



Minimum energy efficiency and safety
standards for rental homes – Regulatory
Impact Statement

Department of Energy, Environment and
Climate Action

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Glossary

Acronym	Full name
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
BCR	Benefit Cost Ratio
CAV	Consumer Affairs Victoria
CBA	Cost Benefit Analysis
DEECA	Department of Energy, Environment and Climate Action
DGS	Department of Government Services
DIY	Do it yourself
EES	Energy Efficient Strategies
GHG	Greenhouse gas
HSM	Housing Stock Model
HSPF	Heating seasonal performance factor
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt hour
LPG	Liquified Petroleum Gas
MJ	Megajoule
MWh	Megawatt hours
NCC	National Construction Code
NPV	Net Present Value
PHW Act	<i>Public Health and Wellbeing Act 2008</i>
PV	Present value
RCAC	Reverse cycle air conditioners
RIS	Regulatory Impact Statement
RTA	<i>Residential Tenancies Act 1997</i>
TCSPF	Total cooling seasonal performance factor
VEU	Victorian Energy Upgrades program
WELS	Water Efficiency Labelling and Standards

Executive summary

Purpose of this regulatory impact statement

The purpose of this RIS is to assess the impact of amending the Residential Tenancies Regulations 2021 (the Residential Tenancies Regulations) to introduce additional minimum standards for rental properties related to:

- ceiling insulation
- draught sealing
- hot water systems and shower heads
- heating and cooling
- blind cord safety anchors.

This RIS also assesses the impact of amending the Residential Tenancies (Rooming House Standards) Regulations 2023 (Rooming House Regulations) to provide for a heating standard in rooming houses.¹

The Department of Government Services (DGS) is responsible for administering the *Residential Tenancies Act 1997* and supporting regulatory frameworks. As majority of the proposed amendments to the Residential Tenancies Regulations and Rooming House Regulations are focused on energy efficiency measures, DGS has worked in close collaboration with the Department of Energy, Environment and Climate Action (DEECA) to design and carefully consider the impacts of the proposed minimum standards.

Problem statement

The amendments to the Residential Tenancies Regulations and the Rooming House Regulations are intended to address the following problems:

- **A significant volume of Victoria’s rental building stock lack basic thermal performance and appliance efficiency measures.** While there are no recent, widespread studies into the prevalence of energy efficiency measures in residential building stock, data from the 2019 Victorian Residential Efficiency Scorecard and market surveys by Newgate in 2018 and Energy Consumer Australia in 2021 highlight some key deficiencies related to the thermal performance of residential properties. Nationally, a study found that rented homes across Australia had poorer thermal performance and appliance efficiency compared to owner-occupied homes.² Data from the Australian Bureau of Statistics also shows that rented premises have significantly lower rates of insulation, low-flow shower heads, draught seals and solar electricity and hot water systems compared to owner-occupied homes.³
- **The rental relationship hinders efficiency and safety upgrades.** This is a result of a number of market failures, including split incentives, information asymmetry and externalities – which perversely affect the behaviours of both rental providers and renters.
- **There are adverse financial impacts associated with inefficient properties and appliances.** Heating and cooling account for nearly half of the running costs in an average Victorian home, while hot water systems account for an additional 17 per cent of total running costs.⁴ Inefficient appliances consume more energy than efficient appliances and can lead to higher energy bills for renters. Low-income renters and renters facing financial stress are least able to bear increased heating costs and therefore are the most likely to experience the impacts of poor thermal comfort, including health impacts.
- **Homes with inefficient thermal control have adverse health and societal impacts.** Renters who cannot afford to adequately heat and cool their homes can face adverse health, mental health, productivity, and social consequences from uncomfortable indoor temperatures. Cold indoor temperatures have been associated with a number of health

¹ A rooming house, as defined under the Residential Tenancies Act 1997, is a property where four or more people can occupy the rented rooms, some of which may be shared.

² Daniel et al. (2020), *Warm cool and energy-affordable housing policy solutions for low-income renters*.

³ Australian Bureau of Statistics (2012), *Household Energy Consumption Survey*.

⁴ Sustainability Victoria (2024), *Save energy in the home* <<https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home>>.

issues, including respiratory and cardiovascular problems.⁵ Insufficient cooling in summers can lead to heatstroke and dehydration, reduce the efficacy of some medications,⁶ and can exacerbate existing mental health conditions.

- **Homes with inefficient thermal control and appliances have adverse impacts on the environment.** Inefficient heating, cooling and hot water system appliances lead to the consumption of large amounts of energy, which produce greenhouse gas emissions and contribute to climate change.
- **Loose hanging blind cords can pose serious safety issues.** Entanglement in loose blind cords can result in injuries or fatalities. Between 2010 and 2020, there were 26 presentations to Victorian hospital emergency departments due to injuries from blind cords, and two fatalities during the same period.⁷ A recent Coroner’s report recommended mandating blind cord safety anchors in all residential properties.
- **Rooming houses with inefficient thermal performance and appliances can pose financial burdens and health risks to residents.** Unlike rental properties, there are currently no minimum standards for rooming houses related to thermal performance or appliance efficiency. As noted above, inefficient homes and appliances can pose a number of financial, environmental, societal and health risks to residents. Rooming house residents are more likely to be vulnerable, low-income earners, experience complex health conditions and have fewer options for alternate accommodation.

Objectives of the Regulations

The Government’s objectives in making the Residential Tenancies Regulations were to ensure that renters are provided with safe and habitable living arrangements, enhance the functioning of the rental market and more generally, ensure that the regulated elements of residential tenancies reflect current community expectations. Similarly, the Government’s objectives in remaking the Rooming Houses Regulations were to reduce the loss of life, injury and trauma caused by inadequate safety and security provisions in rooming houses and to reduce the detrimental effects on comfort and quality of life of rooming house residents caused by substandard living conditions.

Introducing minimum standards for ceiling insulation, draught sealing, hot water systems and shower heads, heating and cooling and blind cords for rental homes, along with heating standards in rooming houses will also seek to support the above Government objectives for the Residential Tenancies Regulations and the Rooming House Regulations. The proposed minimum standards also align with broader Victorian Government policies such as the Gas Substitution Roadmap and the transition towards net zero emissions by 2045.

Specifically, the objectives of the proposed additional minimum standards are to:

- improve renter health, wellbeing, comfort and safety
- reduce renter energy bills
- reduce greenhouse gas emissions, supporting the energy transition and decarbonisation of the rental sector.

Modelling methodology

Options to introduce minimum standards related to the following have been assessed in this RIS using Cost-Benefit Analysis (CBA), which provides a robust, structured and transparent approach to analysing the different impacts, using modelled illustrations of the economic costs and benefits:

- ceiling insulation
- draught sealing
- hot water systems and shower heads
- heating and cooling in rental properties
- heating in rooming houses.

The overarching analysis methodology is outlined below, with further detail provided throughout Chapters 4 – 9, as the intricacies of the modelling methodology for each standard varies.

In conducting the CBA for each standard, the initial step involved identifying the existing and projected stock of rental properties and rooming houses for the analysis period. The current stock of rental properties was sourced from the 2021 ABS Census and adjusted based on recent growth data. Historical growth averages were applied to forecast rental stock

⁵ World Health Organization (2018), *Housing and Health Guidelines, Chapter 4 - Indoor temperatures and insulation*.

⁶ The University of Sydney and Mallee Family Care (2019), *Extreme heat driven by the climate emergency: impacts on the health and wellbeing of public housing tenants in Mildura, Victoria*.

⁷ Coroners’ Court of Victoria (2022), *Finding into Death Without Inquest: Master J (Coroner Gebert, 27 June 2022)*.

expansion over the analysis period. Similarly, the current stock of rooming houses was derived from the Rooming House Register, with future projections based on the historic annual growth rate.

Amendments to introduce the proposed additional minimum standards will occur in 2024,⁸ meaning that the Residential Tenancies Regulations will continue to apply for approximately another 7 years from the time of amendment. Consequently, the costs of the proposed additional minimum standards relating to rental properties have been examined over a 7-year period. As the Rooming House Regulations will continue to apply for approximately another 9 years from the time of amendment, the costs of the proposed minimum standard relating to heating in rooming houses has been examined over a 9-year period. These costs reflect the once-off cost to rental providers or rooming house operators, within the regulatory period, of complying with the proposed minimum standards.

Given the ongoing benefits associated with the expected reduction in energy usage as a result of the proposed minimum standards the impacts of the proposed minimum standards are also presented over the lifetime of the appliances/measures.

Given the effective life of measures and appliances required to be installed under the proposed minimum standards will likely extend longer than the remaining regulatory periods, the benefits attributable to the proposed minimum standards have been analysed over a longer timeframe, commensurate with the relevant lifespan of the appliance/measure installed under each minimum standard. This provides a more accurate representation of the entire flow of benefits from all appliances or measures installed during the remaining life of both Regulations.

The number of rental properties and rooming houses which will need to meet the standards in each of the analysis periods was determined based upon the trigger points for compliance and the prevalence of energy efficiency measures and appliances in the current housing stock. Across the proposed standards, trigger points considered include:

- a specified point in time
- the point at which a new lease commences
- at the end of life of an existing appliance.

Where properties will need to comply with a minimum standard upon a new lease coming into effect, annual turnover in rental leases was determined using data and bond requests from the Department of Families, Fairness and Housing's quarterly rental reports. Where properties will need to install appliances to comply with the proposed minimum standards at the end of the existing appliance's life, assumptions were made regarding the life expectancy of the relevant appliances.

Following the determination of the impacted rental properties and rooming houses in each year of the analysis periods, the impacts of the proposed minimum standards were calculated using the expected and quantifiable costs and benefits that may result from the amendments. The overarching expected costs estimated for each proposed standard include costs associated with the:

- purchase and installation of required measures or appliances
- decommissioning of existing gas appliances, including capping of gas lines and switchboard upgrades (where relevant)
- administrative time spent by rental providers to understand obligations, obtain quotes and/or undertake logistical arrangements for the purchase and installation of the required appliances or measures.

The overarching expected benefits estimated in the analysis for each proposed standard include a reduction in:

- energy expenditure
- greenhouse gas emissions
- healthcare costs associated with air pollution from electricity generation and use of gas appliances
- healthcare costs to society from increased thermal comfort.

The net present value (NPV)⁹ and benefit cost ratio (BCR) of the proposed minimum standards were then calculated from the present value of total costs and benefits. NPV is calculated as the present value of all benefits minus the present value of all costs, expressed in dollars. BCR is calculated by dividing the present value of all benefits by the present value of all costs, expressed as a ratio. A BCR of greater than 1 indicates the benefits of an intervention outweigh the costs incurred as a result of the intervention. The NPV has been used as the leading decision making tool to guide DEECA and DGS selection of preferred options under each of the proposed minimum standards, where practical. In some instances, selection of the preferred option has also taken into consideration potential implementation risks (such as potential supply chain constraints

⁸ While the Residential Tenancies Regulations and Rooming House Regulations are intended to be amended in 2024, any required compliance with the new minimum standards will not need to occur until 2025.

⁹ A discount rate allows future costs and benefits to be compared in present value terms by adjusting for the time value of money. A central discount rate of 4 per cent per annum is used for the analysis in this RIS.

under the heating and cooling standard for rental properties and the heating standard for rooming houses) or alignment with other relevant best practice (such as ceiling insulation installed in new builds to meet 7 Star energy efficiency requirements). Where the selection of the preferred option has deviated from the highest NPV, the preferred option still provides a net benefit to society which is relatively on par with the NPV under other options.

While the BCR was also considered as a secondary metric, prioritisation was given to options which provide greater societal benefits, even if those options come at a higher cost. This approach provides greater alignment with the Victorian Government's objectives, particularly lowering energy bills for renters and reducing greenhouse gas emissions.

In this RIS, the analysis assumes a compliance rate of 100 per cent. Although actual compliance rates are expected to be less, data on adherence to minimum rental standards is limited. Using a 100 per cent compliance assumption yields a conservative, high-end estimate of the potential costs associated with the proposed minimum standards. The real costs and benefits of the proposed minimum standards are anticipated to be less than those estimated in this RIS but will scale linearly with the compliance rate.

Given the difficulty in providing an exact quantification of the benefit that the mandated installation of blind cord safety anchors may provide, a breakeven analysis has been used to assess the impacts of this proposed minimum standard for the Residential Tenancies Regulations. A breakeven analysis is used to determine the point at which the anticipated benefits resulting from a proposed intervention will equal the associated costs of the intervention. This analysis allows decision makers to understand the minimum level of effectiveness required for the intervention to be considered worthwhile or beneficial.

Base Case

The CBA calculates the incremental costs and benefits to society of an intervention relative to a comparative base case in which only current regulations continue to apply. The overarching base case used in this RIS is a scenario in which the minimum standards already prescribed in the Residential Tenancies Regulations and the Rooming House Regulation continue to apply but no new minimum standards are introduced, and there continue to be limited incentives for rental providers and rooming house operators to voluntarily provide energy efficiency and safety upgrades. A key overarching and simplifying assumption made in the base case is that renters and rooming house residents in properties where heating and cooling appliances are not installed will purchase and utilise portable heaters and coolers. It is also assumed that under the base case the proportion of appliances, including the share of electric and gas appliances will remain constant as all appliances will be replaced on a like for like basis.

Options and impact analysis

The RIS considered several options to achieve the regulatory objectives, but only the prescription of additional minimum standards was considered feasible. A number of options for the design of each standard were considered and analysed in this RIS. The design of the standards has considered their application to Class 2 rental homes. Exemptions have been developed to address limitations for complying with standards specific to Class 2 buildings, such as where owners corporation rules prohibit compliance, or where hot water systems service multiple dwellings. Class 2 properties are, however, required to comply with the minimum standards wherever possible.

Ceiling insulation

Three options were analysed relating to mandating a minimum level of ceiling insulation that must be installed, in 'R-value' terms. The R-value of bulk insulation products, such as batts, measures the insulation's thermal resistance, with a higher R value indicating greater resistance to heat transfer, thereby providing a greater level of insulation. The proposed trigger for compliance for ceiling insulation is at the commencement of a new lease agreement. Options considered for minimum R-values to be prescribed include:

- Option 1: R3.5
- Option 2: R4.0
- Option 3: R5.0

The analysis in this RIS has also considered impacts for different cohorts of properties which may be subject to the minimum standards for ceiling insulation, specifically whether only properties with no insulation should be required to meet the minimum standard or whether properties with low insulation, of R1.5 or less, should also be required to upgrade to meet the standard. This distinction constituted sub-options A and B respectively.

Analysis of options

Impact analysis showed that prescribing ceiling insulation yields net benefits over the 26-year analysis period¹⁰ in uninsulated homes. Across all options, the NPV and BCR are higher for uninsulated homes (sub-options A). Application of the standard to homes with low insulation (sub-options B) return BCRs close to, or below 1, indicating these options do not perform as well as sub-options A and, in some instances, the costs outweigh benefits.

Option 3A is DEECA and DGS' preferred option for the minimum standard relating to ceiling insulation. This option yields an estimated NPV of \$249 million and a BCR of 3.45. Option 3A is estimated to provide the highest total benefits across rental properties currently with no insulation (sub-options A), providing alignment with Victorian Government objectives of reduced energy bills and greenhouse gas emissions. Option 3A will also likely bring rented homes in line with the 7 Star energy efficiency standard required for new homes built in Victoria, with CSIRO's Australian Housing Data portal indicating that R5.0 insulation is the most common insulation type in 7 Star homes in Victoria.

Sub-options A consistently outperforms the sub-option B alternatives in terms of BCR, which also test application of the standard to properties with no (R0), plus properties with low (R1.5) levels of insulation. This can be attributed to the diminishing benefits of incremental increases of insulation for avoided energy costs and other benefits. These benefits are largely offset by higher costs of materials to upgrade additional properties with low levels of insulation at present. CBA results for ceiling insulation minimum standards are summarised below in Table i and Table ii.

Table i: CBA results for minimum standards relating to ceiling insulation in rental properties with no existing insulation (26-year PV, \$millions)

	Option 1A – R3.5	Option 2A – R4.0	Option 3A – R5.0
Total costs	\$84.55	\$93.12	\$101.65
Total benefits	\$338.88	\$344.83	\$350.26
NPV (26-years)	\$254.33	\$251.71	\$248.61
BCR (26-years)	4.01	3.70	3.45

Table ii: CBA results for minimum standards relating to ceiling insulation in rental properties with no and low levels of insulation (26-year PV, \$millions)

	Option 1B – R3.5	Option 2B – R4.0	Option 3B – R5.0
Total costs	\$580.79	\$595.32	\$679.61
Total benefits	\$579.46	\$607.92	\$650.48
NPV (26-years)	-\$1.33	\$12.60	-\$29.13
BCR (26-years)	1.00	1.02	0.96

Draught sealing

Four options were analysed relating to minimum level of draught sealing measures that must be undertaken, with options 1-3 representing a cumulative list of various draught sealing measures and Option 4 requiring a comprehensive assessment of the property's needs by a home energy professional. The proposed trigger for compliance for draught sealing measures is at the commencement of a new lease agreement. The details of the options are outlined in Table iii.

¹⁰ Ceiling insulation batts can last anywhere between 25-70 years. A 26-year analysis period is used for the minimum standard relating to ceiling insulation to account for the lower bound of the insulation's lifespan range and the availability of data to 2050 for the analysis.

Table iii: Options analysed for minimum standard relating to draught sealing

Option	Description
Option 1	Basic – requiring weather sealing around the entire perimeter of all external doors.
Option 2	Medium – as above, plus weather seals on wall vents, and unreasonable general gaps and cracks sealed for door and window frames, construction joints and wall linings, skirting and floorboards and wall penetrations.
Option 3	High – as above, plus windows with gaps and other general caulking (such as ceiling roses, skirting and floorboards, and unused heating and cooling vents).
Option 4	Comprehensive – requiring rectification of areas of leakage or draughts identified through a comprehensive assessment by a home energy professional, such as a blower door test.

Analysis of options

Impact analysis showed that prescribing draught sealing measures yields net benefits over the 13-year analysis period,¹¹ under options 1-3. The CBA indicates that the option with the highest NPV over the 13-years is Option 2 with an NPV of \$105 million and a BCR of 1.30. This result is driven by the large increase in energy savings that come from including draught sealing for wall vents, as well as general gaps and cracks, on top of including a weather seal on all external doors. These draught sealing measures are cost-effective and provide substantial benefits when compared to the more comprehensive options 3 and 4. Therefore, Option 2 is DEECA and DGS' preferred option for draught sealing.

The full CBA results are summarised in Table iv.

Table iv: CBA results for minimum standards relating to draught sealing measures (13-year PV, \$millions)

	Option 1 – Basic	Option 2 – Medium	Option 3 – High	Options 4 – Comprehensive
Total costs	\$103.66	\$353.22	\$411.45	\$1,080.68
Total benefits	\$121.31	\$458.14	\$505.56	\$1,027.48
NPV (13-years)	\$17.65	\$104.92	\$94.11	-\$53.20
BCR (13-years)	1.17	1.30	1.23	0.95

Hot water systems

Four options were analysed relating to minimum standards for hot water systems. Each option analysed progressively prescribes higher levels of energy efficiency as the minimum standard, with the fourth option only allowing electrical hot water systems as compliant. An exemption has been included in the design of this standard to allow LPG hot water appliances to continue to be replaced with another LPG system at the end of the existing appliance's life. The proposed trigger for replacement under each option was at the end of the current appliance's operating life. The options analysed are outlined in Table v.

¹¹ It is assumed in the analysis that draught sealing measures have an effective lifespan of 7 years. Therefore, a 13-year analysis period is used for the minimum standard relating to draught sealing to capture the full benefits from any measures installed in year 7.

Table v: Options analysed for minimum standard relating to hot water systems

Option	Description
Option 1	Highest running cost systems (eliminate lowest 25 per cent of inefficient systems).
Option 2	Average running cost systems (eliminate lowest 50 per cent of inefficient systems).
Option 3	Low running cost systems (eliminate lowest 75 per cent of inefficient systems).
Option 4	Low running cost systems, as in Option 3. Only electric systems are compliant (i.e., no gas systems).

Analysis of options

Impact analysis showed that prescribing minimum standards for hot water systems yields net benefits over the 20-year period.¹² Option 4 is the preferred option for prescribing minimum standards for hot water systems on the basis that it yields the highest estimated NPV of \$570 million and will therefore produce the highest net return for Victorians over a 20 year period. While all other options are estimated to return higher BCRs, the NPV has been used as the key decision making tool to guide selection of preferred options in this RIS. Additionally, the higher NPV under Option 4 maximises alignment with Victorian Government objectives and policies, including the reduction of greenhouse gas emissions and supporting the energy transition as outlined in the Gas Substitution Roadmap. Under the preferred option, systems installed would be required to meet the minimum energy efficiency requirements specified in the Plumbing Code of Australia, in line with National Construction Code (NCC) requirements for new homes.

The CBA results are presented in Table vi.

Table vi: CBA results for minimum standards relating to hot water systems (PV, 20-years, \$ millions)

	Option 1 – Highest running cost systems	Option 2 – Average running cost systems	Option 3 – Low running cost systems	Option 4 – Electric only, low running cost systems
Total costs	\$5.25	\$44.52	\$71.46	\$157.45
Total benefits (20-years)	\$27.79	\$364.54	\$488.51	\$727.40
NPV (20-years)	\$22.54	\$320.02	\$417.05	\$569.94
BCR (20-years)	5.29	8.19	6.84	4.62

Shower heads

Only one option was analysed relating to increasing the current minimum standard for the efficiency rating of shower heads. Under this option, the current minimum standard of a 3 Star WELS rated shower head would be increased to a 4 Star WELS rating.

Analysis

As in the above hot water system analysis, the proposed minimum standard for shower heads was modelled over a longer time frame to capture the full stream of benefits accruing from the upgrade of shower heads. The CBA indicates that the

¹² It is assumed in the analysis that gas hot water systems have an effective lifespan of 14 years. Therefore, a 20-year analysis period is used for the minimum standard relating to hot water systems to capture the full benefits from any appliances installed in year 7.

proposed increase in the standard would result in an NPV of \$223 million and return a BCR of 2.22 over the 21-year analysis period.¹³ The results are presented in Table vii.

Table vii: CBA results for minimum standard relating to shower heads (PV, 21-years, \$ millions)

	Option 1 – 4-star WELS rating
Total costs	\$182.87
Total benefits (21-years)	\$406.14
NPV (21-years)	\$223.27
BCR (21-years)	2.22

Heating and cooling in rental properties

Four options were analysed relating to minimum standards for fixed energy efficient heaters and coolers required to be installed in the main living area of a rental property. These options relate to increasing the energy efficiency requirement under the current minimum standard for heaters in rental properties, as well as the introduction of a corresponding minimum standard relating to cooling appliances. Under all options, wherever relevant, reverse cycle appliances can be used for both heating and cooling purposes. Similar to the current requirement for heating appliances, all options also included a provision that in the case an energy efficient cooler cannot be installed, an inefficient cooler must instead be installed.

The options consisted of progressively greater levels of minimum efficiency, starting with Option 1 maintaining the current minimum standard for heating and introducing a minimum standard for cooling appliances. Under options 2-4 only electric heating systems are considered compliant. The options are outlined in Table viii below.

¹³ It is assumed in the analysis that shower heads have an effective lifespan of 15 years. Therefore, a 21-year analysis period is used for the minimum standard relating to shower heads to capture the full benefits from any appliances installed in year 7.

Table viii: Options analysed for minimum standard relating to heating and cooling in rental properties

Option	Description
Option 1	Maintain current heating standard and introduce comparable cooling standard. Under this option, there must be a fixed minimum 2 Star rating gas or electric room heater in the main living room (current heating standard). There must also be a fixed minimum 2 Star rating electric room cooler in the main living room, or a central cooler with a total cooling season performance factor (TCSPF) ¹⁴ of 3.5 minimum (equivalent to a 2 Star room cooler) with an outlet in the main living room.
Option 2	Minimum 2 Star, electric-only heating and cooling. Under this option, there must be a fixed minimum 2 Star rating electric room heater in the main living room or a central heater with a heating seasonal performance factor (HSPF) of 3.5 minimum (equivalent to a 2 Star room heater) with an outlet in the main living room. There must also be a fixed minimum 2 Star rating electric room cooler in the main living room or a central cooler with a TCSPF of 3.5 minimum (equivalent to a 2 Star room cooler) with an outlet in the main living room. Only electric appliances are considered compliant under this option.
Option 3	Minimum 3 Star, electric-only heating and cooling. Under this option, there must be a fixed minimum 3 Star rating electric room heater in the main living room or a central heater with a HSPF of 4.5 minimum (equivalent to a 3 Star room heater) with an outlet in the main living room. There must also be a fixed minimum 3 Star rating electric room cooler in the main living room or a central cooler with TCSPF of 4.5 minimum (equivalent to a 3 Star room cooler) with an outlet in the main living room. Under this option, reverse-cycle air conditioning (RCAC) systems are the only systems that will meet efficiency requirements.
Option 4	Minimum 2 Star, electric-only heating and minimum 3 Star, electric-only cooling. Under this option, there must be a fixed minimum 2 Star rating electric room heater in the main living room, or a central heater with a HSPF of 3.2 minimum (equivalent to a minimum 1.5 Star room heater) with an outlet in the main living room. There must also be a fixed minimum 3 Star electric room cooler in the main living room, or a central cooler with a TCSPF of 3.8 minimum (equivalent to a 2 Star room cooler) with an outlet in the main living room. A lower level of efficiency will be required for ducted systems to account for differences in efficiency levels and market availability between ducted and non-ducted systems. Under this option, RCACs are the only systems that will currently meet efficiency requirements.

Analysis of options

DEECA and DGS's preferred option for the minimum standard relating to heating and cooling in rental properties is Option 4. Option 4 yields an estimated NPV of \$1,404 million over the 20-year analysis period and a BCR of 2.97. While Option 4 yields a relatively lower NPV than Option 3, Option 4 is selected as the preferred option as it also provides for significant benefits which align with Victorian Government objectives of lowering energy bills for renters and reducing greenhouse gas emissions, while also taking into consideration implementation risks associated with potential supply chain constraints.

The CBA results are presented in Table ix.

¹⁴ Total cooling seasonal performance factor is the ratio of the total annual amount of heat that the equipment can remove from the conditioned space to the total annual amount of energy consumed by the equipment. It measures the efficiency of the equipment.

Table ix: CBA results for minimum standards relating to heating and cooling in rental properties (20-year PV, \$ millions)

	Option 1 – 2 Star heating and cooling standard	Option 2 – 2 Star heating and cooling standard, electric only	Option 3 – 3 Star heating and cooling standard, electric only	Option 4 – 2 Star heating and 3 Star cooling standard, electric only
Total costs	\$565.17	\$672.90	\$824.54	\$711.26
Total benefits	\$653.68	\$2,052.64	\$2,274.93	\$2,114.75
NPV (20-years)	\$88.51	\$1,379.74	\$1,450.39	\$1,403.50
BCR (20 years)	1.16	3.05	2.76	2.97

Heating in rooming houses

Two options were analysed relating to minimum standards for heating in rooming houses:

- **Option 1** – Minimum 2 Star, electric-only heating. Under this option, there must be a fixed minimum 2 Star rating electric room heater installed in each bedroom of a rooming house, or a central heater with a HSPF of 3.2 minimum (equivalent to a 1.5 Star room heater) with an outlet in each bedroom.
- **Option 2** – Minimum 3 Star, electric-only heating. Under this option, there must be a fixed minimum 3 Star rating electric room heater installed in each bedroom of a rooming house, or a central heater with a HSPF of 3.2 minimum (equivalent to a 1.5 Star room heater) with an outlet in each bedroom.

RCACs are the only systems that will meet efficiency requirements under both options. A 1.5 Star equivalent standard for central heating systems is proposed under both options, due to market feasibility and supply chain considerations.

Analysis of options

The impact analysis showed that prescribing minimum standards for heating in rooming houses yields net benefits over the 20-year period.¹⁵ DEECA and DGS’s preferred option for the minimum standard relating to heating in rooming houses is Option 1. Option 1 yields an estimated NPV of \$25 million over the 20-year analysis period and a BCR of 3.44. While Option 1 yields a marginally lower NPV than Option 2, Option 1 is selected as the preferred option as it takes into consideration implementation risks associated with potential supply chain constraints.

The CBA results are presented in Table x below.

Table x: CBA results for minimum standards relating to heating in rooming houses (20-year PV, \$millions)

	Option 1	Option 2
Total costs	\$10.37	\$12.04
Total benefits (20-years)	\$35.73	\$38.16
NPV (20-years)	\$25.35	\$26.11
BCR (20 years)	3.44	3.17

¹⁵ It is assumed in the analysis that RCAC systems have an effective lifespan of 12 years. Therefore, a 20-year analysis period is used for the minimum standard relating to heaters in rooming houses to capture the full benefits from any appliances installed in year 9.

Blind cord safety anchors

Finally, the analysis considered one option for blind cord safety anchors in rental properties. Under this option, all internal window coverings (curtains and blinds) in a rental property will require a blind cord safety anchor to secure the cords. Corded internal window coverings that were installed prior to 1 January 2015 must have a blind cord safety anchor installed against a wall or structure at least 1,600 mm above floor level. This requirement will align minimum standards for blind cord safety anchors with the same standard included in the Rooming House Regulations.

Analysis

In contrast to the analysis of the proposed minimum energy efficiency standards in this RIS, a breakeven analysis was employed for the analysis of mandatory blind cord safety anchors. Given the requirement for blind cord safety anchors is being introduced to enhance safety in rental properties and to reduce the risk of injury and, in extreme circumstances, loss of life, the breakeven analysis considers the benefits of avoiding this worst-case scenario, by comparing the costs associated with the installation of blind cord safety anchors to the value of a statistical life (VSL).

It is important to note, avoided loss of life is only the most extreme benefit that could be achieved. Additionally, there are several other benefits that this analysis did not account for, which would further enhance the likelihood of the minimum standard leading to a favourable result. For example, the Victorian Coroners Court report showed that in the same decade in which the two lives were lost, there was evidence of a further 26 hospital presentations, 50 per cent of which required follow up treatment, because of self-inflicted injury from blind cords. It can therefore be expected that the minimum safety standard would also reduce the number of injuries. The breakeven analysis also does not consider the unquantifiable avoided grief and trauma of family members if loss of life is avoided.

When considering these factors alongside the relatively small per rental property cost of approximately \$45 associated with installing blind cord safety anchors, it is highly plausible that requiring rental properties to have blind cord safety anchors installed would have a net positive outcome on the wellbeing of Victorians.

Preferred options and combined impacts

In this analysis, the total additional costs associated with the proposed minimum standards are estimated to be \$1,554 million (PV), or approximately \$222 million per year. These costs are outweighed by the benefits accrued from adopting the preferred options for each standard, amounting to a total of \$4,092 million (PV).

The combined per-property marginal cost on rental providers, relative to the base case, from the proposed minimum standards is estimated to be \$5,519 in 2025. It is important to note that this is representative of an upper bound of the marginal costs a rental provider may face in complying with the proposed minimum standards in 2025. It is unlikely a rental provider would incur all of these costs in the one year.

The per-property cost on rooming house operators is estimated to be \$5,013 in 2025.

A summary of the total costs and benefits (PV) of the preferred standards are outlined in Table xi below.

Table xi: Summary of costs and benefits of the preferred option (PV)

Standard	Preferred option	Costs (\$m)	Benefits (\$m)
Ceiling insulation	Mandating R5 insulation in properties with no insulation	\$101.65	\$350.26
Draught sealing	Seal on all external doors, wall vents and sealing of general gaps and cracks	\$353.22	\$458.14
Hot water systems	Electric low running cost systems (no gas systems)	\$157.45	\$727.40
Shower heads	Minimum 4 Star WELS rating	\$182.87	\$406.14
Heating and cooling (rental properties)	2 Star heating standard and a 3 Star cooling standard, with a 1.5 Star and 2 Star heating and cooling standard respectively for ducted systems	\$711.26	\$2,114.75
Heating (rooming houses)	2 Star reverse cycle air conditioner or a central heating system outlet in each bedroom	\$10.37	\$35.73
Blind cords safety anchors	All internal window coverings (curtains and blinds) in a rental property will require a blind cord safety anchor to secure the cords.	\$37.6	N/A
Total		\$1,554.42	\$4,092.42

Potential impact on the rental market and rooming houses

Evidence from similar reforms suggests rental providers may raise concerns around the impost of minimum rental standards, but that the actual impact on the rental market is likely minimal.¹⁶ While some rent increases might occur, these will be offset to some extent by energy savings for renters. Recent quantitative research did not identify a strong observable link between tenancy law reforms and higher exits from the rental property market¹⁷ or increases in rents.¹⁸

It is important to acknowledge that despite this evidence, there is likely a limit to the costs associated with minimum rental standards that rental providers will absorb, with recent cost of living pressures and interest rate increases likely putting downward pressure on this limit also. Similarly, there is a possibility that rooming house operators may pass on some costs to residents in the form of increased rent. The extent to which this may occur is difficult to predict, given rooming house residents are often vulnerable, low-income Victorians who likely have limited ability to pay increased rent.¹⁹

It is a possibility that supply of rental properties in the short-term could contract as rental providers understand and comply with the additional minimum standards. This could occur due to delays in acquiring materials or appliances and/or the availability of appropriate contractors for installation. The extent to which this may impact on rental supply will be minimised by the requirements to comply either at new lease or at the end of life of an existing appliance, which will limit the number of rental properties required to immediately comply with the proposed minimum standards.

¹⁶ Australian Housing and Urban Research Institute (2022), *Regulation of residential tenancies and impacts on investment* <<https://www.ahuri.edu.au/research/finalreports/391>>.

¹⁷ Ibid.

¹⁸ REA Group (2022), *Victorian rental minimum standards: Market impact one year on and what's to come* <<https://www.realestate.com.au/news/victorian-rental-minimum-standards-market-impact-one-year-on-and-whats-to-come>>.

¹⁹ Peninsula Community Legal Centre (2020), *Open the Door: The Resident's View of Life in a Rooming House*.

Competition and small business impacts

The proposed minimum standards are not anticipated to have any adverse impacts on small business or competition. The costs of meeting the proposed minimum standards will be consistent across rental providers and rooming house operators, impacting both existing properties and any new entrants. Supply of products and trades will not be restricted, as rental providers and rooming house operators will be free to choose relevant suppliers and products to install measures or appliances to meet the minimum standards. There may be some minimal impact on ceiling insulation installers, as they will be required to ensure they are suitably qualified. There is likely to be reduced demand for gas appliances and subsequently some impacts on gas appliance manufacturers. The Victorian Government will continue to consult with local industry including gas appliance manufacturers, the building and construction sector, local government, trade unions and consumer organisations to manage business, workforce and consumer impacts and support industry to take advantage of opportunities in the renewable energy economy. There are no requirements in the proposed minimum standards that would be expected to impose a larger burden on a small business (rental provider or rooming house operator) than a large one.

Implementation and evaluation

Compliance with the minimum standards will be required from 30 October 2025, with the trigger for compliance varying by minimum standard (either at new lease, end of life of existing appliance, or a specified date).

In order to ensure safety and quality in the implementation of the updated minimum standards, particularly for insulation and draught sealing, a number of measures have been considered. These include the requirement for insulation to be installed by a suitably qualified professional (such as installers certified under the Energy Efficiency Council (EEC) certification scheme) and clear exemptions from draught sealing standards for properties where gas appliances may increase the risk of carbon monoxide build-up.

The updated minimum standards will be communicated to stakeholders, including rental providers and rooming house operators, via various communication channels following the making of the Regulations in the second half of 2024. Consumer Affairs Victoria (CAV) will be the agency responsible for enforcing and administering the proposed minimum standards. CAV will also be responsible for ensuring compliance with the new minimum standards by rental providers, registered rooming houses and licensed rooming house operators, primarily through its existing monitoring and enforcement activity undertaken as part of its day-to-day operations.

The effectiveness of the proposed minimum standards will be monitored by DGS on an ongoing basis, including through analysis of data on contacts from renters and rental providers and data on CAV regulatory activity. The proposed regulations assessed in the RIS are high impact, according to the Victorian Guide to Regulation, and so trigger the requirement for a mid-term evaluation. Appropriate timing for this evaluation will be considered following implementation of the regulations

1 Background

This chapter outlines the purpose of the proposed regulations and the requirement for a Regulatory Impact Statement.

