



Victorian Energy Upgrades: Space heating and cooling

Response to Consultation

December 2022



Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



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Executive Summary

On 4 July 2022, the Victorian Department of Environment, Land, Water and Planning (the department) released a public consultation enabling stakeholders to provide feedback on proposed updates to the Victorian Energy Upgrades (VEU) program space heating and cooling activities.

Proposed updates to VEU space heating and cooling activities included:

- the introduction of a new space heating and cooling activity (Part 6), which incentivises the replacement of inefficient heating and cooling appliances with efficient reverse cycle air conditioners (RCAC);
- the transition and removal of existing space heating and cooling upgrade scenarios;
- introducing new electrification upgrade activities that incentivise the replacement of inefficient gas space heating appliances with RCAC;
- allowing RCAC registered to the *Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019* (GEMS 2019 Determination) to be installed under the new space heating and cooling activity;
- introducing new greenhouse gas (GHG) abatement calculations which align with the seasonal performance measures for heating and cooling energy efficiency used in the GEMS 2019 Determination; and
- introducing a threshold on the global warming potential (GWP) of refrigerants used in RCAC installed in the VEU program.

Forty (40) submissions were received from a wide range of stakeholders including members of the public, VEU accredited providers, industry associations and community groups, product manufacturers and energy retailers. The department would like to thank the organisations and individuals who took the time to provide feedback.

In response to feedback received, key decisions made by the department on the revision of space heating and cooling activities under the VEU program are outlined in Table 1. Further detail is provided in the relevant sections of this response to consultation.

Table 1 - Key decisions in response to stakeholder feedback

Please note that the proposed changes to this activity and the indicative dates set out below are subject to further consideration and final approval. Stakeholders are advised not to make any decisions related to space heating/cooling upgrades under the VEU program until final regulations and specifications have been approved and published.

Feedback:	Decision made:
Introduction of electrification activities (gas to electric)	<ul style="list-style-type: none">• The department will proceed with the introduction of electrification upgrades as part of the new space heating and cooling activity by 31 May 2023.
Removal of gas space heating upgrade activities	<ul style="list-style-type: none">• The department will proceed with the removal of gas space heating upgrades under VEU by 30 June 2023 (Part 5 and Part 9).
Removal of evaporative coolers	<ul style="list-style-type: none">• The department will proceed with the removal of evaporative cooler upgrades and all other space heating activities available under VEU by 30 June 2023 (Part 7, Part 10 and Part 23).
Eligible upgrade and decommissioning scenarios	<ul style="list-style-type: none">• The department will proceed with the proposed decommissioning and upgrade options.• The department will limit RCAC installations above 39kW (upgrade scenarios 6C and 6G) to non-residential premises only.

Feedback:	Decision made:
On GEMS 2013 RCAC being eligible for VEU incentives	<ul style="list-style-type: none"> • RCAC registered to the GEMS 2013 Determination will not be eligible to be installed under the new space heating and cooling activity (Part 6).
Minimum efficiency requirements	<ul style="list-style-type: none"> • GEMS 2019 registered RCAC products will be required to meet minimum efficiency requirements set by the department. • Minimum efficiency requirements are based on heating and cooling seasonal performance factors. • Where heating and cooling seasonal performance factors are not available, GEMS 2019 registered RCAC must meet the specified minimum Annual Coefficient of Performance (ACOP) and Annual Energy Efficiency Ratio (AEER). • Based on stakeholder feedback that the proposed minimum efficiency requirements may be too restrictive, the department has reviewed and made changes to the minimum efficiency requirements.
Refrigerants	<ul style="list-style-type: none"> • RCAC below 15 kW will be required to use refrigerants with a global warming potential (GWP) of less than 700 to be installed under VEU – this means that products that use R32 refrigerant will be eligible. • There will be no refrigerant requirement for RCAC above 15 kW. The department may consult on refrigerant requirements for these system sizes in future.
System sizing	<ul style="list-style-type: none"> • The department will not apply a 120% cap on the size of the replacement RCAC being installed. • Stakeholders provided substantial feedback that system sizing, and consumer satisfaction when moving from ducted heating to non-ducted heating must be addressed. • It is the department's expectation that all heating and cooling upgrades under the VEU program must provide an appropriate level of service. To meet this expectation, accredited providers and their installers must ensure that: <ul style="list-style-type: none"> – the system installed is appropriate for the heating and/or cooling needs of the consumer, including having regard to the level of service provided by any decommissioned product; – the consumer has been provided with appropriate guidance on system sizing (a consumer facing VEU sizing guide will be developed by DELWP and the ESC); – the installed product (or combination of installed products) is consistent with the sizing recommended in the VEU sizing guidance and manufacturer recommendations for a household similar to that of the energy consumer; and – the consumer understands and accepts the level of service that will be provided by the new product. • The draft Specifications for space heating and cooling installations (set out at Appendix A) codify these expectations for residential upgrades. These requirements are consistent with existing requirements under the VEU Code of Conduct. Installations that do not meet these requirements will not be eligible for VEECs and may face other enforcement action.
On introducing new formulae to calculate energy savings	<ul style="list-style-type: none"> • The department will proceed with the proposed formulae to calculate energy savings.
On incentive levels	<ul style="list-style-type: none"> • Based on feedback received, the department will cap incentives for the replacement of hard-wired resistance electric heaters and ducted slab heaters. • The department will extend the lifetime of emissions savings for the no-decommissioning scenario to 15 years. This will provide increased incentives under this scenario. • There will be no changes to incentives for other decommissioning scenarios.

Feedback:	Decision made:
On product registration	<ul style="list-style-type: none"> The ESC will maintain a register of approved products for the space heating and cooling activity. Products must be registered with the ESC to be installed under the VEU program, be listed on the GEMS registration database and meet the minimum efficiency and refrigerant requirements.
Installation and decommissioning requirements	<ul style="list-style-type: none"> Only trained professionals that meet any training/licensing requirements set by the ESC will be eligible to undertake space heating and cooling activities. Prior to the introduction of the new space heating and cooling activity, the department will work with the ESC to consider the need for additional requirements and guidance documentation for decommissioning, including requirements for the appropriate disposal of materials.

Maintaining activity integrity:

Access to efficient heating and cooling is important for Victorian homes and business to reduce energy bills and GHG emissions. Health conditions and comfort are significantly impacted if there is not adequate heating and cooling within a premises.

A primary theme of stakeholder submissions was the need to maintain the integrity of the activity and ensure that heating and cooling upgrades are delivered to meet consumer needs. This includes using high quality products and ensuring there is no loss in heating and cooling service when consumers replace existing appliances which could contribute to poor customer outcomes.

The department will work with the ESC to monitor uptake of this activity and work with stakeholders to ensure it is meeting the objectives of the VEU program as well as consumer needs.

Next Steps:

The department will revise the draft Specifications for the new space heating and cooling activity over the coming months and will provide further information on:

- Accredited provider, installer, and consumer guidance documentation and requirements to ensure appropriate system sizing; and
- Decommissioning, disposal and installation (including installer qualification) requirements.

The department expects to publish updated Specifications for the 'Part 6 – Space heating and cooling' activity by 31 May 2023.

Please note that the proposed changes to this activity (including the draft regulations and specifications attached to this paper) are subject to further consideration and final approval. Stakeholders are advised not to make any decisions related to space heating/cooling upgrades under the VEU program until final regulations and specifications have been approved and published.

The department does not make any representation that the proposed changes set out in this paper will (i) take effect, (ii) will take effect on or by a particular date, or (iii) will take effect in the form proposed in this paper.

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1. Introduction

1.1 About the Victorian Energy Upgrades program

VEU is a market-based program that helps Victorians to cut their power bills and reduce GHG emissions by encouraging upgrades to energy efficient technology.

The VEU program is governed by the *Victorian Energy Efficiency Target Act 2007* and has three objectives:

- reduce greenhouse gas emissions
- encourage the efficient use of electricity and gas
- encourage investment, employment and technology development in industries that supply goods and services which reduce the use of electricity and gas by consumers.

The program is making a significant contribution to Victoria's climate change and energy affordability goals. More than 2 million households and 150,000 business premises have participated in the VEU program since it commenced in 2009. The program has reduced Victoria's GHG emissions by over 75 million tonnes to date with average annual bill savings of \$110 for participating households and \$3,700 for participating businesses.



Reduced GHG emissions by over **75** million tonnes.



Approximately **2 million** households and **150,000** businesses have participated.



Participating households and businesses have saved **\$110** and **\$3,700** respectively on their annual energy bills.



Benefits all Victorians through savings made **across the system** when energy demand is reduced.

The VEU program currently includes 37 activities that can be undertaken in eligible Victorian residential, business and non-residential premises. Accredited providers who undertake these energy efficiency activities create Victorian Energy Efficiency Certificates (VEECs). Each VEEC represents one tonne of GHG emissions saved over the lifetime of the activity or product installed. VEECs can then be sold to energy retailers, who must meet an emissions reduction target each year.

For more information on the VEU program, please see the website below or contact the VEU team on energy.upgrades@delwp.vic.gov.au.

