
Submission to the Department of Environment, Land, Water, and Planning on the Gas Substitutions Roadmap

The Property Council welcomes the opportunity to provide input to the Department of Environment, Land, Water, and Planning (DELWP) on the Gas Substitution Consultation Paper (the Paper) on what is an important process for Victoria.

Key themes in the pathway to net-zero carbon through gas substitution are outlined in the first section of this submission. The following headings have been broken down into two sector-specific sections covering all assets in the commercial and residential sectors. Each section will make general comments on the impact of gas substitution for that sector before addressing the questions from the Paper.

The submission will focus on the design, development, and management of the built environment, whether they be commercial or residential assets. Given that more than 60 per cent of gas is consumed by commercial or residential buildings, the opportunity to reduce Victoria's consumption of gas and subsequent emissions footprint is substantial.

The Property Council of Australia

The Property Council is the leading advocate for Australia's property industry – the economy's largest sector and employer.

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The industry pays 59 per cent or \$17.9 billion in tax revenue and pays more than \$21 billion in total wages salaries per year, which is approximately 27.9 per cent of wages and salaries paid to Victorian workers.

The Victorian membership has more than 500 members. They are architects, urban designers, town planners, builders, investors and developers. These members conceive of, invest in, design, build and manage the places that matter most – our homes, retirement living communities, shopping centres, office buildings, education, research and health precincts, tourism and hospitality venues.

This submission is informed by many of the Property Council's key member representatives and expert committee members.

A pathway to net-zero emissions

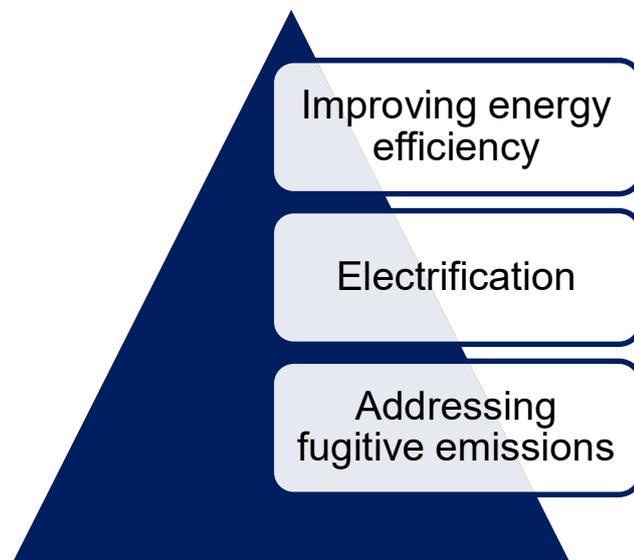
What is already being achieved

The property industry, particularly Property Council members, are already leading the way to Victoria's net-zero emissions future by 2050. Numerous Property Council members have already adopted aggressive targets to deliver net zero operations and require proven, readily available technologies to achieve these targets before 2030.

Individual local councils and their approach to enabling electrification through planning schemes will effectively dictate the transition away from gas. As the Property Council understands, this will likely be addressed in Stage Two of the Environmentally Sustainable Developments (ESD) Roadmap, which plans to outline particular ESD requirements for the entire state of Victoria, regardless of individual council ESD requirements. The Property Council supports a uniform approach across Victoria.

Hierarchy of pathways

Of the six decarbonisation pathways identified in the Paper, the Property Council believes that a hierarchy needs to be established to best curate Victoria's transition away from gas.



First, greater emphasis on improving energy efficiency is the most important pathway. The Paper talks about energy efficiency of appliances but not about the energy efficiency of improvements to the building fabric, airtightness, and heating, ventilating, and air conditioning controls. The key benefits of energy efficiency for the end users include reducing the need for gas (and electricity). The co-benefit of energy efficiency is that it lowers operating costs, reduces load on the grid, improves occupant comfort and enhances

the resilience of the buildings to extreme weather events, as well as improving safety (no gas in the building reduces the risk of fire and asphyxiation).