1.1 Introduction and purpose of this Regulatory Impact Statement

Rental properties and rooming houses in Victoria play an important role in accommodating the housing needs of many Victorians, particularly in the context of declining rates of home ownership. With increasing property prices, an increasing number of individuals and families are needing to rely on the rental market for a viable housing solution. Renting is a long-term housing solution for many Victorians. Australia wide, one third of renters are estimated to be long-term renters who have been renting for more than 10 years.^{20,21} Furthermore, rooming houses often provide last resort accommodation to vulnerable cohorts of the Victorian community who are particularly sensitive to increasing costs of living, including paying rent. Therefore, it is crucial that rental properties and rooming houses provide safe and affordable housing options for Victorians. Minimum standards for rental properties and rooming houses play a role in ensuring the provision of safe, habitable and dignified living conditions for all Victorians, enhancing the quality of housing provided.

In Victoria, the *Residential Tenancies Act 1997* (RTA) defines the rights and duties of residential rental providers, renters, rooming house operators, rooming house residents, caravan park owners, caravan owners, caravan park residents, and Part 4A site owners and tenants.²² Section 511(1)(ac) of the RTA allows regulations to be made prescribing minimum rental standards including the cleanliness, privacy, security and amenity of rented premises. This section also stipulates prescribing or requiring compliance with any other standards prescribed in any legislation relating to, or applicable to, the condition of residential premises including energy and water efficiency standards. The minimum rental standards are prescribed in the Residential Tenancies Regulations 2021 (the Residential Tenancies Regulations).

Section 142C also allows regulations to be made for the purpose of prescribing privacy, safety, security and amenity standards in relation to rooming houses. The minimum rooming house standards are prescribed in the Residential Tenancies (Rooming House Standards) Regulations 2023 (Rooming House Regulations).

The minimum standards under the Residential Tenancies Regulations include the requirement for rental properties to have a fixed heater in the main living area of the premises.²³ During the development of the rental minimum standards, the role of ceiling insulation and draught sealing were identified as critical and complementary measures to improve the effectiveness and efficiency of heating in rental homes. An energy efficiency standard for hot water systems was also identified as a critical measure that would ensure energy affordability for renters. Although ceiling insulation, draught sealing and efficient hot water systems aligned with the underlying objectives of minimum rental and energy standards within the Residential Tenancies Regulations, these were not initially prescribed as further analysis and consideration of the safety and effectiveness of these measures was deemed necessary.

Given Victoria's commitment to achieve net zero emissions by 2045, strategies to reduce greenhouse gas emissions are critical. Households are responsible for most of the greenhouse gas emissions in Victoria.²⁴ Residential sector emissions arise from activities such as electricity and gas consumption for heating and cooking, transport activities, refrigeration and air

²⁰ Stone et. al. (2013), *Long-term private rental in a changing Australian private rental sector, Final Report No. 209, AHURI*.

²¹ Rowley & James (2018), *The private rental sector in Australia: public perceptions of quality and affordability, Bankwest Curtin Economics Centre*.

²² Part 4A site agreements apply for individuals who own a 'moveable dwelling' and rent a site for the dwelling in the park or village they live in (such as a caravan park or lifestyle village). A moveable dwelling is a building that has been designed and manufactured to be moved by another vehicle, such as a prefab, portable, relocatable or tiny home. Part 4A agreements do not apply to moveable homes that can be registered with VicRoads, such as caravans or camper trailers.

²³ For rental agreements entered into from 29 March 2023, the heater must be an energy efficient heater, which can be either a non-ducted air conditioner or heat-pump, a gas space heater with a 2 star or above energy rating, a ducted heating or hydronic heating system with an outlet in the main living area, or a domestic solid fuel burning appliance (such as a fireplace or wood burning stove). Rolling over to a periodic agreement is considered starting a new agreement, even if occupancy began prior to 29 March 2023. The minimum standards in the Residential Tenancies Regulations do not apply to rental agreements that rolled over to a periodic agreement prior to 29 March 2021, when the Regulations were introduced.

²⁴ Department of Energy, Environment and Climate Change (2023), *Greenhouse gas emissions* <<https://www.climatechange.vic.gov.au/greenhouse-gas-emissions>>.

conditioning.²⁵ Therefore, enhancing energy efficiency in homes, including rental homes, is crucial to meeting Victoria’s commitment. In addition to reducing greenhouse gases, improved energy efficiency in rental properties also results in reduced energy costs for renters.

The purpose of this Regulatory Impact Statement (RIS) is to assess the potential impacts on the Victorian community of proposed amendments to the Residential Tenancies Regulations to include minimum energy efficiency standards relating to:

- ceiling insulation
- draught sealing
- hot water systems and shower heads
- heating and cooling appliances.

This RIS will also assess the potential impacts of proposed amendments to the Rooming House Regulations to include minimum standards for energy efficient heating.

In addition to the proposed energy efficiency standards, this RIS also assesses the potential impacts of the proposed inclusion of a minimum safety standard relating to blind cord safety anchors in the Residential Tenancies Regulations. This minimum safety standard would mirror an equivalent standard introduced into the Rooming House Regulations in 2023.

The Minister for Consumer Affairs, supported by the Department of Government Services (DGS), is responsible for administering the RTA and supporting regulatory frameworks. As majority of the proposed amendments to the Residential Tenancies Regulations and the Rooming House Regulations are focused on energy efficiency measures, DGS has worked in close collaboration with the Department of Energy, Environment and Climate Action (DEECA) to design and carefully consider the impacts of the proposed Regulations.

1.2 Legislative and regulatory frameworks governing minimum standards in rental accommodation in Victoria

1.2.1 Residential Tenancies Act 1997

The *Residential Tenancies Act 1997* is the key piece of legislation governing residential tenancies in Victoria. It is the main source of consumer protection for Victorians living in rental accommodation. The objectives of the Act are to define and provide for:

- rights and duties of residential rental providers and renters of rented premises, rooming house operators and residents of rooming houses, and caravan park owners, caravan owners and residents of caravan parks
- inexpensive and quick resolution of disputes under the Act
- establishment of the Rooming House Register
- establishment of a centralised system for the administration of bonds and the Residential Tenancies Bond Authority
- regulation of caravan parks and movable dwellings
- regulation of agreements between site owners and site tenants in respect of Part 4A sites and Part 4A dwellings
- rights and duties of Specialist Disability Accommodation (SDA) providers and SDA residents in respect of SDA enrolled dwellings.

The Victorian Government passed the *Residential Tenancies Amendment Act 2018* to amend the RTA. Over 130 amendments were introduced to the RTA as part of sweeping reforms to rental laws, aimed at ensuring the RTA meets the existing needs of the residential rental market participants.²⁶ The reforms sought to provide better protection for renters and residents while balancing the ability of rental providers to effectively manage their properties. Reforms introduced included:

- a ban on rental bidding
- the power to prescribe in regulations minimum rental standards
- no evictions without a reason
- allowable modification by renters
- the ability to request urgent repairs.²⁷

²⁵ Department of Energy, Environment and Climate Action (2023), *Victorian Greenhouse Gas Emissions Report 2021* <https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0036/687825/Victorian-Greenhouse-Gas-Emissions-Report-2021.pdf>.

²⁶ Victorian Government (2018), *Second reading speech – Residential Tenancies Amendment Bill 2018*.

²⁷ Consumer Affairs Victoria (2021), *Victorian rental law changes* <<https://www.consumer.vic.gov.au/housing/renting/2021-victorian-rental-laws-changes>>.

The amendments were progressively introduced, with the entire suite of reforms coming into effect from 29 March 2021.²⁸ The reforms apply to all types of tenancies, private rentals, caravan parks, and rooming houses.

1.2.2 Building Act 1993

Building standards which outline minimum standards for buildings also apply to the construction and modification of rental properties and rooming houses. These building standards are enforced by local council and are outlined in the *Building Act 1993* and the Building Regulations 2018, which adopt the Australia-wide National Construction Code (NCC).

The NCC sets out the requirements for the design and construction of new buildings in Australia, including setting minimum requirements for safety, health, amenity, accessibility and sustainability. The NCC 2022, adopted by Australian states and territories on 1 May 2023, strengthened minimum requirements for the energy efficiency of new homes, aimed at making homes cheaper to run, more comfortable to live in and more resilient to extreme weather. Minimum energy efficiency requirements under the NCC 2022 became mandatory in Victoria on 1 May 2024. Strengthened standards raised the minimum thermal performance of new homes from 6 to 7 stars, and introduced a ‘whole of home’ energy usage requirement to design for the energy performance of fixed appliances such as heating and cooling, hot water systems and lighting to make homes cheaper to run.

It is important to note that the NCC framework only applies to new buildings, or when significant modification of a pre-existing property occurs. The current stock of rental properties in the Victorian rental market do not need to meet the NCC minimum building standards.

1.2.3 Regulatory framework

The RTA is supported by regulations which further define the rights and responsibilities of the parties involved in a rental arrangement. These regulations include:

- Residential Tenancies Regulations 2021
- Residential Tenancies (Rooming House Standards) Regulations 2023
- Residential Tenancies (Caravan Parks and Movable Dwellings Registration and Standards) Regulation 2020
- Residential Tenancies (Specialist Disability Accommodation) Regulations 2019.

The proposed Regulations seek to amend both the Residential Tenancies Regulations and the Rooming House Regulations. Further detail on each of these regulations is provided below.

1.2.3.1 Residential Tenancies Regulations 2021

The Residential Tenancies Regulations 2021 came into effect on 29 March 2021. The objective of the Residential Tenancies Regulations is to prescribe matters authorised or required to be prescribed under the RTA.²⁹ The current Residential Tenancies Regulations substantially updated the existing regulatory framework governing rental properties in Victoria. The Residential Tenancies Regulations introduced a range of provisions designed to enhance the rights and living conditions of renters. One significant aspect of the Residential Tenancies Regulations was the introduction of minimum standards for rental properties, including minimum standards related to:³⁰

- door locks
- ventilation
- bathroom facilities
- kitchen facilities
- laundry facilities
- structural soundness
- mould and dampness
- electrical and gas safety
- windows and window coverings
- lighting
- heating.

Under the RTA and Residential Tenancies Regulations, rental providers have a duty to ensure that their rental properties meet these minimum standards. Renters have the right to terminate their rental agreement or request and make urgent

²⁸ Consumer Affairs Victoria (2021), *2021 Victorian rental law changes* <<https://www.consumer.vic.gov.au/housing/renting/2021-victorian-rental-laws-changes>>.

²⁹ Victorian Government, *Residential Tenancies Regulations 2021*.

³⁰ Consumer Affairs Victoria (2021), *2021 Victorian rental law changes* <<https://www.consumer.vic.gov.au/housing/renting/2021-victorian-rental-laws-changes>>.

repairs if the property does not meet these required standards. These standards aim to ensure that tenants have access to safe and habitable living spaces, addressing issues that may have previously led to substandard conditions.

1.2.3.2 Residential Tenancies (Rooming House Standards) Regulations 2023

The Residential Tenancies (Rooming House Standards) Regulations 2023 came into effect on 26 February 2023 and replaced the Residential Tenancies (Rooming House Standards) Regulations 2012. The Rooming House Regulations include minimum standards for rooming houses that aim to balance the interests of rooming house residents and operators. The objectives of the Rooming House Regulations are to prescribe:

- privacy, safety, security and amenity standards which a rooming house operator must comply with in relation to all or any combination of the following:
 - rooming houses
 - rooms in a rooming house
 - rooming house facilities and services
 - common areas of rooming areas
 - the general amenity of rooming houses
- other matters in relation to the regulation of rooming house standards.

Rooming houses must meet minimum standards for safety, security, privacy and amenities. Changes introduced to minimum standards for rooming houses in 2023 included:

- increasing the frequency of electrical safety checks to every two years
- requiring laundry facilities to have one washing machine that is in good working order for every 12 residents
- a standard for blind cord safety in rooming houses
- requiring rooming houses to be structurally sound, weatherproof, and free from mould and dampness.

Other standards covering bathrooms, dining facilities, kitchens, residents' rooms, shared laundries and general minimum standards are also included in the Regulations.

The Public Health and Wellbeing (Prescribed Accommodation) Regulations 2020, under the *Public Health and Wellbeing Act 2008* (PHW Act), also outline health and safety standards for rooming houses related to overcrowding, maintenance and cleanliness, water supply, waste disposal and toilet and bathing facilities.

1.3 Victorian energy efficiency reforms in rental properties and rooming houses

Electricity generation is Victoria's largest source of greenhouse gas emissions, accounting for 51.8 per cent of total emissions in 2021, due in large part to the reliance on fossil fuels.³¹ Energy efficiency is a high priority energy abatement strategy that can reduce greenhouse gas emissions and help the Victorian Government meet its goal of reaching net zero emissions by 2045.

The Victorian Government introduced an energy efficiency standard for heating in 2021. All rental properties are now required to have a fixed heater in good working order in the main living area. For rental agreements entered into from 29 March 2023, the fixed heater is required to be energy efficient.³²

The Victorian Government committed to introducing additional energy efficiency measures in rental properties in its Energy Sector Emissions Reduction Pledge. This commitment included minimum energy efficiency standards related to insulation, draught sealing and hot water systems. As part of the update to the Gas Substitution Roadmap in December 2023, the Victorian Government renewed its commitment to the introduction of further minimum energy efficiency standards for rented homes. The proposed new standards will cover ceiling insulation, draught sealing, hot water systems and water efficient shower heads (as a complementary measure for hot water systems), cooling and a revised heating standard, as well as a heating standard for rooming houses. These measures are the subject of this RIS and are discussed further below.

1.3.1 Ceiling insulation

Insulation is critical to controlling heat flows between the indoor and outdoor environments. Insulation acts as a buffer by resisting heat transfer – in winter it helps retain heat inside and in summer it helps prevent heat entering from outside. Insulation can be installed in floors, walls and ceilings and is the cornerstone of an energy efficient building. Minimum standards exist for insulation in all new build construction as part of the NCC, however there is no equivalent minimum

³¹ Department of Energy, Environment and Climate Action (2021), *Victorian Greenhouse Gas Emissions Report 2021* <https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0036/687825/Victorian-Greenhouse-Gas-Emissions-Report-2021.pdf>.

³² Consumer Affairs Victoria (2023), *Rental properties – minimum standards* <<https://www.consumer.vic.gov.au/housing/renting/repairs-alterations-safety-and-pets/minimum-standards/minimum-standards-for-rental-properties>>.

standard for existing buildings (unless renovations requiring a planning permit are being undertaken). The Australian Capital Territory is the only jurisdiction in Australia which currently has a minimum standard for ceiling insulation. Rental properties in the ACT with no ceiling insulation, or existing ceiling insulation with a R-value³³ below R2, are required to install ceiling insulation to a minimum R-value of R5.³⁴

Ceiling insulation³⁵ typically offers the most benefit at the least cost, particularly in retrofit scenarios because ceilings account for a higher proportion of heat loss in winter and heat gain in summer than any other building surface.³⁶ Retrofitting insulation is generally easier in ceilings than in floors or walls. However, it can still be a complex task with a number of safety and quality risks, including exposure to live electrical wiring, working at heights and risks arising from inadequate training and low level of competency. Mitigating these risks with appropriate safety and quality measures, such as electrical safety checks before installation and use of suitably qualified insulation installers, are important components of this work.

1.3.2 Draught sealing

In addition to protecting inhabitants from the weather and heat/cold, residential buildings control the flow of air into and out of the premises. While ventilation is critical for a healthy home, draughts resulting from air gaps are not an effective form of ventilation as they are uncontrolled, compared to a controlled source such as an extraction fan or opening a window. Uncontrolled draughts allow conditioned air to escape from the building, making it harder and more energy-intensive to maintain a comfortable internal temperature, which can lead to higher energy bills and greenhouse gas emissions. Uncontrolled draughts also allow potentially unhealthy air to enter the home from wall cavities, chimneys and subfloor areas, putting the health of residents at risk.

1.3.3 Hot water systems and shower heads

Hot water systems are critical for providing the essential service of hot water for various domestic activities. The importance of hot water systems is particularly evident during colder seasons, where access to hot water becomes a necessity for maintaining cleanliness, health and comfort. The production of hot water accounts for a significant proportion of energy used in Victorian homes (on average approximately 17 per cent),³⁷ and accounts for a significant proportion of energy costs to households. Existing minimum rental standards prescribe connection to a reasonable supply of hot water, however, the implications of having energy-inefficient hot water systems can be substantial. Energy inefficiency not only leads to higher utility bills but also has environmental consequences. Inefficient hot water systems consume more energy than necessary, contributing to increased greenhouse gas emissions. The largest use of hot water in Victorian homes is for showering,³⁸ with homes that have inefficient shower heads dispensing water at higher flow rates and leading to excessive water usage during showers. This, in turn, increases the demand on hot water systems, requiring more energy to heat the additional water and resulting in higher energy bills and increased greenhouse gas emissions.

1.3.4 Heating systems

Inadequate heating can lead to health risks, particularly during the winter months, as exposure to cold temperatures can contribute to respiratory issues, compromised immune systems and other health concerns.³⁹ Adequate heating is particularly important for vulnerable populations that often inhabit rooming houses, such as low-income individuals and those without alternative housing options. Cold and uncomfortable living conditions can have a negative impact on mental wellbeing and hinder residents' ability to engage in daily activities. The adverse health impacts associated with inadequate heating are discussed further in section 2.7. Inadequate heating may also lead to increased energy consumption as residents resort to using alternative, less energy-efficient heating sources, further straining limited resources and potentially compromising safety.

³³ The R-value of an insulation batt measures the batt's thermal resistance. Typically, R-values are determined based on the thickness and the thermal properties of the material used to create the insulation batt. A higher R-value indicates that the insulation batt has greater resistance to heat transfer, providing a greater level of insulation for the property.

³⁴ ACT Government (2023), *Minimum energy efficiency standards for rental homes: Information for renters*. <https://www.justice.act.gov.au/__data/assets/pdf_file/0008/2091842/Fact-Sheet-Minimum-energy-efficiency-standard-for-ceiling-insulation-Renters.pdf>.

³⁵ In this RIS 'ceiling insulation' refers to insulation installed to ceilings which directly abut a roof cavity, i.e. it does not include insulation installed in interstitial spaces such as the ceiling to floor space in a building with multiple floors.

³⁶ Sustainability Victoria (2023), *Home insulation* <<https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/building-or-renovating/key-principles-of-energy-efficient-design/planning-and-design/insulation>>.

³⁷ Sustainability Victoria (2024), *Save energy in the home* <<https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home>>.

³⁸ Department of Energy, Environment and Climate Change (2023), *Shower heads for households* <<https://www.energy.vic.gov.au/for-households/victorian-energy-upgrades-for-households/shower-heads>>.

³⁹ Asthma + Lung UK (2023), *Cold weather and your lungs*, <<https://www.asthmaandlung.org.uk/living-with/cold-weather>>.

1.3.5 Cooling systems

Cooling systems are important in Victorian homes during the summer and are likely to increase in importance given the potential for more frequent and intense heatwaves due to climate change. Effective cooling is not only a matter of comfort, it is important for health and wellbeing. High temperatures can pose health risks, particularly to vulnerable populations such as the elderly and individuals with pre-existing health conditions. The adverse health impacts associated with insufficient cooling in homes are discussed further in section 2.7. A well-functioning cooling system ensures a comfortable indoor environment, helping to mitigate the adverse effects of extreme heat. Inadequate cooling may also lead to increased energy consumption as residents resort to using alternative, less energy-efficient cooling sources. There are currently no minimum standards for cooling in rental properties.

1.4 Phasing out gas connections in new homes and the Gas Substitution Roadmap Update

From 1 January 2024 new homes requiring a planning permit can no longer be connected to the gas network. Under this Victorian Government policy, gas connections will be phased out for new dwellings, apartment buildings, including public and social housing, and residential subdivisions that require planning permits.^{40,41} With nearly 80 per cent of new homes currently built with connections to gas,⁴² the rationale for this ban is threefold. Emissions from the fossil gas sector account for 17 per cent of Victoria's emissions, therefore, reducing the use of gas in residential properties is a key element in meeting Victoria's targets of a 50 per cent reduction on 2005 levels by 2030 and net zero emissions by 2045.⁴³ Secondly, the price of fossil gas has increased sharply in recent years, initially as a result of the connection to international prices due to the commencement of liquified natural gas exports in 2015, and more recently due to supply and demand challenges coupled with extensive flooding and the war in Ukraine. High fossil gas prices add an additional financial burden on Victorian households who are increasingly faced with cost of living pressures. The shift away from fossil gas is expected to save households between \$1,000 to \$2,200 annually on their energy costs.⁴⁴ It is worth noting that rental households have limited access to these savings as they have limited ability to change fossil gas fixed appliances in their rental property to an electric alternative.

Thirdly, our high dependence on fossil gas is a legacy of our proximity to once-plentiful reserves in the Gippsland Basin in Bass Strait. Forecasts from both the Australian Energy Market Operator (AEMO)⁴⁵ and the Australian Competition and Consumer Commission (ACCC) show that the supply from the Gippsland Basin is declining significantly and will continue to do so over this decade. Victoria, which has historically played a key role in supplying gas to other east coast states, could be experiencing a much tighter local supply and demand balance than has historically been the case on high demand days as early as 2026.

The Gas Substitution Roadmap Update released in December 2023 also announced the Victorian Government's intention to undertake a RIS to investigate options to progressively electrify all new residential, and most commercial, buildings where appropriate electric appliance options are readily available.

The same RIS will consider the costs and benefits of requiring existing gas appliances in homes and relevant commercial buildings to be replaced with electric appliances when the current appliance reaches end-of-life.

This policy context is relevant to this RIS as it impacts the viable options for consideration, as government intends for new minimum rental standards to align with broader policy objectives, including those of the Gas Substitution Roadmap.

1.5 Victoria's Built Environment Climate Change Adaptation Action Plan

The Built Environment Climate Change Adaptation Action Plan is one of seven adaptation action plans for Victoria. The plan supports highly exposed Victorian cities, towns, suburbs and regional areas to tackle climate related events through resilience and recovery planning that considers all hazards.

The Built Environment Climate Change Adaptation Action Plan identifies heat as a key risk of climate change for the built environment system, noting that along with already vulnerable people, high temperatures can also make otherwise healthy

⁴⁰ Victorian Department of Energy, Environment and Climate Action (2023), *Save with an all-electric home* <<http://www.energy.vic.gov.au/households/save-with-all-electric-home>>.

⁴¹ Victorian Department of Transport and Planning (2023), *Victoria's Gas Substitution Roadmap* <<https://www.planning.vic.gov.au/guides-and-resources/strategies-and-initiatives/victorias-gas-substitution-roadmap>>.

⁴² Ibid.

⁴³ Premier of Victoria (2023), *New homes to go all electric from 2024* <<https://www.premier.vic.gov.au/new-victorian-homes-go-all-electric-2024>>.

⁴⁴ Ibid.

⁴⁵ AEMO (2023), *Gas Statement of Opportunities* <https://www.aemo.com.au/-/media/files/gas/national_planning_and_forecasting/gsoo/2023/2023-gas-statement-of-opportunities.pdf>.

people vulnerable. The introduction of minimum rental standards is flagged in the Plan as a measure through which energy efficiency and thermal performance of substandard dwellings can be upgraded to reduce exposure to heatwaves and reduce energy costs.

1.6 Broader Reforms underway to the Victorian rental sector

The Victorian Government will act to implement housing reforms across the state and is looking to work with the Victorian community to deliver sustainable, equitable and quality outcomes. With the increasing pressure on housing availability and affordability, the Government is seeking to start with a step change in the quality and quantity of homes in Victoria.

On 20 September 2023, the Government announced a suite of initiatives to protect renters' rights as part of the Housing Statement, including reforms to close loopholes that drive up the cost of living for renters and to provide renters more certainty and security over their leases. Key announcements in the Housing Statement included restricting rent increases between successive fixed-term leases; banning rental bidding; the establishment of the Rental Dispute Resolution Victoria; introduction of a portable rental bond scheme; extending notice of rent increase and notice to vacate periods from 60 to 90 days; and making rental applications easier and protecting renters' personal information.

The Housing Statement builds on over 130 reforms to the Residential Tenancies Act 1997 (RTA) which commenced on 29 March 2021, spanning all types of rental housing regulated by the RTA. The reforms aim to strike a balance between increasing protections for renters and ensuring that rental providers can still effectively manage their properties.

1.7 Preparation and structure of the RIS

The key purpose of this RIS is to assess the impact of amending the Regulations to provide for minimum standards of ceiling insulation, draught sealing, hot water systems and shower heads, heating and cooling and blind cords in rental properties, as well as a heating standard in rooming houses.

This RIS has been prepared in accordance with the *Victorian Guide to Regulation*,⁴⁶ which provides a best practice approach to analysing any proposed regulatory intervention. This RIS estimates the impact of the proposed Regulations on Victorian businesses and community.

Key steps in the process to introduce the proposed Regulations are:

- preparation of the RIS (this document),
- independent assessment by Better Regulation Victoria (BRV),
- public comment on the proposed Regulations, and
- reviewing responses from public consultation prior to introducing the proposed Regulations.

The structure of this RIS and the approach to assessing the impact of the proposed amendments to the Regulations is as follows:

Chapter 2: Identification of the problem and objectives of the proposed Regulations.

This chapter considers the nature and extent of the problem that the proposed Regulations aim to address, including the:

- 1) need for government intervention
- 2) risks of non-intervention
- 3) objectives of such intervention.

Chapters 3 – 9: Identification of options to achieve the intended objectives of the proposed Regulations and assessment of the costs and benefits of those options.

Identification of options to achieve the intended objectives of the proposed intervention was undertaken by Government. Options development was informed by reviewing responses to consultation for previous regulatory impact statements, consultation with stakeholders and review of relevant literature. Preliminary analysis of identified options was undertaken prior to the development of this RIS to provide a technical assessment of the proposed options.

⁴⁶ Commissioner for Better Regulation (2016), *Victorian Guide to Regulation: A handbook for policy-makers in Victoria* <<http://www.betterregulation.vic.gov.au/Guidance-and-Resources>>.

Consistent with the requirements of the *Victorian Guide to Regulation*, an assessment of the costs and benefits of the proposed changes, relative to a reference case (the Base Case) was undertaken. The analysis included the quantification, where possible, of costs and benefits to industry, government, and the Victorian community.

Chapter 10: Summary of the preferred options and total impact

This chapter brings together the preferred options for ceiling insulation, draught sealing, hot water systems and shower heads and heating and cooling in rental properties, as well as a heating standard in rooming houses, and presents the total combined impact of these options. The preferred option for blind cord safety anchors is also noted here. This chapter also considers the distributional impacts of the preferred options.

Chapter 11: Competition and small business impacts

This chapter considers the likely impacts of the preferred option on industry competition and small businesses.

Chapter 12: Implementation and evaluation

This chapter describes the arrangements for the implementation and evaluation of the preferred options.

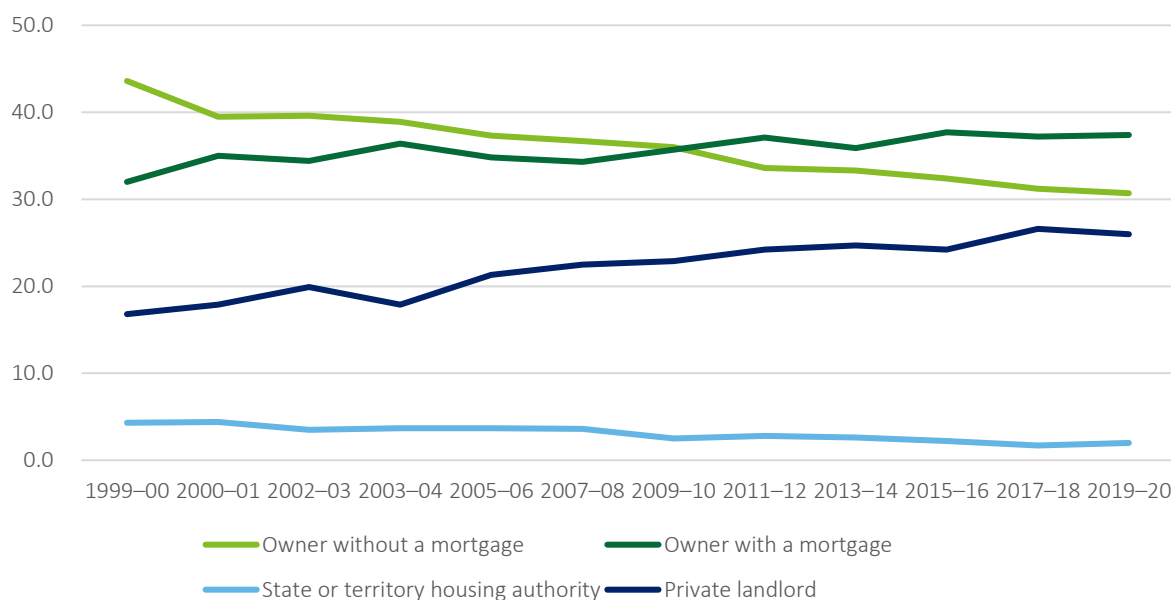
2 The problem and objectives

This chapter outlines the nature and scale of the problem the proposed Regulations seek to address.

2.1 The rental market in Victoria

The Victorian rental market is currently undergoing significant transformation, primarily influenced by a number of economic, demographic and regulatory factors. The decreasing rates of home ownership in Victoria have created a noticeable increase in demand for rental properties. As Chart 2.1 demonstrates, the proportion of Victorian households renting has been increasing since 1999-2000, while home ownership rates have declined. According to the 2021 Census, 28.5 per cent of Victorians were living in rented housing, up from 24.4 per cent in the 1996 Census.⁴⁷

Chart 2.1: Housing tenure in Australia, 1999-2000 to 2019-20



Source: Australian Bureau of Statistics Housing Occupancy and Costs

The NCC classifies residential and commercial buildings into classes, based on their characteristics. The classes for residential buildings are:⁴⁸

- Class 1 – domestic or residential buildings that are either single standalone houses or horizontally attached houses such as terrace houses, row houses or townhouses. Class 1 has two sub-classes:
 - Class 1a: Single dwellings such as a detached house, or a part of attached dwellings such as rowhouses or townhouses
 - Class 1b: boarding house, guest house or hostel with a floor area of less than 300 m²
- Class 2 – domestic apartment buildings where people live above, below or beside each other
- Class 3 – residential buildings other than Class 1 and Class 2 buildings that provide long-term or transient accommodation for a number of unrelated people. Examples include:
 - boarding houses or guest houses exceeding the limit of Class 1b properties

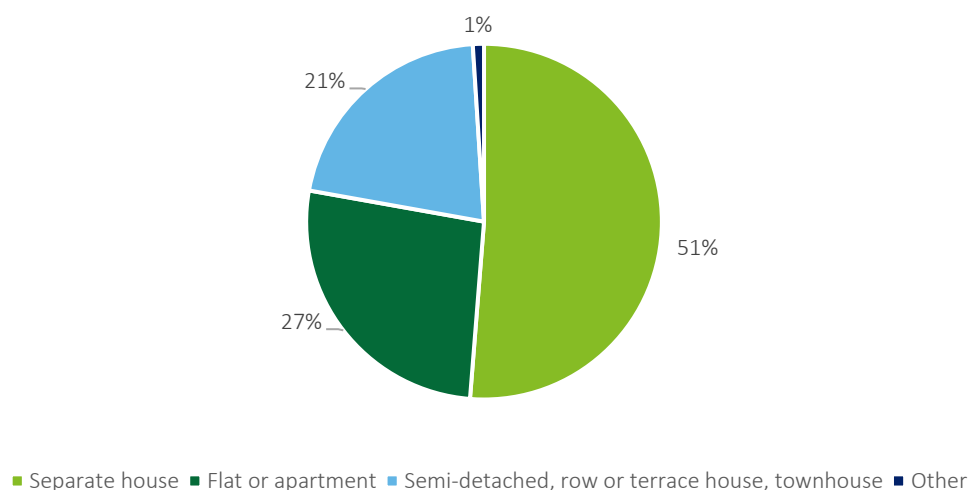
⁴⁷ Australian Bureau of Statistics (2021), *2021 Census*. The 1996 Census has been used as a comparison point as it is the Census closest to the introduction of the *Residential Tenancies Act 1997*.

⁴⁸ Australian Building Codes Board (2022), *Understanding the NCC Building Classifications* <<https://www.abcb.gov.au/sites/default/files/resources/2022/UTNCC-Building-classifications.pdf>>.

- hotels, hostels and backpacker accommodation
- student accommodation or workers’ quarters
- residential care building
- Class 4 – sole dwellings or premises within a non-residential property such as a caretaker’s residence in a storage facility.

As Chart 2.2 demonstrates, most Victorian renters reside in a Class 1a property. The common dwelling type for a rental property is a house, with just over half of all Victorian renters living in a separate house.

Chart 2.2 Dwelling type for renters



Source: Australian Bureau of Statistics

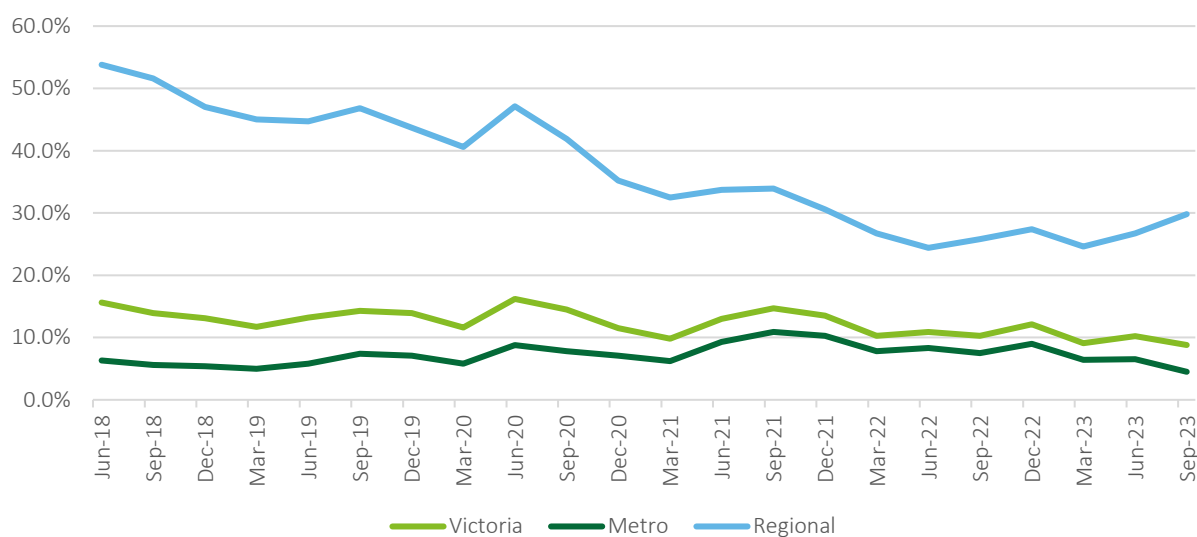
The rental market in Victoria is currently under stress. There is a lack of properties available for rent, with September 2023 vacancy rates at 2.6 per cent in metropolitan Melbourne and 1.9 per cent in regional Victoria.⁴⁹ The 2023 vacancy rates for both metropolitan and regional Victoria remained relatively stable compared to September 2022. Furthermore, rents have also been increasing steadily in Victoria. In the September quarter 2023, the median rent in metropolitan Melbourne was \$515 per week and \$430 per week in regional Victoria.⁵⁰ As Chart 2.3 shows, the proportion of affordable rentals for low-income households⁵¹ has been steadily declining in Victoria with the most significant drop in regional Victoria. While the proportion of affordable properties in regional Victoria has reduced significantly since June 2018, there has been an improvement in the September quarter with 29.8 per cent of new listings classified as affordable, compared to 25.8 per cent in September quarter 2022. In metropolitan Melbourne, only 4.5 per cent of all newly listed rental properties were classified as affordable for low-income households, the lowest level since March 2000 and a significant drop from 7.5 per cent in September quarter 2022.

⁴⁹ Department of Families, Fairness and Housing (2023), *Rental Report statistics – September quarter 2023*.

⁵⁰ Ibid.

⁵¹ Homes Victoria Rental Reports use an affordability benchmark of more than 30 per cent of gross income being spent on rent.

Chart 2.3: Affordable rentals as percentage of all rentals



Source: Adapted from Homes Victoria Rental Report September quarter 2023.