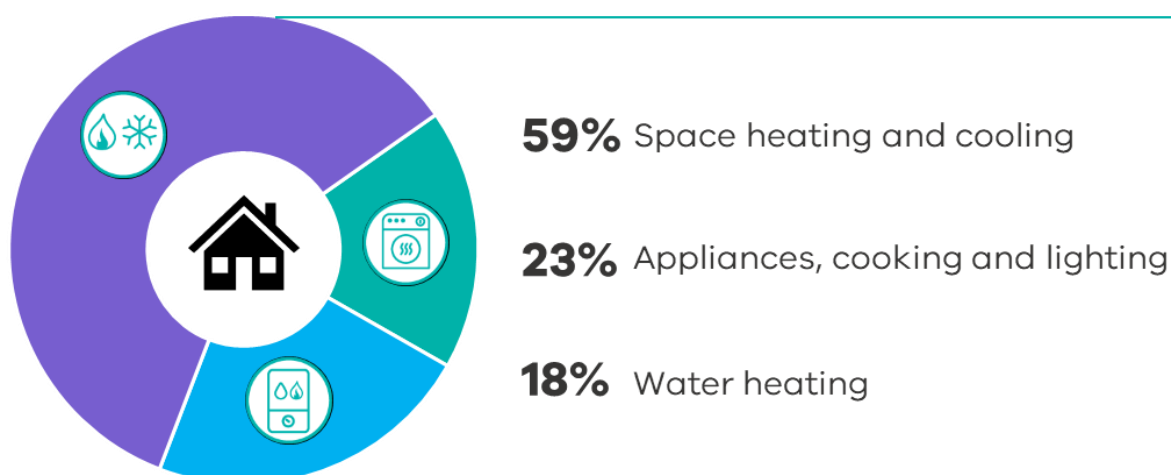
VEU website: <https://www.energy.vic.gov.au/energy-efficiency/victorian-energy-upgrades>.

The department is working on several new and revised activities for the VEU program to ensure Victorians have access to the latest energy efficiency technologies and to increase the pool of opportunity to deliver the program's targets. More information can be found at [Victorian Energy Upgrades \(VEU\) market update and work program](#).

1.2 Space heating and cooling

The Victorian Government is working to improve the energy efficiency of new and existing homes. Energy efficient homes are more comfortable, cost less to heat and cool and help reduce GHG emissions. Space heating and cooling accounts for over 50 per cent of residential energy use in Victoria¹ (Figure 1) and is a high energy end-use for businesses.² While space heating is the largest end-use of energy consumed in Victorian households, space cooling can also make a significant contribution to total energy use, particularly in business premises.³ Providing incentives for Victorian consumers to upgrade or purchase efficient space heating and cooling appliances can reduce electricity and gas demand, GHG emissions and consumer energy bills.

Figure 1 - Residential energy usage by end-use



1.3 Consultation background

The Department of Environment, Land, Water and Planning (the department) is looking to revise the space heating and cooling activities available under the VEU program to ensure the program is delivering on emissions and energy bill savings for Victorian households and businesses.

On 4 July 2022, the department opened a public consultation on the proposed revision of space heating and cooling activities under the VEU program. An issues paper was published seeking stakeholder feedback on proposed changes as well as draft Regulations and Specifications.

The consultation paper is available on the Engage Victoria website:

[Victorian Energy Upgrades - Space heating and cooling activities | Engage Victoria](#)

Stakeholder feedback provided in the consultation has been used to guide and inform the design of the space heating and cooling activity. This response to consultation outlines the feedback received by stakeholders and the decisions by the department on how this feedback will be implemented.

1.4 Stakeholder submissions

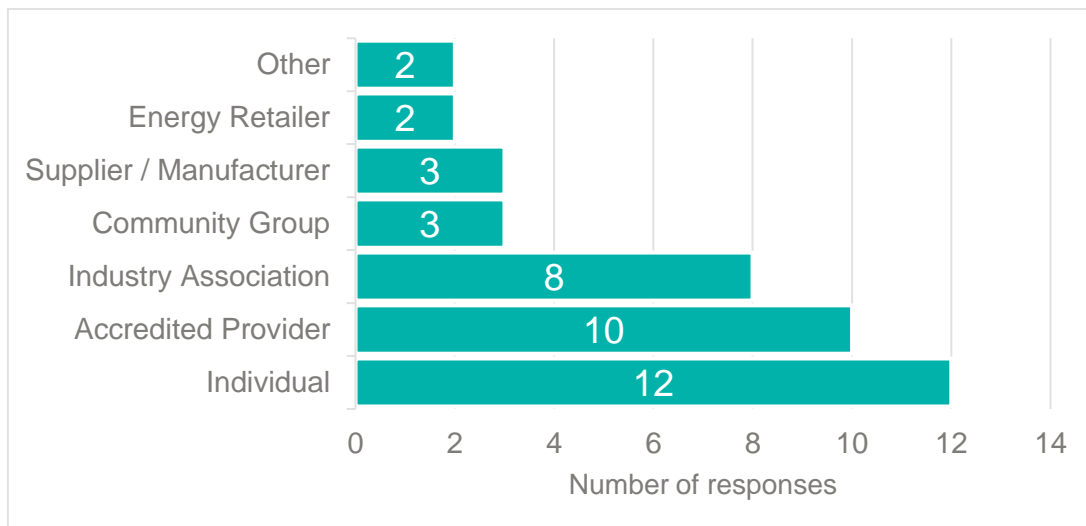
A total of 40 submissions were received from a wide range of stakeholders including members of the public, VEU accredited providers, industry associations and community groups, product manufacturers and energy retailers (Figure 2).

¹ Residential Baseline Energy Study: Australia/New Zealand, Energy Consult (2015)

² Available from – <https://assets.cleanenergycouncil.org.au/documents/consumers/guide-to-improving-electricity-use-in-your-business.pdf>

³ Available from – <https://www.abs.gov.au/ausstats/abs@.nsf/0/85424ADCCF6E5AE9CA257A670013AF89?opendocument>

Figure 2: Consultation responses by stakeholder type



The department would like to thank all the organisations and individuals who took the time to review the material available on the Engage Victoria website and provide submissions. The department has carefully considered all stakeholder feedback. Revisions to the proposed space heating and cooling activity in response to this feedback are detailed in the following sections.

2. Proposed updates to space heating and cooling activities

2.1 On the objectives of the space heating and cooling review

Space heating and cooling activities have had limited uptake under the VEU program. The objective of this review is to update the space heating and cooling activities available under VEU to provide new upgrade opportunities for Victorian consumers and VEU accredited providers.

The proposed updates will replace current space heating and cooling activities with a single activity which provides incentives for the installation of high efficiency reverse cycle air conditioners (RCAC), capable of both heating and cooling. Upgrades include non-ducted RCAC (including single split and multi-split units) and ducted RCAC up to 65 kilowatts (kW) in capacity.

Overall, stakeholders were supportive of the objectives of the review, with feedback including:

- the VEU program space heating and cooling activities require overhaul;
- support for the expansion and update of space heating and cooling upgrade activities;
- the proposed upgrade scenarios being more reflective of space heating and cooling upgrade opportunities;
- installing high-efficiency RCAC can increase energy efficiency and improve indoor air quality for Victorians; and
- upfront cost acts as a barrier for many households who wish to undertake space heating and cooling upgrades.

Some stakeholders provided feedback that the scope of the review was limited to RCAC, and that other heating and cooling technologies such as hydronic heating should be explored for inclusion in VEU. Stakeholder also suggested that building shell efficiency upgrades should be a focus of VEU to further reduce space heating and cooling requirements.

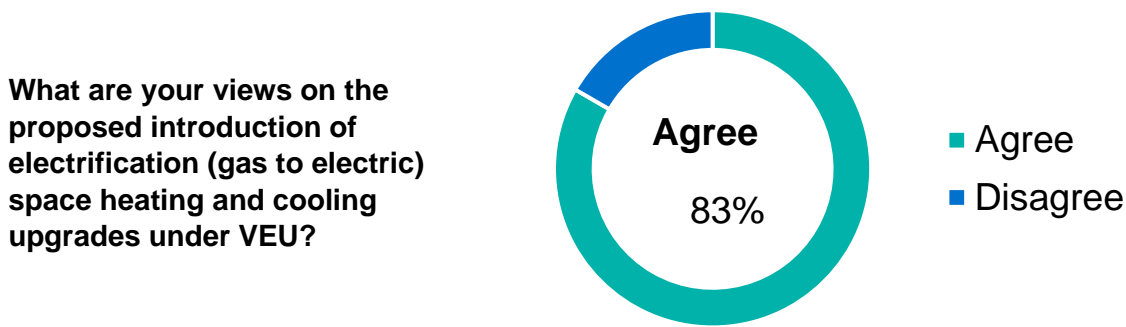
The department is continually reviewing and expanding the range of energy efficiency activities that are available to households and businesses and will consider this feedback as activities are reviewed and developed.

2.2 Expanding the VEU program to allow for electrification upgrades

The Victorian Government recently published the Gas Substitution Roadmap (the Roadmap), which is the Victorian Government's strategic plan to support a coordinated and equitable transition to a decarbonised gas sector. The Roadmap details the most effective approaches to substituting natural gas to help achieve Victoria's emissions reduction targets. Analysis undertaken to inform the Roadmap found that energy efficiency and electrification will play a dominant role in reducing natural gas use and gas sector emissions this decade; whilst renewable or low emission gas technologies are likely to be required at scale in the longer term.

The proposed updates to space heating and cooling activities in the VEU program aligns to the Roadmap by introducing incentives for replacing gas appliances with efficient electric RCAC.

Figure 3: Stakeholder responses on the proposed introduction of electrification (gas to electric) upgrades under VEU



Of stakeholders who provided a response, 83% supported the introduction of electrification (gas to electric) upgrades under VEU (Figure 3).