Second, to improving energy efficiency, electrification should be pursued. Early surveys of Property Council members indicate that they will be pursuing electrification as a way to reduce emissions. As identified in the Paper, 60.5 per cent of Victoria's gas consumption is used for cooking, space heating, and water heating, all of which can be substituted with electric alternatives. A variety of electric alternatives already exist within the marketplace and as demand for these alternatives increases, so will their availability. The result of the increased uptake of electric alternatives will ultimately drive down their price.

Third, fugitive emissions from the existing gas distribution network should be addressed. Once optimum energy efficiency within spaces is achieved and there is no electric alternative, only then should gas be considered. Rectifying inefficiencies within the existing gas network where gas is necessitated will prove crucial in securing net zero emissions.

The Property Council advises that further research is required to consider the adoption of the other three suggested pathways such as hydrogen, biogas, and emerging technologies. Concomitant with these options is the prolongation of the transition from gas and continued emissions of fuel combustion. The substitution of natural gas with gas alternatives is not well understood and will require the fundamental changes of existing infrastructure. For example, one of the challenges of substituting natural gas with hydrogen is that adding more than 10 per cent hydrogen with natural gas will lead to existing steel gas pipework needing to be replaced by plastic pipe and there are significant costs associated with this.

Gas substitution should focus on known technologies to limit disruptions to the emissions reduction targets. Complex unknown gas alternatives and technologies pose a threat to the emissions reductions targets as trial phases and adaptation of infrastructure will be necessary and increase the risk for failure to materialise.

Again, emerging technologies, such as carbon capture and storage (CCS) which are being suggested in the Paper are not directly relevant to Property Council Members or existing building energy users in the same way that improving energy efficiency and transition to electrification is. Many of these strategies like CCS are emerging and understood yet largely unproven at scale and therefore carry a higher risk than the proven technologies of energy efficiency and electrification with renewables despite the evident allure.

Timelines to Net Zero Emissions

As Victoria transitions away from gas, sections of the existing network will experience a decline in consumers. The Property Council cautions against any further investment into gas infrastructure to avoid stranded gas assets which will not be used as demand diminishes. The planned lifetime of the gas network needs to be made clear as customers shift from

parts of the network, leaving the cost of network support to be covered by reducing customer numbers.

A planned lifetime is also necessary to give foresight to both the developers of future built environments and the gas industry as to when assets will likely become redundant. Any current investment in gas infrastructure essentially locks in the use of gas for the duration of that infrastructure's lifespan. Given the reasonably long lifetime of boilers and associated infrastructure, the market needs strong signals now for an orderly transition.

Stimulus

As the operation of heat pumps and gas prices are nearing parity, the initial investment cost remains a disincentive. Stimulus for the installation of electric technologies or the establishment of industry to produce electric alternatives will only assist the uptake of more efficient electric technologies. The corresponding uptake will also assist in driving down costs.

In preparing potential stimulus measures it is important to identify:

1. The upfront costs of appliances.
2. The lifespan of technologies themselves to assist in identifying when the ageing technology can be replaced with a more efficient electrified variant.
3. Price premiums for relatively new (to Australia) commercial heat pump technologies.
4. Requirements to replace connected components within an existing HVAC system.
5. Upgrades to existing electrical infrastructure (where required).
6. Accommodation of increased heat pump plant size and weight in comparison to existing gas-powered systems.

Further integration expansion of the Victorian Energy Upgrades project program to fund retrofits is also an important consideration given the scale and importance of the retrofit markets more expensive than new builds.

The most important consideration on stimulus measures is how measures will be coordinated at a local, state, and federal level. Although stimulus measures might have the best intentions, disparate measures between the three levels of government have the potential to be counterproductive and even hamper the uptake of improved energy efficiency and electric technologies.

Interplay with buildings standards and ratings tools

Consideration needs to be given as to how building energy efficiency ratings tools need to be recalibrated for electric building design. The Property Council also notes that the National Construction Code 2022 energy efficiency standards will be open for consultation later this year. New building codes can be used to encourage electrification and drive better outcomes for energy efficiency.