Ensuring rental properties meet a reasonable standard is crucial for fostering a healthy and equitable housing market, especially as renting is becoming an increasingly long-term housing solution. The need for well-maintained rental properties goes beyond aesthetics, it is fundamentally tied to the wellbeing and comfort of renters. As property prices and declining rates of home ownership lead to increased demands on the rental market, the need for adequate rental housing is growing. This issue is compounded by rising rent prices which can push renters into financial strain and continuing dependency on the rental market. For example, according to the 2021 Australian Bureau of Statistics (ABS) Census, nearly 31 per cent of renters in Victoria spend over 30 per cent of their income on rent, indicating affordability concerns.⁵² It is important to note this statistic predates the full impact of the COVID-19 pandemic and a significant increase in the cash rate by the RBA which has had a direct impact on loan repayments, with reports of increases being passed through to renters as rent increases.⁵³ Minimum standards therefore play a crucial role in ensuring that renters receive appropriate value for their rental payments.

2.2 Potential impacts of minimum standards on the rental sector, renters and rental providers

Introducing minimum standards for rental properties will impose costs on rental providers to comply with the standards. This poses a risk that the costs may prompt some rental providers to withdraw their property from the rental market, further limiting supply in the rental market.

The Australian Housing and Urban Research Institute (AHURI) undertook difference-in-difference modelling to analyse the impact on rental market exits of two tenancy law reforms. These two reforms were the enactment of the NSW *Residential Tenancies Act 2010* and the 2015 Victorian Fairer Safer Housing review, which gave rise to a number of reforms, including a ban on rental bidding and eviction without a reason, allowable modifications and urgent repairs, and the introduction of minimum rental standards. It is important to note some of these reforms came into effect towards the end of AHURI’s analysis period and that AHURI’s research did not analyse the impact of the introduction of the reforms themselves. The analysis found no statistical evidence that tenancy law reforms led to higher exits from the rental property market.⁵⁴ The same AHURI study also undertook a survey of rental providers which found that tenancy law does not factor in strongly as a reason to dispose of their rental property.

⁵² Australian Bureau of Statistics (2021), *Victoria 2021 Census All persons QuickStats*.

⁵³ REA Group (2023), *Rental crisis: interest rate hikes see Melbourne median weekly rents soar by up to \$112* <<https://www.realestate.com.au/news/rental-crisis-interest-rate-hikes-see-melbourne-median-weekly-rents-soar-by-up-to-112>>.

⁵⁴ Australian Housing and Urban Research Institute (2022), *Regulation of residential tenancies and impacts on investment* <<https://www.ahuri.edu.au/research/finalreports/391>>.

Data by the REA Group, which operates one of Australia’s largest residential and commercial property websites, is consistent with AHURI’s research, indicating that minimum standards did not drive an increase in rents and sales by rental providers a year from the introduction of the Residential Tenancies Regulations 2021, which introduced minimum rental standards.⁵⁵

The Legislative Council Legal and Social Issues Committee’s Final Report on the 2023 Inquiry into the rental and housing affordability crisis in Victoria received several submissions that reflected on the impacts of introducing rental minimum standards in 2021, financial and otherwise, to renters and rental providers.⁵⁶

The Committee received varying feedback from rental providers on the financial burden of meeting minimum standards. While some rental providers expressed willingness to comply, viewing it as ‘the cost of doing business’, others raised concerns about the associated costs and cited ‘changing tenancy legislation’ as a reason for selling investment properties. Submissions also highlighted complexity of the regulatory framework, with some providers relying on real estate agencies to ensure compliance.

Submissions from renters focused on the quality of upgrades and enforcement. The report noted concerns raised by highly vulnerable members of the community, who are unlikely to exercise their rights due to power discrepancies between themselves and rental providers, intensified by delays with third-party mediation services or Tribunals, and fear of eviction in a competitive rental market.

A recent Consumer Policy Research Centre (CPRC) report investigated the compliance of existing minimum rental standards introduced over the period beginning in March 2021 and ending in March 2023, across a sample of 100 properties in Victoria. The study suggests that most properties appear to meet minimum standards, indicating “that the standards set by the Victorian Government for rental properties are achievable and that the market has responded to the new requirements for quality rental homes”.⁵⁷ The research also suggested that while it is possible to offer affordable rental properties that comply with the existing rental standards, there was greater compliance risk among more affordable properties when compared to less affordable ones.⁵⁸ While this evidence suggests current standards do not seem to be a barrier to the rental market delivering affordable rental properties, there is a risk that additional standards may lead to greater non-compliance in affordable rental properties.

The introduction of minimum standards is more likely to disproportionately affect older rental properties. Should these properties exit from the rental market, this may reduce choice and supply for renters, particularly at the more affordable end of the market. Additionally, adjustments to rent for rental providers to comply with the minimum standards may occur, and could result in some renters needing to seek different accommodation. However, the purpose of rental standards is to ensure that minimum requirements are met by all rental properties on the market, and renters in the lower cost end of the market are disproportionately affected by the costs and health effects of inefficient and thermally leaky homes. Therefore, it is imperative that any approach to the introduction of rental standards considers these factors in their assessment.

As Victoria is one of only two jurisdictions in Australia to have introduced minimum energy efficiency rental standards, there is limited research and analysis available on impacts on the rental sector specific to the standards being introduced in this RIS. Impacts on the rental market will be monitored throughout implementation to ensure any emerging issues are identified.

2.3 Rooming houses in Victoria

A rooming house, as defined under the RTA, is a property in which there is one or more rooms available for occupancy, in which the total number of people who may occupy those rooms is four or more. On average, however, rooming houses generally have six to eight residents residing in them at a time.⁵⁹ Rooming houses typically operate in buildings with Class 1b or Class 3 classification. Residents of rooming houses are typically vulnerable cohorts of the Victorian community, with rooming houses often providing ‘last resort’ or crisis accommodation to these cohorts.⁶⁰

⁵⁵ REA Group (2022), *Victorian rental minimum standards: Market impact one year on and what’s to come* <<https://www.realestate.com.au/news/victorian-rental-minimum-standards-market-impact-one-year-on-and-whats-to-come>>.

⁵⁶ Parliament of Victoria (2023), *Inquiry into the rental and housing affordability crisis in Victoria* <<https://www.parliament.vic.gov.au/get-involved/inquiries/inquiry-into-the-rental-and-housing-affordability-crisis-in-victoria/submissions/>>.

⁵⁷ Consumer Policy Research Centre and Tenants Victoria (2023), *Is it liveable? A mystery shop of private rental properties*. <https://cprc.org.au/wp-content/uploads/2024/02/CPRC_Is-it-livable-Rental-Report_Digital.pdf>.

⁵⁸ *Ibid.*

⁵⁹ Peninsula Community Legal Centre (2020), *Open the Door: The Resident’s View of Life in a Rooming House*.

⁶⁰ *Ibid.*

In addition to the definition of rooming house outlined above, a rooming house can also refer to a building that has been declared a rooming house by the Minister for Housing.⁶¹ Rooming houses differ from share houses, where share house residents have exclusive possession of the rented property, rooming house residents have exclusive possession of only their room, with shared access to communal facilities, such as bathrooms, kitchens, and laundries. Another point of difference between rooming houses and share houses are the agreements signed by residents. In share houses all residents sign the same agreement while rooming house residents all sign individual agreements with the operator.⁶²

The ABS defines rooming house residents as homeless because rooming houses lack core elements that make up a home, such as a sense of privacy and security and ability to control one's living space.⁶³ The 2021 Census recorded 8,599 people living in rooming houses in Victoria.⁶⁴ According to Census data, 18 per cent of rooming house residents had one or more long-term health and/or mental health conditions and 4 per cent required assistance with core activities. Furthermore, some rooming house residents may have histories of family violence trauma, alcohol and other drug use, or be recently released from prison.⁶⁵

There were 1,142 registering rooming house operators in Victoria in 2022-23 running 1,451 rooming houses. This number is likely to understate the actual number of rooming houses in Victoria as there is evidence of unregistered rooming houses in operation.⁶⁶ The historical average annual growth rate of rooming houses in Victoria, over 2015-2021, has been 3.9 per cent.

Traditionally, rooming houses were purpose-built dwellings which typically comprised many bedrooms and on-site management. However, since the mid-2000's, the model of rooming houses has evolved with the majority of rooming houses now being standard suburban family homes that have been modified to accommodate more residents and operate as rooming houses.^{67,68} The growth of suburban rooming houses can be attributed to the financial incentives for private investors in Victoria's tight rental market and strong growth in house prices.⁶⁹ Gentrification and the rise of private housing developments have also been attributed as drivers of the decline of traditional rooming houses.⁷⁰ An analysis of registered rooming house properties by Consumer Affairs Victoria in 2018 found that:

- 70 per cent were houses
- 55 per cent had a maximum of three to four bedrooms
- 3 per cent had 10 bedrooms or more
- 64 per cent had only one to two bathrooms.⁷¹

Rooming houses in Victoria are largely located in metropolitan Melbourne, which has four of the five Local Government Areas with the highest number of registered rooming houses.⁷² All rooming houses must be registered with the applicable council, as mandated by the PHW Act. In addition to the registration, rooming house operators are also required to have a license to run a rooming house under the *Rooming House Operators Act 2016*.

The Rooming House Regulations were introduced in 2012 to improve concerns about liveability and safety in rooming houses and to guarantee a basic level of personal safety and security for residents. The Rooming House Regulations also introduced minimum standards to be met by rooming house operators. The Rooming House Regulations were recently remade in 2023. Failure to meet the minimum standards is considered an offence under the RTA. Data from Consumer Affairs Victoria (CAV), which is the entity responsible for enforcing the rooming house minimum standards, shows a high level of compliance with the standards from rooming houses. In 2021-22, CAV inspected 234 rooming houses of which 34

⁶¹ The RTA allows the Minister for Housing to declare a building (including a block of self-contained apartments) to be a rooming house by publishing a notice in the Government Gazette, allowing these buildings to be managed under the rooming house provisions. For example, buildings owned or leased by community housing organisations.

⁶² Consumer Affairs Victoria (2023), *Rooming house – minimum standards*.

⁶³ Australian Bureau of Statistics (2012) *A Statistical Definition of Homelessness*, Catalogue No. 4922.0.

⁶⁴ Australian Bureau of Statistics (2023), *Estimating Homelessness: Census*. Due to improvements in data quality, ABS advises that the 2021 data is not directly comparable with Census data from previous years. Therefore a comparison against previous years has not been undertaken.

⁶⁵ Tenants Victoria (2023), *Submissions in response to the draft Residential Tenancies (Rooming House Standards) Regulations 2020*.

⁶⁶ The Age (2019), 'Extreme lengths to avoid detection': *Illegal rooming house operators becoming more sophisticated*.

⁶⁷ Peninsula Community Legal Centre (2020), *Open the Door: The Resident's View of Life in a Rooming House*.

⁶⁸ Victorian Government (2009), *Rooming House Standards Taskforce Chairperson's Report*.

⁶⁹ Deloitte Access Economics (2023), *Residential Tenancies (Rooming House Standards) Regulatory Impact Statement*.

⁷⁰ Consumer Affairs Victoria (2016), *Rooming Houses Industry Report*.

⁷¹ Consumer Affairs Victoria (2018), *CAV Analysis of CoreLogic Data – Rooming house characteristics*.

⁷² Consumer Affairs Victoria (2021). These councils are Monash City Council, Whitehorse City Council, Greater Dandenong City Council and Frankston City Council.

were provided with warnings and no infringements were recorded. However, some negative experiences have been reported by residents of rooming houses.

Research commissioned by CAV in 2019 found that nearly two-third of rooming house residents reported an issue with the property. The most commonly cited concerns related to maintenance, safety and the general condition of the property.⁷³ In a survey conducted by Peninsula Community Legal Centre in 2020, 48 per cent of respondents rated their living conditions as ‘very poor’, ‘bad’ and ‘unsafe’.⁷⁴ Living in poor-quality housing can have a significant negative impact on an individual’s physical and mental health, and quality of life (see section 2.7). For rooming house residents, who are often vulnerable members of the community experiencing disadvantage, the impacts of living in sub-standard housing can further exacerbate the economic, health and social inequities they experience. Living in poor quality homes that have a lack of functioning appliances and that are not well-maintained by operators can impact a resident’s sense of autonomy or empowerment as they are reliant on the rooming house operator to address these issues, which can impact their well-being.⁷⁵ There is evidence in the literature demonstrating the impact of poor quality housing on mental and physical health.^{76,77}

With inflation and housing prices currently rising faster than wages, some Victorian residents will experience a reduction in their real income and purchasing power. The cost of living is compounded by the lack of rental properties available, particularly in regional Victoria. This is pushing more people into rooming houses as a last resort, increasing the importance of minimum standards in these properties.⁷⁸

2.4 A significant volume of Victoria’s rental building stock lacks basic thermal performance and appliance efficiency measures

The Residential Tenancies Regulations that came into effect in 2021 were designed to improve the quality of Victorian rental properties by introducing minimum standards and clarifying the responsibilities of rental providers towards renters. Current minimum rental standards relating to energy efficiency require a fixed heater in good working order to be present in the main living area of all rental properties, with any newly installed heaters having a minimum efficiency rating of 2 Stars. Complementary energy efficiency measures, such as ceiling insulation, draught sealing and cooling standards, are not currently a requirement. If unaddressed, inadequate energy efficiency measures undermine the objective of the regulatory framework to improve the quality of Victorian rental housing.

National research indicates that rented homes have poorer thermal performance and appliance efficiency than owner-occupier homes.⁷⁹ In 2012, the ABS found rented homes across Australia have significantly lower rates of insulation, window treatments, energy efficient lighting, low-flow shower heads, draught-proof seals, solar electricity or hot water systems when compared to owner-occupied homes.⁸⁰

While there are no recent, widespread studies into the prevalence of thermal performance measures in the residential building stock, data from the 2019 Victorian Residential Efficiency Scorecard⁸¹ highlights some key deficiencies related to the thermal performance of 1,870 residential properties that were assessed using the Residential Efficiency Scorecard:

- 85 per cent of assessed properties had the worst possible thermal rating during hot weather, suggesting it is expensive or difficult to cool these properties (the most common issues identified were poor insulation, draughtiness and no external window shading)
- 20 per cent of the properties had no fixed cooling
- 75 per cent of the properties had low or very low thermal ratings during cold weather, suggesting it is expensive or difficult to heat these properties (the most common issues identified were poor insulation and draughtiness)
- 29 per cent of the properties used a very low or low efficiency heater

⁷³ Briarbird & Co (2019), *Consumer Affairs Victoria: Renter research findings*.

⁷⁴ Peninsula Community Legal Centre (2020), *Open the Door: The residents view of life in a rooming house*.

⁷⁵ Deloitte Access Economics (2023), *Residential Tenancies (Rooming House Standards) Regulatory Impact Statement*.

⁷⁶ Baker et al. (2016), *Poor housing quality: Prevalence and health effects*, *Journal of Prevention and Intervention in the Community*.

⁷⁷ Rolfe et al. (2020), *Housing as a social determinant of health and wellbeing: developing an empirically informed realist theoretical framework*, BMC Public Health.

⁷⁸ Realestate.com.au (2023), *Victorian rent crisis: long waiting list for Bendigo rooming house listed for \$140 a week*.

⁷⁹ Daniel et al. (2020), *Warm cool and energy-affordable housing policy solutions for low-income renters*.

⁸⁰ Australian Bureau of Statistics (2012), *Household Energy Consumption Survey*.

⁸¹ Department of Environment, Land, Water and Planning (2019), *Victorian Residential Efficiency Scorecard – Flash report: July 2019*. The data in this report is from onsite assessments conducted by trained and accredited assessors.

<https://assets.nationbuilder.com/betterrenting/pages/364/attachments/original/1677534064/Sweaty_and_Stressed_v1.4.2.pdf>.

- 41 per cent of the properties had ceiling insulation of R1.5 or less, with 8 per cent of properties with no ceiling insulation installed whatsoever.⁸²

It should be noted that the properties included in the Scorecard were not a representative sample of properties in Victoria. Households participating in the Scorecard assessment likely were made up of households with a greater interest in energy efficiency. The report also stated that lower-income households were over-represented in the dataset.

A 2018 survey conducted by Newgate Research⁸³ found that only 1 in 4 renters reported the presence of insulation in their dwellings, with 55 per cent reporting that they didn't know if it was present. This is likely owing to the fact that ceiling insulation is not easily observable to renters. This survey also found that properties with low market value are around half as likely to have ceiling insulation when compared with high value properties (43 per cent compared to 88 per cent). Similarly, a 2015 Victorian Utility Consumption Household survey found that owner-occupiers (95 per cent) were much more likely than private renters (58 per cent) or public renters (55 per cent) to have some ceiling insulation.⁸⁴

As the proportion of Victorians who rent their homes increases so does the possibility of increased problems associated with thermally inefficient homes. While some rental demand will be met by newly built homes which are subject to minimum energy efficiency standards, a significant number of renters will continue to live in the existing thermally inefficient building stock.

2.5 The rental relationship undermines provision of housing with adequate thermal control or efficient appliances

In 2016, the Department of Justice and Community Safety commissioned research into the rental experience of renters and rental providers.⁸⁵ This research found that 18 per cent of renters reported their rental property having no heating or heating appliances which were in poor working order. This prompted the introduction of the minimum rental standards in the Residential Tenancies Regulations which included the requirement of a fixed heater (in good working order) in the main living space. Along with addressing critical amenities issues, the requirement included minimum efficiency standards for the mandated heaters which aligned with objectives relating to cost efficient thermal comfort and net zero emissions.

While the amendments to the Residential Tenancies Regulations improve affordability and thermal comfort for renters, the outcome is less effective if structural deficiencies such as lack of insulation, poor air tightness or lack of cooling persist. When such deficiencies are present, renters then face a trade-off between their own thermal comfort and increased energy costs due to inefficient housing (with heating accounting for approximately 43 per cent of total residential energy consumption).⁸⁶

These pressures are particularly acute for low-income households, who are more likely to live in rental accommodation of lower quality in terms of thermal performance and who are also less likely to be able to afford the increased costs of inefficient heating and cooling. To avoid undermining the objectives of the previous heating amendments, such inefficiencies need to be addressed.

In the absence of mandated requirements, despite the benefits of energy efficiency, rental providers' investment in energy efficient measures in rental accommodation is likely below the socially optimal level due to various barriers, including:

Barrier	Description
<i>Split incentives between renters and rental providers</i>	Split incentives refer to the situation where the party bearing the cost for the activity does not obtain some or all of the benefits of the activity. For example, renters may wish to improve the thermal comfort and cost efficiency of their homes because this will increase their liveability, but they are not typically motivated to improve a house that they do not own – they would bear costs of capital upgrades to the rental provider's asset. Rental

⁸² While the Victorian Residential Efficiency Scorecard suggests 8 per cent of properties have no ceiling insulation installed, the latest Energy Consumer Sentiment Survey (October 2021) suggests this could be as high as 38 per cent.

<<https://ecss.energyconsumersaustralia.com.au/behaviour-survey-oct-2021/state-summary-behave-2021/victoria-behave-oct-2021/>>

⁸³ Newgate Research (2018), *Research report on energy efficiency in rental properties (Report commissioned by DELWP)*.

⁸⁴ Department of Families Fairness and Housing (2015), *Victorian Utility Consumption Household Survey 2015*,

<<https://www.dffh.vic.gov.au/publications/victorian-utility-consumption-household-survey>>.

⁸⁵ EY Sweeney (2016), *Rental experiences of tenants, landlords, property managers, and parks residents in Victoria, Final Report*.

⁸⁶ EnergyConsult (2021), *Residential Baseline Study for Australia and New Zealand 2000 – 2040*.

Barrier	Description
	providers may not be motivated to incur expenses of upgrades when they do not directly receive the benefits of increased comfort or reduced energy bills.
<i>Information asymmetry</i>	Renters' priorities when choosing a house generally consist of whether the property is fit for purpose (i.e. number of bedrooms and bathrooms), the condition of the property and value for money. As energy efficiency/thermal control is considered a lower priority and is not always visible at inspection, rental providers do not prioritise providing information about this aspect of their property. This limits the market from accurately valuing homes with adequate thermal control and efficient appliances relative to homes without.
<i>Externalities</i>	There are indirect benefits for third parties associated with thermal efficiency such as reduced greenhouse gas emissions and healthcare spending (see section 2.7). These third party benefits are not typically accounted for by the renters or rental providers which means the value of thermal efficiency is discounted in their private decisions.

Where rental providers don't invest in energy efficient measures because of these barriers, the onus falls on renters to increase the thermal comfort of the premises they are leasing. The recent renter-led modification provisions within the RTA now permit draught sealing as a prescribed modification which does not require the rental provider's consent. However, the onus falls on the renter to pay for these upgrades, as well as the cost of restoring the property to the condition it was previously in at the end of lease. Renters often have a smaller disposable income and, particularly in the case of insulation and hot water systems, lack agency to install energy performance upgrades in their rental premises which places limitations on the renter-led efficiency upgrades. Renters are more likely to invest in multiple portable heating and cooling units, which when used in poorly insulated homes can be extremely inefficient and costly to operate.

In 2018, the ACCC recognised that consumers who rent often face restrictions to improve the energy efficiency of their home and have poorer quality of insulation in general.⁸⁷ The rental minimum standards are intended to ensure that the impacts of high energy costs and associated health implications of living in poor thermal homes are reduced for renters. Without amendments to the current regulations to drive improvement in energy efficiency, these challenges will continue to undermine the objectives of the rental minimum standards.

The barriers described above also apply to rooming house residents. In many circumstances, rooming houses residents are in a vulnerable position and may have limited alternatives for accommodation. Therefore, they have substantially less bargaining power than tenants in a residential property which can force them to accept sub-standard accommodation. Rooming house operators may not have sufficient incentives to invest in energy efficiency upgrades. A 2021 Parliamentary inquiry into homelessness in Victoria noted that the profits earned by rooming house operators creates an incentive for them to continue substandard operations and increase the number of residents in their property.⁸⁸

2.6 Adverse financial impacts associated with inefficient thermal performance and appliances

Thermal comfort is important for human health, productivity, and wellbeing.⁸⁹ Sustained levels of heat or cold that are uncomfortable due to poor thermal control can increase the physical and emotional stress of renters.⁹⁰ Inefficient hot water systems, heating or cooling appliances consume more energy than efficient models,⁹¹ leading to increased energy costs which can strain renters' household budgets. For some renters facing financial stress, where increased energy costs lead to overdue bills and payments, this can result in the loss of eligibility for discounts and the payment of higher tariffs.⁹²

Chart 2.4 indicates heating and cooling account for nearly half of the running costs in an average Victorian home, while hot water systems account for an additional 17 per cent of total running costs. By incurring these higher costs, renters may

⁸⁷ Australian Competition and Consumer Commission (2018), *Restoring electricity affordability and Australia's competitive advantage, Retail Electricity Pricing Inquiry Final Report*.

⁸⁸ Parliament of Victoria (2021), *Inquiry into homelessness In Victoria Final Report*.

⁸⁹ Daniel et al. (2020), *Warm cool and energy-affordable housing policy solutions for low-income renters*.

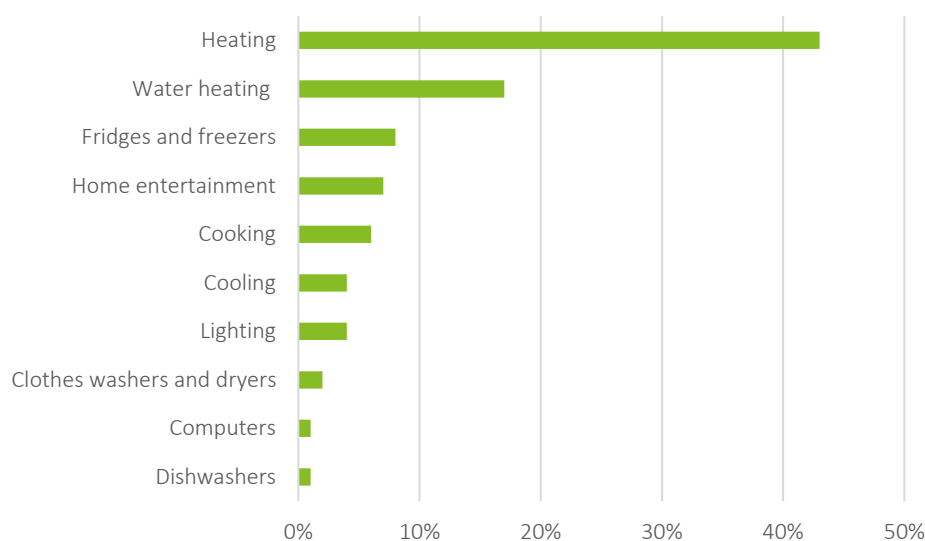
⁹⁰ Choudhury & Majumdar (2011), *Factors affecting comfort: human physiology and the role of clothing* <<https://www.sciencedirect.com/science/article/pii/B9781845695392500016>>.

⁹¹ Your Home (2023), *Appliances and technology* <<https://www.yourhome.gov.au/energy/appliances>>.

⁹² Daniel et al. (2020), *Warm cool and energy-affordable housing policy solutions for low-income renters*.

forego spending in other areas, such as restriction of transportation options, restricting partaking in social activities, or eating cheaper food which may be unhealthier.⁹³

Chart 2.4: Contribution of activities to energy costs in an average Victorian home⁹⁴



Source: Sustainability Victoria⁹⁵

Moreover, a lack of access to requisite temperature controls or an inability to bear higher electricity costs can lead to renters using public air-conditioned places such as shops and libraries to escape extreme temperatures, which can have adverse effects on living standards.⁹⁶

Therefore, renters in properties with inefficient thermal control are often faced with ever increasing rents while living in homes that are lacking basic temperature controls.⁹⁷

2.7 Adverse health and societal impacts associated with inefficient thermal performance and appliances in homes

2.7.1 Low indoor temperatures can have adverse consequences on residents

As Chart 2.4 shows, heating accounts for the largest share of running costs in the average Victorian home. Low-income renters and those who choose not to bear these heating costs are subject to the negative impacts of extreme indoor temperatures. These include adverse health, productivity, and social consequences. Cold indoor temperatures have been associated with increased respiratory illness and mortality, such as the exacerbation of asthma, as well as cardiovascular morbidity and increased blood pressure.⁹⁸ Colder houses are also more likely to be damp which can lead to the growth of mould, which in turn can cause respiratory symptoms.⁹⁹ In extreme situations, renters may be forced to adopt unconventional methods to warm themselves, such as staying in their car to get warm.¹⁰⁰

Poor thermal living conditions increase the risk of illness and falls.¹⁰¹ Deloitte Access Economics has conducted multiple disease burden studies that capture the cost to the economy of diseases such as asthma and chronic obstructive pulmonary

⁹³ Victorian Council of Social Service (2017), *Power Struggles – Everyday battles to stay connected*.

⁹⁴ The chart depicts the contribution of various household activities to the household's total energy costs. For instance, cooking refers to the gas or electricity consumed for the purposes for cooking by appliances such as stoves, ovens, and microwaves.

⁹⁵ Sustainability Victoria (2024), *Save energy in the home* <<https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home>>.

⁹⁶ The University of Sydney and Mallee Family Care (2019), *Extreme heat driven by the climate emergency: impacts on the health and wellbeing of public housing tenants in Mildura*.

⁹⁷ Better Renting (2023), *Sweaty and Stressed: Renting in an Australian summer*.

⁹⁸ World Health Organization (2018), *Housing and Health Guidelines, Chapter 4 - Indoor temperatures and insulation*.

⁹⁹ Howden-Chapman et al. (2005), *Retrofitting houses with insulation to reduce health inequalities: Aims and methods of a clustered, randomised community-based trial*, Social Science & Medicine.

¹⁰⁰ Daniel et al. (2020), *Warm cool and energy-affordable housing policy solutions for low-income renters*.

¹⁰¹ Better Health Victoria (2022), *Cold weather* <<https://www.betterhealth.vic.gov.au/health/HealthyLiving/Cold-weather>>.

disease, both of which can be triggered or exacerbated by cold or dry air from space heating or cooling.^{102,103} In addition to this, a study on hospital emergency admittance in Victoria found that 78 per cent of hypothermic presentations occurred indoors.¹⁰⁴ Such consequences can have a flow on effect, increasing absenteeism for both education and employment as well as increasing healthcare costs. Also impacted are mental exhaustion, mood changes and feelings of despair, which can all adversely influence the daily lives of renters.¹⁰⁵ Additionally, living in uncomfortable thermal conditions can increase social isolation if guests cannot be accommodated adequately.

Living in a cold home can also impact residents' mental health. One study showed that the risk of severe mental distress doubled in people who previously had no history of mental health problems, and tripled in those who did, when they were no longer able to afford to heat their home.¹⁰⁶ The study cited a number of pathways for this effect including stress from feeling cold, financial pressures from heating costs, and reduced feelings of autonomy and control over their environment.

2.7.2 Insufficient cooling in homes can lead to adverse health outcomes

The minimum standards introduced for rental properties in 2021 included a heating standard which mandated that an energy efficient heater be installed in the main living area. However, no similar standards for cooling were introduced. This is despite the fact that Victorian summers are characterised by often sweltering heat and high humidity levels. Insufficient thermal measures as described above compounded by insufficient cooling appliances, such as air-conditioners and fans, can make living conditions difficult for tenants in summer. One report found that rental homes in Victoria can face indoor temperatures higher than 25 degrees about 23 per cent of the time in summer.¹⁰⁷ Anecdotally, some renters have even resorted to sleeping outside their house during hot nights, which has negative implications for their wellbeing and safety.¹⁰⁸

Adequate cooling is not just important for comfort, it can have significant health consequences. High temperatures can pose serious health risks, particularly for vulnerable populations such as the elderly, pregnant women, young children, and individuals with pre-existing health conditions.¹⁰⁹ Heat-related illnesses, including heatstroke and dehydration, become prevalent during heatwaves. Renters with pre-existing medical conditions may incur further health impacts and financial costs as the efficacy of medication can be negatively affected through extreme heat.¹¹⁰ Heat can also exacerbate existing mental health conditions and result in increased fatigue, irritability and anxiety.¹¹¹ It can also lead to decreased cognitive function and productivity. One study found that students living in air-conditioned rooms during a heatwave demonstrated better memory, attention and thinking speeds than those in non-air-conditioned rooms.¹¹²

Adequate cooling therefore not only provides a refuge from these extreme conditions but also serves as a preventive measure, reducing the strain on healthcare resources and minimising the occurrence of heat-related health issues. Air-conditioning has been recognised as the number one protective factor against heat-related illness and death.¹¹³ Government advisory, including those provided by the Victorian Government, advise the use of air conditioning where available to prevent heat-related health problems.¹¹⁴ Extreme heat events are expected to increase in frequency and intensity over the coming decades,¹¹⁵ increasing the need for greater climate resilience of Victoria's building stock through ensuring measures like insulation and cooling are a standard feature of all rental accommodation.

¹⁰² Deloitte Access Economics (2015), *The Hidden Cost of Asthma*.

¹⁰³ Deloitte Access Economics (2008), *Economic Impact of COPD and Cost Effective Solutions*.

¹⁰⁴ Forcey D.S., FitzGerald M.P., Burggraf M.K., Nagalingam V., Ananda-Rajah M.R. (2020), 'Cold and lonely': emergency presentations of patients with hypothermia to a large Australian health network. *Intern Medicine Journal* 50(1):54-60. doi:10.1111/imj.14308.

¹⁰⁵ Daniel et al. (2020), *Warm cool and energy-affordable housing policy solutions for low-income renters*.

¹⁰⁶ Clair, A and Baker, E (2022), *Cold homes and mental health harm: Evidence from the UK Household Longitudinal Study*, *Social Science & Medicine*.

¹⁰⁷ Better Renting (2023), *Sweaty and Stressed: Renting in an Australian summer*.

¹⁰⁸ Daniel et al. (2020), *Warm cool and energy-affordable housing policy solutions for low-income renters*.

¹⁰⁹ Better Health Victoria (2023), *Heat-related health problems* <<https://www.betterhealth.vic.gov.au/health/healthyliving/heat-stress-and-heat-related-illness>>.

¹¹⁰ The University of Sydney and Mallee Family Care (2019), *Extreme heat driven by the climate emergency: impacts on the health and wellbeing of public housing tenants in Mildura, Victoria*.

¹¹¹ Shalchi, H (2023), *Excessive heat and its impact on mental health*.

¹¹² Goodall and Selvakumaran (2023), *Too many renters swelter through summer. Efficient cooling should be law for rental homes*.

¹¹³ Centre for Disease Control and Prevention (2016), *Keep your cool in hot weather*.

<<https://blogs.cdc.gov/yourhealthyenvironment/2016/06/21/keep-your-cool-in-hot-weather-5/>>.

¹¹⁴ Better Health Channel (2023), *How to cope and stay safe in extreme heat*.

<<https://www.betterhealth.vic.gov.au/health/healthyliving/how-to-cope-and-stay-safe-in-extreme-heat>>.

¹¹⁵ The Commonwealth Scientific and Industrial Research Organisation and the Australian Government Bureau of Meteorology (2020), *State of the Climate 2020*.

2.8 Adverse environmental impacts associated with inefficient thermal performance and appliances in homes

Energy efficiency is a high priority energy abatement strategy that can reduce greenhouse gas emissions and help meet the emission reduction targets of Victoria. Inefficient thermal performance in rental properties will hinder Victoria’s climate change ambitions when renters compensate the suboptimal heating with greater energy use, resulting in additional greenhouse gas emissions. Heating and cooling account for 47 per cent of a Victorian household’s energy usage.¹¹⁶ Hot water systems are the second largest users of household energy but are the largest source of greenhouse gas emissions from an average Australian household, accounting for up to 25 per cent of emissions¹¹⁷ and are therefore an important source of achieving emissions reduction. As most of the hot water used in the home is used in the shower,¹¹⁸ the efficiency of shower heads is an important consideration too.

2.9 Inefficient thermal performance and appliances in rooming houses

The rooming house minimum standards introduced in the 2023 Rooming House Regulations do not make provisions related to thermal performance or appliance efficiency in a rooming house. Inefficient thermal performance and appliances can impose adverse financial impacts (see section 2.6) and health risks on residents (see section 2.7). As discussed in section 2.3, rooming house residents are more likely to be vulnerable, low-income earners, experience complex health conditions and have fewer options for alternative accommodations than tenants in a rental property, it is imperative that rooming houses provide adequate living standards, such as efficient heating. Where communal appliances, such as heaters, are available, some rooming house residents have reported barriers to their use. This includes limited hours during which they are available, the cords to communal appliances being cut, prohibitions on use and intentionally limited power outlets in rooms to limit energy usage.¹¹⁹ Therefore, the inclusion of minimum standards which will provide some thermal performance and/or efficiency to rooming house residents is also an important consideration.

2.10 Blind cord safety in rental properties

There are also a number of safety issues present in rental properties. As discussed in section 2.5, there are split incentives in the rental provider and renter relationship, which also impacts on the provision of safe conditions in rental accommodation as rental providers who bear the costs do not receive the direct benefits. There are already a number of existing safety requirements mandated for rental providers to adhere to, such as those listed under Schedule 3 of the Residential Tenancies Regulations 2021, including electrical safety checks, gas checks, and smoke alarms and carbon monoxide alarm checks.

A recent Coroner’s report recommended that blind cord safety anchors should be mandated in all residential rental properties, following the loss of life at a residential rental property that did not have blind safety anchors installed.¹²⁰ The report outlined the danger untethered blind cords can pose, particularly to young children, where entanglement in the cord can result in injuries or loss of life. From 2010 to 2020, the Victorian Injury Surveillance Unit reported 26 presentations to Victorian emergency departments due to injuries from blind cords. Two accidents in Victoria in the past decade, and a further two nationally, resulted in the loss of life.¹²¹

The current regulatory framework in Victoria for the supply and installation of corded internal window coverings does not apply to all residential properties leaving a critical gap in the coverage of existing Australian mandatory safety standards.

Supply and installation requirements for curtains and blinds are currently prescribed in two separate mandatory standards:

- the Trade Practices (Consumer Product Safety Standard – Corded Internal Window Coverings) Regulations 2010 set out mandatory requirements for all corded internal window coverings supplied from 30 December 2010, including the provision of safety devices (cleats and cord guides) for attaching blind cords to fixtures, such as such as walls, as well as installation instructions for the safety devices
- the Competition and Consumer (Corded Internal Window Coverings) Safety Standard 2014 (Cth), prescribes an additional Australian mandatory safety standard for the installation of corded internal window coverings for all internal window coverings installed after 1 January 2015.

¹¹⁶ EnergyConsult (2021), *Residential Baseline Study for Australia and New Zealand 2000 – 2040*.