Stakeholder feedback in support of electrification upgrades included that:

- efficient RCAC offer the greatest potential for GHG emissions reductions;
- electrification is a necessary step towards achieving net zero GHG emissions;
- electrification should be a primary goal of VEU program activities;
- there is considerable interest from consumers in switching from gas to electric appliances;
- replacing gas heaters with efficient RCAC will save households money and reduce cost of living;
- VEU incentives can reduce the payback time for replacing gas heaters; and
- RCAC improve health outcomes by providing a cooling option not available with gas heaters and improving indoor air quality.

Stakeholders concerned about the introduction of electrification activities provided feedback that the supply of electricity may not be assured to households that electrify; the costs for customers to electrify their home are prohibitive; and that GHG emissions from appliances which use grid electricity may be higher than gas.

The department acknowledges these concerns; however, as specified in the Roadmap:

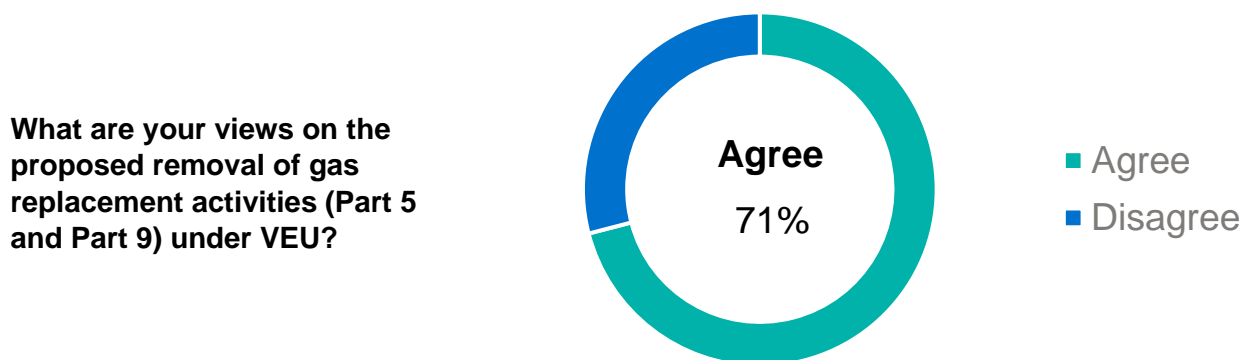
- At a whole-of-electricity system level, Victoria has significantly higher peak demand in summer than in winter (around two gigawatts). Whilst electrification of (predominantly winter) gas loads will increase winter peak, the Roadmap found that even with enormous levels of electrification (across residential, commercial and industrial loads), Victoria would not turn “winter peaking” or reach its historical peak until almost 2030. Electrification in the residential sector only is highly unlikely to see Victoria’s winter peak reach this historical peak for much longer, with significant time to plan and prepare.
- While upfront costs can be a significant barrier towards upgrading to efficient electric appliances, VEU incentives can help lower these up-front costs. This can lead to significant bill savings over the life of the appliance, which increase significantly should a home or business have solar panels installed. In addition, the Roadmap does not require or mandate households to upgrade, and there are no penalties for users who continue to use gas.
- The total GHG emissions outcome from using gas or electricity is a function of both the emissions intensity of the fuel source (and how these are changing over the expected life of the appliance) and importantly, the efficiency of the end appliance delivering the output energy service (e.g. heat):

- The emissions intensity of Victoria’s electricity system is reducing rapidly, with AEMO’s *Integrated System Plan (ISP)* forecasting further significant declines across all core scenarios over the coming decade. This contrasts with the emissions intensity of natural gas, given the challenges of scaling up renewable or alternative gases this decade.
- The trajectory of the emissions intensities of electricity versus gas in the coming decade, combined with the significantly higher efficiency of the electric appliances under consideration in this VEU paper, mean that over their appliance lives, these efficient electric appliances will be lower total emissions than their equivalent gas appliances.

2.3 Removal of VEU gas space heating upgrade activities

The consultation paper proposed the removal of VEU upgrades which incentivise the installation of gas space heating appliances.

Figure 4: Stakeholder responses on the proposed removal of gas replacement activities under VEU.



Of stakeholders who provided a response, 71% agreed with the proposed removal of gas space heating upgrade activities under VEU (Figure 4).

Stakeholders in support of the removal of gas space heating upgrade activities outlined that:

- gas appliances can negatively impact indoor air quality;
- all electric homes are cheaper and cleaner;
- VEU should transition away from gas replacement activities;
- all gas space heating activities subsidised by VEU should be removed; and
- the removal of gas activities should proceed urgently.

Stakeholders who did not support the removal of gas space heating upgrades stated in their feedback that the proposed changes are not technology agnostic and that gas replacement upgrades can continue to offer cost-effective GHG emissions reductions. Stakeholders also provided feedback that removing gas upgrades may cause damage to the local manufacturing industry and jobs, and noted the potential future opportunities for emissions savings through future use of hydrogen and biomethane.

The department acknowledges these concerns; however the Roadmap finds the following:

- When considering the emissions intensity of the different fuel sources, their trajectories over the coming decade (in line with the AEMO ISP) and the efficiency of electric versus gas

appliances, total emissions over the appliance lifetime are lower for efficient electric appliances.

- The Victorian Government recognises that renewable or alternative gases, such as hydrogen and biomethane, will play an important future role in decarbonising Victoria's gas sector, particularly in high-heat and feedstock applications, and potentially as peaking generation in the electricity sector. As part of Roadmap actions, the Government is progressing work to develop these technologies:
 - At the same time, hydrogen and biomethane are not significantly scalable this decade, and decarbonising Victoria's economy will require the gas sector to contribute by 2030. As such, energy efficiency and electrification will play the primary role this decade.
- Further, activities which incentivise the installation of gas space heating appliances currently get very little uptake through the VEU program.
- There are other opportunities currently available through VEU to drive gas efficiency in the commercial and industrial sector. For example, the VEU program recently updated requirements for gas boiler upgrades to help improve uptake of this important gas efficiency activity which will help reduce energy bills for larger commercial and industrial consumers.
- VEU also currently supports bioenergy/biogas projects through incentives for project-based activities. Project-based activities are bespoke energy-saving projects at businesses and non-residential sites, typically with large energy use.
 - Incentives for these projects are determined by comparing energy use before and after the project is implemented, using industry-standard measurement and verification techniques. A single project can include a variety of technologies so long as energy savings can be measured and verified.
 - The department is open to considering how it can support low emissions gasses, including green hydrogen through project-based activities. The department has just recently closed a consultation on proposed improvements to project-based activities under the VEU program.

2.4 Evaporative cooling

The consultation paper proposed the removal of VEU upgrades which incentivise the installation of evaporative coolers. Of stakeholders who provided a response, 75% supported the proposed removal of evaporative cooler upgrades from VEU (Figure 5). Stakeholder feedback on the current VEU evaporative cooler activity included that:

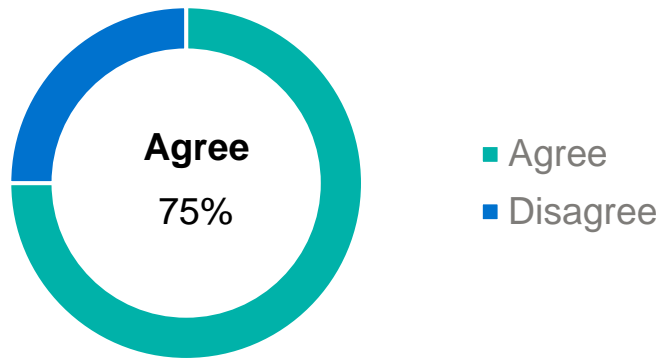
- unlike RCAC which both heat and cool, evaporative coolers provide cooling only;
- evaporative coolers can cause decreases in thermal efficiency by reducing building shell efficiency;
- vents are rarely sealed off when heating is required; and
- limited ability to function in times of high humidity.

Stakeholders who did not support the removal of evaporative cooler upgrades from VEU commented that:

- evaporative coolers provide an alternative cooling option preferred by some allergy sufferers;
- the use of evaporative coolers results in lower GHG emissions compared to RCAC; and
- evaporative coolers may provide a cheaper option for cooling for some households.

Figure 5: Stakeholder responses on the proposed removal of evaporative cooler upgrades under VEU.

What are your views on the proposed removal of evaporative cooler upgrades (Part 23) under VEU?



The evaporative cooler activity has had no uptake under VEU to date. In addition, the current VEU evaporative cooler activity is most likely to occur in circumstances where the heating type is not a RCAC (e.g., gas, wood-fired heater or electric resistance heating). Gas and resistance electric heating are both more GHG intensive than heating with a RCAC, and it would be beneficial to install a RCAC to service both the heating and cooling loads rather than retaining the existing heater.

The department is committed to providing efficient heating and cooling upgrades to households under VEU and will proceed with the removal of the VEU evaporative cooling activity as outlined.

