issues of social equity and affordability need to be considered to ensure that all communities benefit from the gas transition

6. Modelling scenarios

The energy transition is occurring at pace; driven by economics, technological advancement, and increasing global efforts to address the climate imperative. The pace of change is being spurred on by industry and action; and propelled through the policies of local and state governments. The transition is not just underway, it is accelerating.

The Australian Energy Market Operator's (AEMO's) Integrated System Plan (ISP)^{viii} provides an actionable roadmap for navigating Australia's power system through the energy transition, and includes modelling of a range of scenarios which trace different speeds of transition. Recent advice provided to the Australian Energy Regulator by AEMO is that the market is transforming in line with the 'fast change' scenario and that AEMO considers the 'fast change' and 'step change' scenarios as more likely than the 'central scenario'^{ix}.

This example underscores the importance of modelling different transition speed scenarios, which would provide a hedge against future uncertainty. Modelling pace of change scenarios would assist the Victorian Government to develop appropriate policy levers and support decisions about the nature and timing of infrastructure investments. Given the rapidly evolving technological, economic, and policy landscape, this should include modelling of ambitious decarbonisation pathways required to achieve zero emissions by 2040.

Recommendation: Develop and model 'fast change' and 'step change' scenarios

IV should develop modelling to account for different transition speeds. This should include ambitious decarbonisation pathways required to achieve zero emissions by 2040.

References

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