¹¹⁷ Department of Climate Change, Energy, the Environment and Water (2024), *Hot water systems*. <<https://www.energy.gov.au/households/hot-water-systems>>.

¹¹⁸ Sustainability Victoria (2023), *Reduce water heating costs at home*. <<https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home/water-heating>>.

¹¹⁹ Tenants Victoria (2023), *Submissions in response to the draft Residential Tenancies (Rooming House Standards) Regulations 2020*.

¹²⁰ Coroners’ Court of Victoria (2022). *Finding into Death Without Inquest: Master J (Coroner Gebert, 27 June 2022)*.

¹²¹ Ibid.

The 2010 mandatory standard for the supply, and the 2015 mandatory standard for the installation, of internal window coverings were introduced to prescribe an acceptable level of safety in response to the strangulation hazard that corded internal window coverings pose, such as blinds and curtains with loose, long and looped cords.

However, neither of the current mandatory standards apply retrospectively, meaning:

- any internal window coverings installed prior to 2010 may not have had safety devices included
- rental providers could have chosen to install safety devices supplied, but this was not a mandatory requirement before 2015.

This leaves a potentially significant number of Victorian residential properties which may have had internal window coverings installed before 2015 which did not secure blind cords to fixtures and that continue to present a safety risk. While renters are allowed to install blind cord anchors without seeking permission from the rental provider under section 64(1) of the *Residential Tenancies Act 1997* (unless the property is on the Victorian Heritage Register), there is no data available on the number of properties (rental or owner occupied) that currently have blind cord safety anchors installed.

2.11 Objectives

The parent legislation of the proposed regulations is the Residential Tenancies Act 1997 (the RTA). The RTA supports a residential tenancies sector where informed rental providers and renters enter into mutually beneficial rental agreements. The RTA's broad objectives are to facilitate:

- clarity and certainty as to the rights and responsibilities of rental providers and renters, rooming house operators and residents, caravan park owners, caravan owners and residents, and site owners and site renters
- the provision of appropriate security of tenure and safe habitable premises, and a regulatory framework that enables providers to receive a fair return for providing those premises
- the provision of an effective and efficient dispute resolution process, and ability to enforce rights
- a responsible approach to meeting of obligations.

The Government's objectives in making the Residential Tenancies Regulations 2021 were to:

- ensure that renters are provided with safe and habitable living arrangements
- enhance the functioning of the rental market by improving clarity and certainty of rights and responsibilities between rental providers and renters
- more generally, ensure that the regulated elements of residential tenancies reflect current community expectations.

Likewise, the Government's objectives in making the Residential Tenancies (Rooming House Standards) Regulations 2023 were to reduce:¹²²

- loss of life, injury and trauma caused by inadequate safety and security provisions in rooming houses
- detrimental effects on comfort and quality of life for residents of rooming houses caused by substandard living conditions.

Introducing minimum standards for ceiling insulation, draught sealing, hot water systems and shower heads, heating and cooling, and blind cords, along with heating standards in rooming houses will also seek to support the above Government objectives for the Residential Tenancies Regulations 2021 and Residential Tenancies (Rooming House Standards) Regulation 2023 through complementary and supportive measures to the existing regulations.

Specifically, the objectives of these reforms are to:

- improve renter health, wellbeing, safety and comfort
- reduce renter energy bills
- reduce greenhouse gas emissions, supporting the energy transition and decarbonisation of the rental sector.

¹²² Deloitte Access Economics (2022), *Residential Tenancies (Rooming House Standards) Regulations 2022 Regulatory Impact Statement*.

3 Options development and analysis methodology

This chapter outlines the approach to developing viable options to address the identified problem and objectives. This chapters also outlines the overarching methodology for analysing the impact of the identified options across all the proposed minimum standards.

As part of the RIS process, it is necessary to consider different options that could achieve the Victorian Government’s objectives. The *Subordinate Legislation Act 1994* requires a RIS to consider “other practicable means of achieving [the] objectives, including other regulatory as well as non-regulatory options.” This includes consideration of a range of approaches, including co-regulation and non-regulatory approaches, and those that reduce the burden imposed on businesses and/or the community.

3.1 Feasible options to achieve the objectives

There are several types of options available to achieve the objectives outlined in section 2.11. These include:

- regulation – mandating minimum standards for rental properties and rooming houses
- financial incentives – providing grants and subsidies for installation of energy saving and safety measures and appliances in rental properties and rooming houses
- information and educational campaigns – providing publicly available information to increase the standards of rental properties and rooming houses by reducing knowledge barriers
- support services – guidance and remediation for renters and rooming house residents in properties with inefficient and unsafe measures and appliances
- mandatory disclosures – require rental providers and rooming house operators to disclose the features and energy rating of the property when advertised.

3.2 Non-viable options

A number of the feasible options noted above are unlikely to meaningfully address the problem outlined in Chapter 2 in an efficient manner. This is largely due to the split incentives that exist (section 2.5), where rental providers and rooming house operators will incur costs to upgrade their properties, while the benefits will accrue to renters and rooming house residents.

3.2.1 Financial incentives for rental providers and rooming house operators

Financial incentives, such as Victorian Energy Upgrades (which are typically less than 100 per cent of costs) would reduce the financial burden to rental providers and rooming house operators of upgrading their properties, but this would not address the split incentive problem. Where a financial incentive might be offered at less than or equal to cost, a rental provider or rooming house operator will still need to cover the remaining cost of upgrades at their own expense for the renter or rooming house resident’s benefit. There is evidence in the literature that suggests that the uptake of energy efficiency upgrades is lower in areas with a greater proportion of rental properties.¹²³ Rental providers will often only engage with the incentive program if it makes them better off – that is, if they can recover from renters any costs incurred.¹²⁴ This is also likely to apply to rooming house operators. Even if a financial incentive scheme covers the full cost of installation, rental providers also have the logistical and administrative burden of organising the upgrades and may lose rental revenue if the property is uninhabitable while the upgrades are undertaken, and will likely be expected to maintain or replace installed appliances in the future, at their own cost. This would likely further decrease rental providers’ and rooming house operators’ propensity to upgrade their properties in response to financial incentives.

¹²³ Willand, N., Moore, T., Horne, R., & Robertson, S. (2020), *Retrofit Poverty: Socioeconomic Spatial Disparities in Retrofit Subsidies Uptake. Buildings and Cities*, 1(1), 14–35.

¹²⁴ Australian Housing and Urban Research Institute (2017) *The Impact of Energy Efficiency Standards in the Victorian Private Rental Market*.

3.2.2 Information and education campaigns

Information and education would allow renters to make more informed decisions about prospective properties, as well as help rental providers and rooming house operators to understand the potential benefits of upgrading their properties to provide housing which meets minimum standards. However, the prevalence of split incentives and strong competition in the rental property and rooming house market in Victoria means that additional information is unlikely to meaningfully increase the minimum standard of rental properties or rooming houses. Renters may have a limited capacity to persuade their rental providers to make upgrades to the property and may not be in a position to wait for a more suitable property due to the low availability of rental properties in Victoria.¹²⁵ Similarly, rooming houses are often a last resort accommodation option for their residents, and as such, the bargaining power of rooming house residents is often even more limited than in the rental market. Furthermore, renters may be unable to judge certain characteristics of a property, such as its insulation level and the efficiency of its hot water system, at the time of inspecting the property.

3.2.3 Support services for renters and rooming house residents

Support services could be implemented to help remediate situations where a rental property or rooming house is not sufficiently warm or safe. However, there must be an enforceable standard prescribed in regulations. There are similar services already available for both rental properties and rooming houses, but these are restricted to breaches under the RTA and existing minimum health and safety standards.^{126,127} The RTA prescribes penalties for rental providers if the rented premises do not meet the prescribed minimum standards. Similarly, the RTA prescribes penalties for rooming house operators if a rooming house does not comply with the prescribed safety, security, privacy and amenity standards. Additionally, these support services can come with high costs, rendering them inaccessible to a large portion of the renter and rooming house resident cohort which has a lower ability to pay.

3.2.4 Mandatory disclosure

The mandatory disclosure of a rental property or rooming house’s energy rating or features would improve the quality of information in the property market. Disclosure of energy performance information could potentially address information asymmetry for some renters or residents by providing information to assist renters to choose an appropriate property which meets their basic needs. It could also encourage rental providers and rooming house operators to improve their property to differentiate it from competitors and attract renters. However, while mandatory disclosure can achieve desirable outcomes and improve the problem, prescribing mandatory standards provides a clear approach which is more likely to achieve the minimum desired outcome.

Additionally, regulations to mandate disclosure of information are unlikely to address the problem in cases where lower-income households have limited choices about where they live, which is particularly the case for many rooming house residents. This is a result of the lack of affordable rental properties available (section 2.1) and the fact that energy efficiency may be a lower priority than other factors such as rent and location.

The Commonwealth Government is leading on the development of a National Disclosure Framework in collaboration with Australian States and Territories. Energy Ministers across Australia agreed to a draft in 2022,¹²⁸ with completion anticipated in 2024. When finalised, the framework will help inform future disclosure policy in Victoria.

3.3 Viable options

Given the reasons outlined in section 3.2, mandating minimum standards in the Residential Tenancies Regulations and Rooming House Regulations is considered to be the only viable approach to address the problems outlined in Chapter 2. As such, only options relating to the mandating of minimum standards have been assessed in this RIS. To address the problems described in Chapter 2, options for minimum rental standards relating to each of the following measures or appliances have been analysed:

- ceiling insulation
- draught sealing
- hot water systems and shower heads
- heating and cooling

¹²⁵ Realestate.com.au (2023), *Victorian rental crisis: Tenants warned of worse to come as vacancies slip below 8,000 available homes* <<https://www.realestate.com.au/news/victorian-rental-crisis-tenants-warned-of-worse-to-come-as-vacancies-slip-below-8000-available-homes>>.

¹²⁶ Tenants Victoria (2024), *Complaints about rental providers and agents*.

¹²⁷ Consumer Affairs Victoria (2021), *Report your rooming house concerns*.

¹²⁸ Department of Climate Change, Energy, the Environment and Water (2022), *Trajectory for Low Energy Buildings Update Statement and release of DRAFT National Disclosure Framework* <<https://www.energy.gov.au/energy-and-climate-change-ministerial-council/energy-ministers-publications/trajectory-low-energy-buildings-update-statement-and-release-draft-national-disclosure-framework>>.

- blind cord safety anchors.

Additionally, options for a minimum rooming house standard relating to heating have also been analysed.

3.4 Options design and exemptions

The options for the standards analysed in this RIS were designed by DEECA and DGS. The options for each proposed minimum standard are described in their relevant chapters, throughout Chapters 4 – 9. Supply chain considerations have been factored into the design of options, as well as the rationale for selection of preferred options for the heating and cooling standard in rental properties, and the heating standard in rooming houses.

Along with the proposed minimum standards, the Residential Tenancies Regulations and Rooming House Regulations will provide for a number of circumstances in which rental properties or rooming houses will be exempt from complying with a particular minimum standard. In particular, the design of the minimum standards has considered their application to Class 2 rental homes. Exemptions have been developed to address limitations for complying with standards specific to Class 2 buildings, such as where owners corporation rules prohibit compliance or where hot water systems service multiple dwellings. Exemptions for each minimum standard are outlined in their respective chapters.

If a rental provider considers that an exemption applies to their rental property, they should have evidence to this effect and let the renter know before they enter a rental agreement.

3.5 Overarching cost-benefit analysis methodology for minimum standards relating to energy efficiency

3.5.1 Cost-benefit analysis

A cost-benefit analysis (CBA) has been used to assess the proposed minimum standards in this RIS relating to:

- ceiling insulation
- draught sealing
- hot water systems and shower heads
- heating and cooling in rental properties
- heating in rooming houses.

CBA provides a robust, structured and transparent approach to balancing the different impacts, using modelled illustrations of the economic costs and benefits of different options to achieve a desired outcome. CBA calculates the incremental costs and benefits to society of an intervention relative to a comparative base case, through determining whether the additional benefits outweigh the additional costs, over the analysis period. There are two figures commonly used to interpret results from a CBA – the net present value (NPV) and the benefit cost ratio (BCR).

The NPV measures the benefits of an intervention (relative to the base case), minus (net) the costs of that intervention (also calculated relative to the base case). The NPV is expressed in present value dollar terms. A discount rate is applied in calculating the NPV to place less weight on future costs and benefits than present costs and benefits. Where the NPV is positive, the benefits of pursuing an intervention outweigh the costs.

The BCR considered the scale of benefits relative to costs, expressed as a ratio. A BCR of greater than 1 indicates the benefits of an intervention outweigh the costs incurred as a result of the intervention.

The NPV has been used as the leading decision making tool to guide DEECA and DGS selection of preferred options under each of the proposed minimum standards, where practical. In some instances, selection of the preferred option has also taken into consideration potential implementation risks (such as potential supply chain constraints under the heating and cooling standard for rental properties and the heating standard for rooming houses) or alignment with other relevant best practice (such as ceiling insulation installed in new builds to meet 7 Star energy efficiency requirements). Where selection of the preferred option has deviated from the highest NPV, the preferred option still provides a net benefit to society which is relatively on par with the NPV under other options.

While the BCR was also considered as a secondary metric, prioritisation was given to options which provide greater societal benefits, even if those options come at a higher cost. This approach provides greater alignment with Victorian Government objectives (section 2.11), particularly lowering energy bills for renters and reducing greenhouse gas emissions.

The overarching analysis methodology is outlined below, with further detail provided throughout Chapters 4 – 9, which provide the options and analysis for each of the proposed minimum standards. Appendix A provides a comprehensive list of data sources and assumptions used in the analysis.

3.5.2 Base case

For the analysis in this RIS, the overarching base case is a scenario in which the minimum standards already prescribed in the Residential Tenancies Regulations and the Rooming House Regulations continue to apply, but no new minimum standards are introduced. In this scenario, rental providers and rooming house operators continue to not be incentivised to implement these measures themselves.

Given the limited incentive for rental providers and rooming house operators to provide energy efficient properties and appliances, a key overarching and simplifying assumption made in the base case is that renters who are not provided with fixed cooling appliances, and rooming house residents who are not provided with heating or cooling appliances, purchase and utilise portable coolers and heaters. This assumption enables the simplification of analysis based on the available data and allows for comparison between options as renters continue to receive a consistent level of thermal comfort under all options.

It is also assumed that under the base case, the proportion of appliances, including the share of electric and gas appliances, will remain constant as all appliances will be replaced on a like for like basis (i.e., there is no assumed voluntary uptake/switching to higher energy efficient appliances). Similarly, there is no assumed voluntary installation of ceiling insulation or draught sealing measures. This is considered to be a conservative, yet reasonable assumption, given the split incentives problem described in section 2.5.

3.5.3 Analysis period

The proposed minimum standards considered in this RIS would amend both the Residential Tenancies Regulations and the Rooming House Regulations.

The Residential Tenancies Regulations came into effect in 2021 and are due to sunset in 2031. With the new minimum standards being proposed to be introduced in 2024, the Residential Tenancies Regulations will be in effect for approximately a remaining 7 years at the time of amendment. Therefore, the costs of the proposed minimum standards which relate to rental properties have been analysed over an analysis period of 7 years – the remaining lifetime of the Residential Tenancies Regulations, from 2024 to 2030, inclusive.

The recently remade Rooming House Regulations came into effect in 2023 and are due to sunset in 2033. With the new minimum standards being proposed to be introduced in 2024, the Rooming House Regulations will be in effect for approximately a remaining 9 years at the time of amendment. Therefore, the impacts of the proposed minimum standards which relate to rooming houses have been analysed over an analysis period of 9 years – the remaining lifetime of the Rooming House Regulations.

It is important to note that costs captured in the analysis reflect the one-off costs to rental providers and rooming house operators of complying with the proposed minimum standards. Additionally, no costs and benefits will be incurred in the first year of the proposed standards being introduced, as compliance with the new standards will be required from 2025, one year after the regulations are amended.

Given the ongoing benefits associated with the expected reduction in energy usage as a result of the proposed minimum standards (such as reduced energy costs, greenhouse gas emissions and air pollution) the impacts of the proposed minimum standards are also presented over the lifetime of the appliances/measures. This provides a more accurate representation of the entire flow of benefits from all appliances or measures installed during the remaining life of both Regulations. The benefits derived from appliances/ measures installed within the lifetime of the relevant regulations cease in the respected year when the appliance is assumed to reach the end of its useful life. For example, as 2030 is the last year of the Residential Tenancies Regulations, the analysis period for each minimum standard for rentals extends until 2030 plus the assumed useful life of the measure or appliance installed under the relevant standard.

3.5.4 Compliance rate

There is limited data available on compliance rates with minimum rental standards. One recent survey of 100 rental properties in Victoria found a compliance rate of 85 per cent with the current minimum standard for heating in rental properties.¹²⁹ Compliance with a broader range of minimum rental standards was found to be 95 per cent on average.

A compliance rate of 100 per cent has been assumed in the analysis in this RIS. An assumption of 100 per cent compliance provides a conservative estimate at the upper end of feasible costs which the proposed minimum standards may impose. Actual costs and benefits resulting from the proposed minimum standards will likely be lower than the estimates provided in this RIS, despite strong penalties for non-compliance. In the event the compliance rate is lower than 100 per cent, the total

¹²⁹ Consumer Policy Research Centre and Tenants Victoria, (2023), *Is it liveable? A mystery shop of private rental properties*. <https://cprc.org.au/wp-content/uploads/2024/02/CPRC_Is-it-livable-Rental-Report_Digital.pdf>.

cost, and magnitude of benefits, would scale linearly with the actual compliance rate given a relatively constant per upgrade benefit-cost ratio for each improvement in the modelling. For example, a 70 per cent compliance rate across all the proposed minimum standards would mean that both the costs and benefits would be approximately 30 per cent lower than the estimates in this RIS.

3.5.5 Stock of rental properties and rooming houses

For each of the standards analysed through a CBA, the current stock of rental properties and rooming houses, as well as projected stock over the analysis period, were first determined. For rental properties, the number of rental dwellings were taken from the ABS Census 2021 and updated for latest growth figures. Historic average growth was also used to estimate the growth in rentals over the analysis period. For rooming houses, the current stock of rooming houses was taken from the Rooming House Register and projected over the analysis period using the average annual historic growth rate.

3.5.6 Proportion of rental properties or rooming houses required to meet the proposed standards in each year

The number of rental properties or rooming houses which would need to meet the standard in each year of the analysis period was then determined, based upon the point at which properties will need to comply with the standard and the prevalence of the various energy efficiency measures and appliances within the current housing stock.

Across the proposed minimum standards, the ‘trigger points’ for compliance considered include:

- a specified point in time
- the point at which a new rental agreement commences¹³⁰
- at the end of an existing appliance’s life.

Where properties will need to comply with a minimum standard when a new lease is entered into, annual turnover in rental leases was based upon data on bond return requests from the Department of Families Fairness and Housing’s quarterly rental reports.¹³¹ Where properties will need to install appliances which meet the minimum standard at the end of life of an existing appliance, assumptions were made on the life expectancy of relevant appliances (such as heaters, hot water systems and reverse-cycle air conditioners). The trigger points for each of the proposed standards are described in detail throughout Chapters 4 – 9.

A number of sources and assumptions were used to determine the prevalence of the relevant energy efficiency measures and appliances in the current housing stock. These sources and assumptions are detailed in Appendix A.

3.5.7 Approach to estimating costs

Following determination of the impacted stock of rental properties or rooming houses in each year of the analysis period, the impact of the proposed minimum standards was calculated, based upon the expected and quantifiable costs and benefits that may result from the amendments. Overarching expected costs estimated in the analysis for each proposed standard include:

- costs associated with the purchase and installation of required measures or appliances
- costs associated with decommissioning of gas appliances, including capping of gas lines and switchboard upgrades
- costs associated with the administrative time spent by rental providers to obtain quotes and undertake logistical arrangements for the purchase and installation of required measures or appliances.

The costs associated with the purchase and installation of required measures or appliances under each standard are described in detail throughout Chapters 4 – 9.

3.5.7.1 Administrative costs

Administrative costs associated with time spent by rental providers to understand obligations, obtain quotes and undertake logistical arrangements for the purchase and installation of required measures or appliances under each standard was included in the analysis.

For standards where new appliances are likely to be replacing existing appliances that would have been eventually replaced in the base case, an assumption of one hour of administrative time has been applied to account for time taken for a rental provider to understand their obligations to meet the minimum standard. This assumption has been applied to hot water systems, shower heads and heating and cooling in rental properties.

¹³⁰ In line with the current minimum standards in the Residential Tenancies Regulations, rolling over to a periodic agreement on or after the date at which compliance with the additional proposed minimum standards is required will be considered starting a new rental agreement, even if occupancy began before that date.

¹³¹ Department of Families, Fairness and Housing, *Past Rental Reports*, <<https://www.dffh.vic.gov.au/publications/past-rental-reports>>.

While the minimum standard relating to draught sealing is also a new requirement, one hour of administrative time is also assumed for this standard given the logistical arrangements are assumed to be relatively straightforward.

Where new obligations are introduced, i.e. for ceiling insulation and heating in rooming houses, the administrative time has been assumed to be three hours to account for more complexity in making arrangements to install new measures/appliances.

The time required was multiplied by the average value of leisure time in Australia, based upon average weekly earnings, valued at \$36 per hour.¹³²

3.5.8 Approach to estimating benefits

The proposed minimum standards assessed by CBA in this RIS relate to the introduction of standards which will increase the energy efficiency and safety of rental properties, and energy efficiency of rooming houses. This increased energy efficiency will manifest in reduced energy usage by renters and rooming house residents, and consequentially, reductions in greenhouse gas emissions and air pollution from electricity generation.¹³³ Therefore, the overarching expected benefits estimated in the analysis for each proposed standard include reduced/avoided:

- energy expenditure
- greenhouse gas emissions
- health costs of air pollution associated with electricity generation and use of gas appliances
- reduced healthcare costs to society from increased thermal comfort for ceiling insulation and draught sealing activities.

3.5.8.1 Reduced energy expenditure

Savings on energy expenditure were calculated based on the estimated reduction in energy usage under each option for each standard. Reduction in energy usage was first determined for each option under each standard, due to either greater thermal performance of rental properties (associated with ceiling insulation or draught sealing measures) or the use of more energy efficient appliances (such as hot water systems, heaters and coolers). Once determined, reductions in energy usage were converted to monetary units, by applying dollar per kilowatt hour (kWh) electricity retail costs or dollar per megajoule (MJ) gas retail costs.

Forecast energy costs used in the analysis for this RIS were provided by DEECA. Forecast retail gas price projections are based upon wholesale gas prices from AEMO's Inputs, Assumptions and Scenarios Report step change scenario (2023). Due to changing wholesale gas market conditions, there is significant uncertainty around the future of gas prices in Victoria. While AEMO current forecasts suggest a relatively stable gas price, AEMO also acknowledges there is significant uncertainty and their 2024 Gas Statement of Opportunities forecasts supply constraint in the future. The stable gas price assumption used in the core analysis means results are conservative in informing decision making. In a scenario where gas prices do increase in the future, the benefits calculated in this analysis will increase. This scenario is tested in sensitivity analysis in section 10.5.1.

Electricity retail prices are based upon wholesale prices calculated by Endgame Economics (2024), with AEMO's draft ISP Step Change model (2024) used as a direct basis and current market bidding behaviour overlaid.

Under the core assumption, real gas prices decrease by 8 per cent to 2032, before returning to 2025 levels by 2050, while real electricity prices have an initial 11 per cent decrease to 2030 before increasing by to 16 per cent above 2025 levels in the mid 2040's and ending at 7 per cent higher by 2050.

3.5.8.2 Reduced greenhouse gas emissions

Estimation of the monetary value of avoided greenhouse gas emissions under each option for each standard were also determined based on the estimated reductions in energy usage. Energy usage was converted from kWh and MJ into tonnes of greenhouse gas emissions, by applying emissions intensity factors provided by DEECA. These emissions intensity factors for electricity scale down over time to account for the decrease in the emissions intensity of the energy grid as Victoria decarbonises to reach a target of net zero emissions by 2045. Carbon amounts were converted to monetary units by applying dollar per tonne values of carbon. Carbon values were provided by DEECA, and based upon targets-based carbon values in the IPCC Sixth Assessment Report which would provide a likely chance of limiting global temperatures to below 2°C

¹³² The Office of Impact Analysis (2023), *Regulatory Burden Measurement Framework*, <<https://oia.pmc.gov.au/sites/default/files/2023-09/regulatory-burden-measurement-framework.pdf>>.

¹³³ While some of the proposed minimum standards will induce the provision of appliances, such as heaters and coolers, where none were previously required to be provided by rental providers or rooming house operators, the simplifying assumption in the base case, which assumes that all renters or rooming house residents would use an inefficient portable heater and/or cooler in the absence of being provided such appliance, means that all the proposed standards will lead to a reduction in energy usage compared to the base case.

above pre-industrial levels, which is consistent with the Victorian Government’s net zero emissions by 2045 target. The carbon values increase over time to account for the increased damage imposed by additional greenhouse gas emissions.

3.5.8.3 Reduced healthcare costs associated with air pollution with electricity generation and use of gas appliances

Estimation of the monetary value of avoided health costs from air pollution related to electricity generation was also determined based on the estimated reductions in energy usage. The energy usage in kWh and MJ was converted to megawatt-hours (MWh) and adjusted to account for the proportion of electricity generation sources that are from coal and from gas, respectively. The mix of electricity generation sources were provided by DEECA, and adjusted over time to account for a greater proportion of renewable energy generation in the future as the grid decarbonises. Energy usage amounts were converted to monetary values by applying a dollar per MWh which represents the health costs associated with air pollution that arise from electricity generation.

A value of \$15.88 per MWh was applied to coal fired electricity generation. This value is based upon research by Ward & Power (2015) which adapted modelling on air pollution in the United States to the Victorian context based upon similarities in stack heights and population densities. There is limited Victorian specific data on the health damages from electricity generation, and while more recent research has been undertaken since 2015 (such as Mazaheri et al. (2021) which looked at similar damage costs in NSW), given air pollution costs are highly location specific, the Ward & Power value has been selected for this analysis as it is considered more appropriate.

A similar value of \$1.05 per MWh has been applied to gas-fired electricity generation, based on estimates from the Australian Academy of Technological Sciences and Engineering (ATSE) report on the Hidden Costs of Electricity Generation.¹³⁴ As evidence suggests that there are health benefits also associated with reducing gas use in a home,¹³⁵ the ATSE value of \$1.05 per MWh has also been applied to energy usage from gas to account for the benefit from the reduction of direct combustion of gas at the appliance.

3.5.8.4 Reduced healthcare costs resulting from increased thermal comfort

Health benefits associated with increased thermal comfort in this analysis have been estimated for the proposed minimum standards relating to ceiling insulation and draught sealing, by drawing on the outcomes of the Victorian Healthy Homes Program¹³⁶ and New Zealand’s Warm Up New Zealand: Heat Smart program.¹³⁷ These studies estimate health benefits through avoided healthcare costs resulting from an increase in thermal comfort.

A core assumption applied in this RIS when estimating the energy saved under the proposed minimum standards relating to ceiling insulation and draught sealing is that households consume the required amount of energy to maintain a comfortable level of thermal temperature. To account for cases where renters are unable to heat their homes to a sufficient level, regardless of the amount of energy used, the analysis for these minimum standards assumes 10 per cent of rental properties will receive thermal comfort benefits *in addition* to other benefits, such as reduced energy expenditure and avoided greenhouse gas emissions. This assumption is considered conservative because at least some households in rental properties affected by the proposed minimum standards are likely to be able to heat their home but not to a level to sufficiently avoid any negative health effects.

The Victorian Healthy Homes Program was a randomised controlled trial designed to measure the impact of an energy efficiency and thermal comfort home upgrade on temperature, energy use, health and quality of life. A number of upgrade works were undertaken, predominately for older and low-income Victorians. The upgrade works included measures such as underfloor insulation, ceiling insulation, draught proofing, LED lights, curtains and blinds, split system service, new split systems, gas heater service, new gas heaters, and carbon monoxide testing. The total benefits received across all households were estimated to be \$887 per person over the 3-month winter period.

To estimate the health benefits of installing ceiling insulation in Victorian rental properties the following steps were taken in the analysis:

¹³⁴ Australian Technological Sciences and Engineering (ATSE) (2009), *The Hidden Costs of Electricity: Externalities of Power Generation in Australia* <<https://www.atse.org.au/wp-content/uploads/2019/01/the-hidden-costs-of-electricity.pdf>>.

¹³⁵ Bambrick, H., Charlesworth, K., Bradshaw, S., & Baxter, S. (2021) *Kicking the gas habit: How gas is harming our health*. Canberra: Climate Council.

¹³⁶ Sustainability Victoria (2022), *The Victorian Healthy Homes Program: Research Findings*, <<https://assets.sustainability.vic.gov.au/susvic/Report-Energy-Victorian-Healthy-Homes-program-research.pdf>>.

¹³⁷ Grimes, Denne, Howden-Chapman, Arnold, Telfar-Barnard, Preval, and Young (2012) *Cost Benefit Analysis of the Warm Up New Zealand: Heat Smart Programme*, <https://www.healthyhousing.org.nz/sites/default/files/2021-12/NZIF_CBA_report-Final-Revised-0612_1.pdf>.

- assume 50 per cent of the benefits can be attributed to ceiling insulation. This is considered to be a realistic assumption as previous studies where similar efficiency measures have been installed show that most of the health benefits are driven by ceiling insulation improvements¹³⁸
- to account for the Victorian Healthy Homes Program’s focus on low-income earners and older Victorians, it was assumed that middle and high income earners accrue 39.34 per cent of the benefits found for low-income earners. This benefit ratio was calculated by the ratio between the benefits received by community service card holders and those without community service cards when installing ceiling insulation, as found in the Heat Smart program in New Zealand¹³⁹
- this is then multiplied by the average number of 2.5 people per household in Australia¹⁴⁰ and applied across the rental cohort assumed to receive health benefits (10 per cent).

To attribute these benefits across the different policy options, an assumption was made in the analysis for this RIS that the health benefits outlined above occur when a household moves from no ceiling insulation to R3.5. For other ceiling insulation options (R4.0 or R5.0) and draught sealing measures, the health benefits are estimated proportionally based on the relative energy savings achieved compared to those attained under R3.5. This approach uses energy saved as a proxy measure for the effectiveness of the ceiling insulation/draught sealing measure’s impact on thermal comfort.

3.5.8.5 Rebound effect

The rebound effect occurs when improvements in the thermal performance of a property that reduces spending on energy, results in increased consumption of energy elsewhere (of either the same good or of other goods and services). When analysing policy to raise the thermal performance of rental homes the rebound effect should be considered. The rebound effect can explain why the expected reduction in energy consumption due to efficiency gains from the proposed minimum standards relating to ceiling insulation and draught sealing, may not equal the actual reduction in energy consumption after the minimum standards have been introduced, because although current energy usage rates will become more efficient, the accompanying lower energy costs may actually result in households increasing energy consumption.

There is limited Australian data on post occupancy surveys that would allow accurate estimations of a rebound effect. However, research that does exist suggests the rebound effect could be within the range of 0-30 per cent.^{141,142} Accordingly, a rebound effect of 25 per cent has been applied to each of the economy wide benefits attributable to energy savings from the proposed minimum standards, namely the:

- reduction in greenhouse gas emissions
- health benefits from the reduction in air pollution.

As the Victorian Healthy Homes Program found no evidence of a rebound effect for Victorians who received energy efficiency upgrades, the chosen rebound effect of 25 per cent ensures that estimates of these benefits are conservative. The rebound effect was not applied to the energy bill savings accrued to individual households because regardless of how renters use the money saved because of the policy, they still derive new and additional value from those savings.

3.6 Breakeven analysis methodology for minimum standard relating to blind cord safety anchors

Given the difficulty in providing an exact quantification of the benefit that the mandated installation of blind cord safety anchors may provide, a breakeven analysis has been used to assess the impacts of this proposed minimum standard for the Residential Tenancies Regulations.¹⁴³

A breakeven analysis is used to determine the point at which the anticipated benefits resulting from a proposed intervention will equal the associated costs of the intervention. This analysis allows decision makers to understand the minimum level of effectiveness required for the intervention to be considered worthwhile or beneficial and requires decision makers to consider whether this minimum benefit is likely to eventuate.

Similarly to the analysis methodology for other proposed minimum standards assessed through CBA, the breakeven analysis for the proposed blind cord safety anchor minimum standard required the determination of the stock of rental properties

¹³⁸ Grimes, Denne, Howden-Chapman, Arnold, Telfar-Barnard, Preval, and Young (2012) *Cost Benefit Analysis of the Warm Up New Zealand: Heat Smart Programme*, <https://www.healthyhousing.org.nz/sites/default/files/2021-12/NZIF_CBA_report-Final-Revised-0612_1.pdf>.

¹³⁹ Ibid.

¹⁴⁰ Agarwal, Bishop, and Day (2023), *A new measure of average household size*, Reserve Bank of Australia, <<https://www.rba.gov.au/publications/bulletin/2023/mar/a-new-measure-of-average-household-size.html>>.

¹⁴¹ Azevedo, I (2014), *Consumer end-use energy efficiency and rebound effects*, Annual Review of Environment and Resources (39).

¹⁴² Energy Efficient Strategies (2011), *The value of Ceiling Insulation (Report commissioned by Insulation Council of Australia and New Zealand)*.

¹⁴³ An equivalent standard was recently introduced in the Residential Tenancies (Rooming House Standards) Regulations 2023.

that will require the installation of blind cord safety anchors on all corded internal window coverings, and the consequential number and cost of blind cord safety anchor installations. The value of a statistical life is used to determine whether the costs are expected to breakeven, given the potential for blind cord safety anchors to prevent loss of life.

4 Ceiling insulation

This chapter describes the policy options and parameters relating to the proposed introduction of minimum standards for ceiling insulation in rental properties and analyses the impacts of the options.

4.1 Options — Ceiling insulation

A number of options have been considered to inform the design of a minimum standard for ceiling insulation in rental properties. These options, as well as the base case, are described below.

4.1.1 Base Case – Ceiling insulation

Under the base case, there would continue to be no requirement for rental providers to ensure their property has ceiling insulation, and rental providers have limited incentive to implement these measures themselves. It is assumed under the base case that properties maintain a consistent level of thermal comfort by using various heating and cooling appliances. The amount of energy consumed in the base case depends on the level of existing ceiling insulation estimated in Energy Efficient Strategies (EES) Housing Stock Model (HSM) designed for DEECA in 2019.

4.1.2 Options – Ceiling insulation

This RIS has analysed three options relating to mandating the minimum level of ceiling insulation that must be installed, in terms of the ‘R-value’. This analysis focuses on the R-Value of the insulation batt, distinguishing it from the overall combined R-Value of the entire roof space as used in NCC, which falls outside the scope of this analysis. The R-value of bulk insulation products, such as batts, measures the insulation’s thermal resistance. Typically, R-values are determined based on the thickness and the thermal properties of the material used to create the insulation batt. A higher R-value indicates that the insulation batt has greater resistance to heat transfer, providing a greater level of insulation for the property and greater subsequent energy savings. Ceiling insulation batts are typically sold in R-value increments of R0.5 or R1.0 and typically range from R2.5 to high performance batts of R7.0 and above.

When constructing homes to the previous 6 Star energy rating under NatHERS requirements, ceiling insulation of R4.0 was the most commonly installed insulation level. The options for analysis in this RIS have been selected testing R4.0 as a midpoint, with the next insulation increment either side of this level, R3.5 and R5.0, also tested under the options.

The following options for minimum R-values of ceiling insulation have been analysed:

- **Option 1** – R3.5
- **Option 2** – R4.0
- **Option 3** – R5.0

The appropriate level of insulation depends on the climate zone in which a property is located, with higher R-values recommended for colder climates.¹⁴⁴ However, it is DEECA’s policy preference that a single minimum standard for insulation apply across all rental properties. This will avoid the introduction of more than one minimum standard across the state, allowing for ease of implementation and communication.

4.1.2.1 Sub-options — Application of the standard

The analysis in this RIS has also considered impacts for different cohorts of properties which may be subject to the minimum standards for ceiling insulation, specifically whether only properties with no insulation should be required to meet the minimum standard or whether properties with low insulation, of R1.5 or less should also be required to upgrade to meet the standard. Properties with existing insulation of R1.5 or less will only be required to ‘top-up’ existing insulation by adding new insulation of a sufficient R-value that would bring the total insulation to the minimum specified level. This is distinct from having to remove existing insulation and re-installing new insulation. For these properties costs are expected to be reduced substantially.