2.5 Transition timeframe

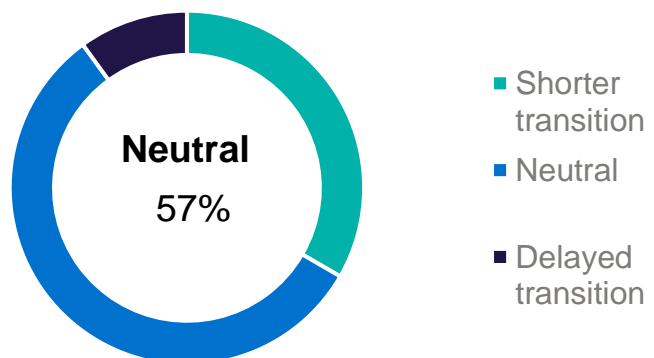
The consultation paper proposed that existing space heating and cooling activities would be removed from the VEU program from 30 April 2023, following the introduction of the new Part 6 – space heating and cooling activity.

Most stakeholder feedback was either neutral or supported a shorter transition process (Figure 6).

Stakeholders in support of a shorter transition time outlined the limitations of the current VEU space heating and cooling activities, limited uptake, and the need to move immediately towards electrification. Stakeholders that proposed an extended transition timeframe commented that manufacturing may require extra time to allow for any required changes and suppliers would prefer a 12-month period to install existing stock under the VEU program.

Figure 6: Stakeholder responses on the proposed transition timing for existing space heating and cooling activities.

Do you have any comments on the proposed transition process and timing for existing VEU space heating and cooling activities?



After considering all stakeholder feedback, the department has decided to proceed with the transition timeframes outlined below. This means that the existing space heating and cooling activities (Part 5, 7, 9, 10 and 23) will be removed from the VEU program by 30 June 2023 (Table 2).

Table 2 – Transition process for existing VEU space heating activities

Please note that the proposed changes to this activity and the indicative dates set out below are subject to further consideration and final approval. Stakeholders are advised not to make any decisions related to space heating/cooling upgrades under the VEU program until final regulations and Specifications have been approved and published.

VEU Activity	Activity Description	Transition process
Part 6 (new activity)	Installing a high efficiency air conditioner.	New activity introduced into VEU program – 31 May 2023.
Part 5	Installing a high efficiency ducted gas heater.	Removed 30 June 2023.
Part 7	Installing a high efficiency ducted air-to-air heat pump.	Removed 30 June 2023. Ducted air-to-air heat pumps will be eligible to be installed under the new Part 6 activity.
Part 9	Installing a high efficiency room gas LPG heater.	Removed 30 June 2023.
Part 10	Installing a high efficiency room air-to-air heat pump.	Removed 30 June 2023. Room air-to-air heat pumps will be eligible to be installed under the new Part 6 activity.
Part 23	Installing a ducted evaporative cooler.	Removed 30 June 2023.

SUMMARY OF KEY DECISIONS:

- The department will proceed with the introduction of the new VEU Part 6 space heating and cooling activity by 31 May 2023 (with existing activities under Parts 7 and 10 to be consolidated into Part 6 with some changes).
- The department will proceed with the introduction of electrification upgrades (gas to electric) as part of the new space heating and cooling activity.
- The department will proceed with its proposed approach of removing gas space heating upgrades (Part 5 and Part 9) under VEU by 30 June 2023.
- The department will proceed with its proposed approach of removing evaporative cooler upgrades (Part 23) and all other space heating activities available under VEU (Part 7 and Part 10) by 30 June 2023.

3. Eligible upgrade scenarios

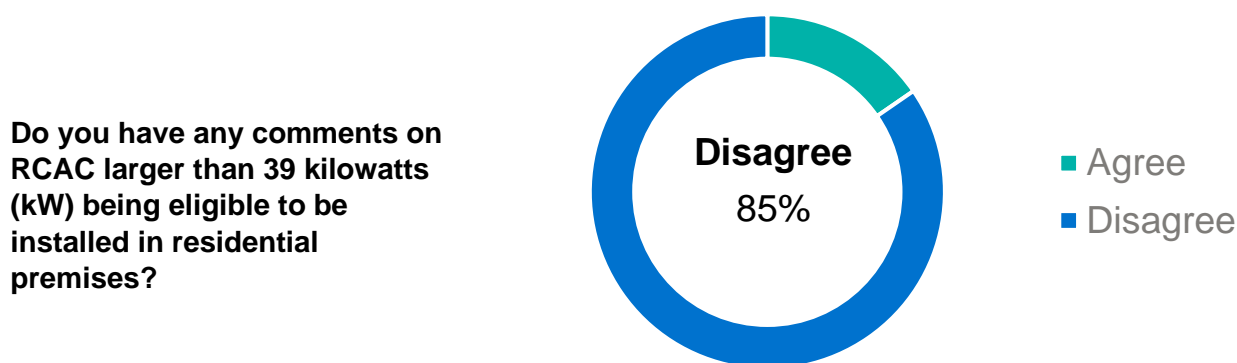
Under the *Greenhouse and Energy Minimum Standards (Air Conditioners up to 65 kW) Determination 2019* (GEMS 2019 Determination) air conditioners are registered to 23 different product classes. This includes RCAC, water-to-air air conditioners, wall mounted unitary air conditioners and portable air conditioners.

The proposed VEU Part 6 – space heating and cooling activity includes upgrades to RCAC registered under GEMS classes 6 to 21. GEMS classes are grouped by capacity (kW) and configuration (ducted and non-ducted) into seven upgrade scenarios (6A to 6G). This excludes upgrades to portable air conditioners (Classes 1 to 4), window-wall products (Class 5) and water-to-air conditioners (Classes 22 to 23).

No data was provided to support any change in eligible GEMS classes. General feedback provided by stakeholders supported the proposal to include RCAC upgrades registered to the GEMS 2019 Determination.

Several stakeholders provided feedback that upgrades to systems over 39kW should be excluded in residential premises, as they typically do not require a system this size (Figure 7).

Figure 7: Stakeholder responses on the inclusion of systems >39kW in a residential premise



In response to stakeholder feedback, the department will proceed with the proposed upgrade scenarios and GEMS classes. Upgrades to RCACs larger than 39 kilowatts (kW) will not be eligible in residential premises. The upgrade scenarios and eligible premises in which an upgrade can occur are listed in Table 3.

Table 3 – Eligible GEMS air conditioner classes

Scenario	Product to be installed	GEMS 2019 Classes	Size (kW)	Residential	Non-Residential
6A	GEMS registered ducted RCAC	Classes 10 and 15	<10kW	✓	✓
6B	GEMS registered ducted RCAC	Classes 11, 16 and Class 6 ducted units	10kW to <39kW	✓	✓
6C	GEMS registered ducted RCAC	Classes 12, 17 and Class 7 ducted units	39kW to ≤65kW	✗	✓
6D	GEMS registered non-ducted RCAC	Classes 8, 13 and 18	<4kW	✓	✓

Scenario	Product to be installed	GEMS 2019 Classes	Size (kW)	Residential	Non-Residential
6E	GEMS registered non-ducted RCAC	Classes 9, 14 and 19	4kW to <10kW	✓	✓
6F	GEMS registered non-ducted RCAC	Classes 11, 16, 20 and Class 6 non-ducted units	10kW to <39kW	✓	✓
6G	GEMS registered non-ducted RCAC	Classes 12, 17, 21 and Class 7 non-ducted units	39kW to ≤65kW	X	✓

3.1 Decommissioning scenarios

The decommissioning scenarios proposed under the space heating and cooling activity include⁴:

- hard-wired electric resistance room heaters;
- central electric resistance or ducted slab heaters;
- room gas heaters;
- ducted gas heaters;
- room reverse cycle air conditioners (non-ducted);
- ducted reverse cycle air conditioners; and
- a no decommissioning scenario, where the existing heating or cooling equipment is not specified, or a new installation is occurring.

Feedback was received from stakeholders that the decommissioning scenarios were comprehensive and a significant improvement on current VEU activities. Other feedback received included that:

- replacement of evaporative coolers should be included;
- replacement of plug-in heaters should be included;
- refrigerative air conditioners which have electric resistance heating should be included; and
- the definition of a hard-wired electric resistance room heater should be updated and expanded to include reference to a “dedicated circuit”.

While these are not specified decommissioning options, there is a dedicated scenario that allows for these upgrades to occur under – “Scenario xi - None of the combinations specified”. It is considered that this scenario should be used where a consumer would like to upgrade from evaporative coolers, plug-in heaters, window mounted systems or wood-fired heaters.

The definition for hard-wired electric room heater will not be changed, as not all hard-wired electric room heaters will necessarily be on a dedicated circuit. The department welcomes further feedback on the decommissioning scenarios as the activity is implemented.

4. Where applicable, decommissioning options also include scenarios where a refrigerative air conditioner (cooling only) is present in conjunction with an eligible heating product

SUMMARY OF KEY DECISIONS:

- The department will proceed with the proposed decommissioning and upgrade options.
- The department will limit RCAC products above 39kW (upgrade scenarios 6C and 6G) to non-residential premises only.

4. System sizing

4.1 Over-sizing or under-sizing

RCAC come in a range of heating and cooling capacities (in kilowatts, kW), referred to as the 'size' of the RCAC. Sizing of RCAC is critical when upgrading to efficient heating and cooling systems. The RCAC should be appropriately sized for the space that it will be heating and cooling to maximise energy efficiency and ensure it meets the heating and cooling needs of the consumer:

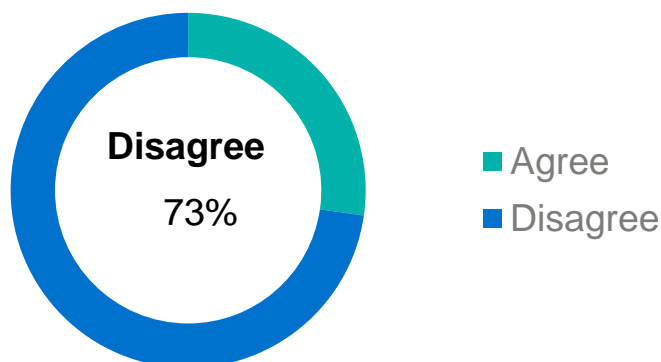
- an over-sized RCAC will cost more to purchase and will be less energy efficient, resulting in an unnecessary increase in energy consumption; and
- an under-sized RCAC may be insufficient to deliver the desired heating/cooling needs or must run at maximum power output which can cause unnecessary increases in energy usage and maintenance costs.

