

16 January 2025

Department of Energy, Environment and Climate Action
Level 3, 8 Nicholson Street
East Melbourne VIC 3003

To whom it may concern,

Climateworks Centre submission on setting new targets for the Victorian Energy Upgrades program

Climateworks Centre welcomes the opportunity to respond to the Department of Energy, Environment and Climate Action's (DEECA) consultation on setting new targets for the Victorian Energy Upgrades (VEU) program.

Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. We develop specialist knowledge to accelerate emissions reduction, in line with the global 1.5 degrees Celsius temperature goal, across Australia, Southeast Asia and the Pacific.

Climateworks has regularly engaged with the Victorian Government, including through submissions to consultations on the 2035 Emissions Reduction Target, Infrastructure Victoria's 30-year strategy, Minimum Standards for Rental Properties and Rooming Houses, and the inquiry into renewable energy in Victoria.

The energy system in Climateworks' 1.5°C-aligned decarbonisation scenario

In 2023, Climateworks published [least-cost emissions reduction pathways for Australia](#). Our report shows a Paris-aligned least-cost pathway for limiting warming to 1.5°C reaches emissions reductions of 68 per cent below 2005 levels by 2030 and net zero before 2040.

In our 1.5°C-aligned scenario, renewables make up 90 per cent of total electricity generation in the National Electricity Market (NEM) by 2030 and close to 100 per cent by 2034. Clean electricity generation capacity expands from around 62 GW in 2024 to around 116 GW by 2030 and 298 GW by 2050. All coal-fired power generation ceases by 2035, and gas-powered generation reduces by 69 per cent by 2030 and 96 per cent by 2050 (Climateworks Centre 2023). To achieve net zero, renewables, electrification and energy-efficiency measures underpin buildings, industry and transportation decarbonisation. The insights from these pathways for the importance of changes to energy end use, particularly around energy efficiency, are very relevant for VEU policy.

Climateworks' Renovation Pathways program provides additional evidence to underpin our submission

Climateworks' Renovation Pathways program demonstrated the economic benefits and emissions reduction impacts of thermal upgrade packages and switching gas appliances to electric equivalents. We modelled the costs and societal benefits of thermal upgrade packages for low-performance homes, including gap sealing and insulation (see Appendix for details of upgrades included). Recognising that many homes have inadequate insulation, our modelling assumes ceiling insulation

of R0.25 and finds significant benefits available to Victorians. This research forms the evidence base for our recommendations. Using real home data from the Australian Housing Data portal, our analysis is based on the Race for 2030 research program by CSIRO and RMIT (Rajagopalan et al. 2023). Our analysis includes results specific to Victoria's climate zones.

There are significant benefits to upgrading homes with poor energy efficiency (i.e. homes with ceiling insulation of R0.25 and no insulation to walls or floors, poor airtightness and gas space conditioning (Climateworks Centre 2023)). Our analysis of Victorian homes indicates that upgrading ceiling insulation from R0.25 to R3 results in annual emissions savings of 2.4 tCO₂e for detached houses, 0.5 tCO₂e for apartments and 1.3 tCO₂e for townhouses when undertaken alongside draught sealing and a switch from gas space conditioning to an efficient electric heat pump (Figure 3, Appendix). The upgrade packages are detailed in Figure 1 and Figure 2 in the Appendix.

We analysed Victoria's housing stock and calculated the economic costs and benefits for houses based on their construction material (called 'archetypes'). We found that thermal upgrades, including insulation, are responsible for the majority of energy savings. We therefore commend the Victorian Government on including thermal upgrade measures.

When thermal upgrades are undertaken in conjunction with all-electric appliances, our analysis indicates they have a positive benefit-cost ratio (BCR) for all dwelling types (Figure 5, Appendix), and occupants could save between \$800 and \$2,600 on annual energy bills, based on 2023 gas and electricity prices (Figure 6, Appendix). Additional benefits, such as peak demand reduction, are discussed below.