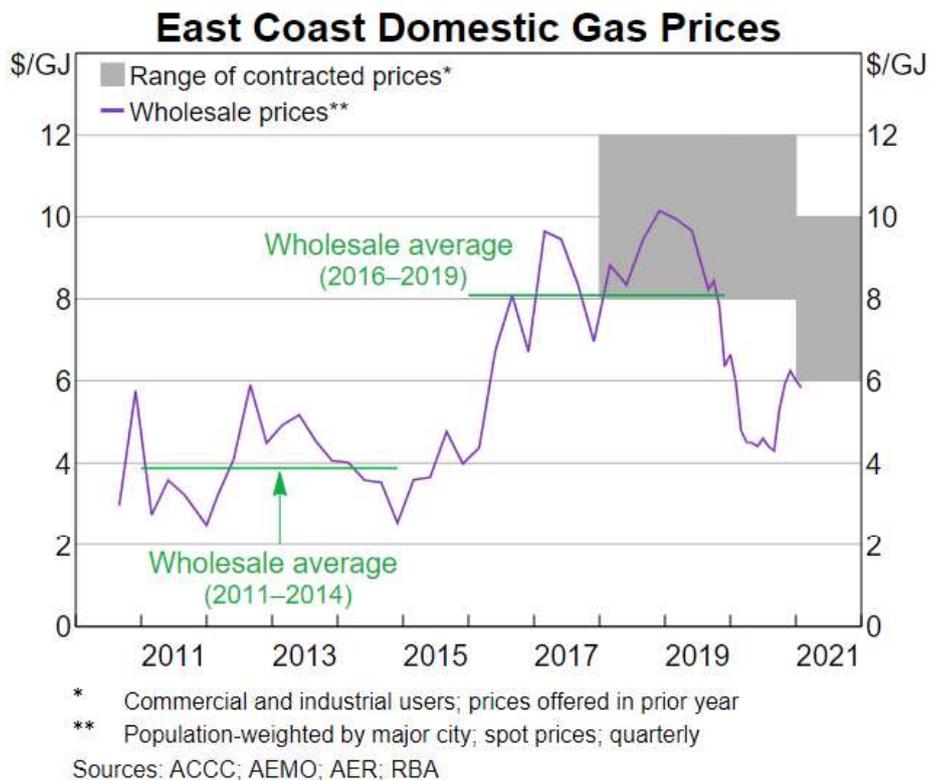
NABERS, with the support of the Property Council, is already proposing to include a new measure of renewable energy percentage that will highlight the source of energy, renewable or otherwise, and assist in informing the market and creating incentives to move to 100 per cent renewable energy. In this market, progressive tenants will seek NABERS Energy 5+ stars and 100 per cent renewable energy.

Further, given that DELWP is also in the process of developing new ESD requirements which are slated to include an as-built performance rating tool, the rating of assets that still rely upon fossil fuels is an important consideration. Minimum performance rating requirements might not be achieved if buildings still rely upon gas infrastructure, whereas electrified alternatives would rank much higher.

The cost of inaction

There are two concerns about a reliance on gas consumption while Victoria transitions away from the fuel. The first and most important is the environmental impacts of burning a fossil fuel. As outlined in the Paper, gas contributes to 15.8 per cent of Victoria's emissions. The exploration and sourcing of natural gas is related to a range of negative environmental impacts including land use, pollution, and damage to water tables. Adoption of more energy efficient electrified buildings can contribute to reducing these secondary impacts and Victoria's greenhouse gas emissions.

The second impact is the increasing cost of gas as it has become exposed to export market volatility. Over the past 10 years the price of gas has increased, as demonstrated below. Indeed, the price of gas hit \$20 per gigajoule in Victoria in July, the highest rate since 2016. As noted in the Paper, declining production from the Victorian gas fields in the near term will likely exacerbate this price pressure and impact on the state's economy. A transition away from gas and decreasing demand avoids infrastructure investment and supply pressure with the potential to reduce upward cost pressure on both commercial and residential consumers.



The Property Council welcomes the evident understanding by the Victorian Government that investment in maintaining the current gas network consumption through national network augmentation and ongoing infrastructure maintenance could better be directed to efforts to transition from gas to non-gas alternatives.