To prevent over-sizing, the consultation paper invited stakeholder feedback on a potential cap on the size of the RCAC being installed when replacing existing heating/cooling equipment.

Although stakeholders agreed that over-sizing was an issue that should be addressed, submissions identified both under-sizing and over-sizing as potential issues for new and replacement RCAC installations. 73% of stakeholders disagreed with the inclusion of a cap on the heating capacity of replacement units to address system sizing issues (Figure 8).

Figure 8: Stakeholder responses on the proposed cap of 120 per cent of the unit being decommissioned

What are your views on replacement RCACs not having a rated heating capacity more than 120 per cent of the unit being decommissioned?



Feedback from stakeholders on system sizing included that:

- under-sizing of systems may be more important to manage than over-sizing as it will not meet the heating and cooling needs of the consumer;
- including a mandatory cap on the size of RCAC to be installed could cause conflict with the RCAC being fit for purpose for the room it is heating and cooling;
- pre-existing heating equipment may not have been sized appropriately, and it can be difficult to determine its capacity;
- over or under-sizing should not be based on a per cent capacity requirement;
- installers should be well trained in the technology they are installing and are best placed to advise on the size of the RCAC required; and
- customers should be made aware how the recommended upgrade meets their heating and cooling needs.

Stakeholder suggestions on how over or under-sizing could be addressed included:

- using best practice guidelines;
- recording the size of the area being heated or cooled; and
- demonstrating that the RCAC sizing matches the manufacturer’s recommendations.

The department acknowledges that over or under-sizing of RCAC is an important issue to be addressed to ensure that customers are satisfied with the product being installed, and that it meets their heating and cooling requirements. However, applying a cap may restrict units from being installed that are fit for purpose, and does not account for potential under-sizing.

Accredited providers and their employees or sub-contractors (e.g. salespersons or installers) need to assess each site on its merits and must:

- optimise the RCAC installation size based on their assessment; and
- educate the consumer on the appropriate RCAC size for the consumer’s heating and cooling needs (including the size of the area being heated or cooled).

There are several on-line tools to assist installers and consumers on the correct sizing of their RCAC:

- The Australian Institute of Refrigeration Air Conditioning and Heating (AIRAH) FairAir website⁵ provides in-depth information as well as energy, noise and heating and cooling calculators to help determine the appropriately sized RCAC.
- Solar Victoria’s Home Heating and Cooling Upgrade (HHCU) programme has released a buyer’s guide with guidance on the RCAC system size required for different room sizes (Figure 9).⁶
- Manufacturer recommendations and guidance.

Figure 9: Recommended RCAC system size (cooling capacity in kW) based on a range of room sizes (HHCU buyer’s guide)

Room size	Capacity
Up to 20 m ²	2–2.5kW
20–40 m ²	2.5–5kW
40–60 m ²	4–6kW
60–80 m ²	5–7kW
80+ m ²	6–9kW

It is the department’s expectation that all heating and cooling upgrades for residential households under the VEU program must provide an appropriate level of service. To meet this expectation, accredited providers (and their installers) must ensure that:

- the system installed is appropriate for the heating and cooling needs of the consumer, including having regard to the level of service provided by any decommissioned product;
- the consumer has been provided with appropriate guidance on system sizing (consumer-facing VEU sizing guidance will be developed by DELWP and the ESC);
- the installed product (or combination of installed products) is consistent with the sizing recommended in the VEU sizing guidance and manufacturer recommendations for a household similar to that of the energy consumer; and

5. FairAir website available at: <https://fairair.com.au>

6. HHCU Buyers Guide available at: [Home Heating & Cooling Buyers Guide](#)

- the consumer understands and accepts the level of service that will be provided by the new system.

To address appropriate sizing, the department and ESC will develop high-level sizing guidance for accredited providers, installers and consumers. This guidance will align with typical industry 'best practice' to minimise the risk of inappropriately sized systems being installed.

The draft Specifications for space heating and cooling installations (set out in Appendix A) outline these expectations. In addition, these requirements are consistent with existing obligations under the VEU Code of Conduct to ensure that the accredited provider (or installer) gives clear and accurate information to the consumer about the suitability of the product for their needs. Installations that do not meet these expectations will not be eligible for VEECs.

4.2 Replacing ducted with non-ducted systems

When replacing ducted gas with efficient RCAC, there are several upgrade options available to consumers, including:

- installing single-split system RCAC in multiple rooms;
- installing a multi-split system RCAC, which can provide heating and cooling to multiple rooms (typically adjacent), connected to a single outdoor unit; and
- installing a ducted RCAC, which distributes heat to rooms through ducts and vents in the ceiling.

A range of factors will influence the consumers preferred upgrade, including the placement of outdoor units, insulation of the building, heating and cooling preferences, and upfront and on-going costs. Regardless of the upgrade option, consumers will likely expect a similar level of heating service as before the upgrade (i.e., a system that can cover the heating and cooling needs for the majority of the house).

Several stakeholders provided feedback that the consultation paper proposes scenarios where ducted heating can be replaced with a single non-ducted RCAC.

- For example, scenario 6E(vii) includes incentives toward replacing a ducted gas heater which covers whole of house heating in winter, with one RCAC, with a heating capacity of 6 kW which may only heat one room.

These upgrades are unlikely to meet the consumer's heating and cooling needs. The department's expectation is that incentives (VEECs) for this scenario must go towards a system or combination of RCAC that are appropriately sized and meet the needs of the consumer.

- In this example, the ducted gas system can be decommissioned and replaced with one 6kW RCAC, however, additional RCAC will most likely be required to be considered fit for purpose and meet the heating and cooling needs of the consumer.
- Incentives for other RCAC are treated as a new installation under decommissioning option 'Xi - None of the combinations specified above, or a new system'.
- No additional heaters other than RCAC can be installed during the VEU upgrade, and accredited providers must provide evidence that the installation meets the appropriate sizing requirements, and that the consumer has been provided and understands the product sizing guidance issued by the ESC.

Examples of the options available to consumers when upgrading from ducted gas through the proposed VEU space heating and cooling activity are shown in Table 4.

Table 4 – Upgrading from ducted gas to RCAC under VEU

Upgrade from ducted gas to:	Indicative VEECs:	Comments:
Single split RCAC (6 kW)	<ul style="list-style-type: none"> • Approx. 25 VEECs for decommissioning the ducted gas system. • Additional VEECs can be claimed for other split systems that are installed (up to a maximum of 3 additional RCAC under 'Scenario Xi - no decommissioning'). 	<p>When using this upgrade option, accredited providers and their installers must ensure that:</p> <ul style="list-style-type: none"> • the combination of RCAC installed provides an appropriate level of service to the consumer • meets any product sizing guidance issued by the department or ESC • no additional heating and/or cooling equipment is installed as part of the upgrade (for example, no plug-in heaters are to be installed).
Multi-split RCAC (12 kW)	<ul style="list-style-type: none"> • Approx. 60 VEECs for decommissioning the ducted gas system. • Additional VEECs can be claimed for other split systems that are installed (up to a maximum of 3 additional RCAC under 'Scenario Xi - no decommissioning'). 	<p>When using this upgrade option, accredited providers and their installers must ensure that:</p> <ul style="list-style-type: none"> • the combination of RCAC installed provides an appropriate level of service to the consumer • meets any product sizing guidance issued by the department or ESC • no additional heating and/or cooling equipment is installed as part of the upgrade (for example, no plug-in heaters are to be installed).
Ducted RCAC (15 kW)	<ul style="list-style-type: none"> • Approx. 56 VEECs for decommissioning the ducted gas system. 	<p>When upgrading this option accredited providers and their installers must ensure that:</p> <ul style="list-style-type: none"> • the RCAC installed provides an appropriate level of service to the consumers • meets any product sizing guidance issued by the department or ESC • no additional heating and/or cooling equipment is installed as part of the upgrade (for example, no plug-in heaters are to be installed).

As noted above, the department and ESC will develop appropriate sizing guidance for consumers and set installation requirements for accredited providers and their installers to ensure that:

- the system installed is appropriate for the heating and cooling needs of the consumer, including having regard to the level of service provided by any decommissioned product;
- the consumer has been provided with appropriate guidance on system sizing;
- the installed product (or combination of installed products) is consistent with the sizing recommended in the VEU sizing guidance and manufacturer recommendations for a household similar to that of the energy consumer; and
- the consumer understands and accepts the level of service that will be provided by the new system.

SUMMARY OF KEY DECISIONS:

- The department will not apply a 120% cap on the size of the replacement RCAC being installed.
- The department and the Essential Services Commission (ESC) will develop guidance documentation for consumers and set requirements for accredited providers and installers to ensure RCAC installed through VEU are appropriately sized to meet the consumer's heating and cooling needs.