Submission summary

Climateworks recommends that DEECA consider the following as it develops 2026 and 2027 targets for the VEU program:

- Maintain targets of at least 7 million Victorian Energy Efficiency Certificates (VEECs) in 2026 and 2027, consistent with 2024 and 2025 targets, under both the 'main regulatory scenario' and 'alternative regulatory scenario'.
- Deliver fair and equitable support for priority households, particularly low-income households and renters, to enable high-ambition VEU targets while avoiding the negative aspects of the 'death spirals' that could occur as fewer customers utilise gas network infrastructure.
- Provide rebates and discounts for a broader range of thermal efficiency, distributed energy resources (DER) and demand management technologies to achieve progressively more ambitious VEU targets.

Recommendations on setting new targets for the Victorian Energy Upgrades program

Recommendation 1: Maintain targets of at least 7 million VEECs in 2026 and 2027, consistent with 2024 and 2025 targets, under both the 'main regulatory scenario' and 'alternative regulatory scenario'.

Climateworks notes that VEEC targets between 2018 and 2024 exceed the proposed 2026 target of 6 million VEECs under Option 3 of the 'main regulatory scenario'. A target of at least 7 million VEECs is in keeping with previous years' targets. According to the consultation's Regulatory Impact Statement, options 2 and 3 align with Victoria's legislated targets of achieving a 75–80 per cent reduction in emissions by 2035 and net zero by 2045 (DEECA 2023). A high-ambition target for 2026 and 2027 can help Victoria set an ambitious economy-wide emissions reduction target for 2040, due to be set in 2028 (DEECA 2023). A high-ambition target for 2026 and 2027 also aligns with consumers' appetite for energy efficiency improvements (Energy Consumers Australia 2022).

We recognise that policy changes may make opportunities for generating VEECs harder for some activities. However, we highlight the importance of improving energy efficiency within least-cost decarbonisation pathways, the amount of additional opportunities for abatement shown in our work and the ambition of Victorian emissions reduction targets. Hence our recommendation to maintain the

target for VEECs even if this in effect will create greater energy efficiency activities when combined with policy changes in other areas.

Climateworks recommends that the Victorian Government maintain targets of at least 7 million VEECs in 2026 and 2027, regardless of whether the 'main regulatory scenario' or 'alternative regulatory scenario' eventuates. Should the Victorian Government determine a target of 7 million VEECs in 2026 is unachievable, Climateworks supports adopting Option 3 under the 'main regulatory scenario'.

Climateworks' analysis shows expanding the VEU program to include all products within the Renovation Pathways upgrade bundles could equate to 3 to 4 VEECs per home. When scaled to achieve Option 3's target of 1 million additional VEECs in 2026 and 1.3 million VEECs in 2027 (compared to Option 2) under the 'main regulatory scenario', this could result in an additional:

- 250,000 to 330,000 detached houses being upgraded to meet the 2026 target
- 325,000 to 430,000 detached houses being upgraded to meet the 2027 target

These upgrades could deliver significant financial benefits to Victorians:

- \$650 million to \$858 million in savings from upgrades completed in 2026
- \$845 million to \$1.2 billion in savings from upgrades completed in 2027

These improvements would make a meaningful contribution to Victoria's emissions reduction efforts and support the Victorian Government's policy of transitioning the state's 2 million residential homes off the gas network, as outlined in Victoria's Gas Substitution Roadmap.

Recommendation 2: Deliver fair and equitable support for priority households, particularly low-income households and renters, to enable high-ambition VEU targets while avoiding the negative aspects of the 'death spirals' that could occur as fewer customers utilise gas network infrastructure.

Climateworks' modelling indicates the move away from gas in buildings would be rapid in both a well-below-2°C and 1.5°C scenario, reaching near zero by the mid-2040s under each. Electrification, improved thermal performance and energy efficiency will contribute significantly to Australia's and Victoria's net zero commitments and will make residential, commercial and light industry buildings cheaper to run. Furthermore, the Regulatory Impact Statement notes Option 3 under the 'main regulatory scenario' has the highest Net Present Value, largest benefits for industry and best community health outcomes.

However, it is important to consider that certain buildings, such as those occupied by low-income earners and renters and those used for particular industrial processes, may not have the resources or opportunity to electrify as rapidly as the rest of the population. This will likely lead to a 'death spiral' where the increasing cost to maintain underutilised gas network infrastructure means more and more people shift off the network. Without oversight and coordination, this is likely to mean customers who are unable to electrify are required to pay more in network costs and get trapped on high-cost energy.