¹⁴⁴ Sustainability Victoria (2024), *Home ceiling insulation* <<https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/building-or-renovating/key-principles-of-energy-efficient-design/planning-and-design/insulation/ceiling>>.

The two following sub-options of properties to which the standard could apply have also been analysed:

- **Sub-option A** – Rental homes with no ceiling insulation (R0)
- **Sub-option B** – Rental homes with no ceiling insulation (R0) and rental homes with low levels of ceiling insulation (R1.5 or less).

4.2 Policy parameters — Ceiling insulation

There are a number of policy parameters that have been established in designing the minimum standard for ceiling insulation in rental properties. These parameters apply to all options analysed in the CBA for the ceiling insulation minimum standard and are summarised in Table 4.1 overleaf.

Table 4.1: Policy parameters for minimum standard relating to ceiling insulation

Parameter	Setting	Rationale
Exemptions	<p>Rental properties will be exempt from complying with the proposed ceiling insulation standard where:</p> <ul style="list-style-type: none"> the cost of installation would be significantly higher than the average cost of installation in the same building class there are greater than normal health or safety risks for installation owners corporation rules prohibit installation or owners corporation has responsibility for the roof cavity and the rental provider does not own the roof space ceiling insulation cannot be installed without substantial building work or causing substantial damage to the premises permit to alter the premises has been refused under the <i>Heritage Act 2017</i> it is otherwise not reasonably practicable to install insulation. 	<p>Coordination problems associated with insulating roof spaces in common property are anticipated to make installing insulation in the majority of Class 2 rental property’s roof space impractical. However, rental providers are expected to work with their respective owners corporation and other relevant bodies to seek permission to make changes to comply with the standards wherever possible.</p> <p>In some instances, installation of ceiling insulation may not be practical due to site-specific risk factors such as:</p> <ul style="list-style-type: none"> restricted access to roof space roof design (for e.g. metal deck/skillion roof, cathedral roof design) insufficient void space to install insulation structural issues presence of hazardous materials such as asbestos or unsafe wiring. <p>Skillion roofs, very low-pitched roofs and roof cavities that cannot be accessed without removing the ceiling lining or roofing material are exempt.</p> <p>Where other legislation or regulation may apply, such as the Owners Corporations Regulations 2018 or the <i>Heritage Act 2017</i>, exemptions will apply to avoid conflict.</p>
Trigger	<p>Compliance with the standard will be required at the time of a new lease being entered into.</p>	<p>Ceiling insulation can be installed in a rental property as it transitions to new renters within a reasonable timeframe.</p>
Installation requirements	<p>Installation will be required to be undertaken by a suitably qualified professional, such as a Certified Insulation Installer. Installation will be required in compliance with AS3999, “Bulk thermal insulation-Installation”.</p> <p>Ceiling insulation products must satisfy AS/NZS 4859.1: “Thermal insulation materials for buildings – Part 1: General criteria and technical provisions”, AS1530.1: “Methods for fire tests on building materials, components and structures – Part 1: Combustibility test for materials” and AS/NZS1530.3: “Methods for fire tests on building materials, components and structures – Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release.”</p>	<p>Stakeholders, including the insulation industry, suggested that professional installation could improve the overall effectiveness of ceiling insulation as professional installation is more likely to achieve product consistency and higher instances of compliance with manufacturer guidelines. Suitably qualified professionals are also more likely to be equipped to manage risks associated with installing insulation, including hazardous materials, electrical safety and restricted spaces, than an unqualified person.</p>

Ceiling insulation products cannot be a foil or foil-faced bulk insulation product that has a reflective metallic surface laminated onto paper, plastic or bulk insulation material and is able to conduct electricity.

The Energy Efficiency Council is offering certification for trained insulation installers, and has recommended government require the use of trained and accredited installers for government-supported insulation installations as part of its Insulation Roadmap.¹⁴⁵

Insulation products that are compliant with relevant Australian and New Zealand Standards will provide assurance for quality and performance of the product as well as assurance that the product is safe to install. This also aligns with a recommendation in the industry-led Insulation Roadmap.

Foil or foil-faced bulk insulation products will not be permitted due to the increased safety risks to installers from electrocution compared with other bulk insulation products, as per recommendations from the Royal Commission into the Home Insulation Program.¹⁴⁶

Pre-installation inspections A *Pre-insulation installation electrical safety checklist* must be completed by a licensed electrician prior to insulation installation commencing.

Installation of ceiling insulation can pose risks for both those installing it and the residents of the property. Ceiling voids can contain a range of significant hazards including unsafe electrical wiring, hazardous substances, such as asbestos, or structural issues. A pre-insulation installation electrical safety checklist undertaken by a licensed electrician prior will reduce these risks.

In the event the pre-installation checklist identifies anything faulty or unsafe, rental providers will be required to rectify these issues prior to the installation of ceiling insulation.¹⁴⁷

¹⁴⁵ Energy Efficiency Council (2021), *Industry-led roadmap for quality control and safety in insulation installation*.

¹⁴⁶ Hanger AM QC (2014), *Report of the Royal Commission into the Home Insulation Program*, <https://parlinfo.aph.gov.au/parlInfo/download/publications/abledpapers/adfaac79-2e7c-496f-872c-a7e275c1843b/upload_pdf/ReportoftheRoyalCommissionintotheHomeInsulationProgram.pdf;fileType=application%2Fpdf#search=%22publications/abledpapers/adfaac79-2e7c-496f-872c-a7e275c1843b%22>.

¹⁴⁷ Costs associated with rectification works have not been included in the analysis due to insufficient reliable data available to estimate the number of houses requiring rectification works, or the estimated costs associated with those works.

4.2.1.2 Application of the ceiling insulation minimum standards to Class 2 buildings

In line with the current Residential Tenancies Regulations and the exemptions outlined above in Table 4.1, it will be considered unreasonable for rental providers to install insulation where owners corporation rules prohibit installation. As roof cavities are typically considered common property, Class 2 rental properties (domestic apartment buildings) will largely be exempt from complying with the minimum standard and so have been excluded from the modelling.

Where rental properties in Class 2 buildings do not meet the exemption thresholds, they will be required to meet the minimum standards for ceiling insulation. For example, in some cases, single storey attached dwellings where there is common space below (e.g. two dwellings above a common basement or carpark) are considered Class 2 buildings. In these circumstances it is more likely a rental provider may have ownership of their roof cavity, and so would be required to adhere to the minimum standards for ceiling insulation. Under these circumstances, the modelled costs and benefits would proportionately increase with the additional number of rental properties the minimum standard would apply to.

4.3 Options analysis – Ceiling insulation

4.3.1 Methodology – Ceiling insulation

To estimate the number of properties that are impacted by the different policy options, the analysis followed the overarching methodology outlined in section 3.5. The number of properties incurring costs were estimated by using the turnover of properties needing ceiling insulation installations or upgrades to meet the standard. Comparatively, the total number of properties turned over each year provided the rolling stock of properties that would experience the benefits of ceiling insulation.

As the Residential Tenancies Regulations are due to sunset in 2031, all updates to properties beyond 2030 are outside the scope of this analysis. Therefore, no costs incurred beyond 2030 are included in the analysis. However, the model assumes that the benefits of ceiling insulation persist beyond the lifetime of the regulations, leading to continued advantages for properties that underwent these upgrades. Based on a lower bound assumption of a 25-year effective lifetime for ceiling insulation and input data limited to 2050, the analysis period for ceiling insulation is 26 years, between 2024 and 2050.

4.3.1.1 Approach to estimating costs

Three main cost streams are included in the analysis, including material, labour and the time cost to obtain a quote. Several key parameters underpin the cost estimations for the ceiling insulation minimum standard and are detailed below.

Materials

The cost of materials was estimated through the per square metre cost of insulation batts with different thermal resistance levels (R-value). The per square metre costs were estimated using the retail prices sourced from Bunnings and then reduced by 10 per cent to account for the discount professional tradespeople receive.¹⁴⁸

To estimate the level of ceiling insulation required under each property, two assumptions underpinned the analysis. The first assumption was the level of insulation already installed and the square metre size of each property. The HSM provided an estimate of these values for each LGA in Victoria. The analysis then used the average for properties in each climate zone (hot, moderate and cold).

The total cost of materials was calculated by multiplying the size of the property (in square metres) with the per square metre cost of the insulation batt that would bring the house up to the standard required by the option. Where a property had existing insulation, that insulation was assumed to be evenly distributed across the property and require a top up of insulation at the R-value corresponding to the difference between the required insulation level and the existing insulation.

Installation and electrical assessment

The costs associated with installing ceiling insulation were estimated on an hourly basis. Assumptions on the time and required labour in the analysis are based upon a process map designed by SACS Consulting (2022) for DEECA of a typical insulation installation process. This process map included a number of steps and mapped the roles and time required to conduct each step. Two of the steps identified by SACS Consulting, and the associated costs and labour requirements, were included in the costing as they will be prescribed in the proposed minimum standard:

- pre-installation electrical safety assessment
- installation (including, pre-installation safety and preparation).

¹⁴⁸ Bunnings (2023), Earthwool R4.0 195 x 430 x 1160mm 7.5m² Insulation Ceiling Batt - 15 Pack - 195 x 430 x 1160, <https://www.bunnings.com.au/earthwool-r4-0-195-x-430-x-1160mm-7-5m-insulation-ceiling-batt-15-pack-195-x-430-x-1160_p0300790, accessed 19 December 2023.

Additionally, while a site assessment prior to installation of ceiling insulation will not be prescribed in the proposed minimum standard, costs associated with time for a site assessment and quote were also included in the analysis, as it is considered a reasonable assumption that this is a standard practice step that would be taken by most rental providers.

The analysis assumes:

- a pre-installation electrical safety assessment, required to be undertaken by a licensed electrician, would take two hours to complete. The cost of an electrician was assumed in the analysis to include a \$105 call out fee and an hourly rate of \$90¹⁴⁹
- a site assessment and works preparation would take three hours, and this would be performed by a suitably qualified insulation installer at an hourly cost of \$65
- installation of ceiling insulation would take up to three hours and require a team of three people. This was similarly included in the analysis using the hourly cost of a suitably qualified insulation installer of \$65.

These hourly costs were aggregated into a per property cost and multiplied by the number of rental properties requiring ceiling insulation under each option.

Time dedicated to obtaining quotes

Consistent with the overarching methodology, it was assumed that the time taken by a rental provider to identify appropriate installers, have them inspect the property to determine the workload and arrange a quote is 3 hours, across all options. This was then multiplied by the cost of leisure \$36 per hour, as applied elsewhere in the model.

4.3.1.2 Approach to estimating benefits

Four benefits streams are included in the analysis. These are: energy savings (gas and electricity), health benefits from reduced air pollution, and greenhouse gas (GHG) abatement, and avoided healthcare costs to society as a result of increased thermal comfort. This analysis assumes that insulation maintains its effectiveness throughout the entire 26-year analysis period (i.e. no degradation) and energy savings levels remain constant (despite potential decreases due to the increasing energy efficiency of various appliances). These benefits were estimated using the approach outlined in section 3.5.8.

Energy savings were estimated using inputs from the HSM, which provided data on levels of insulation and energy requirements in Victorian homes. Energy savings were determined by taking the difference between the energy required to heat and cool a home under different grades of insulation, with the additional energy use required in colder climates also being accounted for. Parameters were then applied that characterise the different appliances used to heat and cool homes to account for current variability in energy type and appliance efficiency.

4.3.2 CBA results – Ceiling insulation

The CBA results of options to introduce a minimum standard for ceiling insulation in rental properties are outlined in Table 4.2 (application of the standard only to rental properties with no insulation) and Table 4.3 (application of the standard to properties with no and low levels of insulation). The analysis over a 26-year period is presented in detail below, with the overall impacts on the NPV and BCR also shown over the remaining 7-year lifetime of the Residential Tenancies Regulations.

The CBA indicates that the option with the highest BCR over the 26-year period is Option 1A with a BCR of 4.01 and estimated net benefit of \$254 million. This result is driven largely by the lower costs associated with insulation batts of a level of R3.5. The additional benefits associated with more effective insulation batts (i.e., Options 2A and 3A) are not enough to offset the higher costs associated with installation and materials. However, it should be noted that Option 3A yields the highest benefits of an estimated \$350 million.

Overtime, the benefits grow relative to costs as the BCR improves across all three options and both sub-options. However, benefits outweigh the lower costs under Option 1A at the greatest ratio over the longer timeframe of 26 years. The growth in benefits across all options is driven by the accumulation of energy savings through avoided energy costs. It is likely that some of the benefits have not been captured in this analysis due to the data being limited to 2050; for measures installed between 2026 and 2030, the benefits expected to be received in the final years of the asset's life have not been captured as part of the analysis.

Sub-options A consistently outperform the sub-option B alternatives, which also test application of the standard to properties with no (R0), plus properties with low (R1.5) levels of insulation. The lower NPV and BCRs under sub-options B are due to the diminishing benefits of incremental increases of insulation for avoided energy costs and other benefits. These benefits are largely offset by high costs of materials to upgrade additional properties with currently low levels of insulation.

¹⁴⁹ hipages (2023), *How Much Does an Electrician Cost?* (Average of data) <https://hipages.com.au/article/how_much_does_an_electrician_cost>.

Overall, the BCRs of sub-options A are all above 3 over the 26-year period, indicating that benefits greatly outweigh costs across all of these sub-options, with marginal differences driven by energy saved and cost of materials. Sub-options B all have BCRs close to 1 over the 26-year period, indicating these sub-options do not perform as well as sub-options A. Under Option 1B and 3B, costs outweigh benefits. Option 3B is estimated to underperform all alternatives with the lowest projected BCR of 0.96 over 26-years.

Table 4.2: CBA results for ceiling insulation with no existing insulation, (26-year PV, \$millions)

	Option 1A – R3.5	Option 2A – R4.0	Option 3A – R5.0
Materials	\$37.73	\$46.30	\$54.83
Labour	\$30.74	\$30.74	\$30.74
Quote/admin costs	\$4.26	\$4.26	\$4.26
Electricity safety checks	\$11.82	\$11.82	\$11.82
Total costs	\$84.55	\$93.12	\$101.65
Avoided energy costs	\$246.58	\$249.00	\$252.96
Avoided GHG emissions	\$66.52	\$67.17	\$68.24
Avoided air pollution cost	\$0.30	\$0.35	\$0.35
Avoided healthcare costs	\$25.49	\$28.32	\$28.71
Total benefits	\$338.88	\$344.83	\$350.26
NPV (26-years)	\$254.33	\$251.71	\$248.61
BCR (26-years)	4.01	3.70	3.45
<i>Total benefits (7-years)</i>	<i>\$82.53</i>	<i>\$84.05</i>	<i>\$85.37</i>
<i>NPV (7-years)</i>	<i>-\$2.03</i>	<i>-\$9.07</i>	<i>-\$16.28</i>
<i>BCR (7-years)</i>	<i>0.98</i>	<i>0.90</i>	<i>0.84</i>

Table 4.3: CBA results for ceiling insulation in rental properties with no and low levels of insulation, (26-year PV, \$millions)

	Option 1B – R3.5	Option 2B – R4.0	Option 3B – R5.0
Materials	\$213.51	\$228.05	\$312.34
Labour	\$241.14	\$241.14	\$241.14
Quote/admin costs	\$33.39	\$33.39	\$33.39
Electricity safety checks	\$92.75	\$92.75	\$92.75
Total costs	\$580.79	\$595.32	\$679.61
Avoided energy costs	\$421.77	\$440.72	\$471.79
Avoided GHG emissions	\$113.78	\$118.89	\$127.27
Avoided air pollution cost	\$0.59	\$0.62	\$0.66
Avoided healthcare costs	\$43.33	\$47.69	\$50.76
Total benefits	\$579.46	\$607.92	\$650.48
NPV (26-years)	-\$1.33	\$12.60	-\$29.13
BCR (26-years)	1.00	1.02	0.96
<i>Total benefits (7-years)</i>	<i>\$141.14</i>	<i>\$148.12</i>	<i>\$158.49</i>
<i>NPV (7-year)</i>	<i>-\$439.65</i>	<i>-\$447.20</i>	<i>-\$521.12</i>
<i>BCR (7-year)</i>	<i>0.24</i>	<i>0.25</i>	<i>0.23</i>

4.3.3 Summary of preferred option – Ceiling insulation

All NPVs under sub-options A are relatively on par with each other over the 26-year analysis period. While Option 1A yields the highest estimated NPV, DEECA and DGS' preferred option for the minimum standard relating to ceiling insulation is Option 3A which results in a slightly lower NPV. Under Option 3A, rental properties currently with no insulation will be required to install insulation with a minimum thermal rating of R5.0.

Option 3A yields an estimated NPV of \$249 million and a BCR of 3.45, implying that for every dollar of cost incurred by a rental provider, \$3.45 in benefits to renters and society more broadly would be achieved. Option 3A is estimated to provide the highest total benefits across sub-options A of \$350 million (PV, 26-years), providing alignment with Victorian Government objectives.

In selecting the preferred option, DEECA and DGS have also taken into account consideration of other relevant best practice. Option 3A will likely bring rented homes in line with the 7 Star energy efficiency standard required for new homes built in Victoria. R5.0 insulation is the most common insulation type in 7 Star homes in Victoria, according to CSIRO's Australian Housing Data portal. The portal shows 41 per cent of detached homes installing R5.0 ceiling insulation or higher, compared to 24 per cent of homes that have installed R4.0 and 11 per cent that have installed R3.0.

The preferred standard will also future-proof rental homes. Most modern insulation batts have a warranty of 50 years, or the remaining lifetime of the home. As insulation is also often effective well beyond the warranty period, insulation installed under this standard is expected to be in place for several decades. Installing R5.0 will ensure rental homes receive greater energy and emission savings over the lifetime of the batt, when compared to lower rated insulation products.

5 Draught sealing

This chapter describes the policy options and parameters relating to the proposed introduction of minimum standards for draught sealing measures in rental properties, and analyses the impacts of those options.

5.1 Options – Draught sealing

A number of options have been considered to inform the design of a minimum standard for draught sealing measures in rental properties. These options, as well as the base case, are described below.

5.1.1 Base case – Draught sealing

Under the base case, there would continue to be no requirement for rental providers to install draught sealing measures in their rental properties, and rental providers have limited incentive to implement these measures themselves. As with the analysis of ceiling insulation standards, it is assumed that properties maintain a consistent level of thermal comfort by using various heating and cooling products. Energy consumed in the base case has been defined by air leakage due to a lack of various draught sealing measures as estimated in Sustainability Victoria's *Draught Sealing Retrofit trial* (2016).

5.1.2 Options – Draught sealing measures

This RIS has analysed four options relating to mandating the minimum level of draught sealing measures that must be applied in rental properties. These options are:

- **Option 1** – Basic level, requiring weather sealing around the entire perimeter of all external doors
- **Option 2** – Medium level, requiring measures under Option 1 plus weather seals on wall vents, and unreasonable general gaps and cracks sealed for door and window frames, construction joints and wall linings, skirting and floorboards, and wall penetrations
- **Option 3** – High level, requiring measures under Option 1 and Option 2, plus windows with gaps and other general caulking (such as ceiling roses, skirting and floorboards, and unused heating and cooling vents)
- **Option 4** – Comprehensive level, requiring rectification of areas of leakage or draughts identified through a comprehensive assessment by a home energy professional, such as a blower door test.

5.2 Policy parameters – Draught sealing

There are a number of policy parameters that have been established in designing the minimum standard for draught sealing in rental properties. These parameters apply to all options analysed in the CBA for the draught sealing minimum standard and are summarised in Table 5.1 below.

Table 5.1: Policy parameters for minimum standard relating to draught sealing

Parameter	Setting	Rationale
Exemptions	<p>Rental properties will be exempt from complying with the proposed draught sealing standard where:</p> <ul style="list-style-type: none"> owners corporation rules prohibit the fitting of sealing or weatherstripping products to external doors a flueless space heater or flueless gas cooking appliance (without a rangehood) is installed an open-flued gas appliance is installed permit to alter the premises has been refused under the <i>Heritage Act 2017</i> it is otherwise not reasonably practicable to draughtproof the rented premises. 	<p>Similarly to ceiling insulation, where other legislation or regulation may apply, such as the Owners Corporations Regulations 2018 or the <i>Heritage Act 2017</i>, exemptions will apply to avoid conflict between rental providers' obligations. For owners corporation rules in Class 2 buildings, exemptions will only apply where the rules prohibit the fitting of sealing or weather-stripping products to external doors or windows.</p> <p>Flueless space heaters and open flued gas appliances¹⁵⁰ can pose a safety issue (carbon monoxide build-up and ingress as a result of negative pressure)¹⁵¹ if there is inadequate ventilation in the indoor space, so properties with these types of appliances will be exempt.</p> <p>An exemption will also apply for draught sealing in a room where a gas cooking appliance (without a rangehood) is present.</p>
Trigger	Compliance with the standard will be required at the time of a new lease being entered into.	Draught sealing measures can be applied to a rental property as it transitions to new renters with minimal delay.

5.2.1.2 Application of the draught sealing minimum standards to Class 2 buildings

Draught sealing activities, such as sealing doors and filling gaps and cracks, are practical to apply to both Class 1 and Class 2 rental properties, unlike installing ceiling insulation. Class 2 buildings, however, are likely to have fewer areas which require sealing compared to Class 1 buildings, as they are typically smaller and there will be some draught sealing measures which Class 2 rental properties are exempt from installing due to common property restrictions, such as weather sealing on some external doors. Any measures exempt due to owners corporations restrictions have been accounted for in the lower average number of measures that have been estimated to apply to Class 2 rental properties, compared to Class 1 rental properties.

In some cases, single storey attached dwellings with common spaces below (e.g., two dwellings above a common basement or carpark) are also considered Class 2 buildings. In such circumstances, it is more likely that a rental provider may have ownership of external doors and windows, and so would be required to adhere to the minimum standards for draught sealing. Under these circumstances, the modelled costs and benefits would increase proportionately with the additional draught sealing measures these rental properties could implement.

5.2.1.3 Flueless space heaters, flueless gas cooking appliances and open flued gas appliances

During consultation undertaken by DEECA, a number of stakeholders expressed concern regarding the implementation of this standard in properties which have gas appliances, specifically open flued gas heaters and flueless space heaters. There is a significant safety concern which arises in homes with malfunctioning gas appliances, unflued or open flued gas heaters with regards to the possibility of the build-up of carbon monoxide (CO) indoors and carbon monoxide poisoning. A recent incident that highlights the dangers of CO build-up is the death of Sonia Sofianopoulos in 2017. In the Victorian Coroner's report following an inquest into the death of Ms. Sofianopoulos, who died from CO poisoning, it was determined that a combination of events had resulted in her death. The heater's draught diverter, in the presence of low-velocity downward airflow induced by a negative pressure environment in the room, led to poor combustion. This, in turn, resulted in elevated

¹⁵⁰ The Australian Standard AS/NZS5263.0 defines an open flued appliance as an "indoor appliance designed to be connected to a flue system, its combustion air being drawn from the room or space in which it is installed."

¹⁵¹ Negative pressure arises when the indoor atmospheric pressure is lower than the outside atmospheric pressure. This can cause toxic combustion by-products (including CO) to be drawn into the home, rather than expelled through the flue as intended.

levels of carbon monoxide in the flue products, which were subsequently drawn into the room air due to the down draught.¹⁵² This issue can be exacerbated by the use of extraction fans such as rangehoods or bathroom ventilation which can create a negative indoor pressure and create an unsafe operating environment for an open flued gas heater, flueless space heater or other open flued gas appliances. Although draughts should not be relied upon to ensure appropriate or adequate ventilation for gas appliances, this is an important safety consideration for these specific types of heaters.

The installation of flueless space heaters and open flued gas heaters which do not meet prescribed safety requirements is prohibited under the Gas Safety (Gas Installation) Regulations 2018. It is possible, however, that a number of existing properties still have these types of appliances installed.

As safety is of highest priority for this policy, any rental properties with open flued gas appliances or flueless space heaters will be exempt from the minimum standards for draught sealing to reduce the likelihood of carbon monoxide poisoning occurring. An exemption is also proposed for draught sealing in a room where there is a flueless gas cooking appliance, where that gas cooking appliance does not have a rangehood.

These safety exemptions will be complemented by the existing requirement in the Residential Tenancies Regulations 2021 for rented premises with gas appliances, fixtures or fittings to be subject to a gas safety check by a licensed or registered gasfitter every two years, including ensuring any gas appliances are able to operate and draw draughts as intended. These gas safety checks will also be useful in informing rental providers of the flue type of any existing gas appliance, which may assist rental providers in understanding their obligations under the draught sealing standard.

In the absence of clear data on the prevalence of flueless space heaters and flueless gas cooking appliances in rental properties, the modelling did not make an assumption on the number of rental properties that would be exempt from complying with the draught sealing minimum standard. As installation of flueless space heaters has largely been prohibited since 2009, it is possible that the number of rental properties with these types of appliances is low.

There is some data available on the prevalence of open flued gas heaters in Victoria's housing stock. This data has been used to incorporate an assumption in the modelling to account for a number of rental properties which might be exempt from complying with the standard due to the presence of an open flued gas heater. This assumption has been estimated through the following process:

- an estimate for the number of relevant appliances in Victoria, in 2020, was sourced from the *Phase out of Open Flued Gas Space Heaters RIS* (2021) at 340,000
- rentals as a proportion of housing stock was taken from the Housing Stock Model to infer 84,000 houses had an open flued gas heater in 2020, or 13.5 per cent of total rental properties
- given the adoption of new regulations in 2021 banning the installation of new open flue gas heaters, it was assumed that the only change to the stock would be the rate of retirement of existing stock. This was assumed to be 7.5 per cent, per annum, in line with estimates in the *Phase out of Open Flued Gas Space Heaters RIS*
- the number of affected homes was decreased by 7.5 per cent each year to determine the proportion of homes that would be exempt in each year of the analysis period.

5.3 Options analysis – Draught sealing

5.3.1 Methodology – Draught sealing

Similar to the ceiling insulation analysis, to estimate the number of properties that are impacted by the different policy options, the draught sealing analysis utilised the overarching methodology outlined in section 3.5.

The total number of properties turned over each year provide the rolling stock of properties that would experience the benefits of draught sealing. As the Residential Tenancies Regulations are due to sunset in 2031, all updates to properties beyond 2031 are outside the scope of this analysis. Therefore, no costs were accounted for beyond 2031. Comparatively to the ceiling insulation model, draught sealing measures have a shorter useful life and the variance across different measures is large – some measures show cost effectiveness for up to two years, while others for over thirty years.¹⁵³ The analysis assumes that draught sealing measures have an effective life of 7 years. To capture the benefits of any draught sealing measures installed in the final year of the Residential Tenancies Regulations, the analysis for draught sealing is presented over 13 years.

¹⁵² Coroners Court of Victoria (2018), *Inquest into the death of Sonia Sofianopoulos*. (File no. COR 2017/3566).

¹⁵³ Energy Consult (2017), *Minimum energy efficiency standards in rental – Technical specifications*.

The average measures for each household and the respective proportions of homes requiring each measure are summarised in Table 5.2.

Table 5.2: Average measures required for Class 1 and Class 2 rental properties

Measure	Class 1	Class 2	Proportion of homes requiring measure (if option specifies)	Options measure is included in
External door	1.9	1	68.8%	Options 1-3
Wall vent	12	6	62.5%	Options 2-3
General gaps and cracks	125.1	69	87.5%	Options 2-3
Window	6.3	3.2	25%	Option 3
Ceiling rose	2	1.1	6.3%	Option 3
Unused heating and cooling vents	1.88	1.04	50%	Option 3
Activities based on blower door test	1	0.55	100%	Option 4*

Source: Analysis undertaken by ACIL Allen (2021) for DEECA, data from Sustainability Victoria's Draught Sealing Retrofit Trial (2016) and Energy Consult (2017).

* Measures required under Option 4 would be to seal all areas of leakage identified through a comprehensive assessment, such as a blower door test. These measures would likely include a combination of the measures required under options 1-3.

5.3.1.2 Approach to estimating costs

Three main cost streams are included in the analysis for draught sealing, including material, labour and the time cost to obtain a quote. Where appropriate, all costs were indexed for inflation based on the CPI value in September 2023. Several key parameters underpin the cost estimations.

Material

The material costs were estimated by using the following inputs:

- average number of draught sealing measures required for Class 1 and Class 2 properties¹⁵⁴
- proportion of properties requiring the measure¹⁵⁵
- unit product cost of each measure.¹⁵⁶

The product of these inputs were summed together to calculate the overall cost of materials.

These costs were then discounted by 10 per cent to account for a trade discount applied to professional installations. To account for rental providers that would install the required measures themselves (do-it-yourself (DIY)), an assumption of 20 per cent of properties undertaking DIY was applied. For these properties the 10 per cent trade discount was not incorporated.

Labour

The labour costs were estimated using the following inputs:

¹⁵⁴ Department of Energy, Environment and Climate Action (2019), *Housing Stock Model*.

¹⁵⁵ ACIL Allen (2021), *Minimum Standards for insulation and draught sealing in rented premises: Options analysis paper*.

¹⁵⁶ Ibid.

- average number of draught sealing measures required for Class 1 and Class 2 properties¹⁵⁷
- proportion of properties requiring the measure¹⁵⁸
- unit labour cost associated with a professional installing each measure.¹⁵⁹

The product of these inputs were used to calculate the overall cost of labour.

As with the analysis for materials, to account for properties that would install the required measures through DIY, an assumption of 20 per cent of properties undertaking DIY was applied. For these properties the unit labour cost was adjusted by the difference between the per hour cost of a trade worker and the cost of leisure time.

Under Option 4, an additional \$565 was included in the calculation of labour costs to account for the estimated cost of a blower door test.¹⁶⁰

Time dedicated to obtaining quotes and administrative tasks

Consistent with the overarching methodology, it was assumed that the time taken by a rental provider to identify appropriate tradespersons and arrange a quote is 1 hour, across all options. This was then multiplied by the cost of leisure \$36 per hour, as applied elsewhere in the model.

As with the other costs, a rate of 20 per cent DIY was assumed in the analysis whereby these properties would not experience the cost of time dedicated to obtaining quotes. However, it was assumed that this time would be spent purchasing and undertaking various activities related to completing the draught sealing measures. For these reasons, a similar 1-hour cost of leisure time was applied to those properties assumed to install the required measures through DIY.

Under each option, it was assumed that each household must only undertake these administrative tasks once, regardless of the number of sealing measures implemented in the household.

5.3.1.3 Approach to estimating benefits

Four main benefit streams are included in the analysis, including energy savings (gas and electricity), immediate benefits from reduced air pollution, greenhouse gas (GHG) abatement and avoided healthcare costs associated with increased thermal comfort. With the exception of avoided healthcare costs, these benefits were estimated using the approach outlined in section 3.5.8. Avoided healthcare costs were prorated based on the estimates for ceiling insulation analysis and the associated energy saving benefits. The rationale underpinning this approach is that energy saving serves as a useful proxy for the effectiveness of measures to provide thermal comfort.

5.3.2 CBA results – Draught sealing

The CBA results of options to introduce a minimum standard for draught sealing in rental properties are outlined in Table 5.3 below. The results for the draught sealing standard are presented over a 13-year analysis period. Given the expected life of draught sealing measures is assumed to be 7 years, the full stream of benefits from draught sealing measures is captured by extending the analysis period to 2036 (which includes the final year of benefits received from measures installed in 2030). Together, this implies a 13-year analysis period between 2024 and 2036.

The CBA indicates that the option with the highest BCR over the 13-year period is Option 2 with a BCR of 1.30 and estimated net benefit of \$105 million. This result is driven by the large increase in energy savings that come from including draught sealing for wall vents, as well as general gaps and cracks, on top of including a weather seal on all external doors. These draught sealing measures are cost-effective and provide substantial benefits when compared to the additional draught sealing measures required by the more comprehensive options 3 and 4. Comparatively, Option 4 underperforms all alternatives over the 13-year period, with a BCR of 0.95 and projected net cost of \$53 million.

¹⁵⁷ Department of Energy, Environment and Climate Action (2019), *Housing Stock Model*.

¹⁵⁸ ACIL Allen (2021), *Minimum Standards for insulation and draught sealing in rented premises: Options analysis paper*.

¹⁵⁹ Ibid.

¹⁶⁰ Ibid.

Table 5.3: CBA results for draught sealing measures (13-year PV, \$millions)

	Option 1 – Basic	Option 2 – Medium	Option 3 – High	Options 4 – Comprehensive
Materials	\$38.59	\$123.97	\$149.28	\$367.37
Labour	\$49.28	\$209.11	\$242.03	\$690.42
Quote/admin costs	\$15.80	\$20.15	\$20.15	\$22.89
Total costs	\$103.66	\$353.22	\$411.45	\$1,080.68
Avoided energy costs	\$92.16	\$348.07	\$384.09	\$780.61
Avoided GHG emissions	\$18.76	\$70.84	\$78.18	\$158.88
Avoided air pollution costs	\$0.10	\$0.37	\$0.41	\$0.83
Avoided healthcare costs	\$10.29	\$38.87	\$42.89	\$87.17
Total benefits	\$121.31	\$458.14	\$505.56	\$1,027.48
NPV (13-years)	\$17.65	\$104.92	\$94.11	-\$53.20
BCR (13-years)	1.17	1.30	1.23	0.95
<i>Total benefits (7-years)</i>	<i>\$78.93</i>	<i>\$298.09</i>	<i>\$328.89</i>	<i>\$668.53</i>
<i>NPV (7-years)</i>	<i>-\$24.73</i>	<i>-\$55.13</i>	<i>-\$82.56</i>	<i>-\$412.15</i>
<i>BCR (7-years)</i>	<i>0.76</i>	<i>0.84</i>	<i>0.80</i>	<i>0.62</i>

5.3.3 Summary of preferred option – Draught sealing

DEECA and DGS' preferred option for the minimum standard relating to draught sealing is Option 2. Option 2 yields the highest estimated NPV of \$105 million over the 13-year analysis period. Under Option 2, rental properties will be required to install a weather seal on all external doors and seal wall vents plus general gaps and cracks.

Option 2 yields an estimated BCR of 1.30, implying that for every dollar of cost incurred by a rental provider, \$1.30 in benefits to renters and society more broadly would be achieved.

While Option 4 would provide the greatest benefits in line with the Victorian Government's objectives, the high costs associated with the undertaking of a blower door test decreases the net benefits for Option 4. Additionally, there is limited availability of blower door testing professionals that would be able to meet demand generated under this option, and so has not been considered for implementation.

6 Hot water systems and shower heads

This chapter describes the policy options and parameters relating to the proposed introduction of minimum standards for domestic hot water systems and increased standard for shower heads in rental properties, and analyses the impacts of those options.

6.1 Options – Hot water systems

A number of options have been considered to inform the design of a minimum standard for hot water systems and shower heads in rental properties. These options, as well as the base case, are described below.

6.1.1 Base case – Hot water systems

Under the base case, there would continue to be no minimum standard for rental properties in relation to hot water systems under the Residential Tenancies Regulations. This means there would continue to be limited incentive for rental providers to improve the energy efficiency of their hot water systems over and above current systems. It is conservatively assumed under the base case that when a hot water system reaches its end of life, it is replaced with a comparable, like-for-like system.

6.1.2 Options – Hot water systems

This RIS has analysed four options relating to mandating the minimum standard of hot water systems that must be installed in rental properties. These options are:

- **Option 1** – Eliminate highest running cost systems. Under this option, the least efficient 25 per cent of the current stock of hot water systems in rental properties would be replaced at end of life with systems that are more efficient. At the end of life, these systems will need to be replaced with a system above this threshold. In this option, gas hot water systems will only be permitted to be installed where they replace an existing gas hot water system.
- **Option 2** – Average running cost systems. Under this option, the threshold for efficiency is set at the median efficiency of all hot water systems. Systems in the lower 50 per cent will have to be replaced at the end of life with systems in the upper 50 per cent. As such, compared to Option 1, under this option electric off-peak systems would no longer be permitted to be installed in rental properties and would need to be replaced at end-of-life. As under Option 1, installation of gas hot water systems would only be permitted where an existing gas hot water system is being replaced. The new gas hot water system, however, maybe required to be of a higher efficiency than the existing system.
- **Option 3** – Low running cost systems. This option follows the same logic as Option 2 but sets the energy efficiency threshold at 75 per cent of the lowest performing systems to be replaced at the end of life with an efficient system from the top 25 per cent. Additional restrictions are placed on compliant gas hot water systems, requiring higher efficiency systems to be installed compared to Option 2.
- **Option 4** – Electric only, low running cost systems. This option has the same energy efficiency requirements as Option 3. However, gas hot water systems would no longer be compliant if installed as a replacement system. Only heat pumps and electric-boosted solar hot water systems would be compliant under this option.