5. Product requirements

5.1 Eligibility of GEMS 2013 registered products

Air conditioners (<65 kW) sold in Australia must be registered to either the GEMS 2013 Determination or the GEMS 2019 Determination until March 2025. By 2025 all air conditioners within Australia are required to be registered against the GEMS 2019 Determination, which includes having Zoned Energy Rating Label data available.⁷

The consultation paper proposed that RCAC registered to the GEMS 2013 Determination will be eligible to be installed under the VEU program until 31 March 2025 (as per Commonwealth Legislation). After this date, only GEMS 2019 registered RCACs will be eligible to be installed under the VEU program.

Stakeholder feedback on the inclusion of GEMS 2013 registered products included that:

- the phase out date could be sooner
- accredited providers did not plan on using these models and support a shorter transition period
- GEMS 2013 models may be 'obsolete'.

Further analysis of the GEMS registration database has been undertaken, and it has been found that:

- 5200 out of 5400 models on GEMS registration database are registered to the GEMS 2019 Determination.

Based on stakeholder feedback, the limited number of GEMS 2013 registered products on the GEMS registration database, and the limited number of GEMS 2013 products installed through VEU, only GEMS 2019 products will be able to be installed under the VEU program from 31 May 2023.

The department notes that a substantial number of GEMS 2019 registered products do not have seasonal performance data available. These models will be eligible to be installed under VEU, provided they meet minimum specified Annualised Energy Efficiency Ratio (AEER) and Annualised Coefficient of Performance (ACOP) values.

5.2 Minimum efficiency requirements

RCAC must meet minimum efficiency requirements set by the Department to be eligible for installation under the VEU program.

- GEMS 2019 registered RCAC must meet the specified minimum seasonal performance ratings for heating (HSPF) and cooling (TCSPF) for the cold zone (residential or business, depending on the kW capacity of the RCAC installed). These values are recorded in the public GEMS registration database.⁸
- GEMS 2019 registered RCAC without seasonal performance ratings must meet the specified minimum ACOP and AEER. These values are recorded in the public GEMS registration database.

Stakeholder feedback on the minimum efficiency requirements was that:

- there should be minimum efficiency requirements for RCAC installed under the VEU program;

⁷ Available from – <https://www.energyrating.gov.au/products/air-conditioners/>

⁸ GEMS Registration Database – https://reg.energyrating.gov.au/comparator/product_types/

- some stakeholders agreed with the proposed minimum efficiency requirements;
- some stakeholders provided feedback that the minimum efficiency requirements may be too high, limiting the number of RCAC products eligible to be installed; and
- one stakeholder provided feedback that minimum efficiency requirements should be reviewed over time as technology improves.

Based on this feedback, the department has reviewed the proposed minimum requirements and assessed the number of RCAC on the GEMS registration database that meet the minimum efficiency requirements for each upgrade scenario. Based on this review, the department will make the following changes to the minimum efficiency requirements:

- sub-divide some upgrade categories (by kW capacity) and introduce different minimum efficiency requirements;
- adjust the minimum efficiency requirements for some upgrade scenarios to ensure there is an adequate number of energy efficient RCAC that meet the minimum efficiency requirements; and
- base minimum efficiency requirements for RCAC above 39kW on commercial seasonal performance factors.

These changes are highlighted in red in Table 5.

Table 5 – Minimum efficiency requirements for RCAC to be installed under VEU

Cat.	Product Description	GEMS 2019 Class	GEMS 2019 min HSPF Cold Zone	GEMS 2019 min TCSPF Cold Zone	GEMS 2019 min ACOP	GEMS 2019 min AEER
6A	Ducted air to air < 10 kW	Classes 10 or 15	3.6	4.4	3.9	3.5
6B	Ducted air to air 10 kW ≤ to < 25 kW	Classes 6 (ducted units only), 11 or 16	3.4	4.2	3.7	3.4
6B [NEW]	Ducted air to air 25 kW ≤ to < 39 kW	Classes 6 (ducted units only), 11 or 16	3.2	3.6	3.7	3.4
6C	Ducted air to air 39 kW < to ≤ 65 kW	Classes 7 (ducted units only), 12 or 17	3.2	4.8	3.5	3.2
6D	Non-ducted air to air < 4 kW	Classes 8, 13 or 18	4.2	5.4	4.4	4.1
6E	Non-ducted air to air 4 kW ≤ to < 7 kW	Classes 9, 14 or 19	3.7	5.0	4.0	3.7
6E [NEW]	Non-ducted air to air 7 kW ≤ to < 10 kW	Classes 9, 14 or 19	3.6	4.8	3.9	3.7
6F	Non-ducted air to air 10kW ≤ to ≤ 39kW	Classes 6 (non-ducted units only), 11, 16 or 20	3.6	4.6	3.9	3.6
6G	Non-ducted air to air 39kW < to ≤ 65kW	Classes 7 (non-ducted units only), 12, 17 or 21	2.7	5.3	3.8	3.4

Note: Products must meet the seasonal performance factors for the residential cold zone for all upgrades, other than 6C and 6G which use seasonal performance factors for the commercial cold zone.

Stakeholder submissions also raised concerns that it would be a lost opportunity for ‘smart’ RCAC, which are demand response (DR) capable. The department will not include a DR requirement at this stage due to insufficient available models however, these requirements may be reviewed and introduced over time.

5.3 Refrigerants

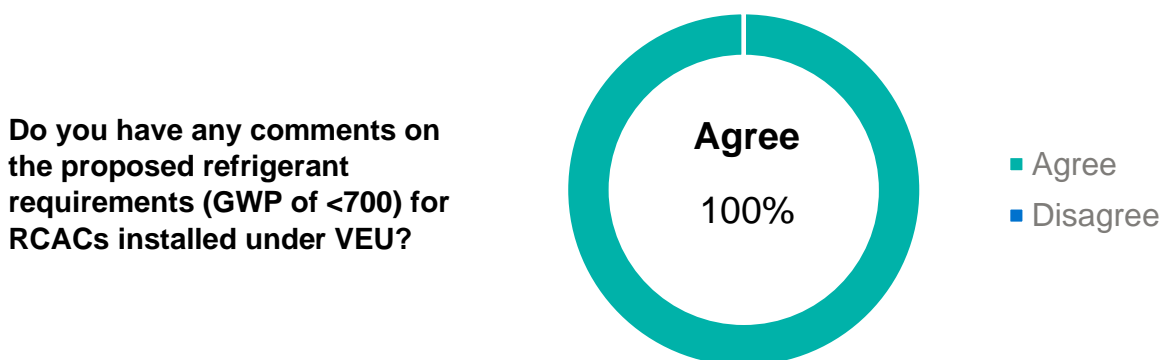
Refrigerants play an essential role in RCAC by transferring heat from one area to another. The choice of refrigerant is important, as if leaks occur, they can have a negative impact on the environment by contributing to global warming. The Global Warming Potential (GWP) of a refrigerant is its global warming impact relative to the impact of the same quantity of carbon dioxide over a 100-year period.

Four main types of refrigerants are used in RCAC:

- R407C, GWP = 11,774;
- R410A, GWP = 2,088;
- R22, GWP = 1,810; and
- R32, GWP = 675.

The refrigerant R32 has the lowest GWP out of the four commonly used refrigerants and is now rapidly increasing its market share. The consultation paper proposed that only RCAC (both ducted and non-ducted) which use refrigerants with a GWP less than 700 will be eligible to be installed under the VEU program.⁹ This requirement aligns to refrigerant limits imposed in Solar Victoria’s Home Heating and Cooling Upgrades program.

Figure 10 - Stakeholder responses on the proposed refrigerant requirements for RCAC’s installed under VEU



Where feedback was provided, stakeholders agreed with the proposed refrigerant requirement (GWP of <700) (Figure 10). Stakeholder feedback included that the RCAC industry is more advanced than other heat pump technologies in moving towards low GWP refrigerants.

As the use of refrigerants in RCAC is a developing area, some stakeholders noted that a planned review may be required as technology changes. Other stakeholders supported the requirement but commented that this requirement should be fixed for a reasonably long time, and that an appropriate transition timeframe would be required should there be any future changes to VEU refrigerant requirements. One stakeholder also provided feedback that there are safety concerns when using R32 in larger RCAC, as R32 is classified as mildly flammable (as opposed to R410A which is non-flammable), and larger RCAC require larger volumes of refrigerant to operate efficiently.

⁹ The department is aware that the GWP for the refrigerant R32 has been updated in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6). The GWP threshold will be set so that RCAC using R32 can be installed.

Changes to proposed refrigerant requirements:

The department has further assessed the availability of RCAC that would meet the proposed refrigerant requirements.

- RCAC above 15 kW - Analysis of the GEMS registration database shows there are a limited number of RCAC models (non-ducted and ducted) above 15 kW that would meet the refrigerant requirement (GWP less than 700), with very few models eligible in larger RCAC sizes (39 to 65kW). Introducing a refrigerant requirement on systems larger than 15 kW may severely limit the number of RCAC eligible to receive VEU incentives, and activity uptake.
- RCAC below 15 kW - Analysis of the GEMS registration database shows that there are a sufficient number of RCAC models (non-ducted and ducted) below 15 kW that meet the refrigerant requirement.

Based on this assessment:

- all RCAC below 15 kW will be required to meet the refrigerant requirement (GWP below 700); and
- there will be no refrigerant requirement for RCAC above 15 kW, however, the department may look to introduce a refrigerant requirement in future once there are sufficient models available.