The VEU program can help avoid the negative impacts of a 'death spiral' by providing sufficiently sized discounts and rebates to facilitate the electrification of priority buildings. This would require collaborating with the Australian Government, energy market bodies and gas distribution network service providers to coordinate an orderly transition for households and businesses susceptible to increasing gas prices. Policies alongside the VEU program to support priority households can enable high ambition targets to be set without unfairly impacting low-income households.

We recognise that higher VEEC targets increases the cost of the policy to consumers as retailers pass on implementation costs. This increases the importance of additional targeted support for priority households. Policies to minimise the impact on priority households could include minimum energy performance standards for rentals, mandatory disclosure of home energy efficiency ratings at point of sale or lease, or increased financial support to transition for households that meet lower income

thresholds. We note the Victorian Government's action so far towards implementing these policies, such as through the recent consultation on minimum energy efficiency standards and the development of the Victorian residential energy efficiency scorecard. Climateworks Centre (2024)'s *Enabling Australia's home renovation wave* report defines priority households as those that could benefit from additional focus from policymakers due to systemic barriers that prevent access to energy performance upgrades.

Recommendation 3: Provide rebates and discounts for a broader range of thermal efficiency, distributed energy resources (DER) and demand management technologies to achieve progressively more ambitious VEU targets.

Climateworks supports the Victorian Government's intent to review the technologies incorporated into the VEU program through its Strategic Review. The VEU program could position itself to achieve Climateworks' recommended targets of at least 7 million VEECs in 2026 and 2027, and increase targets from 2028, by expanding rebates and discounts to cover more technologies. That could include a broader range of thermal efficiency, DER and demand management technologies, as outlined below. If the Government decides that technologies for DER demand management are better kept separate from the VEU scheme, given they have a complex and dynamic impact on emissions, we advise that Victoria sets up an alternative policy to deliver higher rates of DER and demand management. We note that the energy market bodies are also actively considering how changes to policy and energy market rules can encourage transition in this area.

Thermal efficiency technologies:

Climateworks' analysis demonstrates the importance of a building's thermal shell in improving energy performance. Buildings with high-performing thermal shells see substantially reduced energy use, lower emissions, improved occupant health and thermal comfort and resilience against extreme temperatures. This is true for residential, commercial and light industrial buildings. Evidence for residential buildings is demonstrated in Climateworks' [Renovation Pathways](#) reports.

Renovation Pathways shows that in Victoria, homes that meet the 'climate-ready' standard – modelled in Climateworks' research to include insulation in ceilings, floors and walls, sealed draughts, shaded and double-glazed windows and an efficient electric heat pump – can reduce energy use by 14.3 MWh per dwelling annually and emissions by 2.6 tCO₂e compared to a 'low-performing' home with minimal insulation, unsealed draughts and gas heating. These thermal upgrades would also support better energy demand management, with 'climate-ready' enhancements reducing peak demand by around 5.5 kW per dwelling.

In addition to those currently supported through the VEU program, Climateworks' research shows ceiling, floor and wall insulation, heavy window drapes, roller shutters, double glazing and heat recovery ventilation can all enhance buildings' thermal performance. Low-energy technologies, such as ceiling fans, lockable fly screens and window shading, also benefit households. Some buildings may gain from upgrading from single-phase to three-phase power, particularly households installing high-speed electric vehicle chargers. Expanding the range of technologies supported by the VEU program will significantly improve the thermal efficiency of Victorian residential, business and light commercial buildings.

DER and demand management technologies:

Consumer energy resources and larger DER offer a significant opportunity to transform how electricity is generated, traded, delivered and consumed. Technologies such as independently orchestrated virtual power plant networks, community batteries and vehicle-to-grid demand response services will play an important role in reducing building emissions, consumer energy costs and grid-scale infrastructure investment. They will also support the stabilisation of the grid when electricity demand exceeds supply, including during solar and wind droughts.

Victorians and the NEM would benefit from a VEU program that incentivises a wider range of DER and demand management technologies. Alongside the rebates and discounts offered under the current program design, the VEU Strategic Review could consider the interplay between consumers, retailers, independent aggregators and the electricity market. This could include ensuring support, processes, regulation and financial returns promote Victorians' participation in demand management and flexible trading.

Thank you for taking the time to consider our submission. We would welcome an opportunity to brief your team if you would like to explore our responses in further detail.