The compliant and non-compliant hot water systems under each of the above options are summarised in Table 6.1.

Table 6.1: Summary of compliant and non-compliant hot water systems under each option

Variable	Option 1 – Highest running cost systems (eliminate lowest 25 per cent of inefficient systems).	Option 2 – Average running cost systems (eliminate lowest 50 per cent of inefficient systems)	Option 3 – Low running cost systems (eliminate lowest 75 per cent of inefficient systems).	Option 4 – Electric only, low running cost systems.
Compliant systems	<ul style="list-style-type: none"> • Electric off-peak storage • Solar electric • Heat pump <p>Existing gas systems can be replaced with any other gas system.</p>	<ul style="list-style-type: none"> • Solar electric • Heat pump <p>Existing gas systems can be replaced with:</p> <ul style="list-style-type: none"> • >5 Star gas – instantaneous and storage • Solar gas 	<ul style="list-style-type: none"> • Solar electric • Heat pump <p>Existing gas systems can be replaced with:</p> <ul style="list-style-type: none"> • >6 Star gas – instantaneous and storage • Solar gas 	<ul style="list-style-type: none"> • Solar electric • Heat pump
Non-compliant systems	<ul style="list-style-type: none"> • Electric peak – includes storage (continuous) • Electric peak instantaneous 	<ul style="list-style-type: none"> • Mains gas instantaneous <5 Star • Mains gas storage <5 Star • Electric off-peak storage (controlled) • Electric peak – includes storage (continuous) • Electric peak instantaneous 	<ul style="list-style-type: none"> • Mains gas instantaneous <6 Star • Main gas storage (all) • Electric off-peak storage (controlled) • Electric peak – includes storage (continuous) • Electric peak instantaneous 	<ul style="list-style-type: none"> • Mains gas instantaneous (all) • Mains gas storage (all) • Electric off-peak storage (controlled) • Electric peak – includes storage (continuous) • Electric peak instantaneous • Solar gas

6.2 Policy parameters – Hot water systems

There are a number of policy parameters that have been established in designing the minimum standards for hot water systems and shower heads in rental properties. These parameters apply to all options analysed in the CBA for the hot water system and shower head minimum standard and are summarised in Table 6.2.

Table 6.2: Policy parameters for minimum standards relating to hot water systems

Parameter	Setting	Rationale
Exemptions	<p>Rental properties will be exempt from complying with the proposed hot water system standard where:</p> <ul style="list-style-type: none"> • (for Class 2 rental properties) the cost of installing a compliant system would be significantly higher than the average cost of installation in a Class 2 building • (for Class 2 rental properties) heated water to the rented premises is supplied by a centralised system • a temporary water heater is installed for no more than 60 days • the fuel source for existing and replacement appliances is LPG • there is an existing system in good working order • an appliance is being replaced under a manufacturer, supplier or installer warranty. 	<p>Reasonable supply to hot water in a rental property is an existing minimum standard for rental properties. Upgrading existing systems to be energy efficient can be cost prohibitive in some instances and exemptions have accordingly been determined. This includes an exemption for Class 2 properties where there is a centralised hot water system servicing multiple properties.</p> <p>For a rental property where network augmentation would be required to enable a higher electrical load, this property would be exempt as this would pose excessive costs compared to an average installation. Electrical rectification work, such as upgrading a switchboard, however, will be considered a part of the normal costs associated with the required upgrade.</p> <p>In instances where compliance with the minimum standard cannot be met immediately, temporary hot water systems are exempt from the standard (for no more than 60 days) to ensure continuous supply of hot water to the rental property.</p> <p>The exemption for LPG systems is provided given there is limited data available on the specific type and regional distribution of LPG systems in rented homes.</p> <p>An exemption is in place to allow existing systems reach the end of their life or where an appliance being replaced under a warranty is provided to avoid conflicts with consumer protections where a hot water system fails within the warranty period.</p>
Trigger	<p>Compliance with the hot water system minimum standard will be required at the end of life of the existing system.</p>	<p>Rental providers will need to upgrade their existing non-compliant system once it reaches the end of its operating life. This will help to minimise impacts on the supply chain of hot water systems.</p>

6.3 Options analysis – Hot water systems

6.3.1 Methodology – Hot water systems

The CBA for hot water systems built upon analysis undertaken by EES in 2022 for DEECA. The EES analysis used the HSM and hot water system prevalence data to build a base case, from which the capital costs and energy profiles of upgrading to alternate hot water systems could be modelled for each option.

The analysis for this RIS utilised the appliance stock change outputs under each option from the EES analysis, using the stock changes as inputs underpinning the modelling undertaken by Deloitte for this RIS. Under the EES analysis it was assumed that as gas hot water systems reach their end of life, they would be replaced by electric heat pump systems. As per the exemptions table above (Table 6.2), LPG systems can be replaced with another LPG system at the end of an existing appliance's life.

Using the stock changes under each option as the basis, the analysis followed the steps broadly outlined in section 3.5. Specifically, this included estimating, for each option, the:

- total cost of appliances
- energy usage and energy costs
- tonnes of GHG emissions and the cost of those emissions
- cost associated with air pollution from electricity generation and use of gas appliances.

6.3.2 CBA results – Hot water systems

The CBA results of options to introduce a minimum energy efficiency standard for hot water systems in rental properties are outlined in Table 6.3 below. The analysis over a 20-year period is presented in detail below, with the overall impacts on the NPV and BCR also shown over the 7-year lifetime of the Residential Tenancies Regulations.

All options modelled result in a positive BCR and provide net benefits. The CBA indicates that the option with the highest BCR over the 20-year period is Option 2 with a BCR of 8.19 and estimated net benefit of \$320 million. Option 2 also returns the highest BCR under the 7-year analysis period.

The cost of complying with the options increases as the efficiency of the standard under each option increases, due to the higher cost of compliant electric systems. These costs, however, are continuously outweighed by the benefits under each option, with Option 4, which has the highest costs, also returning the highest net benefit of \$727 million.

Table 6.3: Cost benefit analysis results for minimum standards relating to hot water systems (PV, 20-years, \$ millions)

	Option 1– Highest running cost systems	Option 2 – Average running cost systems	Option 3 – Low running cost systems	Option 4 – Electric only, low-cost systems
Capital costs (including installation and decommissioning costs)	\$4.78	\$40.64	\$64.93	\$149.88
Quote/admin costs	\$0.47	\$3.88	\$6.52	\$7.57
Total costs	\$5.25	\$44.52	\$71.46	\$157.45
Avoided energy costs	\$24.19	\$307.24	\$397.46	\$511.51
Avoided GHG emissions	\$3.29	\$52.95	\$85.83	\$211.76
Avoided air pollution costs	\$0.31	\$4.35	\$5.23	\$4.13
Total benefits (20-years)	\$27.79	\$364.54	\$488.51	\$727.40
NPV (20-years)	\$22.54	\$320.02	\$417.05	\$569.94
BCR (20-years)	5.29	8.19	6.84	4.62
<i>Total benefits (7-years)</i>	<i>\$8.99</i>	<i>\$130.68</i>	<i>\$166.75</i>	<i>\$196.18</i>
<i>NPV (7-years)</i>	<i>\$3.74</i>	<i>\$86.16</i>	<i>\$95.29</i>	<i>\$38.73</i>
<i>BCR (7-years)</i>	<i>1.71</i>	<i>2.94</i>	<i>2.33</i>	<i>1.25</i>

6.3.3 Summary of preferred option – Hot water systems

DEECA and DGS's preferred option for the minimum standard relating to hot water systems is Option 4. Option 4 yields the highest estimated NPV of \$570 million over the 20-year analysis period. Under Option 4, only electric low running cost hot water systems will be allowed to be installed at the end of an existing appliance's life. Gas hot water systems (excluding LPG systems) would not be compliant under this option. Heat pump and solar hot water systems installed under this option would be required to meet the minimum energy efficiency requirements specified in the Plumbing Code of Australia, in line with NCC requirements for new homes.

Option 4 yields an estimated BCR of 4.62, implying that for every dollar of cost incurred by a rental provider, \$4.62 in benefits to renters and society more broadly would be achieved.

While all other options are estimated to return a higher BCR than Option 4, as discussed in section 3.5, the NPV has been used as the key decision making tool to guide selection of preferred options in this RIS. The higher NPV under Option 4 maximises alignment with Victorian Government objectives, as Option 4 provides the highest energy savings and avoided greenhouse gas emissions. Further, Option 4 also aligns with the Gas Substitution Roadmap, an important Victorian Government policy (outlined in section 1.4).

6.4 Options – Shower heads

6.4.1 Base case – Shower heads

Under the base case, the Residential Tenancies Regulations would continue to require shower heads (and any appliances, fixtures or fittings which use or supply water) to be a 3 Star rating in the Water Efficiency Labelling and Standards (WELS)

scheme. The current minimum standard relating to shower heads was introduced as part of the Residential Tenancies Regulations in 2021 and aligned with requirements under the Plumbing Regulations 2018.

It is assumed under the base case that all rental properties comply with the current 3 Star standard and there continues to be limited incentives for rental providers to exceed the 3 Star shower head standard.

6.4.2 Option – Shower heads

The analysis focused solely on one policy approach regarding shower heads. It proposed elevating the standard from a minimum 3 Star WELS rating to a minimum 4 Star WELS rating for shower heads. While the market does offer shower heads with ratings above 4 stars, these higher-rated options often come with a trade-off in flow rate. Consequently, setting a standard higher than 4 stars could lead to discontent among renters due to potential inadequacies in shower performance. The option analysed in this RIS in relation to shower heads is:

- **Option 1** – increase shower head minimum standard to a 4 Star WELS rating for rental properties.

6.5 Policy parameters – Shower heads

There are several policy parameters that have been established by in designing the minimum standards for shower heads in rental properties which are summarised in Table 6.4.

Table 6.4: Policy parameters for minimum standards relating to shower heads

Parameter	Setting	Rationale
Exemptions	Rental properties for which a replacement shower head cannot be installed or will not operate effectively.	The age, nature or structure of the plumbing in a rental property may inhibit the replacement of a shower head with a higher efficiency model.
Trigger	Compliance with the shower head minimum standard will be required at the time of a new lease being entered into.	Shower heads can be installed in a rental property as it transitions to new renters with minimal delay.

6.6 Options analysis – Shower heads

6.6.1 Methodology – Shower heads

The CBA for shower heads was based upon analysis undertaken by EES in 2022 for DEECA. The analysis for this RIS utilised outputs from the EES analysis and built upon this work. Specifically, the outputs used from the EES modelling included:

- annual changes in the stock of 3 and 4 Star shower heads
- energy usage (PJ)
- greenhouse gas emissions (Kt).

In order to build upon the EES modelling, using the above outputs, Deloitte undertook a number of additional steps in line with the overarching methodology outlined in section 3.5, including:

- calculating the cost associated with purchase and installation of 4 Star shower heads¹⁶¹
- quantifying the avoided energy costs
- quantifying the avoided cost of greenhouse gas emissions
- calculating estimates of avoided costs associated with air pollution from energy generation
- incorporating an administrative time cost assumption incurred by rental providers.

While the effectiveness of shower heads are dependent on the hot water system installed in a property, the hot water system and shower head impacts have been assessed independently within this RIS. Specifically, the base case stock of hot

¹⁶¹ Typically only the marginal cost between requirements in the base case and under the options are analysed in a RIS. In this case, the marginal cost would be the difference between replacing a 3 Star shower head with a 4 Star shower head. However, assuming that shower heads are upgraded infrequently, the full cost of installing a 4 Star shower head has been incorporated into this analysis.

water systems in rental properties was used to assess the impacts of the increased shower head standard. The interaction of these standards is considered further via sensitivity analysis in Chapter 10.

In addition to energy savings from the installation of more efficient shower heads, renters will also receive benefits in the form of reduced water usage. The benefits related to reduced water usage and subsequent savings on water bills has not been incorporated in the modelling for this RIS. Therefore, the modelling results are conservative and likely understate the benefits associated with a more stringent 4-Star minimum standard for shower heads.

6.6.2 CBA results – Shower heads

The CBA results of the option to increase the minimum efficiency standard for shower heads is outlined in Table 6.5 below. As in the above hot water system analysis, the proposed minimum standard for shower heads was modelled over a longer time frame to capture the full stream of benefits accruing from the upgrade of shower heads within the lifetime of the Residential Tenancies Regulations. A 21-year period has also been used to analyse the impacts of the proposed minimum standard.

Only one option was analysed for the purpose of this RIS – increasing the minimum WELS standard from 3 Stars to 4 Stars. The CBA estimated the proposed increase in the minimum standard for shower heads would yield a BCR of 2.22 and estimated net benefit of \$223 million over the 21-year analysis period. The benefits are driven by a \$321 million reduction in energy costs from the improved efficiency of the 4 Star shower heads.

Alternatively, considering only the benefits accrued over the 7-year period, the proposed increase in the minimum standard for shower heads would result in an estimated net cost of \$28 million, returning a BCR of only 0.85.

Table 6.5: Cost benefit analysis results for minimum standard relating to shower heads (PV, 21-years, \$ millions)

Option 1 – 4-star WELS rating	
Capital costs	\$159.44
Quote/admin costs	\$23.43
Total costs	\$182.87
Avoided energy costs	\$321.21
Avoided GHG emissions	\$83.09
Avoided air pollution costs	\$1.84
Total benefits (21-years)	\$406.14
NPV (21-years)	\$223.27
BCR (21-years)	2.22
<i>Total benefits (7-years)</i>	<i>\$155.28</i>
<i>NPV (7-years)</i>	<i>-\$27.59</i>
<i>BCR (7-years)</i>	<i>0.85</i>

6.6.3 Summary of preferred option – Shower heads

DEECA and DGS's preferred option for the minimum standard relating to shower heads is to increase the minimum standard to require the installation of a 4 Star WELS rated shower head (Option 1). Option 1 yields an estimated NPV of \$223 million over the 21-year analysis period, and a BCR of 2.22, implying that for every dollar of cost incurred by a rental provider under the proposed minimum standard, \$2.22 in benefits to renters and society more broadly would be achieved.

7 Heating and cooling in rental properties

This chapter describes the policy options and parameters relating to the proposed introduction of minimum standards for a fixed energy efficient cooler in rental properties, and the impacts of those options. This chapter also analyses options for increasing the energy efficiency of the existing heating standard in rental properties.

7.1 Options – Heating and cooling in rental properties

A number of options have been considered to inform the design of a new minimum standard for cooling in rental properties, as well as an increase in the existing minimum standard for heaters in rental properties. These options, as well as the base case, are described below.

7.1.1 Base case – Heating and cooling in rental properties

Under the base case, the current heating standards would continue to be in place, which requires all rental properties to have a fixed energy efficient heater, in good working order, in the main living area of the rental property. A fixed energy efficient heater is prescribed to include one of the following:¹⁶²

- a non-ducted air conditioner or heat pump with a 2 Star or above energy rating
- a gas space heater with a 2 Star or above energy rating
- a ducted heating or hydronic heating system with an outlet in the main living area
- a domestic solid fuel burning appliance such as a fireplace or wood burning stove.

It is assumed that under the base case, all rental properties comply with the current minimum standard relating to a fixed energy efficient heater.

Under the base case, there would continue to be no requirement for rental properties to similarly have a fixed cooler in the main living area of the rental property. It is estimated that approximately 20 per cent of dwellings in Victoria do not have a cooler.¹⁶³

7.1.2 Options – heating and cooling in rental properties

This RIS has analysed four options relating to mandating the minimum standard of fixed energy efficient heater and coolers required to be installed in the main living area of a rental property. Under all options, wherever relevant, reverse cycle appliances can be used for both heating and cooling purposes. Additionally, under all options, if an energy efficient heater or cooler cannot be installed, an inefficient heater or cooler must instead be installed. The options analysed are:

- **Option 1 – Maintain current heating standard and introduce comparable cooling standard.** Under this option, there must be a fixed minimum 2 Star rating gas or electric room heater in the main living room (current heating standard). There must also be a fixed minimum 2 Star rating electric room cooler in the main living room, or a central cooler with a total cooling season performance factor (TCSPF)¹⁶⁴ of 3.5 minimum (equivalent to a 2 Star room cooler) with an outlet in the main living room.
- **Option 2 – Minimum 2 Star, electric-only heating and cooling.** Under this option, there must be a fixed minimum 2 Star rating electric room heater in the main living room, or a central heater with a heating seasonal performance factor

¹⁶² Consumer Affairs Victoria (2023), *Rental properties – minimum standards*.

¹⁶³ Energy Efficient Strategies and Tony Isaac Consulting (2022), *Options analysis paper for minimum energy efficiency standards for rented premises*.

¹⁶⁴ Total cooling seasonal performance factor is the ratio of the total annual amount of heat that the equipment can remove from the conditioned space to the total annual amount of energy consumed by the equipment. It measures the efficiency of the equipment.

(HSPF)¹⁶⁵ of 3.5 minimum (equivalent to a 2 Star room heater) with an outlet in the main living room. There must also be a fixed minimum 2 Star rating electric room cooler in the main living room, or a central cooler with a TCSPF of 3.5 minimum (equivalent to a 2 Star room cooler) with an outlet in the main living room.

- **Option 3 – Minimum 3 Star, electric-only heating and cooling.** Under this option, there must be a fixed minimum 3 Star rating electric room heater in the main living room, or a central heater with a HSPF of 4.5 minimum (equivalent to a 3 Star room heater) with an outlet in the main living room. There must also be a fixed minimum 3 Star rating electric room cooler in the main living room, or a central cooler with a TCSPF of 4.5 minimum (equivalent to a 3 Star room cooler) with an outlet in the main living room. Under this option, reverse-cycle air conditioning (RCAC) systems are the only systems that currently meet efficiency requirements.
- **Option 4 – Minimum 2 Star, electric-only heating and minimum 3 Star, electric-only cooling.** Under this option, there must be a fixed minimum 2 Star rating electric room heater in the main living room, or a central heater with a HSPF of 3.2 minimum (equivalent to a minimum 1.5 Star room heater) with an outlet in the main living room. There must also be a fixed minimum 3 Star electric room cooler in the main living room, or a central cooler with a TCSPF of 3.8 minimum (equivalent to a 2 Star room cooler) with an outlet in the main living room. A lower level of efficiency will be required for ducted systems to account for differences in efficiency levels and market availability between ducted and non-ducted systems. Under this option, RCACs are the only systems that will currently meet efficiency requirements.

The compliant heating and cooling systems under each option are outlined in Table 7.1.

Table 7.1: Summary of compliant appliances under each option

Compliant systems	Option 1 – 2 Star heating and cooling standard	Option 2 – 2 Star heating and cooling standard, electric only	Option 3 – 3 Star heating and cooling standard, electric only	Option 4 – 2 Star heating and 3 Star cooling standard, electric only
Heating	<ul style="list-style-type: none"> • Non-ducted split system air-conditioners (including reverse-cycle air-conditioners) ≥ 2 Star heating • Ducted split systems • Ducted gas heaters • Non-ducted gas heaters • Electric resistance heaters • Domestic solid fuel burning appliance 	<ul style="list-style-type: none"> • Non-ducted split system air-conditioners ≥ 2 Star heating • Ducted split system air-conditioners ≥ 3.5 HSPF (2 Star heating equivalent) 	<ul style="list-style-type: none"> • Non-ducted split system air-conditioners ≥ 3 Star heating • Ducted split system air-conditioners ≥ 4.5 HSPF (3 Star heating equivalent) 	<ul style="list-style-type: none"> • Non-ducted split system air-conditioners* ≥ 2 Star heating • Ducted split system air-conditioners* ≥ 3.2 HSPF (1.5 Star heating equivalent)
Cooling	<ul style="list-style-type: none"> • Non-ducted split system air-conditioners ≥ 2 Star cooling • Ducted split system air-conditioners ≥ 3.5 TCSPF (2 Star cooling equivalent) 	<ul style="list-style-type: none"> • Non-ducted split system air-conditioners ≥ 2 Star cooling • Ducted split system air-conditioners ≥ 3.5 TCSPF (2 Star cooling equivalent) 	<ul style="list-style-type: none"> • Non-ducted split system air-conditioners ≥ 3 Star cooling • Ducted split system air-conditioners ≥ 4.5 TCSPF (3 Star cooling equivalent) 	<ul style="list-style-type: none"> • Non-ducted split system air-conditioners* ≥ 3 Star cooling • Ducted split system air-conditioners* ≥ 3.8 TCSPF (2 Star cooling equivalent)

*As these systems provide both heating and cooling, the system will need to comply with the 3 Star standard for cooling and 2 Star standard for heating.

7.2 Policy parameters – Heating and cooling in rental properties

There are a number of policy parameters that have been established in designing the minimum standard for heating and cooling in rental properties. These parameters apply to all options analysed in the CBA for the heating and cooling minimum standard and are summarised in Table 7.2.

¹⁶⁵ Heating seasonal performance factor is the ratio of the total annual amount of heat that the equipment can add to the conditioned space when operated for heating in an active mode to the total annual amount of energy it consumes.

Table 7.2: Policy parameters for minimum standard relating to heating and cooling

Parameter	Setting	Rationale
Exemptions	<p>Rental properties will be exempt from complying with the proposed heating and cooling standard where:</p> <ul style="list-style-type: none"> • the cost to install an energy efficient system is significantly higher than the average cost of installation in the same building class • owners corporation rules prohibit installation of appliances • compliance with any other Act or local law makes the cost of installation prohibitive • there is an existing system in good working order • an appliance is under a manufacturer, supplier or installer warranty • it is otherwise not reasonably practicable to install a compliant system. <p>Heating standard exemptions:</p> <ul style="list-style-type: none"> • Rental properties with LPG heaters, wood heaters or hydronic heating will be exempt from meeting the heating standard. <p>Cooling standard exemptions:</p> <ul style="list-style-type: none"> • Rental properties with fixed central evaporative cooling systems will be exempt from meeting the cooling standard. <p>Where a fixed efficient heater and/or cooler is unable to be installed in the main living area, a fixed inefficient heater and/or cooler will be required to be installed in the main living area instead.</p>	<p>Where the cost to install an energy efficient cooling system is significantly higher than the average cost of installation in the same class of building, there will instead be a requirement to install an inefficient alternative. For a rental property where network augmentation would be required to enable a higher electrical load, this property would be exempt as this would pose excessive costs compared to an average installation. Electrical rectification work, such as upgrading a switchboard, however, will be considered a part of the normal costs associated with the required upgrade.</p> <p>The exemption for conflict with other legislation and regulations is in place to account for circumstances where other regulations and legislation significantly increase the cost of compliance - for example, where installation of an energy efficient appliance would require significant building works to meet <i>Heritage Act 2017</i> requirements.</p> <p>An exemption is in place to allow existing heating and cooling systems reach the end of their life or where an appliance being replaced under a warranty is provided to avoid conflicts with consumer protections where a heating/cooling system fails within the warranty period.</p> <p>Unreasonable exemptions reflect the approach to current minimum heating standards in the Residential Tenancies Regulations. It also covers unforeseeable circumstances such as insufficient space to install a compliant system.</p> <p>Central evaporative cooling systems have a low running cost and are considered energy efficient. Evaporative coolers draw hot air from outside through a series of wet filter pads, removing heat from the air and humidifying it. The cooled, moist air is then blown through the house. Evaporative coolers are not subject to efficiency labelling requirements. However, they are highly energy efficient as they do not require a compressor or refrigerant operation as required by other air conditioners. Additionally, evaporative coolers are not easy to retrofit in a property. Therefore, rental properties that already have evaporative cooling systems will be exempt from complying with the minimum standard. An evaporative cooler can be replaced with another evaporative cooler at end of life.</p>

Hydronic heating is also considered an energy efficient appliance. Hydronic heating utilises a closed-loop system of heated water piped throughout the home to provide radiant heating via radiators or piping in walls and floors. Many hydronic heating systems are able to be zoned so that the households can choose which areas are to be heated. The ability of water to retain heat compared to air, means hydronic heating is likely a more energy efficient heating option than forced air heating systems. Additionally, hydronic heating is not easy to retrofit in a property. Therefore, rental properties with hydronic heating will be exempt from complying with the minimum standard. Hydronic heating systems can be replaced with another hydronic system at end of life.

Solid fuel burning systems are exempt under the current heating standard and can be replaced with another solid fuel burning system at end of life.

Properties with existing LPG systems are exempt given there is limited data available on the specific type and regional distribution of LPG systems in rented homes.

<p>Trigger</p>	<p>Heating standard: Where there is an existing heating appliance, compliance with the minimum standard will be required at the end of life of the existing system.</p> <p>Cooling standard: From 30 October 2025, compliance with the minimum standard will be required at the time of a new lease, if there is no existing cooling appliance in the rental property. When there is an existing cooling appliance, it must be replaced with an efficient cooler at end of life. From 30 October 2027, all rental properties will be required to have a fixed cooler installed in the main living area.</p>	<p>Where an existing heating appliance is installed in the rental property, the requirement to replace the system at the end of its operating life will help to minimise impacts on supply chain of heaters.</p> <p>Where no existing cooling appliance is installed in the rental property, between 2025-2027 a compliant cooler can be installed in a rental property as it transitions to new renters with minimal delay. Prescribing a date of required compliance will ensure all renters are provided with adequate cooling appliances by mid-2027, balancing the need to provide important benefits to renters that align with Government objectives with impacts on the supply chain of compliant systems.</p>
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7.3 Options analysis – Heating and cooling in rental properties

7.3.1 Methodology

DEECA developed a model to analyse the options for the heating and cooling standard in rental properties which was updated by Deloitte. This model includes appliance costs, energy usage and appliance penetration data in rental homes. A set of appliance combinations for heating and cooling in Class 1 and Class 2 buildings were established by DEECA using the appliance penetration data. These combinations provided the proportion of different appliances in the base case, common heating and cooling combinations, and the impact of the current heating standard for rental homes (i.e., all Class 1 rental homes now have a heater installed). Next, the total number of rental homes with each appliance combination was modelled in a base case scenario using the current and projected growth of rental stock in Victoria.

As the Residential Tenancies Regulations are due to sunset in 2031, a 7-year analysis period was used to compare the costs and benefits over the remaining lifetime of the current Regulations. While no costs beyond 2031 were considered for analysis, the benefits provided by the standard extend beyond the lifetime of the Regulations as heaters and coolers have a lifespan of approximately 15 years. Therefore, appliances installed during the life of the Regulations will continue to provide benefits in the future.

For each option assessed against the base case, a set of rules were established to determine how each appliance combination would be upgraded under the proposed regulation. These rules were applied to the future forecasting of appliance shares for both Class 1 and Class 2 properties, which were then used to estimate the energy usage, energy costs, GHG emissions, appliance costs for rental providers and renters, and the health impacts for air pollution. These values were used to calculate the NPV and BCR under different options.

It is assumed rental providers will incur once-off costs of purchasing heaters and coolers during the lifetime of the current Regulations along with an administrative time cost of 1 hour to obtain quotes. The administrative costs of sourcing quotes and coordinating with renters and/or rental agencies would have been incurred in the base case as well when appliances reach the end of their life. The administrative costs incurred under this standard instead relate to the time spent by rental providers in investigating replacements to gas appliances.

Deloitte built upon the DEECA model using the overarching methodology described in section 3.5. This included:

- undertaking the analysis for Option 4
- updating capital cost of heating and cooling appliances by 6.5 per cent CPI increases for household appliances
- calculating the benefits to renters from the avoided cost of purchase of portable coolers
- adding the costs incurred by rental providers in obtaining quotes for upgrading appliances. Consistent with section 3.5.7.1, it was assumed that a rental provider would need to spend 1 hour, valued at \$36
- updating the health cost of air pollution from coal fired electricity generation as outlined in section 3.5.8.3.

While the cooling minimum standard will mandate that all rental properties will be required to have a fixed cooler installed by 30 October 2027, the modelling undertaken for this minimum standard was based upon an assumption that an energy efficient cooler would need to be installed at the time of a new lease. In practice, this change in the point at which compliance is required would have minimal impact on the modelling results, as the annual turnover rate assumption applied in the modelling for new leases is 34 per cent,¹⁶⁶ which sees the current total stock of rental properties turning over by the end of 2027.

7.3.2 CBA results – heating and cooling in rental properties

The CBA results of options for heating and cooling in rental properties are outlined in Table 7.3 below. The results have been modelled over a 7-year period and 20-year period.

All options modelled result in a positive BCR and provide net benefits over the 20-year period. The CBA indicates that the option with the highest BCR over 20 years is Option 2, a 2 Star heating and cooling standard. This option has a BCR of 3.05 and estimated net benefits of \$1,380 million over 20 years.

The benefits across all options are largely driven by a reduction in the energy costs associated with gas usage. Options 3 and 4 provide higher benefits than Option 2 but they also have higher associated costs due to 3 Star systems being more expensive than 2 Star systems. The higher efficiency benefits achieved under these options are offset by the relatively higher costs. Option 1 underperforms against all other options, indicating significant benefits to be achieved from phasing out gas appliances.

¹⁶⁶ Department of Families, Fairness and Housing, *Rental reports*.

Table 7.3: CBA results for heating and cooling standards in rental properties (20-year PV, \$ millions)

	Option 1 – 2 Star heating and cooling standard	Option 2 – 2 Star heating and cooling standard, electric only	Option 3 – 3 Star heating and cooling standard, electric only	Option 4 – 2 Star heating and 3 Star cooling standard, electric only
Capital costs (including installation and decommissioning costs)	\$552.87	\$659.88	\$810.29	\$697.96
Quote/admin costs	\$12.30	\$13.03	\$14.25	\$13.30
Total costs	\$565.17	\$672.90	\$824.54	\$711.26
Avoided portable cooler costs for renters	\$175.39	\$175.39	\$175.39	\$175.39
Avoided energy costs	\$402.34	\$1,313.72	\$1,504.11	\$1,366.68
Avoided GHG emissions	\$69.31	\$551.84	\$580.97	\$560.19
Avoided air pollution costs	\$6.64	\$11.70	\$14.46	\$12.49
Total benefits	\$653.68	\$2,052.64	\$2,274.93	\$2,114.75
NPV (20-years)	\$88.51	\$1,379.74	\$1,450.39	\$1,403.50
BCR (20 years)	1.16	3.05	2.76	2.97
<i>Total benefits (7-years)</i>	<i>\$388.79</i>	<i>\$680.27</i>	<i>\$759.79</i>	<i>\$703.86</i>
<i>NPV (7-years)</i>	<i>-\$176.38</i>	<i>\$7.36</i>	<i>-\$64.75</i>	<i>-\$7.40</i>
<i>BCR (7 years)</i>	<i>0.69</i>	<i>1.01</i>	<i>0.92</i>	<i>0.99</i>

7.3.3 Summary of preferred option

DEECA and DGS's preferred option for the minimum standard relating to heating and cooling in rental properties is Option 4. Option 4 yields an estimated NPV of \$1,404 million over the 20-year analysis period. Under Option 4, rental properties will be required to install a 2 Star electric room heater or a 3.2 HSPF ducted electric heating system (equivalent to a 1.5 Star room heater) and a 3 Star electric room cooler or a 3.8 TCSPE ducted electric cooling system (equivalent to a 2 Star room cooler).

Option 4 is estimated to yield a BCR of 2.97, implying that for every dollar of cost incurred by rental providers, \$2.97 in benefits to renters and society more broadly would be achieved.

While Option 4 yields a relatively lower NPV than Option 3, Option 4 is selected as the preferred option as it also provides for significant benefits which align with Victorian Government objectives, as well as takes into consideration implementation risks associated with potential supply chain constraints.

Supply chain analysis undertaken by DEECA indicates an insufficient supply of ducted systems with the required equivalent efficiency rating to achieve the prescribed efficiency requirement under options 2 and 3. Similarly, while there is an adequate supply of 3 Star coolers, the supply chain analysis shows an insufficient supply of 3 Star heaters to meet the

requirements of implementing a 3 Star heating standard. By implementing a hybrid approach that accounts for product supply, Option 4 maximises the benefits that can be achieved from prescribing a heating and cooling standard in rental properties.

Another benefit of Option 4 is the consideration of the differences in efficiency between ducted and non-ducted systems. Ducted systems operate at a lower efficiency level than reverse cycle air conditioners and therefore ducted systems of a higher efficiency level would be required to achieve the prescribed efficiency rating.

8 Heating in rooming houses

This chapter describes the policy options and parameters relating to the proposed introduction of minimum standards for a fixed energy efficient heater in rooming houses, and analyses the impacts of those options.

8.1 Options – Heating in rooming houses

A number of options have been considered to inform the design of a new minimum standard for heating in rooming houses. These options, as well as the base case, are described below.

8.1.1 Base case – Heating in rooming houses

Under the base case, there would continue to be no requirement for rooming house operators to provide heating for their residents. If an operator were to install heating, there would be no restriction on the type of heater that could be installed.

Given a lack of data on the prevalence of heating in rooming houses in Victoria, a conservative assumption has been made in the base case that no rooming houses currently have any heating appliances installed in bedrooms and therefore residents use portable heating appliances.

8.1.2 Options – heating in rooming houses

This RIS has analysed two options relating to mandating minimum standards for heating in rooming houses. These options are:

- **Option 1** – Minimum 2 Star, electric-only heating. Under this option, there must be a fixed minimum 2 Star rating electric room heater installed in each bedroom of a rooming house, or a central heater with a HSPF of 3.2 minimum (equivalent to a 1.5 Star room heater) with an outlet in each bedroom.
- **Option 2** – Minimum 3 Star, electric-only heating. Under this option, there must be a fixed minimum 3 Star rating electric room heater installed in each bedroom of a rooming house, or a central heater with a HSPF of 3.2 minimum (equivalent to a 1.5 Star room heater) with an outlet in each bedroom.

RCACs are the only systems that currently meet efficiency requirements under both options. A 1.5 Star equivalent standard for central heating systems is proposed under both options, due to market feasibility and supply chain considerations.

8.2 Policy parameters for heating in rooming houses

There are a number of policy parameters that have been established in designing the minimum standard for heating in rooming houses. These parameters apply to all options analysed in the CBA for the heating minimum standard and are summarised in Table 8.1. below

Table 8.1: Policy parameters for heating in rooming houses

Parameter	Setting	Rationale
Exemptions	<p>Rooming houses will be exempt from complying with the proposed heating standard where:</p> <ul style="list-style-type: none"> • installation would impose an excessive cost when compared to the average cost of installation in a room of the same building class • the rooming house already has hydronic heating servicing the bedrooms • compliance with any other Act or local law makes the cost of installation prohibitive • there is an existing system in good working order • an appliance is being replaced under a manufacturer, supplier or installer warranty • it is otherwise not reasonably practicable to install a compliant system. <p>Where a fixed efficient heater is unable to be installed in each bedroom, a fixed inefficient heater will be required to be installed in each bedroom instead.</p>	<p>Excessive cost exemptions will be available at a per-room basis. If it is significantly more expensive to install a RCAC in one room, that room will be exempt but other rooms in the rooming house will need to have RCACs installed. The excessive cost exemption will not be considered on a cumulative basis for each system to be installed in a rooming house.</p> <p>RCAC systems require installation of a system inside the home as well as an outdoor unit on the exterior. For larger rooming houses, there may be situations in which the amount of space available to install systems is limited and impracticable.</p> <p>The exemption for conflict with other legislation and regulations is in place to account for circumstances where other regulations and legislation significantly increase the cost of compliance - for example, where installation of an energy efficient appliance would require significant building works to meet <i>Heritage Act 2017</i> requirements.</p> <p>An exemption is in place to allow existing heating and cooling systems reach the end of their life or where an appliance being replaced under a warranty is provided to avoid conflicts with consumer protections where a heating/cooling system fails within the warranty period.</p>
Trigger	<p>12 months from the start date of the Regulations in properties where there is no fixed heating in bedrooms.</p> <p>Where there is currently an existing central heating system or RCAC in bedrooms, it will need to be replaced with a compliant system at end of life.</p>	<p>To ensure rooming house residents are provided with adequate heating as soon as practicable, provision of a compliant heater in each bedroom will be required 12 months from the amendment of the Regulations.</p> <p>Where heating is already provided to rooming house residents, a non-compliant system will need to be replaced with a compliant system at the end of its useful life, which will help to minimise impacts on supply chain of heaters. As noted in section 8.1.1, the number of rooming houses with existing heating are expected to be very low.</p>

8.3 Options analysis – Heating in rooming houses

8.3.1 Methodology

The overarching methodology described in section 3.5 was similarly used to estimate the costs and benefits of the proposed heating standard in rooming houses. As the Rooming House Regulations are due to sunset in 2033, a 9-year analysis period has been utilised to compare the costs and benefits over the remaining lifetime of the Rooming House Regulations. Appendix A provides detail on the assumptions and variables utilised in the analysis.