SUMMARY OF KEY DECISIONS:

- RCAC registered to the GEMS 2013 Determination will not be eligible to be installed under the new Part 6 space heating and cooling activity.
- RCAC products below 15 kW in size will be required to use refrigerants with a GWP less than 700 to be installed under VEU – this means that products that use R32 refrigerant will be eligible.
- There will not be a refrigerant requirement for RCAC products above 15 kW. The department may consult on this in future, once an adequate number of RCAC models can meet this requirement.
- RCAC products will be required to meet minimum efficiency requirements set by the department. Based on stakeholder feedback that these may be too restrictive, the department has reviewed and proposed new minimum efficiency requirements.

6. Greenhouse gas (GHG) abatement calculations

6.1 On calculations

Stakeholder submissions contained very little feedback on the GHG abatement calculations. Where feedback was received, stakeholders supported the introduction of new calculations for space heating and cooling emissions savings, and noted they were an improvement on existing VEU calculation methodologies.

One submission suggested that the calculations incorrectly include cooling savings when moving from ducted gas to a RCAC.

- Cooling savings for this scenario assume that if a consumer was to upgrade to a RCAC they would have otherwise bought a RCAC product with average market efficiency. The VEU cooling savings in this scenario represent the difference in GHG emissions between a high-efficiency RCAC installed under VEU, and the market-average efficiency RCAC that may have been installed.

6.2 On incentives and market uptake:

There was mixed feedback on the level of incentive and potential market uptake of the proposed space heating and cooling activity. Stakeholders that supported the proposed incentives noted that incentive levels are a significant improvement on existing space heating and cooling activities and are adequate to have market uptake, particularly for non-ducted RCAC upgrade scenarios.

Two stakeholder submissions provided feedback that the incentive calculations when replacing hard-wired electric resistance heaters and ducted slab heaters (decommissioning scenarios i to iv) result in large, potentially unrealistic savings, and that the proposed VEECs, could undermine the integrity of the activity.

For electrification upgrades, many submissions raised concerns that the level of incentive is insufficient to drive significant uptake. Feedback included that:

- GHG abatement awarded for electrification activities and therefore incentives, are not sufficient to have a large impact on household decision making;
- GHG abatement awarded would not cover the cost of changeover from gas heating to RCAC;
- the level of GHG abatement would not drive investment in the activity from accredited providers; and
- the proposed activity is unlikely to drive uptake due to out-of-pocket costs.

Stakeholders also had mixed feedback on the product lifetime used to calculate GHG savings. 50% of submissions supported using a 12-year lifetime, however 50% of stakeholders indicated that longer lifetimes should be used to calculate GHG savings, particularly when consumers choose to switch from gas heating to efficient electric heating and cooling equipment. Some stakeholders noted that where consumers go from gas to electric appliances the associated GHG emissions savings should go beyond the expected lifetime of the product (e.g., up to 25 years) because they may not return to gas appliances again.

The department has considered stakeholder feedback on incentive levels, and a response is provided in the following sections.

Incentives for replacing hard-wired electric resistance heaters and ducted electric resistance/slab heating (decommissioning scenarios i to iv)

Calculations for both scenarios are based on the capacity of the unit being installed and assume that the heater being replaced is of a similar size.

The department recognises that both scenarios have a potential risk in incentives far exceeding installations costs.

- There will be a cap on the capacity (in kW) that can be input into the equations. This cap will be 2.4 kW for hard-wired electric resistance heaters and 15 kW for ducted slab heaters. This cap will ensure incentives are set at an appropriate level for these scenarios.

Other decommissioning scenarios (v to x)

The department considers that the level of GHG abatement calculated and therefore incentive is reflective of the level of energy savings achieved by these products compared to the defined baselines. There will be no change to the GHG abatement calculations for these scenarios.

No decommissioning scenarios (xi)

This scenario is intended to be used for new installations of a RCAC, or when the existing space heating and cooling equipment is not listed in the decommissioning options. For this scenario, emission savings are calculated as the difference in GHG emissions between an average efficiency RCAC, and a high-efficiency RCAC installed through the VEU program (as opposed to decommissioning scenarios where the lifetime reflects the lifetime of the new product being installed *and* the expected lifetime of the product being replaced if not for the VEU program).

As there is no baseline unit being decommissioned, it is reasonable to assume that the installed RCAC and GHG emissions saved may last for a period longer than 12-years. For this scenario, the department has decided to increase the lifetime to 15-years, to better reflect emission savings, and promote uptake of efficient space heating and cooling equipment.

The department appreciates feedback from stakeholders regarding longer product lifetimes where consumers are switching from gas to electric. However, at this stage, there is insufficient evidence to support awarding emissions savings well beyond the expected lifetime of the product installed. Further, this proposal could result in large, potentially unrealistic savings, and the number of potential VEECs on offer could undermine the integrity of the activity.

SUMMARY OF KEY DECISIONS:

- GHG abatement calculations outlined in the consultation paper will remain as proposed.
- Based on feedback received, the department will cap incentives for the replacement of hard-wired electric resistance heaters and ducted slab heaters.
- The department will extend the lifetime of GHG emissions savings for the 'no-decommissioning' scenario to 15 years. This will provide increased incentives for this scenario.
- There will be no changes to GHG abatement for all other decommissioning scenarios as the department contends these have been set at appropriate levels to reflect expected abatement from the activity.

7. Product registration, installation, and decommissioning requirements

7.1 Product registrations

To ensure high efficiency RCAC are installed under VEU, all products will be required to:

- be registered by the ESC before they are eligible to receive incentives;
- meet the specified minimum performance criteria; and
- be registered to the GEMS 2019 Determination.

This is consistent with Solar Victoria criteria. Evidence that a product or system meets these criteria would be provided to the ESC for approval. Following approval by the ESC, the product would be listed on a register of approved products maintained by the ESC.

The department will work with the ESC to provide further information on the product registration process for the proposed Part 6 activity.

7.2 Installation requirements

Stakeholder submissions on safe and practical installation requirements for the activity stated that appropriate installer training would be required. One stakeholder raised concerns that the proposed new space heating and cooling activity may result in best practice not being followed by new installers. Another stakeholder outlined that requirements must be in place to stop an influx of relatively inexperienced and potentially unskilled people into high-risk work activities.

One stakeholder highlighted the high-risk nature of RCAC installations as they involve working at heights, working in confined spaces, and working on a site with multiple contactors/workers.

RCAC installations in Victoria are only permitted by licensed installers and must include compliance certificates. The ESC is responsible for setting licensing/training requirements for VEU activities and will require that VEU accredited providers use appropriately qualified and trained installers to complete VEU space heating and cooling activities.

Installer qualification requirements and guidance for space heating and cooling activities will be published before activity commencement.

7.3 Decommissioning

Stakeholder submissions on safe, and practical installation and decommissioning requirements for the space heating and cooling activity included that:

- refrigerants should be properly degassed where applicable;
- disposal of the decommissioned product should occur via an authorised recycler;
- requirements should include product recycling or gas degassing receipts; and
- materials such as copper, aluminium or other metals should be separated and recycled appropriately.

Three stakeholders stated that current methods should be retained and that there was no need to overcomplicate the decommissioning process.

The department has clear expectations that where a product is decommissioned:

- the original appliance is decommissioned in a practical and safe manner, including so it cannot be re-used by the consumer

- any refrigerants present in the decommissioned product will be safely handled and disposed in accordance with all relevant requirements
- where safe and practical to do so, the decommissioned product will be removed from site (including any waste generated by the VEU activity) and appropriately recycled.

All persons participating in the VEU program are subject to its Code of Conduct, including in upgrades where decommissioning of appliances occurs. It is the department’s expectation that VEU installers are aware of and comply with all relevant product handling, disposal or recycling laws that currently apply to them.

Draft decommissioning requirements have been set out in the draft Specifications at Appendix A. Prior to the introduction of the new space heating and cooling activity the department will work with the ESC to further develop these decommissioning requirements and prepare guidance documentation.

7.4 Installation limits

Installation limits play an important role in ensuring the integrity of the program and that an appropriate number of energy saving upgrades can occur. Limits on the number of VEU space heating and cooling upgrades that can be undertaken in either residential or non-residential premises are shown in Table 6.

Table 6 – Installation limits for space heating and cooling upgrades

Sector	Product installed:	Decommissioning:	Installation limit
Residential	Ducted	Decommissioning	1
		No decommissioning	1
	Non-ducted	Decommissioning	5*
		No decommissioning	3
Non-residential	Ducted	Decommissioning	5*
		No decommissioning	2
	Non-ducted	Decommissioning	5*
		No decommissioning	3

****For decommissioning scenarios, only one RCAC can be installed per appliance that is decommissioned.***

For example:

If a ducted gas system is being decommissioned and replaced with multiple non-ducted RCAC units at a residential premises:

- A consumer can access incentives for decommissioning their ducted gas system while installing **one** non-ducted RCAC.
- Incentives for a further **three** non-ducted RCAC can be claimed under the ‘no decommissioning’ scenario.
- A total of **four** non-ducted systems will have been installed – and as the no decommissioning limit of three has been reached, this means that no further non-ducted systems can be installed under the ‘no decommissioning’ scenario.

- A fifth non-ducted RCAC can **only** be installed if another heating appliance (other than the ducted gas) is decommissioned. Many of the decommissioning upgrades will not be applicable as ducted gas is the main form of heater in the premises. Only additional room gas heaters, or existing non-ducted reverse cycle air conditioners can be decommissioned if present and replaced with an RCAC.