Yours sincerely,

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Appendix: Climateworks' Renovation Pathways modelling for Victoria

Figure 1: Thermal upgrade packages applied to low-performing homes in Climateworks' Renovation Pathways modelling.

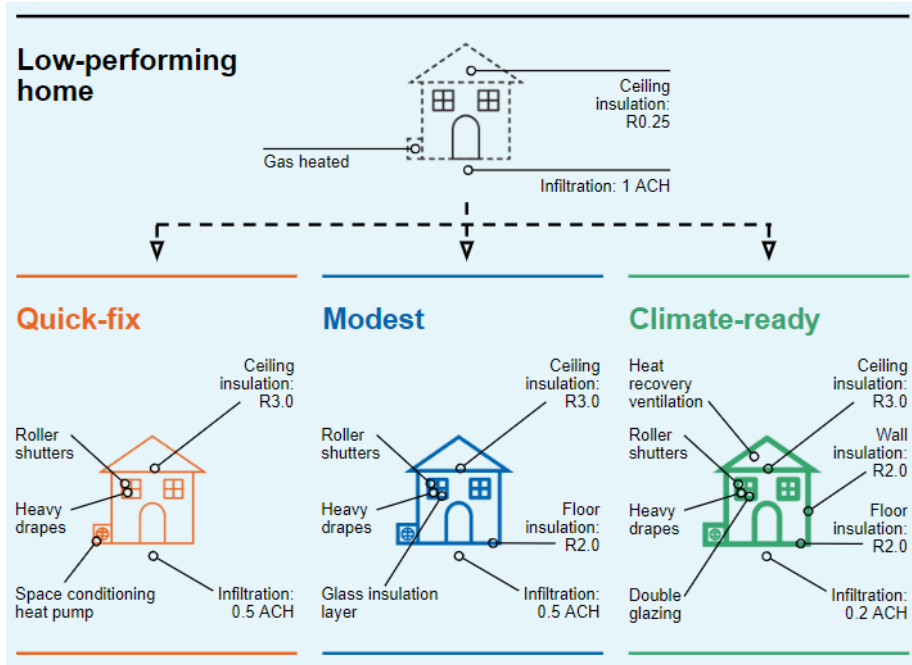


Figure 2: Full suite of packages applied to low-performing homes in Climateworks' Renovation Pathways modelling, including thermal upgrades, electrification of hot water and cooking appliances, and rooftop solar for the remaining energy use.

	ENERGY PERFORMANCE UPGRADE BUNDLES	ELECTRIFICATION	ROOFTOP SOLAR	
Quick-fix	Insulation	Ceiling R3.0		
	Infiltration/ draughts (walls, floor, ceiling)	0.5 ACH		
	Curtains	Heavy drapes	Efficient electric hot water heating and cooking	Maximum roof area for solar required to match level of electricity use
	Window shades	Roller shutters		
	Thermal appliance – heating & cooling	Efficient electric heat pump		
Modest	Insulation	Ceiling R3.0, Floor R2.0		
	Infiltration/ draughts (walls, floor, ceiling)	0.5 ACH		
	Curtains	Heavy drapes	Efficient electric hot water heating and cooking	Medium roof area for solar required
	Window shade	Roller shutters		
	Window system	Additional layer of glass or film		
Thermal appliance – heating & cooling	Efficient electric heat pump			
Climate-ready	Insulation	Ceiling R3.0, Floor R2.0, Wall R2.0		
	Infiltration/ draughts (walls, floor, ceiling)	0.2 ACH		
	Curtain	Heavy drapes	Efficient electric hot water heating and cooking	Minimum roof area for solar required
	Window shades	Roller shutters		
	Window system	Efficient double glazing		
Thermal appliances – heating & cooling and heat recovery ventilation (HRV)	Efficient electric heat pump with HRV Efficient 85% heat recovery			

Figure 3: Average annual emissions reductions per low-performing home after thermal upgrades (including electrification of space conditioning) and electrification of all gas appliances (hot water, cooking) in Victoria.