As early signs of this transition are already evident in the market, the Property Council encourages careful consideration of the proposed adoption of emerging technologies and gas substitutes in the Paper. This is because the increased costs associated with integrating such measures into the existing gas infrastructure while Victoria inevitably transitions away from gas to meet its target of a 28-33 per cent carbon emissions reduction by 2025 will be borne by fewer consumers. The continuing cost of maintenance of ageing gas infrastructure will fall on a diminishing number of consumers, including some least able to afford it. Although the price of gas is regulated, increased costs pressures will either lead to the abandonment of new technologies or a capitulation from regulators and unregulated gas price increases.

Leadership and education

Government leadership through the procurement of energy-efficient electrified buildings will set an example for future assets to follow.

In addition to the stimulus measures, consideration should be given to improving the technical competency and local experience within the mechanical services consultancy industry required to identify and implement optimal solutions concerning the electrification of HVAC systems.

The industry's educators must be rapidly upskilled to meet the technical challenges of electrification. All educational institutions should begin training the next generation of service providers, so they are ready for an electric future. Further, reskilling programs are required for those employed in the supply of gas systems to ensure that jobs in what will become an increasingly obsolete industry in the future is not what prevents Victoria's reaching emission reduction targets.

Similarly, the curated transition of the industry "ecosystem" (importers, manufacturers, sales and particularly plumbers) that currently encourage gas over alternatives will be critical to the success of the Victorian Government-led transition.

Further, a public education campaign that showcases the advantage of electric appliances and a transition away from fossil fuels would be hugely beneficial in shifting public perception to favour electric alternatives.

Commercial

What is the scale of opportunities and potential to accelerate uptake?

Many new buildings are already being designed to be gas-free and energy-efficient at the leading end of the market. To meet the requirements of large commercial property tenants and shareholders, owners are moving to electrifying their assets to meet Net Zero Carbon commitments. More could be done to ensure installation of efficient electric alternatives and encourage more efficient building developments in suburban and regional locations. There exists in the industry much legacy electric technology (heat pumps and “hybrid electric heat pumps for example) that is decades old technology with modest “in use” seasonal performance that risks negative experiences when transitioning from gas.

The scale of opportunity for improving the energy efficiency and electrification of existing commercial buildings and other sectors such as university buildings is huge.

The key benefit of electrification with current-generation technology heat pumps for many new buildings when used in combination with energy-efficient construction is the profound reductions in energy use and improved comfort outcomes. The Japanese Government, early to this transition, have invested heavily with industry in research and development of more effective heat pump technologies with resultant increased sales of heat pumps for climate control and domestic hot water.

What are the key technical, regulatory and economic barriers?

Some of the key barriers to energy efficiency and electrification are the costs of replacing existing boilers and hot water units which have not reached the end of their economic lives.

Another challenge is that until the grid in Victoria is further decarbonised switching to heat pumps which are powered by a carbon-intensive grid could lead to an increase in emissions until the grid is decarbonized or the building owner puts in place a renewable energy power purchase agreement. There may also be some issues associated with acoustics, existing HVAC system design and additional space requirements for heat pumps, associated storage tanks and energy storage batteries in existing buildings in some circumstances.

What are the roles to be played by government, industry and how will consumers' preferences be accounted for in the transition?

Residential apartment developments can be delivered without gas. However, there is concern that commercial operators in ground floor mixed-use spaces may be less inclined to lease cooking spaces that do not have gas cooking options.

Consultant members of the Property Council members report that their clients are often unaware of how electric alternatives can be used in large commercial assets. Electric alternatives for the food and beverage industry are a particular challenge for the property industry.

It can help the transition by using the mandate of large tenant commercial properties to require gas-free buildings and provide grants to property owners to help offset the premature cost of converting existing gas installations to all-electric.

What are the likely timings of technical maturity and economic viability?