To estimate the current stock of rooming houses and bedrooms the proposed heating standard will apply to, the current number of rooming houses in Victoria was sourced from the Rooming House Register and multiplied by the average number of bedrooms in a rooming house, based upon CoreLogic data from 2018. The historical average growth in rooming houses was used to project the future growth in rooming houses over the forward period.

Given a lack of data on the profile of heating provided in rooming houses, the analysis assumes that no rooming houses currently have fixed heating appliances installed within bedrooms and that residents instead purchase and use portable heaters (and coolers).¹⁶⁷ The modelling assumes 10 per cent of rooming houses will be unable to install a fixed efficient heater in each bedroom and instead incur the costs of installing a fixed inefficient heater in each bedroom.

Rooming house operators will incur costs associated with the purchase and installation of the required number of RCACs in their rooming house, along with the assumed one hour of administrative time cost associated with obtaining quotes and making logistical arrangements. Given the need to comply with the standard 12 months from the start date of the proposed minimum standard, majority of rooming houses incur these costs in the second year of the analysis period. Costs continued to be incurred over the 9-year analysis period by new rooming houses coming into operation. The lifespan of both 2 Star and 3 Star RCACs is assumed to be 12 years, so each rooming house only incurs these costs once within the lifetime of the Regulations.

As all rooming house residents will be provided with a fixed efficient or inefficient heater, the avoided cost of portable heaters is included in the modelling as a benefit to rooming house residents. Given RCACs have dual functionality of heating and cooling, in instances where rooming house residents are provided with an efficient fixed heater, the modelling also includes the avoided cost of portable coolers as a benefit to rooming house residents.

DEECA used the average energy usage of 2 and 3 Star RCAC appliances in a Class 1 property and extrapolated to estimate the energy usage in a rooming house bedroom by analysing the ratio of average floor areas. To determine the benefits of the options, the difference between energy consumption in the base case (from portable heaters) was compared to the expected energy usage by 2 and 3 Star RCACs under Options 1 and 2, respectively. Benefits were calculated in line with the overarching methodology described in section 3.5.8. An additional benefit was included in the analysis to account for the avoided cost rooming house residents would incur in relation to the need to purchase a portable heater.

To capture the full flow of benefits from appliances installed within the 9-year analysis period, results are also presented over a 20-year analysis timeframe.

8.3.2 CBA results – Heating in rooming houses

The CBA of options to introduce a minimum standard for heating in rooming houses yielded the results summarised in Table 8.2, which shows both options 1 and 2 have positive NPVs and BCRs greater than 1, indicating a net positive impact from the policy options.

The CBA indicates that the option with the highest net benefit over the 20-year analysis period and the highest BCR is Option 1, which requires the installation of a 2 Star RCAC or a 1.5 Star equivalent central system outlet in each bedroom of a rooming house. This option yields an estimated net benefit of \$25 million (NPV) and a BCR of 3.44.

While Option 2 has higher benefits, the additional costs under the option associated with installing a more expensive 3 Star RCAC result in a BCR of 3.17. The incremental cost of a 3 Star RCAC offsets the incremental benefits provided by the increased energy efficiency of a 3 Star RCAC. Over the shorter term, both options are estimated to provide approximately \$10 million in net benefits.

¹⁶⁷ This assumption simplifies the analysis by enabling the comparison of energy consumption (and subsequent benefits) between different heating appliances. Where rooming house residents are not currently using portable heaters for thermal comfort, a range of health benefits would be expected to accrue to residents under the proposed options where their thermal comfort improves as a result of being provided with (and using) a heater.

Table 8.2: CBA results for heating standard in rooming houses (20-year PV, \$millions)

	Option 1	Option 2
Capital costs	\$10.16	\$11.83
Quote/admin costs	\$0.21	\$0.21
Total costs	\$10.37	\$12.04
Avoided portable heater and cooler costs	\$4.14	\$4.14
Avoided energy costs	\$27.29	\$29.30
Avoided GHG emissions	\$3.93	\$4.31
Avoided air pollution cost	\$0.37	\$0.40
Total benefits (20-years)	\$35.73	\$38.16
NPV (20-years)	\$25.35	\$26.11
BCR (20 years)	3.44	3.17
<i>Total benefits (9-years)</i>	<i>\$20.03</i>	<i>\$21.63</i>
<i>NPV (9-years)</i>	<i>\$9.65</i>	<i>\$9.59</i>
<i>BCR (9-years)</i>	<i>1.93</i>	<i>1.80</i>

8.3.3 Summary of the preferred option

DEECA and DGS's preferred option for the minimum standard relating to heating in rooming houses is Option 1. Option 1 yields an estimated NPV of \$25 million over the 20-year analysis period. Under Option 1, rooming house operators will be required to install a fixed 2 Star RCAC or 1.5 Star equivalent central system outlet in each bedroom in their rooming house. For rooming house operators who already provide fixed heating, they will need to upgrade heating systems to ensure they comply with the standard once current heating systems reach the end of their useful life. In properties where an energy efficient heater cannot be installed in each bedroom, an inefficient fixed heater will need to be installed instead.

Option 1 is estimated to yield a BCR of 3.44, implying that for every dollar of cost incurred by rooming house operators, \$3.44 in benefits to rooming house residents and society more broadly would be achieved.

While Option 1 yields a marginally lower NPV than Option 2, Option 1 is selected as the preferred option as it takes into consideration implementation risks associated with potential supply chain constraints.

As noted in section 7.3.3, supply chain analysis undertaken by DEECA suggests there is likely limited availability of 3 Star heating systems, and so while Option 2 would provide greater benefits aligned with the objectives of the minimum energy efficiency standards, Option 1 has been selected as the preferred option to account for available supply of compliant systems.

9 Blind cord safety anchors

This chapter describes the policy options and parameters relating to the proposed introduction of minimum standards for blind cord safety anchors in rental properties and analyses the impacts of those options.

9.1 Options – Blind cord safety anchors

9.1.1 Base case

As discussed in section 2.10, there is a critical gap in the current regulatory framework for curtain and blind cord safety that has resulted in tragic and preventable loss of life.

Under the base case, the requirements under the Residential Tenancies Regulations 2021 for all windows in a rented premise to be fitted with curtains or blinds to reasonably block out light and to provide privacy to the renters will continue to apply. While the mandatory Australian standard related to blind cord safety anchors would continue to apply for any new blinds installed, given the Australian standard is not retrospective, any internal window coverings installed in rental properties prior to 2015 would continue to not be required to have blind cords secured. There is limited data on the prevalence of blind cord safety anchors already installed in the current stock of rental properties.

9.1.2 Option 1 – Mandate the installation of blind cord safety anchors for all blinds

Under this option, all internal window coverings (curtains and blinds) in a rental property will require a blind cord safety anchor to secure the cords. Under this option, corded internal window coverings that were installed prior to 1 January 2015 must have a blind cord safety anchor installed against a wall or structure at least 1,600 mm above floor level. The safety anchors must be installed such that:

- it uses any components specified in the installation instructions as necessary to meet requirements for cord safety, and
- is in accordance with the installation instructions for corded internal window covering for the purposes of ensuring that a loose cord cannot form a loop of 220 mm or longer that is less than 1,600 mm above floor level.

This option implements the recommendation from the 2022 Coroner’s Report that all rental properties be mandated to have blind cords affixed to the wall.¹⁶⁸ As this option implements the Coroner’s recommendation, it is the only option considered. This option will align the minimum standards in the Residential Tenancies Regulations with the equivalent minimum standard, which was inserted into the Rooming House Regulations in 2023.

9.2 Policy parameters – Blind cord safety anchors

The only policy parameter that has been established by DGS in designing the minimum standards for blind cord safety anchors in rental properties relates to the point at which compliance will be required, and is outlined in Table 9.1.

There will be no exemptions allowed for in the Residential Tenancies Regulations for complying with this standard.

Table 9.1: Policy parameters for blind cord safety anchors

Parameter	Setting	Rationale
Trigger	12 months from the start date of the Regulations in rental properties where there are no safety anchors for blind cords.	To ensure the safety of renters as soon as practicable, installation of safety anchors for all blind cords in a rental property will be required 12 months from the amendment of the Residential Tenancies Regulations.

¹⁶⁸ Coroners Court of Victoria (2022), *Finding into death without inquest: Master J (Coroner Gerbert, 27 June 2022)*.

9.3 Options analysis – Blind cord safety anchors

As outlined in Chapter 3, a breakeven analysis has been used to estimate the efficacy of requiring rental properties to install blind cord safety anchors for all internal window coverings, given the difficulty in providing an exact quantification of the benefit the minimum standard may provide.

9.3.1 Cost methodology

The costs of implementing this requirement have been calculated on a per window, per rental property basis. The total number of rental properties assumed to be required to comply with this minimum standard is 515,701 Class 1 rental properties and 188,874 Class 2 rental properties in 2023, as used elsewhere in this RIS.¹⁶⁹ In order to include costs incurred by new rental properties over the 7-year analysis period, the growth in rental stock over the forward period was assumed to converge towards a 10-year average of 3.4 per cent by 2027.

There is limited data on the prevalence of blind cord safety anchors already installed in the current rental property stock. Therefore, under the base case it was conservatively assumed that 20 per cent of rental properties are already compliant with the Australian safety standard. This assumption was based upon the 10 per cent of properties that were found to be wholly compliant with the standard by the ACCC in 2016,¹⁷⁰ as well as an additional 10 per cent to account for those properties that are likely to be partially compliant (i.e. have some windows with blind cord safety anchors). These figures were combined with ABS data that showed, on average, Class 1 and Class 2 properties have approximately 2.92 and 1.74 bedrooms, respectively.¹⁷¹ The analysis assumes one window covering per bedroom in a Class 1 and Class 2 property, as well as one additional window covering in a lounge room area.

Labour and material costs were calculated for each window requiring a safety anchor. Material costs were assumed to be \$7.10 per window.¹⁷² Labour costs were calculated based on a \$36 per hour value of leisure time for DIY installation, as used elsewhere in this RIS, and installation time was assumed to be 15 minutes per window.

The analysis assumed that all currently non-compliant rental properties will take the necessary actions to comply with the minimum standard within 12 months of the amendments to the Residential Tenancies Regulations (i.e. 100 per cent compliance by mid-2025). While the extent of compliance with the minimum standard is highly uncertain, a 100 per cent compliance rate has been used in this analysis as a conservative estimate to analyse the full costs of the introduction of the minimum standard, and to align with compliance rate assumptions used throughout this RIS.

Following the above approach, it is estimated the introduction of a minimum standard which requires the installation of blind cord safety anchors in all rental properties will cost \$37.6 million over the remaining 7-year lifetime of the Residential Tenancies Regulations.

9.3.2 Value of a statistical life

The requirement for blind cord safety anchors is being introduced to enhance safety in rental properties and to reduce the risk of injury and, in extreme circumstances, loss of life. For the purposes of this analysis, the benefits of requiring the use of safety anchors for blind cords have been estimated by analysing the impacts of avoiding this worst-case scenario.

To estimate the benefits of introducing a minimum standard which requires rental properties to install blind cord safety anchors, this analysis uses a Value of a Statistical Life Year (VSLY) measure of \$393,281 (2023 AUD).¹⁷³ Given an average life expectancy in Victoria of 84 years,¹⁷⁴ and evidence from the Coroners Court of Victoria that the average age of loss of life from blind cords in the past decade is 2 years old,¹⁷⁵ a value of \$11.93 million is used as the value of a statistical life (VSL) in this breakeven analysis.

9.3.3 Breakeven analysis

By dividing the total costs to rental providers of complying with the minimum standard by the VSL, this analysis estimates that in order to breakeven, the minimum standard for blind cord safety anchors would need to avoid the loss of 3.15 lives over the 7-year analysis period.

¹⁶⁹ Based upon Australian Bureau of Statistics (2021), Census data of rental housing stock and actual growth in rental properties since 2021.

¹⁷⁰ Australian Competition & Consumer Commission (2016), *ACCC warns of dangers of loose blind and curtain cords*, <<https://www.accc.gov.au/media-release/accc-warns-of-dangers-of-loose-blind-and-curtain-cords>>.

¹⁷¹ Australian Bureau of Statistics (2021), *2021 Census - counting dwellings, place of enumeration*.

¹⁷² Bunnings (2024), *Windoware Curtain Chain Cord Tensioner*, <https://www.bunnings.com.au/windoware-curtain-chain-cord-tensioner_p1288887>, accessed: 23/01/2024.

¹⁷³ Australian Safety and Compensation Council (2006), *The health of nations: The Value of a Statistical Life*.

¹⁷⁴ Australian Bureau of Statistics (2023), *Life expectancy* <<https://www.abs.gov.au/statistics/people/population/life-expectancy/latest-release>>.

¹⁷⁵ Coroners Court of Victoria (2022), *Finding into death without inquest: Master J (Coroner Gerbert, 27 June 2022)*.

Evidence from the Victorian Coroners Court report indicates that blind cord safety anchor accidents resulted in the loss of two lives in Victoria between 2010 and 2020,¹⁷⁶ or approximately 0.2 lives lost per year. A number of other benefits would further contribute to the minimum standard yielding a positive outcome. For example, the Victorian Coroners Court report showed that in the same decade in which the two lives were lost, there was evidence of a further 26 hospital presentations, 50 per cent of which required follow up treatment, because of self-inflicted injury from blind cords.¹⁷⁷ It is expected that the introduction of the minimum standard for blind cord safety anchors would also avoid a number of these injuries. The breakeven analysis also does not consider the unquantifiable avoided grief and trauma of family members if loss of life is avoided. Additionally, the small sample size used to estimate the average lives lost per year means this average could change over time. It is a distinct possibility when considering both the number of injuries and this low sample size that blind cords may represent a greater risk than the recent evidence suggests.

When considering these factors alongside the relatively small per rental property cost of approximately \$45 associated with installing blind cord safety anchors, it is highly plausible that requiring rental properties to have blind cord safety anchors installed would have a net positive outcome on the wellbeing of Victorians. For these reasons, DGS consider the benefit of potentially avoiding catastrophic incidents to outweigh the relatively small imposition of the installation costs on rental providers when both quantifiable and non-quantifiable anticipated benefits are considered.

¹⁷⁶ Coroners Court of Victoria (2022), *Finding into death without inquest: Master J (Coroner Gerbert, 27 June 2022)*.

¹⁷⁷ *Ibid.*

10 Impact of preferred options

This chapter summarises the total impacts of the preferred options.

10.1 Impact of preferred options

10.1.1 Summary of preferred options

The preferred standards, and the total costs and benefits of those standards are summarised in Table 10.1.

Across all the standards considered as part of this analysis, the combined incremental costs of the preferred options over the remaining 7-year life of the Residential Tenancies Regulations and remaining 9-year life of the Rooming House Regulations are estimated to be \$1,554 million (PV), or approximately \$222 million per year. These costs are outweighed by the benefits accrued from adopting the preferred options for each standard, amounting to a total of \$4,092 million (PV).¹⁷⁸

The total impact across all proposed minimum standards, as outlined in Table 10.1, are presented in present value terms, noting that the time period over which the costs and benefits have been accounted for varies between different minimum standards based upon considerations such as the remaining lifetime of the relevant regulations, the expected lifetime of different appliances or measures required under each proposed minimum standard and the availability of data.

Table 10.1: Summary of costs and benefits of the preferred options (PV, \$millions)

Standard	Preferred option	Costs	Benefits
Ceiling insulation	Option 3A - Mandating R5 insulation in properties with no insulation	\$101.65	\$350.26
Draught sealing	Option 2 - Seal on all external doors, wall vents and sealing of general gaps and cracks	\$353.22	\$458.14
Hot water systems	Option 4 - Electric low running cost systems (no gas systems)	\$157.45	\$727.40
Shower heads	Option 1 - Minimum 4 Star WELS rating	\$182.87	\$406.14
Heating and cooling (rental properties)	Option 4 - 2 Star heating standard and a 3 Star cooling standard, with a 1.5 Star and 2 Star heating and cooling standard respectively for ducted systems	\$711.26	\$2,114.75
Heating (rooming houses)	Option 1 - 2 Star reverse cycle air conditioner or a central heating system outlet in each bedroom	\$10.37	\$35.73
Blind cords safety anchors	All internal window coverings (curtains and blinds) in a rental property will require a blind cord safety anchor to secure the cords.	\$37.6	N/A
Total		\$1,554.42	\$4,092.42

¹⁷⁸ The analysis period for each standard depends on the assumed lifetime of the required measure, as outlined in section 3.5.

10.2 Distributional impacts

10.2.1 Marginal costs to rental providers and rooming house operators

The combined marginal cost to rental providers per rental property in 2025 is estimated to be \$5,519, across all of the proposed standards. The breakdown of costs to rental providers for complying with each standard, relative to costs incurred under the base case, are outlined in Table 10.2. As the proposed standards relating to ceiling insulation, draught sealing and blind cord safety anchors require rental providers to install measures which they would likely not have otherwise installed in the base case (i.e., the cost to rental providers in the base case is zero), the marginal cost in these cases is the full cost of the upgrade.

The costs in Table 10.2 include the marginal cost of any upgrade work, appliances, installation and the time cost of any related administrative tasks. It is important to note that this is representative of an upper bound of the costs a rental provider may face in complying with the proposed minimum standards in 2025. It is unlikely a rental provider would incur all of these costs in the one year. Not accounting for inflation, these costs per rental property are expected to stay relatively constant over the 7-year analysis period.

Table 10.2 Marginal cost per dwelling of preferred options in 2025

Policy setting	Per-property cost to rental providers
Ceiling insulation – Option 3A	\$2,480
Draught sealing – Option 2	\$607
Hot water systems – Option 4	\$361
Shower heads – Option 1	\$236
Heating and cooling – Option 4	\$1,790
Blind cord safety anchors	\$45
Total marginal cost per dwelling	\$5,519

Similarly, the cost of the preferred option on a per rooming house basis is estimated to be \$5,013 in 2025. As it is assumed there are currently no rooming houses which have heating installed, this cost represents the full cost of the upgrades for an average rooming house. This cost incorporates the cost of appliances, installation and the time cost of any related administrative costs. Not accounting for inflation, these costs per rooming house are expected to stay relatively constant over the 7-year analysis period.

10.2.2 Potential cost offsets

There are a range of cost offsets that may be available to rental providers and rooming house operators to support the implementation of the preferred standards.

The Victorian Energy Upgrades (VEU) program is a Victorian Government initiative that incentivises households (including rental providers and rooming house operators) and businesses to improve the energy efficiency of their homes and

businesses.¹⁷⁹ Activities eligible under the program include upgrades to heating and cooling appliances, hot water systems, shower heads and weather sealing.¹⁸⁰

The *Victorian Energy Efficiency Target Act 2007*, under which the VEU program operates, specifies that in order to be eligible for a rebate, an activity must “result in a reduction in greenhouse gas emissions that would not otherwise have occurred if the activity was not undertaken”. This means the VEU program may not be able to provide incentives for upgrades to meet regulatory requirements. The VEU program may explore options that consider whether to uphold this additionality requirement or allow rental providers and rooming house operators to continue to access VEU incentives once mandatory requirements have commenced.

Table 10.3 outlines the range of potential incentives that could be available under each of the proposed standards, dependent on factors such as eligibility, the existing system and property types. In circumstances where upgrade activities are eligible for VEU incentives, the per property costs for rental providers and rooming house operators outlined in Table 10.2 would be reduced by the amount of the rebate received.

Table 10.3: Range of rebates available for upgrades under the Victorian Energy Upgrades scheme

Appliance installed	Potential VEU rebate
Solar electric boost hot water system	\$350 - \$770
Heat pump hot water system	\$350 - \$630
Weather sealing	\$70 - \$140
Shower head	\$70
Single RCAC (Class 1)	\$1,050
Multi-split RCAC (Class 1)	\$5,600
Ducted RCAC (Class 1)	\$3,500

Source: DEECA

10.2.3 Benefits to renters

The breakdown of estimated benefits accrued to renters in 2025 under each proposed standard is outlined in Table 10.4. These benefits represent the direct savings to renters in the form of energy costs from improved appliance efficiency¹⁸¹ and thermal performance of the home, as well as improved health benefits from better thermal conditions.

¹⁷⁹ Department of Energy, Environment and Climate Change (2024), *About the VEU program* <[¹⁸⁰ Department of Energy, Environment and Climate Change \(2023\), *Victorian Energy Upgrades for households* <\[>\]\(https://www.energy.vic.gov.au/households/victorian-energy-upgrades-for-households\).](https://www.energy.vic.gov.au/households/victorian-energy-upgrades-for-households/about-the-veu-program#:~:text=Victorian%20Energy%20Upgrades%20reduce%20emissions,billion%20in%20energy%20system%20costs.>>.</p>
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¹⁸¹ Benefits related to improved appliance efficiency arise from the fact that renters are assumed to utilise inefficient coolers in the base case. The use of these inefficient coolers will decline as renters are provided with energy efficient appliances under the minimum standard.

Table 10.4: Marginal benefit per property to renters of preferred options in 2025

Policy setting	Per-property benefit to renters
Ceiling insulation – Option 3A	\$454
Draught sealing – Option 2	\$113
Hot water systems – Option 4	\$220
Shower heads – Option 1	\$38
Heating and cooling – Option 4	\$215

Where renters currently use a portable air conditioner, they will receive an additional benefit in the form of avoided replacement costs of a portable cooler when their current appliance reaches the end of its life. This benefit would be, on average, \$1,176 per avoided portable air conditioner purchased.

Similarly, the benefits accrued per rooming house are, on average, \$988 in 2025. Based upon an average of 4.17 bedrooms in a rooming house, the average benefit per rooming house resident is estimated to be \$237 in 2025. This benefit reflects the direct savings to rooming house residents in the form of energy costs from improved appliance efficiency.¹⁸² Where rooming house residents currently use a portable heater and/or cooler, they will receive an additional benefit in the form of avoided replacement costs of that portable appliance when their current appliance reaches the end of its life. This benefit would be, on average, \$474, per avoided portable appliance purchased.

10.3 Potential impact on the rental market

10.3.1 Potential impact on supply in the rental market

It is not expected that an increase to the per property cost of a rental property will lead to a withdrawal of properties from the rental market. As noted in section 2.2, recent AHURI research suggests that tenancy law reforms in NSW and Victoria, including introduction of minimum rental standards, have not been a significant factor in rental providers choosing to leave the rental market.¹⁸³ AHURI found that, while stakeholders representing rental providers raised concerns about the consequences of increased minimum standards when consulted, the evidence in the market showed no statistically significant change in rental market exits.¹⁸⁴ Furthermore, research from Deloitte Access Economics found that overall, the impacts of recent rental reform in Queensland, which included minimum standards, on the rental market were negligible. It is important to note the average compliance cost from the analysed reforms was approximately \$2,000 per rental property.¹⁸⁵ It is important to acknowledge that despite the above evidence, there is likely a limit to the costs associated with minimum rental standards that rental providers will absorb, with recent cost of living pressures and interest rate increases likely putting downward pressure on this limit also (see section 2.2).

It is a possibility that supply of rental properties in the short-term could contract as rental providers understand and comply with the additional minimum standards. This could occur due to delays in acquiring materials or appliances and/or the availability of appropriate contractors for installation. The extent to which this may impact on rental supply will be minimised by the requirements to comply either at new lease or at the end of life of an existing appliance, which will limit the number of rental properties required to immediately comply with the proposed minimum standards. Additionally, selection of the

¹⁸² Benefits related to improved appliance efficiency arise from the fact that rooming house residents are assumed to utilise inefficient heaters in the base case. The use of these inefficient heaters will decline as rooming house residents are provided with energy efficient appliances under the minimum standard.

¹⁸³ Australian Housing and Urban Research Institute (2022), *Regulation of residential tenancies and impacts on investment* <<https://www.ahuri.edu.au/research/finalreports/391>>.

¹⁸⁴ Ibid.

¹⁸⁵ Deloitte Access Economics for the (former) Queensland Department of Communities, Housing and Digital Economy (2021), *Updated economic analysis of Queensland rental reforms* <https://www.chde.qld.gov.au/_data/assets/pdf_file/0025/18484/update-economic-analysis-queensland-residential-renting-reforms.pdf>.

preferred minimum standards for heating and cooling has taken into account potential implementation risks, such as supply chain constraints for RCACs.

10.3.2 Potential impact on rents

It is likely too, that increased costs for rental providers would be passed on to their tenants. Should this be the case, the increase in rent would be offset, at least in part, directly by the benefits accrued by renters in the form of energy savings. Various analyses have found that similar policy changes, such as changes to minimum housing standards, have not led to significant long-term changes in rental prices. Generally, these analyses found that the cost that was expected to be passed on was a very small portion of the overall change in the user cost as a result of the policy.^{186,187}

These outcomes are expected *on average*, as some rental providers may pass on all or most of the cost of the policy change to their renters, while some property owners may bear the entire cost. The ability for the cost to be imposed on renters also depends on many economic factors, such as the competitiveness of the rental market at the time (based on supply and demand constraints).

10.4 Impact on rooming houses

The introduction of heaters in each room of a rooming house, while providing residents with benefits, is also likely to impose costs on residents through higher electricity bills. Under the RTA, rooming house operators can only charge residents separately for the electricity that residents consume if their room has a separate meter and only has one resident living in it.¹⁸⁸ If a room does not have a separate meter, the utility costs are factored into the rent for that room.

There is a possibility that rooming house operators may pass on some costs to residents in the form of increased rent. The extent to which costs are likely to be passed on to residents is difficult to predict. Many rooming house residents receive government pensions or may work in low paying jobs.¹⁸⁹ In some instances, a rooming house resident on Job Seeker may pay up to 50 per cent of their income on rent.¹⁹⁰ Therefore, residents might have a limited ability to pay increased rent and rooming house operators may have a limited ability to recover the costs of complying with the proposed standard. Evidence suggests a rooming house can return on average between \$1,200 to \$1,500 per week for operators, making the annual costs of the proposed heating standard for a rooming house operator approximately 6-8 per cent of one year's potential earnings.¹⁹¹

10.5 Sensitivity analysis

Sensitivity testing was undertaken on several variables and sources of uncertainty, including reduced energy savings, increased appliance costs, lower and upper bound carbon values and the assumed rate of compliance. The results and choice of preferred option were robust to variation in all of these variables across the standards, even under significant changes.

Detailed results from sensitivity testing of key uncertainties are outlined in sections 10.5.1 (energy prices), 10.5.2 (interactions between standards) and 10.5.3 (health benefits).

Sensitivity testing was also used to demonstrate the increase in appliance costs required for the preferred options to reach a breakeven point. For example, for heating and cooling in rental properties, it would require an increase in appliance costs of 360 per cent for the costs to outweigh the benefits under Option 4, over the 20-year analysis period.

10.5.1 Energy prices

The results from analysis in this RIS are sensitive to inputs related to forecast gas price assumptions, and to a lesser extent forecast electricity price assumptions (see section 3.5.8.1). Due to the uncertainty surrounding future energy prices,

¹⁸⁶ Regulatory Impact Solutions, (2019), *Regulatory Impacts Statement: Residential Tenancies Regulations 2020*.

¹⁸⁷ Queensland Department of Communities, Housing and Digital Economy (2021), *Updated economic analysis of Queensland residential renting reforms (prepared by Deloitte Access Economics)*.

¹⁸⁸ Victoria Legal Aid (2023), *Rooming houses: Learn about the legal rights and responsibilities of rooming house residents, owners and managers*.

¹⁸⁹ Peninsula Community Legal Centre (2020), *Open the door: the residents view of life in a rooming house*.

¹⁹⁰ Tenants Victoria (2022), *Safe, secure and affordable housing for rooming house residents – Rooming Houses Lived Experience Project submission*.

¹⁹¹ The Hopkins Group (2020). *What is the demand for Rooming Houses in Victoria?* <<https://thehopkinsgroup.com.au/what-is-the-demand-for-rooming-houses-in-victoria>>. Values are for an 8 bedroom rooming house, so have been adjusted for the average number of bedrooms as noted by CAV in 2018 (4.73). There is some evidence to suggest that rooming houses may return higher gross rental yields than traditional rental properties (which average around four per cent), as they can experience reduced vacancy rates given the potential to continue collecting rent from other residents in the rooming house when one resident vacates.

sensitivity testing has been undertaken by adopting arbitrary percentages as example scenarios. The scenarios tested include:

- retail gas prices 33 per cent higher than the core assumption
- retail gas prices and retail electricity prices 33 per cent higher than the core assumption.

The results from the sensitivity testing based on the above scenarios are presented in Table 10.5. Sensitivity testing examining a 33 per cent increase in gas prices only was considered necessary noting the significant uncertainty around the future of gas prices in Victoria and the forecast supply constraints in the AEMO 2024 Gas Statement of Opportunities. An increase in retail electricity prices alone was not tested, as residential CBA results are more sensitive to increases in retail gas prices than electricity prices. Gas and electricity price increases over 33 per cent were not tested, as any further increases in energy prices would only result in more positive BCRs.

Sensitivity testing was also undertaken to confirm the viability of preferred options in an unlikely scenario where energy prices reduce significantly. Notably, all proposed minimum standards maintain BCRs above, or in close proximity to, one, even in an extreme scenario where energy prices are reduced to zero. This indicates the benefits associated with avoided greenhouse gas emissions, reduced air pollution and avoided health impacts, are enough to outweigh the costs of the proposed minimum standards. The draught sealing and shower head minimum standards were the only exception to this, with those results breaking even when energy prices are reduced by 30 per cent and 70 per cent, respectively.

Table 10.5: Sensitivity test for energy price assumptions for preferred options (PV, \$ millions)

Minimum standard	Core assumption	Retail gas prices 33% higher than core assumption	Retail gas and electricity prices 33% higher than core assumption
Ceiling insulation			
<i>NPV (26-year)</i>	\$248.61	\$316.51	\$332.08
<i>BCR</i>	3.45	4.11	4.27
Draught sealing			
<i>NPV (13-year)</i>	\$104.92	\$213.03	\$219.78
<i>BCR</i>	1.30	1.60	1.62
Hot water systems			
<i>NPV (20-year)</i>	\$569.94	\$798.84	\$738.74
<i>BCR</i>	4.62	6.07	5.69
Shower heads			
<i>NPV (21-year)</i>	\$223.27	\$281.72	\$329.27
<i>BCR</i>	2.22	2.54	2.80
Heating and cooling in rental properties			
<i>NPV (20-year)</i>	\$1,403.50	\$1,977.84	\$1,854.50
<i>BCR</i>	2.97	3.78	3.61
Heating in rooming houses			
<i>NPV (20-year)</i>	\$25.35	No impact on core result	\$34.36
<i>BCR</i>	3.44	No impact on core result	4.31

10.5.2 Interaction between standards

The results reported in section 10.1.1 and analysis undertaken in Chapters 4 to 9 have been conducted in isolation for each standard against the base case, without accounting for interactions between standards in the modelling. In reality, the effectiveness and benefits provided by the standards is likely to be influenced by other efficiency measures in the property. These interactions are discussed below, with some sensitivity testing of results undertaken.

10.5.2.1 Interaction between ceiling insulation, draught sealing and heating/cooling standards

Adequate insulation and draught sealing play important roles in enhancing the energy efficiency within homes. Insulation acts as a thermal barrier and prevents the transfer of heat between the interior and exterior of the house. By installing adequate ceiling insulation, homes can maintain a more stable internal temperature, reducing the need for the constant operation of heating/cooling appliances. Similarly, sealing gaps and cracks can stop the heated air from escaping in winter, and prevent warm air from entering the house in summer,¹⁹² thereby reducing the time for which heaters and coolers are required.

The combined effect of insulation and draught sealing can enable the home to maintain the desired temperature for longer periods of time without the constant need for heating and cooling. Therefore, further savings on energy costs can be achieved. Reducing the time heating/cooling appliances are in use will result in lower energy consumption and consequently will reduce the greenhouse gas emissions and the health impact from air pollution from heating and cooling appliances, resulting in increased benefits.

Reducing energy usage under the heating and cooling standard by 30 per cent to account for the benefits provided by improved ceiling insulation and draught sealing still results in a positive NPV for the preferred option over 20 years. After accounting for the reduced energy usage, Option 4 yields a positive BCR of 2.16 and a positive NPV of \$822 million over the 20-year analysis period. The results of this sensitivity analysis are presented in Table 10.6.

Table 10.6: Sensitivity test for a 30 per cent reduction in energy usage for heating and cooling preferred option (Option 4) (PV, 20 years. \$millions)

Heating and cooling in rental properties	Core assumption	30% reduction in energy usage
Cost of appliances	\$697.96	\$697.96
Quote/admin costs	\$13.30	\$13.30
Total costs	\$711.26	\$711.26
Avoided portable cooler costs	\$175.39	\$175.39
Avoided energy costs	\$1,366.68	\$956.68
Avoided GHG emissions	\$560.19	\$392.14
Avoided air pollution costs	\$12.49	\$8.74
Total benefits	\$2,114.75	\$1,532.94
NPV (20-years)	\$1,403.50	\$821.69
BCR (20-years)	2.97	2.16

¹⁹² Sustainability Victoria (2023), *Draught proofing a home*.

10.5.2.2 Hot water systems and shower heads

Shower heads with a higher efficiency have a lower flow rate, resulting in reduced use of hot water, which has been accounted for in the analysis in Chapter 6. However, as the energy efficiency of a hot water system increases, the relative benefits from a more efficient shower head decrease. Given the analysis in Chapter 6 was undertaken using the base case prevalence of hot water systems, sensitivity analysis has been undertaken to test the effectiveness of the option when combined with the proposed minimum standard for hot water systems.

Reducing energy usage for shower heads by 30 per cent to account for the benefits provided by increasing the energy efficiency of hot water systems, still results in a positive NPV for the preferred option over 20 years. After accounting for the reduced energy usage, increasing the minimum standard to require a 4 Star WELS shower head results in a positive BCR of 1.55 and a positive NPV of \$101 million over the 20-year analysis period. The results of this sensitivity analysis are presented in Table 10.7.

Table 10.7: Sensitivity test for a 30 per cent reduction in energy usage for shower heads preferred option (Option 1) (PV, 20 years. \$millions)

Shower heads	Core assumption	30% reduction in energy usage
Cost of appliances	\$159.44	\$159.44
Quote/admin costs	\$23.43	\$23.43
Total costs	\$182.87	\$182.87
Avoided energy costs	\$321.21	\$224.85
Avoided GHG emissions	\$83.09	\$58.16
Avoided air pollution costs	\$1.84	\$1.29
Total benefits	\$406.14	\$284.30
NPV (20-years)	\$223.27	\$101.43
BCR (20-years)	2.22	1.55

10.5.3 Health benefits for ceiling and draught sealing analysis

Throughout the analysis for ceiling insulation and draught sealing, it is assumed that 10 per cent of renters will receive health benefits, in addition to energy savings (explained in more detail in section 3.5.8.4). As there is limited literature on whether renters may receive health benefits *in addition* to energy savings, this approach has been tested through sensitivity analysis to understand the impact on modelling results if the 10 per cent of renters who receive health benefits are assumed to not receive any energy savings.

By reducing the energy saved under the preferred option for the ceiling insulation standard (Option 3A) by 10 per cent to understand a scenario in which renters will only receive either health or energy saving benefits, Option 3A yields a positive BCR of 3.13 and a positive NPV of \$216 million over a 26-year analysis period. By reducing the energy saved under the preferred option for the draught sealing standard (Option 2) by 10 per cent to understand a scenario in which renters will only receive either health or energy saving benefits, Option 2 yields a positive BCR of 1.18 and a positive NPV of \$63 million over a 13-year analysis period. The results of this sensitivity analysis are presented in Table 10.8 below.