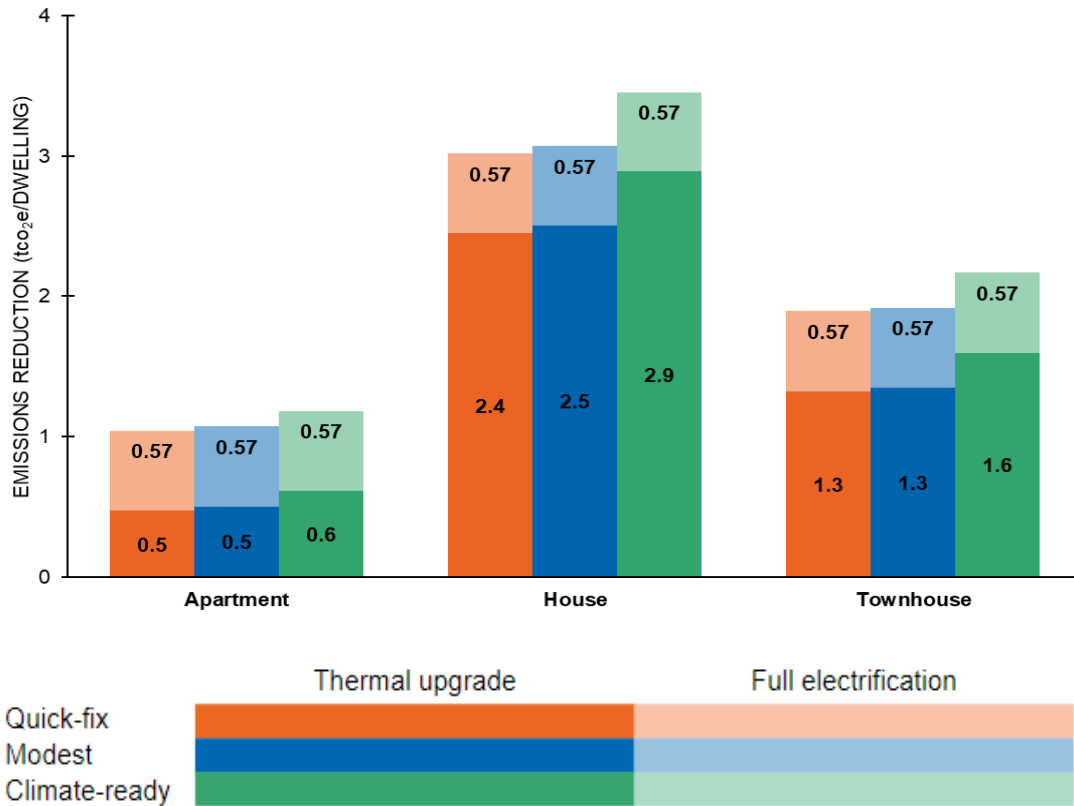


Figure 4: Average energy savings for low-performing homes after quick-fix thermal upgrade (including electrification of space conditioning) and electrification of all gas appliances (hot water, cooking) in Victoria, per archetype. For 13 of the 16 archetypes, thermal upgrades present the biggest opportunity to reduce energy consumption and lower bills.