Building energy-efficient, gas-free buildings are commercially viable now and refurbishments and conversions can be viable depending on the circumstances of existing projects. There is now a greater focus on a “fabric first” approach in the design of new buildings and a focus on improving the as constructed insulation and airtightness of new and refurbished buildings. This can be further encouraged through enhanced building regulations and industry training and should be implemented as soon as possible. The technical solution will be highly building-specific and may require several technical solutions to completely remove gas consumption.

COVID restrictions on building occupancy have highlighted the energy losses associated with central plants and long reticulation loops in domestic hot water systems. A return to floor-by-floor electric systems using the latest technology instantaneous hot water systems offers an alternative approach for many existing assets.

What are the best ways to maintain social acceptability and consumer confidence?

Take existing customers on the journey and show them a clear and achievable pathway. Consumers need to be aware that gas is a fossil fuel that contributes to human-induced climate change.

What are the inter-dependencies and trade-offs with other pathways (are pathways complementary or alternatives)?

There are strong interdependencies between energy efficiency and electrification. Well insulated, airtight buildings do not get as cold and are easier to service using energy-efficient pumps. However, in other pathways there are not so many interdependencies.

Interdependency opportunities that exist include:

- Electric vehicles
- Energy storage (electrical and thermal storage)
- Smart / adaptable grids
- Smart building technology
- Demand response

Again, it must be emphasised that building new gas infrastructure can lock in emission-intensive technologies for several decades.

What are the key uncertainties and potential for unintended consequences?

Some of the key uncertainties articulated to the Property Council include:

- Impact on electrical load capacity, although this will be mitigated as the demand maximums for cooling and heating will not be simultaneous but fall in different seasons (winter space heating and summer cooling maximums)
- Industry skills and expertise
- Penetration of renewable electricity generation and decarbonisation of the NEM
- Capacity of existing electrical infrastructure (offset by energy efficiency and inbuilt contingency / oversizing of electrical infrastructure)
- Spatial requirements and acoustic restrictions
- Local manufacturing capability and skilled employment opportunities

Poor understanding of the correct application of heat pumps in substitution of gas equipment, combined with low cost, poor-performing legacy technologies widely supplied in the Australian market, could witness a repeat of an earlier transition effort two decades ago.

Residential

What is the scale of opportunities and potential to accelerate uptake?

The energy efficiency measures can include simple and reliable technologies such as insulation, sealing gaps and whole building pressure testing as well as plant, equipment and control upgrades. Improving the energy efficiency of homes is a key strategy in reducing the inequity of energy poverty in Australia. The risks of shoddy and dangerous work that were encountered in the “pink batts” rollout are well understood and have been mitigated in subsequent energy efficiency improvement programs.

What are the key technical, regulatory and economic barriers?

Delivery of fully electric homes will impact standard load and demand assumptions, so consideration for the grid and preparing for this will be crucial. Property Council members also report the availability of electrical infrastructure as the main motivators for a push toward gas or electric.

In the greenfields residential space, Property Council members have faced issues with Distribution Businesses (DBs) requiring gas infrastructure. The requirement is not necessary for projects and is necessitated by DBs to increase their own revenue. As the requirement by DBs for gas infrastructure is not monitored by Essential Services Commission, DBs can operate without regulation. Property Council members report they are striving for electrification as it is cheaper. Gas connections to the boundary should not be required. A requirement for residential assets for gas boosted solar hot water is an unfortunate driver as currently reported by the market.

A 2005 Victorian variation of the National Construction Code (NCC) restricts installation of alternatives to a solar-gas hot water service (HWS) in new dwellings unless they also have a

rainwater tank plumbed to toilets, a reticulated recycled water supply, or a greywater treatment unit. This regulation creates a barrier for the installation of low emissions electric hot water systems (LEEHWS) such as electric heat pumps and solar electric HWS.

Consideration also needs to be given to changes to AS3000 for residential properties and the provision of adequate circuits for “all-electric” homes to avoid issues with circuit protection tripping.

Property Council members also report issues with substation demand requirements. There have been teething issues due to increased electric demand in the absence of gas, although these are easily addressed.

For consumers with photovoltaic (PV) systems, consideration needs to be given to how they can feed energy back onto the grid. Further, rebates have not targeted battery installation for electrification. Such supplementary measures feed into the effectiveness of the uptake of PV systems.