Table 10.8: Sensitivity test for separate health and energy saving benefits for ceiling insulation and draught sealing preferred options (26-year PV, \$millions)

	Ceiling insulation (Option 3A)		Draught sealing (Option 2)	
	Core assumption	Separate health and energy savings	Core assumption	Separate health and energy savings
Materials	\$54.83	\$54.83	\$123.97	\$123.97
Labour	\$30.74	\$30.74	\$209.11	\$209.11
Quote/admin costs	\$4.26	\$4.26	\$20.15	\$20.15
Electricity safety checks	\$11.82	\$11.82	-	-
Total costs	\$101.65	\$101.65	\$353.22	\$353.22
Avoided energy costs	\$252.96	\$227.66	\$348.07	\$313.26
Avoided GHG emissions	\$68.24	\$61.42	\$70.84	\$63.76
Avoided air pollution cost	\$0.35	\$0.32	\$0.37	\$0.33
Avoided healthcare costs	\$28.71	\$28.71	\$38.87	\$38.87
Total benefits	\$350.26	\$318.10	\$458.14	\$416.22
NPV (26-years)	\$248.61	\$216.45	\$104.92	\$62.99
BCR (26-years)	3.45	3.13	1.30	1.18

11 Competition and small business impacts

This chapter assesses the small business and competition impacts from the preferred options.

11.1 Competition impacts

As Victoria is party to the Competition Principles Agreement, regulation in Victoria is required to include a competition assessment.¹⁹³ The Competition Principles Agreement sets out that any new primary or subordinate regulation should not restrict competition except where:

- restriction of competition is required to meet the government’s objectives; and
- the benefits of restriction outweigh the costs.

Restrictions on competition can be identified where there will be changes to the way a market functions due to the implementation of the proposed regulation. Specifically, restriction can occur where:

- the number or range of suppliers is limited
- the ability of suppliers to compete is limited
- the incentive of suppliers to compete vigorously is reduced.

Any affirmative answers to the following questions in Table 11.1 indicate that the regulation is considered to restrict competition:

Table 11.1: Competition assessment questions

Test question	Answer	Explanation
<p>Are the proposed measures likely to limit the numbers of producers or suppliers to:</p> <ul style="list-style-type: none"> • only one producer? • only one buyer? • less than four producers? 	No.	<p>The regulations do not restrict how the insulation, draught sealing products, hot water systems, heaters and coolers and blind cord anchors will be supplied. Existing suppliers are free to supply their products on a competitive basis as they were before.</p> <p>There are currently over 700,000 rental properties and over 1,000 rooming houses in Victoria. It is expected that rental providers/rooming house operators will either absorb the cost themselves or pass it on tenants/residents rather than leave the market.</p>
<p>Would the proposed measures restrict the ability of businesses to choose their output, price or service quality?</p>	No.	<p>The regulations do not restrict or prescribe how the appliances/measures will be supplied. Existing suppliers are free to supply the new products on a competitive basis as they were before. Rental providers/rooming house operators can choose their preferred brand and supplier as long as the products meet the required specifications.</p> <p>Ceiling insulation installers will be required to ensure they are suitably qualified to do so. Where installers are not currently qualified, there will be minimal impact on those suppliers as a result of the ceiling insulation minimum standard.</p>

¹⁹³ Better Regulation Victoria (2016), *Victorian Guide to Regulation*.

Test question	Answer	Explanation
Would the proposed measures discourage entry into the industry by new firms/individuals or encourage exit from existing providers?	No.	<p>The proposed standards do impose an incremental cost on new entrants relative to the base case, but this cost applies to existing rental providers/rooming house operators as well.</p> <p>Compared to the number of other significant costs associated with decisions to put a property on the rental market, as well as the potential rental yields, the incremental costs associated with the proposed minimum standards are not considered likely to prevent a new entrant from entering the rental market.</p> <p>Newly built rental properties entering the rental market will soon likely meet the requirements of the minimum standards. For example, under the Gas Substitution Roadmap, new homes requiring a planning permit from 1 January 2024 are no longer allowed to connect to the gas network and therefore will have electric appliances installed instead. Additionally, the NCC 2022 requirements came into effect in Victoria from 1 May 2024. Under these requirements, new homes will be built to a higher efficiency standard (see section 1.2.2).</p> <p>As discussed in section 10.3, rental providers/rooming house operators may have to increase their rental prices in order to recover the costs of complying with the new standards, but this is the case for all impacted rental providers/rooming house operators.</p> <p>There is likely to be reduced demand for gas appliances and subsequently some impacts on gas appliance manufacturers. Many gas appliances manufacturers already also offer electric appliances. The Victorian Government is already working closely with the small number of gas appliance manufacturers in Victoria to manage impacts and support the expansion of existing as well as new electric product lines to meet the growing demand this policy reform will create in accordance with the broader Gas Substitution Roadmap and target of net zero greenhouse gas emissions by 2045.</p>
Would the proposed measures impose higher costs on a particular class or business or type of service (e.g. small business)?	No.	<p>The proposed standards apply to all rental properties/rooming houses regardless of their characteristics. However, as the standards require the installation of RCAC/central heating system ducts in all bedrooms in a rooming house, larger rooming houses will face higher costs compared to a small rooming house. However, larger rooming houses will likely have more residents and therefore a higher rental income relative to smaller rooming houses, so this not expected to impact on competition.</p>
Are the proposed measures likely to make it more difficult for consumers to move between or leave service providers?	No.	<p>The regulations are applied indiscriminately and do not impose any restrictions on choosing a rental provider/rooming house operator or tradesperson.</p>
Would the proposed measures affect the ability of businesses to innovate, adopt new technology or respond to the changing demands of consumers?	No.	<p>The regulations do not place any restrictions on the way suppliers can provide their products, other than what is prescribed in existing standards. Similarly, there is nothing in the proposed Regulations that prevent rental providers/ rooming house operators from adopting and responding to changing consumer demands.</p>

11.2 Small business impacts

To ensure the impacts of regulation on small business are examined appropriately, an assessment of the effects on small businesses is required. This aims to ensure that regulation does not impact business growth and productivity unreasonably, especially that of small businesses.

Small businesses can experience disproportionate impacts from regulation due to limited resources for interpretation of updates in compliance requirements, and the cumulation of different requirements. The lack of economies of scale may affect these businesses' ability to comply with different options.

It is not considered that the preferred options will disproportionately limit the ability for small rental providers/ rooming houses to operate, particularly as the standards apply consistently across all rental properties/rooming houses. The costs associated with complying with the proposed Regulations will scale with the size of the rental property/ rooming house. Furthermore, the changes to the Regulations are not complex and do not contain any administrative requirements and are likely to be easily understood by rental providers/ rooming house operators. The regulations do not impose any change to the market structure that might disproportionately benefit larger businesses with economies of scale.

12 Implementation and evaluation plan

This chapter outlines the actions that DEECA and DGS will undertake to implement and assess both the efficiency and effectiveness of the proposed minimum standards.

12.1 Implementation

The key questions to be considered for implementation are:

- What needs to be done?
- When will it be done?
- Who will do it?

The actions outlined in Table 12.1 will need to take place in the lead up to the amendment of the Residential Tenancies Regulations and the Rooming House Regulations to implement the proposed minimum standards.

Table 12.1: Implementation and evaluation timeline

Action	Responsible party	Anticipated timeframe
RIS release	Department of Government Services	June 2024
Consultation period	Department of Energy, Environment and Climate Action Department of Government Services	June to July 2024
Submissions considered	Minister for Consumer Affairs	July to September 2024
Recommend and make Regulations	Governor in Council	October 2024

While the amendments to the Residential Tenancies Regulations and the Rooming House Regulations commence on 30 October 2024, compliance with the minimum standards will be required from 30 October 2025. The trigger points for compliance vary by standard, as summarised in Table 12.2 below. The selection of the preferred options has taken into account industry capacity to deliver upgrades, along with supply chain availability of suitable products. There is an opportunity to consider an expansion of the standards at a later date should product availability and industry capacity be able to support an increased efficiency level. DEECA will continue to monitor industry capacity to delivery upgrades, particularly for ceiling insulation in the lead up to the commencement of the standards.

Table 12.2: Trigger points for compliance by standard

Standard	Trigger for compliance	Compliance required from
Ceiling insulation	New lease, where there is no ceiling insulation present	30 October 2025
Draught sealing	New lease	30 October 2025
Hot water	End of life of existing hot water system	30 October 2025
Shower head	New lease	30 October 2025
Heating	End of life of existing heating system	30 October 2025
Cooling	New lease, where there is no existing cooling system OR End of life of existing cooling system	30 October 2025 or by 30 October 2027 if a new lease has not been entered into at the property. 30 October 2025
Blind cord safety anchor	By specified date	30 October 2025
Heating in rooming houses	By specified date where there is no existing heating system OR End of life of existing heating system	30 October 2025 30 October 2025

12.2 Implementation considerations

12.2.1 Quality and safety

Quality and safety are a critical component of implementing minimum standards for rental properties and rooming houses, particularly for insulation and draught sealing standards. Past experience from other jurisdictions implementing similar energy efficiency policies has demonstrated the importance of ensuring that the safety of all program participants is considered throughout the program lifecycle.

12.2.1.1 Ceiling insulation

The industry-led Insulation Roadmap was released in 2022 and signed by insulation companies and associations. The roadmap includes 24 recommendations to be undertaken to ensure that insulation is installed to meet safety and quality requirements so that it is effective. This roadmap is supported by the Affiliated Insulation Industry Coalition to encourage the implementation of recommendations for industry.

The development of the ceiling insulation minimum standard in rental properties has been guided by the recommendations in the roadmap. The safety and quality approach employed by the Australian Capital Territory to introduce their insulation standard for rental homes has been considered by DEECA. A robust framework is being developed by the Victorian Government to ensure safe and quality insulation installation in existing homes.

Under the proposed minimum standard for ceiling insulation in rental properties, installers will be required to be suitably qualified, including by achieving Energy Efficiency Council Certified Installer certification. Certification under the scheme requires:

- completion of six units of competency
- submission of Job Assessment Forms that have been assessed by the assessment panel
- proof of appropriate level and type of insurance.

Prior to any insulation work commencing, a pre-insulation installation electrical safety checklist is required to be completed by a licensed electrician. Any issues identified must be rectified prior to the installation commencing.

DEECA will consider the capacity of industry and number of suitably qualified insulation installers available to complete required works when implementing the policy, as well as availability of suitable training. Measures such as a delayed

implementation timeframe from 2025 and compliance required at new lease (as opposed to a specific date) are expected to assist in providing industry sufficient time to build capacity.

12.2.1.2 Draught sealing

There are safety concerns regarding the impact of implementing draught sealing measures in homes with gas appliances. Of particular concern are open flued gas appliances, and the potential to allow the build-up of hazardous carbon monoxide within the home. Clear exemptions will be included in the Residential Tenancies Regulations to rooms and/or residences with specific types of gas appliances from needing to comply with the minimum standard for draught sealing.

From 1 January 2022, new open flued gas heaters are required to meet standards which require them to shut off after 15 minutes if negative pressure is detected. Additionally, the Residential Tenancies Regulations now require rental providers to conduct electrical and gas safety inspections every two years. This will also contribute to decreased safety risk for the renters. Communications to stakeholders, including fact sheets for rental providers, will highlight the risk of draught sealing where these gas appliances are present.

DIY installations will still be permitted for draught sealing measures as the level of risk is deemed to be lower than for ceiling insulation activities. In terms of capacity building, it is expected that the availability of draught ceiling installers will be higher than for insulation, given that any tradesperson will be allowed to install draught sealing measures, and that DIY installations will also be permitted.

12.3 Communicating the changes

The updated minimum standards will be communicated to stakeholders, including rental providers and rooming house operators, via various communication channels following the remaking of the Residential Tenancies Regulations and the Rooming House Regulations in the second half of 2024. These communication channels will include information fact sheets (developed in consultation with DEECA) for rental providers and rooming house operators on the Consumer Affairs Victoria (CAV) website, along with updated information for the CAV call centre to respond to public enquiries.

12.4 Compliance and enforcement

Enforcement and compliance processes are in place for the current minimum standards. The amendments will not require CAV to change the way these processes operate, and CAV will be responsible for ensuring compliance with the new minimum standards by rental providers, registered rooming houses and licensed rooming house operators, primarily through its existing enforcement activities undertaken as part of its day-to-day operations.

12.5 Evaluation strategy

DGS, in close coordination with CAV, will monitor the proposed Regulations and their ongoing effectiveness in ensuring that accommodation for renters and rooming house residents meets the proposed minimum standards.

The effectiveness of the proposed Regulations will be monitored on an ongoing basis through analysis of data on contacts from renters and rental providers, in particular, information and advice provided on minimum standards and repairs issues, and data on CAV regulatory activity such as inspections or investigations regarding rental properties and rooming house operators. Analysis of this information may indicate trends in issues faced by renters and rooming house residents, rental providers and rooming house operators and will assist in meeting the objectives of the proposed Regulations. It is intended that the data collated will also inform the development of the key evaluation questions required to inform the mid-term evaluation.

As Victoria is introducing minimum energy efficiency rental standards ahead of most other Australian jurisdictions, impacts on the rental market will also be monitored throughout implementation to ensure any emerging issues are identified.

DGS will also maintain an issue log to track issues raised in relation to the effectiveness of the proposed Regulations. This issue log will be informed by stakeholder and public feedback, received through existing processes such as Ministerial correspondence or anecdotal feedback.

12.5.1 Near-term evaluation activities

As part of ongoing monitoring activities, DEECA will track uptake of accreditation of insulation installers to understand increased market activity associated in particular with the ceiling insulation standard.

12.5.2 Medium-term evaluation activities

The proposed minimum standards assessed in this RIS are high impact, according to the Victorian Guide to Regulation, and so trigger the requirement for a mid-term evaluation. Appropriate timing for this evaluation will be considered following implementation of the regulations.

The mid-term evaluation will include contacts data, data on investigations and Victorian Civil and Administrative Tribunal data relating to cases raising non-compliance with the proposed minimum standards. The mid-term evaluation will also be informed by consultation with stakeholders to understand how well the minimum standards are working and to identify issues and potential improvements. These stakeholders may include Public Housing Tenants Association, Community Housing Industry Association, Victorian Council of Social Service, Brotherhood of St Laurence, Registered Accommodation Association of Victoria, Owners Corporation Network, Tenants Victoria and Real Estate Institute of Victoria. DGS will report to the Minister for Consumer Affairs on the outcomes of the evaluation and whether the proposed Regulations should be re-made, and if so, what changes may be required.

Appendix A Modelling parameters

Table A.1: Key parameters for modelling

Parameter	Value	Source																				
Discount Rate	4 per cent	<i>Economic Evaluation Guidelines, Victorian Department of Treasury and Finance, 2013</i>																				
Active lease growth rate	<table border="1"> <thead> <tr> <th>2021</th> <th>2022</th> <th>2023</th> <th>2024</th> <th>2025</th> </tr> </thead> <tbody> <tr> <td>0.53%</td> <td>2.64%</td> <td>2.02%</td> <td>2.10%</td> <td>2.50%</td> </tr> <tr> <th>2026</th> <th>2027</th> <th>2028</th> <td></td> <td></td> </tr> <tr> <td>3.00%</td> <td>3.40%</td> <td>3.40%</td> <td></td> <td></td> </tr> </tbody> </table>	2021	2022	2023	2024	2025	0.53%	2.64%	2.02%	2.10%	2.50%	2026	2027	2028			3.00%	3.40%	3.40%			<i>Department of Families, Fairness and Housing rental reports</i> Actual growth until 2024, then assumed convergence to 10-year average of 3.40 per cent.
2021	2022	2023	2024	2025																		
0.53%	2.64%	2.02%	2.10%	2.50%																		
2026	2027	2028																				
3.00%	3.40%	3.40%																				
Rental housing stock in 2023	Class 1: 515,701 Class 2: 188,874	<i>ABS Census, 2021</i>																				
Proportion of rental properties renewing leases annually	34.0 per cent	<i>Department of Families, Fairness and Housing rental reports</i>																				
Size of average Class 1 dwelling	148 m ² with garage 128.74 m ² without garage	<i>DEECA Housing stock model, 2019</i>																				
Size of average Class 2 dwelling	75.01 m ²	<i>DEECA Housing stock model, 2019</i>																				
NatHERS Rating	2 Stars for both Class 1 and Class 2 properties	<i>DEECA Housing stock model, 2019</i>																				
Estimated retail electricity cost (\$/kWh)	\$0.27 in 2025 \$0.29 in 2050	<i>Calculated by DEECA based on wholesale price forecasts from Endgame Economics, 2024 (based on the AEMO draft ISP Step Change model, 2024)</i>																				
Estimated retail gas cost (\$/MJ)	\$0.03 in 2025 \$0.03 in 2050	<i>Calculated by DEECA based on wholesale price forecasts from AEMO's Inputs, Assumptions and Scenarios Report, 2023</i>																				
Greenhouse gas coefficient – electricity market (t/MWh)	0.74 in 2025 0.02 in 2050	<i>Endgame Economics, 2024 (based on the AEMO draft ISP Step Change model, 2024)</i>																				

Parameter	Value					Source
Greenhouse gas coefficient – natural fossil gas (t/GJ)	0.06 (constant)					<i>DEECA assumption</i>
Carbon price per tonne	2024	2025	2026	2027	2028	<i>Intergovernmental Panel on Climate Change 6th Assessment Report, 2022 Carbon Price converted to AUD by DEECA</i>
	\$106	\$112	\$118	\$124	\$130	
	2029	2030	2031	2032		
	\$135	\$141	\$154	\$167		
Health cost of air pollution	Coal fired electricity: \$15.88/MWh Gas fired electricity: \$1.05/MWh					<i>Ward & Power, 2015</i> <i>Australian Technological Sciences and Engineering (ATSE), 2009</i>
Value of an hour of leisure time	\$36					<i>Regulatory Burden Measurement Framework, Department of the Prime Minister and Cabinet, 2023</i>

Table A.2: Key modelling parameters for ceiling insulation

Parameter	Value	Source																																			
Rental housing stock requiring upgrades or complete installs	Stock requiring upgrades: 366,155 Stock requiring installs: 53,268	DEECA Housing stock model, 2019																																			
Ceiling insulation material cost (\$/m ²)	R2.0: 5.63 R2.5: 5.81 R3.5: 8.24 R4.0: 10.13 R5.0: 12.00	Deloitte Access Economics analysis of public retail prices in 2023																																			
Trade discount for professionals	10 per cent	ACIL Allen, 2021																																			
Ceiling insulation – Average hours involved installing ceiling insulation, including electrical assessment, site assessment and quote, pre-installation safety check and preparation, and the installation process.	12	Deloitte Access Economics assumption based upon SACS Consulting, 2022																																			
Average property insulation space (m ²)	Class 1: 154.4 ¹⁹⁴	DEECA Housing stock model, 2019																																			
Ceiling insulation – Professional labour cost (\$/hour)	65	hipages, 2023																																			
Energy usage before and after insulation (weighted average all climates) (MJ/m ²) ¹⁹⁵	<table border="1"> <thead> <tr> <th></th> <th colspan="2">Heat</th> <th colspan="2">Cool</th> </tr> <tr> <th></th> <th>Central</th> <th>Space</th> <th>Central</th> <th>Space</th> </tr> </thead> <tbody> <tr> <td>Base</td> <td>477.19</td> <td>604.32</td> <td>74.92</td> <td>100.51</td> </tr> <tr> <td>R1.5</td> <td>326.8</td> <td>403.09</td> <td>42.93</td> <td>54.94</td> </tr> <tr> <td>R3.5</td> <td>308.95</td> <td>381.66</td> <td>39.63</td> <td>50.42</td> </tr> <tr> <td>R4.0</td> <td>307.34</td> <td>379.79</td> <td>39.36</td> <td>50.02</td> </tr> <tr> <td>R5.0</td> <td>304.57</td> <td>376.51</td> <td>38.93</td> <td>49.32</td> </tr> </tbody> </table>		Heat		Cool			Central	Space	Central	Space	Base	477.19	604.32	74.92	100.51	R1.5	326.8	403.09	42.93	54.94	R3.5	308.95	381.66	39.63	50.42	R4.0	307.34	379.79	39.36	50.02	R5.0	304.57	376.51	38.93	49.32	DEECA Housing stock model, 2019
	Heat		Cool																																		
	Central	Space	Central	Space																																	
Base	477.19	604.32	74.92	100.51																																	
R1.5	326.8	403.09	42.93	54.94																																	
R3.5	308.95	381.66	39.63	50.42																																	
R4.0	307.34	379.79	39.36	50.02																																	
R5.0	304.57	376.51	38.93	49.32																																	

¹⁹⁴ The presence of a garage may reduce the average property insulation space depending on the property. Sensitivity analysis was conducted to test if such a reduction would significantly change analysis results and the outcome was negligible.

¹⁹⁵ Energy consumption figures are for Class 1ai buildings (detached homes), energy figures for other classes of buildings will vary.

Parameter	Value					Source
Energy usage before and after insulation (climate zones 7 & 8) (MJ/m ²) ⁵²		Heat		Cool		<i>DEECA Housing stock model, 2019</i>
		Central	Space	Central	Space	
	Base	678.49	855.24	66.48	90.62	
	R1.5	480.12	589.59	36.09	47.02	
	R3.5	456.95	561.87	33.04	42.66	
	R4.0	455.38	560.12	32.93	42.36	
	R5.0	451.83	555.92	32.42	41.78	

Table A.3: Key modelling parameters for draught sealing

Parameter	Value	Source		
Draught sealing material cost (\$/measure)	Basic	External door	52	<i>ACIL Allen, 2021</i>
	Medium (includes basic)	Wall vent	3	<i>Sustainability Victoria, 2016</i>
		General gaps and cracks	1	<i>Deloitte Access Economics, 2024</i>
	High (includes medium)	Ceiling rose	20	
		Unused heating/cooling vents	28	
	Comprehensive	Window	9	
	Comprehensive	Activities based on blower door test	561	
Trade discount for professionals	10 per cent			<i>ACIL Allen, 2021</i>
Draught sealing professional labour cost (\$/measure)	Basic	External door	69	<i>ACIL Allen, 2021</i>
	Medium (includes basic)	Wall vent	6	<i>Sustainability Victoria, 2016</i>
		General gaps and cracks	2	<i>Deloitte Access Economics, 2024</i>
	High (includes medium)	Ceiling rose	26	
		Unused heating/cooling vents	37	
	Comprehensive	Window	12	
	Comprehensive	Activities based on blower door test	764	
		Blower door test	565	
	Class 1 properties			<i>Sustainability Victoria, 2016</i>
	External door		1.9	<i>Energy Consult, 2017</i>
	Wall vent		12	
	General gaps and cracks		125.1	
	Ceiling rose		2	
	Unused heating/cooling vents		1.88	
	Window		6.3	
Number of draught sealing measures by building type	Activities based on blower door test		1	
	Class 2 properties			<i>Sustainability Victoria, 2016</i>
	External door		1	<i>Energy Consult, 2017</i>
	Wall vent		6	
	General gaps and cracks		69	
	Ceiling rose		1.1	
	Unused heating/cooling vents		1.04	
	Window		3.2	

Parameter	Value	Source
	Activities based on blower door test	0.55
Proportion of homes requiring each measure sealed	External door	69 per cent
	Wall vent	63 per cent
	General gaps and cracks	88 per cent
	Ceiling rose	6 per cent
	Unused heating/cooling vents	50 per cent
	Window	25 per cent
	Activities based on blower door test	100 per cent
Air leakage per unsealed measure (m ³ /hour)	External door	38.1
	Wall vent	3.7
	General gaps and cracks	1
	Ceiling rose	12.3
	Unused heating/cooling vents	18.3
	Window	2.7
	Activities based on blower door test	420
Gas savings per unit of air leakage reduction (MJ/year)	17.05	ACIL Allen, 2021
Electricity savings per unit of air leakage reduction (kWh/year)	0.12	ACIL Allen, 2021
Average appliance and duct efficiency	94 per cent	Australian Department of Industry, Science, Energy and Resources and NSW Department of Planning, Industry and Environment (2021) Residential Space Heaters in Australia & New Zealand
Market penetration of appliances	Electric heating: 51 per cent	ABS 2013, 4670.0
	Gas heating: 49 per cent	
Proportion of homes requiring each measure sealed	External door: 68.8 per cent	Sustainability Victoria, 2016 Energy Consult, 2017
	Wall vent: 62.5 per cent	
	General gaps and cracks: 87.5 per cent	

Table A.4 Key modelling parameters for hot water systems and shower heads

Parameter	Value	Source
Appliance lifespan	Water heaters	12 years
	Shower heads	15 years
Major household appliance CPI	6.5 per cent	ABS 2023 – Monthly Consumer Price Index Indicator
Hot water system appliance and installation costs	Class 1 properties	
	Mains Gas Instantaneous ≤ 4 star	\$2,349
	Mains Gas Instantaneous 5 star	\$2,556
	Mains Gas Instantaneous ≥ 6 star	\$3,235
	Mains Gas Storage ≤ 4 star	\$2,003
	Mains Gas Storage ≥ 5 star	\$2,409
	Electric off peak storage (controlled)	\$2,197
	Electric peak storage (continuous)	\$1,777
	Solar electric boost (continuous)	\$6,751
	Solar electric boost (controlled)	\$6,751
	Heat Pump (continuous)	\$4,518
	Heat Pump (controlled)	\$4,518
	Solar gas boost	\$7,537
	Class 2 properties	
	Mains Gas Instantaneous ≤ 4 star	\$1,973
	Mains Gas Instantaneous 5 star	\$2,124
	Mains Gas Instantaneous ≥ 6 star	\$2,622
	Mains Gas Storage ≤ 4 star	\$1,777
	Mains Gas Storage ≥ 5 star	\$2,119
	Electric off peak storage (controlled)	\$1,917
Electric peak storage (continuous)	\$1,454	
Solar electric boost (continuous)	\$5,353	
Solar electric boost (controlled)	\$5,653	
Heat Pump (continuous)	\$4,167	
Heat Pump (controlled)	\$4,167	
Solar gas boost	\$6,514	
4 Star shower head fixing and installation cost	\$245	Energy Efficient Strategies, 2021
Cost of capping gas pipeline	\$300	DEECA assumption

Parameter	Value	Source
Proportion of properties requiring capping of gas appliances	100 per cent of properties where a gas appliance is discontinued	<i>DEECA assumption</i>
Annual gas consumption (MJ/Year)	<p>Class 1 properties</p> <p>Mains Gas Instantaneous ≤ 4 star 16,640</p> <p>Mains Gas Instantaneous 5 star 15,147</p> <p>Mains Gas Instantaneous ≥ 6 star 13,633</p> <p>Mains Gas Storage ≤ 4 star 18,959</p> <p>Mains Gas Storage ≥ 5 star 17,056</p> <p>Solar gas boost 4,654</p> <p>Class 2 properties</p> <p>Mains Gas Instantaneous ≤ 4 star 10,592</p> <p>Mains Gas Instantaneous 5 star 9,609</p> <p>Mains Gas Instantaneous ≥ 6 star 8,599</p> <p>Mains Gas Storage ≤ 4 star 14,410</p> <p>Mains Gas Storage ≥ 5 star 12,759</p> <p>Solar gas boost 2,623</p>	<i>Energy Efficient Strategies, 2021</i>
Annual electricity consumption (MJ/year)	<p>Class 1 properties</p> <p>Mains Gas Instantaneous ≤ 4 star 145</p> <p>Mains Gas Instantaneous 5 star 145</p> <p>Mains Gas Instantaneous ≥ 6 star 145</p> <p>Mains Gas Storage ≤ 4 star -</p> <p>Mains Gas Storage ≥ 5 star -</p> <p>Electric off peak storage (controlled) 12,470</p> <p>Electric peak storage (continuous) 11,950</p> <p>Solar electric boost (continuous) 3,678</p> <p>Solar electric boost (controlled) 3,996</p> <p>Heat Pump (continuous) 4,334</p> <p>Heat Pump (controlled) 4,245</p> <p>Solar gas boost 187</p> <p>Class 2 properties</p> <p>Mains Gas Instantaneous ≤ 4 star 129</p> <p>Mains Gas Instantaneous 5 star 129</p> <p>Mains Gas Instantaneous ≥ 6 star 129</p> <p>Mains Gas Storage ≤ 4 star -</p> <p>Mains Gas Storage ≥ 5 star -</p> <p>Electric off peak storage (controlled) 9,020</p> <p>Electric peak storage (continuous) 8,259</p>	<i>Energy Efficient Strategies, 2021</i>

Parameter	Value	Source
	Solar electric boost (continuous)	2,625
	Solar electric boost (controlled)	2,913
	Heat Pump (continuous)	3,575
	Heat Pump (controlled)	3,575
	Solar gas boost	173

Table A.5 Key modelling parameters for heating and cooling in rental properties

Parameter	Value	Source	
Proportion of dwellings practical to upgrade	Class 1 properties	<i>Energy Efficient Strategies, 2021</i>	
	No pre-existing system		90 per cent
	Ducted system		90 per cent
	Non-ducted system		90 per cent
	Class 2 properties		
	No pre-existing system		40 per cent
	Ducted system		40 per cent
	Non-ducted system		90 per cent
	Cost of appliances		Class 1 properties
Room RCAC/ Room cooling 1 Star		\$1,870	
Room RCAC/ Room cooling 2 Star		\$2,190	
Room RCAC/ Room cooling 3 Star		\$2,563	
Room RCAC/ Room cooling 4 Star		\$3,002	
Room RCAC/ Room cooling 5 Star		\$3,515	
Ducted RCAC 1 Star		\$7,656	
Ducted RCAC 2 Star		\$9,120	
Ducted RCAC 3 Star		\$10,863	
Ducted RCAC 4 Star		\$12,939	
Ducted RCAC 5 Star		\$15,413	
Multi-split 2 Star		\$6,531	
Multi-split: 3 Star		\$7,644	
Ducted gas		\$4,943	
Room gas		\$2,705	
Electric resistance		NA	
Other (wood)		\$4,267	
Evaporative		\$5,631	
Portable air conditioner		\$1,490	
Class 2 properties			
Room RCAC/ Room cooling 1 Star		\$1,123	
Room RCAC/ Room cooling 2 Star		\$1,314	
Room RCAC/ Room cooling 3 Star		\$1,538	
Room RCAC/ Room cooling 4 Star		\$1,801	
Room RCAC/ Room cooling 5 Star		\$2,109	
Ducted RCAC 1 Star		\$4,288	
Ducted RCAC 2 Star		\$5,107	
Ducted RCAC 3 Star	\$6,083		

Parameter	Value	Source
	Ducted RCAC 4 Star	\$7,246
	Ducted RCAC 5 Star	\$8,631
	Multi-split 2 Star	\$4,199
	Multi-split: 3 Star	\$4,913
	Ducted gas	\$4,943
	Room gas	\$2,404
	Electric resistance	\$447
	Other (wood)	\$3,994
	Evaporative	\$4,605
	Portable air conditioner	\$863
Cost of removing gas appliances	Class 1 properties	<i>Frontier Economics, 2022</i>
	Ducted gas heaters	\$799
	Room gas	\$132
	Class 2 properties	<i>ABS 2023 – Monthly Consumer Price Index Indicator</i>
	Ducted gas heaters	\$491
	Room gas	\$139
Proportion of rental properties requiring removal of gas systems	20 per cent	<i>DEECA assumption</i>
Cost of capping cost appliances – Class 1 and Class 2 properties	\$300	<i>ACT Government</i>
Proportion of rental properties requiring capping of gas appliances where a gas appliance is discontinued	100 per cent	<i>DEECA assumption</i>
Cost of switchboard upgrades	\$1,200	<i>Deloitte analysis</i>
Cost of supply upgrades	\$3,500	<i>Frontier Economics, 2022</i>
Proportion of rental properties requiring switchboard and supply upgrades	19 per cent	<i>DEECA assumption</i>
Annual electricity usage – cooling (kWh)	Class 1 properties	<i>Energy Efficient Strategies, 2021</i>
	Room RCAC/ Room cooling 1 Star	147
	Room RCAC/ Room cooling 2 Star	105
	Room RCAC/ Room cooling 3 Star	82
	Room RCAC/ Room cooling 4 Star	67
	Room RCAC/ Room cooling 5 Star	57
	Ducted RCAC 1 Star	579

Parameter	Value	Source
	Ducted RCAC 2 Star	414
	Ducted RCAC 3 Star	322
	Ducted RCAC 4 Star	263
	Ducted RCAC 5 Star	223
	Multi single RCAC 2 Star	216
	Multi single RCAC 3 Star	168
	Multi single RCAC 4 Star	137
	Multi single RCAC 5 Star	116
	Evaporative	96
	Portable air conditioner	294
	Class 2 properties	
	Room RCAC/ Room cooling 1 Star	36
	Room RCAC/ Room cooling 2 Star	26
	Room RCAC/ Room cooling 3 Star	20
	Room RCAC/ Room cooling 4 Star	17
	Room RCAC/ Room cooling 5 Star	14
	Ducted RCAC 1 Star	193
	Ducted RCAC 2 Star	138
	Ducted RCAC 3 Star	107
	Ducted RCAC 4 Star	88
	Ducted RCAC 5 Star	74
	Multi single RCAC 2 Star	57
	Multi single RCAC 3 Star	45
	Multi single RCAC 4 Star	36
	Multi single RCAC 5 Star	31
	Evaporative	32
	Portable air conditioner	73
Annual electricity usage – heating (kWh)	Class 1 properties	<i>Energy Efficient Strategies, 2021</i>
	Room RCAC/ Room cooling 1 Star	1,673
	Room RCAC/ Room cooling 2 Star	1,195
	Room RCAC/ Room cooling 3 Star	928
	Room RCAC/ Room cooling 4 Star	759
	Room RCAC/ Room cooling 5 Star	643
	Ducted RCAC 1 Star	4,080
	Ducted RCAC 2 Star	2,915
	Ducted RCAC 3 Star	2,268
	Ducted RCAC 4 Star	1,856
	Ducted RCAC 5 Star	1,569
	Multi single RCAC 2 Star	2,451
		<i>DEECA calculations</i>

Parameter	Value	Source
	Multi single RCAC 3 Star	1,906
	Multi single RCAC 4 Star	1,562
	Multi single RCAC 5 Star	1,315
	Ducted gas (base)	639
	Gas room (base)	79
	Electric resistance	3,919
	Other (wood, room)	49
	Class 2 properties	
	Room RCAC/ Room cooling 1 Star	949
	Room RCAC/ Room cooling 2 Star	680
	Room RCAC/ Room cooling 3 Star	530
	Room RCAC/ Room cooling 4 Star	435
	Room RCAC/ Room cooling 5 Star	364
	Ducted RCAC 1 Star	2,531
	Ducted RCAC 2 Star	1,808
	Ducted RCAC 3 Star	1,406
	Ducted RCAC 4 Star	1,149
	Ducted RCAC 5 Star	975
	Multi single RCAC 2 Star	1,517
	Multi single RCAC 3 Star	1,182
	Multi single RCAC 4 Star	970
	Multi single RCAC 5 Star	812
	Ducted gas (base)	639
	Gas room (base)	79
	Electric resistance	2,221
	Other (wood, room)	49

Table A.6: Key parameters for heating in rooming houses

Parameter	Value	Source
Number of rooming houses in 2023	1,519	<i>Consumer Affairs Victoria</i>
Average number of bedrooms in a rooming house	4.17	<i>Consumer Affairs Victoria analysis, using 2018 Rooming House stock and CoreLogic RP Data</i>
Average size of rooming house bedroom	13.6 m ²	<i>CSIRO, <https://ahd.csiro.au/dashboards/design/zones/></i>
Annual growth rate of rooming houses	4%	<i>Deloitte Rooming Houses RIS 2022</i>
Proportion of rooming houses with heating in bedrooms	0 per cent	<i>DEECA assumption</i>
Proportion of dwellings unable to install a fixed efficient heater	10 per cent	<i>DEECA assumption</i>
Cost of portable heater	\$80	<i>DEECA assumption</i>
Cost of portable cooler	\$85	<i>Energy Efficient Strategies, 2021</i>
Cost of fixed inefficient electric heater	\$420	<i>Energy Efficient Strategies, 2021</i>
Lifespan of heater and cooler appliances	12 years	<i>Energy Efficient Strategies, 2021</i>
Cost of RCAC appliances	2 Star: \$1,234 3 Star: \$1,444	<i>Energy Efficient Strategies, 2021</i>
CPI increase for major household appliances	6.5 per cent	<i>ABS 2023 – Monthly Consumer Price Index Indicator</i>
Electricity usage (kWh)	Portable heater Portable cooler 2 Star RCAC heating 2 Star RCAC cooling 3 Star RCAC heating 3 Star RCAC cooling	1,349 104 416 37 323 29 <i>DEECA calculations</i>

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