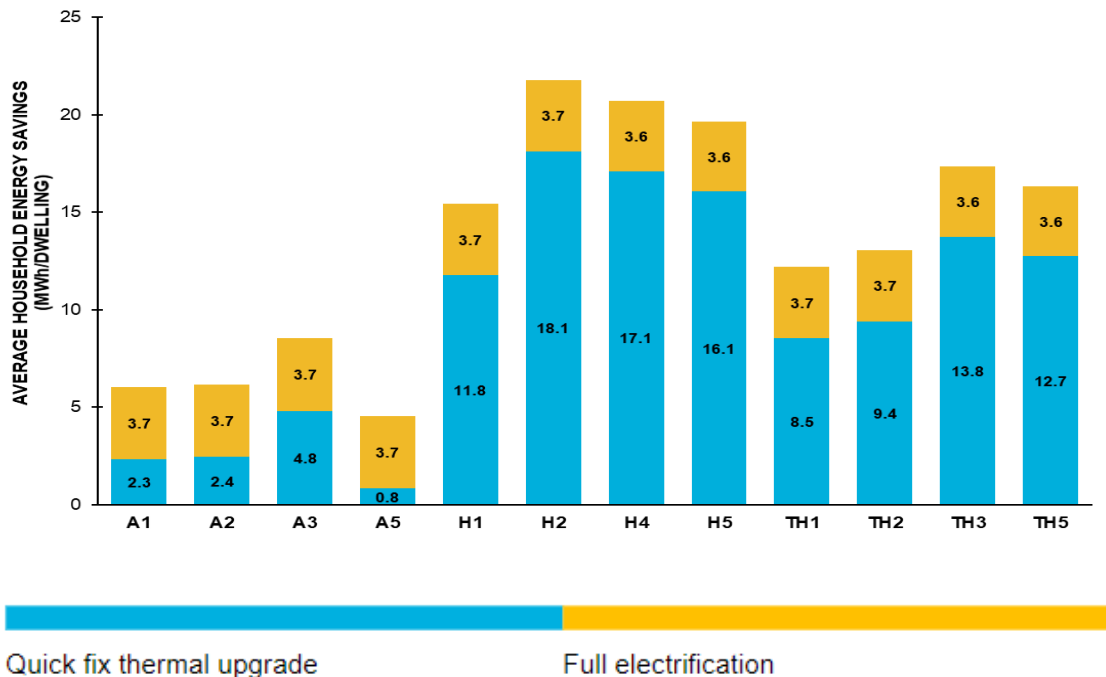


Figure 5: Private benefit-cost ratio per low-performing home after combined thermal upgrade (including electrification of space conditioning) and electrification of all gas appliances (hot water, cooking) in Victoria.

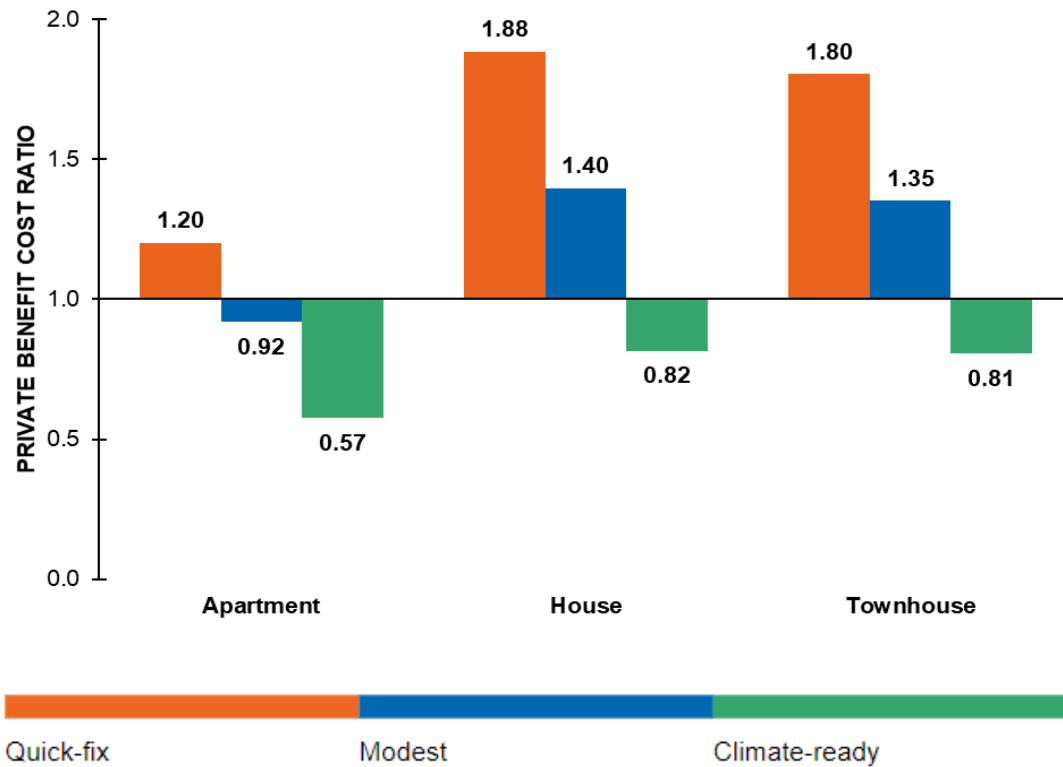


Figure 6: Average annual bill savings per low-performing home after combined thermal upgrade (including electrification of space conditioning) and electrification of all gas appliances (hot water, cooking) in Victoria. Figures based on 2023 Victorian gas and electricity prices.