Case Study 1 – Residential developer: cost of heat pumps

Heat pump hot water analysis has found there is additional \$600 per dwelling. The developer is only using heat pumps in a stage at one Victorian built form development where gas boosted solar hot water was not an option.

Electrification is not an issue for new builds; however, retrofits prove difficult.

What are the roles to be played by government, industry and how will consumers preferences be accounted for in the transition?

Shifting public preference away from gas will prove particularly difficult. Although electric alternatives are more efficient, induction cooktops are still perceived to be a less favourable option to gas among consumers and in some markets the gas industry is funding influencers to campaign in favour of gas for cooking as often once gas is connected for the kitchen, hot water, and heating easily follow.

Case Study 2 – Residential developer: consumer market research

A prominent residential developer undertook customer database research in 2020 of a sample size of 77 individuals interested in purchasing at a new medium density infill development. The respondents were asked on their preference on gas or induction:

- *Overwhelming majority (80%) prefer Gas cooktop over electric cooktop (17%). Reasons for this preference are that it's cheaper, easier to maintain, more efficient, heats up better and produce better flavour food than electric cooktops.*
- *Electric cooktops are perceived to look sleek, easy to clean and more sustainable for the few that preferred it.*

It was noted that the preference for gas might also be driven by limited knowledge of induction cooking and associated benefits based on some of the comments provided.

To this extent, an influencer-led education campaign championed by the Victorian Government that showcases the advantages of induction cooktops could prove vital.

What are the likely timings of technical maturity and economic viability?

Technically mature options are already in the market thanks to efforts by industry and government in other countries. However, the Australian market continues to exhibit extensive sales of outdated technologies. Most operators in this space are no longer Australian owned and much manufacturing has been offshored so caution with protecting or promoting this legacy supply chain and damaging “all electrics” reputation with consumers may be indicated.

What are the best ways to maintain social acceptability and consumer confidence?

As mentioned earlier in this submission, market education and promotion of high-performance options is vital to increase social acceptability and consumer confidence.

What are the inter-dependencies and trade-offs with other pathways (are pathways complementary or alternatives)?

Projects, where a hybrid of gas and electric are adopted, are also undesirable. A hybrid approach poses no financial upside for developers as they are still required to install redundant gas lines.

Final comments

The Property Council, in collaboration with the Australian Sustainable Built Environment Council and other peak bodies, is currently drafting a research piece to model least-cost decarbonisation pathways. The research piece which will go out for tender shortly and intends to make an:

- assessment of electrification, gas and other forms of generation as lowest cost pathways within buildings and cost implications of different pathways for network augmentation;
- establish an end goal to decarbonise building operations in alignment with Australia's Paris Agreement targets.
- file knowledge and information gaps among all key stakeholders, particularly;
 - informing policymakers who are responsible for legislation/regulation that impacts on new and existing buildings (including the National Construction Code) and planning and investment in electricity and gas distribution networks;
 - businesses (particularly in design, engineering, construction and property development) that are designing or investing in new buildings, retrofitting existing buildings or making decisions about new investment; and,
- cataloguing and analysing legacy legislation and regulations with a technology bias that could work against a least-cost transition, and where possible, suggest solutions.

Upon completion, this research piece would be hugely beneficial to DELWP in mapping out the regulations that will enable the Victorian Government to achieve its net-zero emissions goal by 2050 especially as it will likely contain a state-specific analysis for the Victorian situation. However, given current timeframes, this is not possible, although the Property Council looks forward to keeping DELWP apprised of any updates on this research piece.

The Property Council would also encourage the Victorian Government to engage with organisations such the Australian Institute of Refrigeration, Air Conditioning and Heating, if they are not doing so already, to explore foster a greater understanding of how proposed measures may affect buildings.

Next Steps

We look forward to continuing to support DELWP in the development of a transition to a net zero emissions future for Victoria. We would like to re-iterate our availability to provide expert industry knowledge where it is required to support a better understanding of the nuances of the property industry.



Yours sincerely,



Danni Hunter
Executive Director, Victoria