What about multi-split RCAC?

- Multi-splits are treated as ONE decommissioning scenario. For a residential customer with ducted gas, incentives for the installation of **one** multi-split RCAC would be awarded for decommissioning the ducted gas system.
- Incentives for a further **three** non-ducted RCAC can be claimed under the no-decommissioning scenario if required.

SUMMARY OF KEY DECISIONS:

- The ESC will maintain a register of approved products for the space heating and cooling activity. Products must be registered with the ESC to be installed under the VEU program, be listed on the GEMS registration database and meet the minimum efficiency and refrigerant requirements.
- Only trained professionals will be eligible to undertake space heating and cooling activities.
- Prior to the introduction of the new space heating and cooling activity, the department will work with the ESC to set requirements and develop guidance documentation on decommissioning, installation and installer qualifications.
- Space heating and cooling upgrades will be subject to product installation limits per premises.

8. Next Steps

The department will revise the draft Specifications for the new space heating and cooling activity over the coming months to provide further information on:

- Guidance documentation to ensure space heating and cooling upgrades are sized appropriately; and
- Installation and decommissioning requirements.

The department expects to publish updated Specifications for the revised 'Part 6 – Space heating and cooling' activity by 31 May 2023.

Appendix A Draft Regulations and Specifications

Draft Specifications for the new Part 6, Space heating and cooling activity are provided in Appendix A (**Draft Specifications**). The department is reviewing aspects of the Specifications and will provide updates to stakeholders before these are finalised.

PLEASE NOTE, these draft amendments to the VEU regulations and Specifications (Draft Regulations and Specifications) are in draft form only.

The Department does not make any express or implied representation or warranty that the Draft Regulations and Specifications: (i) will take effect; (ii) will take effect on or by a particular date; or (iii) will take effect in the current form. Neither the department, nor any other person, is or may be liable to any other person in connection with the department's decision to include the Draft Regulations and Specifications in this consultation document.

The *Victorian Energy Efficiency Target Regulations 2018* commenced on 10 December 2018 and provide for deemed activities in the program. Details of the technical requirements for these regulations are contained in the publication *Victorian Energy Upgrades – Specifications*.

The Regulations set out the activities that attract incentives and the methodologies for calculating greenhouse gas (GHG) emissions reductions, while the Specifications document provides further technical details of the GHG emissions calculations and activity or product requirements. The technical elements in the Specifications can be more responsive to changing circumstances and be updated more frequently, without foregoing appropriate consultation processes.

The proposed space heating and cooling activity has been set out in the draft Regulations and Specifications. Please see the following sections for:

- Draft Victorian Energy Efficiency Target Regulations 2018 – Space heating and cooling.
- Draft Victorian Energy Upgrades – Specifications - Part 6 – Space heating and cooling.

The Draft Regulations and Specifications released for consultation on 4 July 2022 have been updated based on stakeholder feedback submitted to the department. These updates reflect policy design decisions outlined in this response to consultation.

Appendix A(i) – Draft Space Heating and Cooling – High Efficiency Air Conditioner – Regulations

Definitions – regulation 5

In regulation 5 of the Principal Regulations—

(a) **insert** the following definitions—

“**air conditioner** has the same meaning as it has in the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019 as made under the Greenhouse and Energy Minimum Standards Act 2012 of the Commonwealth and as amended from time to time;

air-to-air meaning has the same meaning as it has in the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019 as made under the Greenhouse and Energy Minimum Standards Act 2012 of the Commonwealth and as amended from time to time;

conditioned space has the same meaning as it has in the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019 as made under the Greenhouse and Energy Minimum Standards Act 2012 of the Commonwealth and as amended from time to time;”.

(b) for the definition of **controlled heating or cooling product substitute**—

controlled heating or cooling product means any of the following products—

- (a) a ducted gas heater;
- (b) a central electric resistance heater that provides heating to a space with a floor area of at least 100 m²;
- (c) an air-to-air air conditioner (whether ducted or otherwise) that is capable of both heating and cooling;
- (d) a hard-wired electric room heater used as the main form of heating any premises;
- (e) a gas or liquefied petroleum gas room heater;
- (f) a refrigerative air conditioner (whether ducted or not), being an air conditioner that is only capable of cooling a conditioned space, and that is not located in—
 - (i) in the case of an air conditioner in residential premises, a bedroom; or
 - (ii) in the case of an air conditioner in business or non-residential premises, a room with an area less than 20m²;
- (g) an in-slab electric heater, being a heater that provides radiated heat to a premises through electric cabling embedded in or on top of a concrete slab;
- (h) a product that—
 - (i) is capable of cooling or heating, or both cooling and heating, a conditioned space; and
 - (ii) is specified in the Secretary's specifications for the purposes of this definition;

decommission means either—

- (a) to comply with the specified decommissioning requirements (if any) for a prescribed activity; or
- (b) in any other case, to disable and render permanently unusable;”.

References in Schedule 2 to certain matters being specified – regulation 7

- (1) After regulation 7(2)(c) of the Principal Regulations insert—
"(ca) pre-installation requirements;"
- (2) For regulation 7(2)(o) of the Principal Regulations substitute—
"(o) minimum thermal efficiency requirements;
(p) product disposal requirements;
(q) refrigerant requirements;
(r) volume range;
(s) minimum delivery temperature."

Prescribed activities – regulation 10

- (1) In regulation 10(1)(b) of the Principal Regulations, for "5 to 10" **substitute** "5, 7, 9 and 10".
- (2) After regulation 10(2) of the Principal Regulations insert—
"(1B) For the purposes of section 15(1) of the Act, an activity set out in clause 4(1)(a) of Part 6 of Schedule 2 is a prescribed activity if—
 - (a) the activity is undertaken in business premises or other non-residential premises in compliance with that Part; and
 - (b) the construction of the premises in which the activity is undertaken was not completed in the 2 year period preceding the day on which the activity was undertaken.
- (1C) For the purposes of section 15(1) of the Act, an activity set out in clause 4(1)(b) of Part 6 of Schedule 2 is a prescribed activity if—
 - (c) the activity is undertaken in any premises in compliance with that Part; and
 - (d) the construction of the premises in which the activity is undertaken was not completed in the 2 year period preceding the day on which the activity is undertaken.
- (1D) For the purposes of section 15(1) of the Act, an activity set out in clause 4(1)(c) of Part 6 of Schedule 2 that is undertaken in business or other non-residential premises in compliance with that Part is a prescribed activity.
- (1E) For the purposes of section 15(1) of the Act, an activity set out in clause 4(1)(d) of Part 6 of Schedule 2 that is undertaken in any premises in compliance with that Part is a prescribed activity."

Certificate cannot be created unless installed product listed on ESC register – regulation 16

Regulation 16(2)(a) and (b) of the Principal Regulations are revoked.

Part 6 of Schedule 2 substituted

For Part 6 of Schedule 2 to the Principal Regulations substitute—

"Part 6—Space heating and cooling

4 Prescribed activity

- (1) The prescribed activity is—
 - (a) decommissioning a specified controlled heating or cooling product in accordance with the specified decommissioning requirements (if any) and the product disposal requirements (if

any) and installing a product specified in subclause (2) in accordance with the specified pre-installation requirements (if any) and the specified installation requirements (if any); or

- (b) decommissioning a specified controlled heating or cooling product in accordance with the specified decommissioning requirements (if any) and the product disposal requirements (if any) and installing a product specified in subclause (2) as belonging to product category 6A, 6B, 6D, 6E, 6F or 6H in accordance with the specified pre-installation requirements (if any) and the specified installation requirements (if any): or
 - (c) installing a product specified in subclause (2) in accordance with the specified pre-installation requirements (if any) and the specified installation requirements (if any), or
 - (d) installing a product specified in subclause (2) as belonging to one of the following product category 6A, 6B, 6D, 6E, 6F or 6H in accordance with the specified pre-installation requirements (if any) and the specified installation requirements (if any).
- (2) The specified products are the following—
- (a) a product listed on the ESC register as belonging to a product category whose category number is specified in column 1 of Table 6.1;
 - (b) an unlisted product that complies with the criteria specified in column 2 of an item in Table 6.1.

Table 6.1 – Product categories

Column 1	Column 2												
<i>Category number</i>	<i>Criteria applying to product category</i>												
6A	<p>A ducted air-to-air air conditioner that:</p> <ul style="list-style-type: none"> (a) is capable of both cooling and heating; and (b) achieves the specified minimum performance requirements; and (c) has a rated capacity of less than 10 kW; and (d) uses a refrigerant that meets the specified refrigerant requirements; and (e) meets any specified warranty requirements; and (f) meets any other requirements of the Secretary's specifications for this product category. 												
6B	<p>A ducted air-to-air air conditioner that:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Appendix B</td> <td style="width: 50%;">is capable of both cooling and heating; and</td> </tr> <tr> <td>Appendix C requirements; and</td> <td>achieves the specified minimum performance</td> </tr> <tr> <td>Appendix D but less than or equal to 39kW; and</td> <td>has a rated capacity of more than or equal to 10kW</td> </tr> <tr> <td>Appendix E refrigerant requirements; and</td> <td>uses a refrigerant that meets the specified</td> </tr> <tr> <td>Appendix F</td> <td>meets any specified warranty requirements; and</td> </tr> <tr> <td>Appendix G specifications for this product category.</td> <td>meets any other requirements of the Secretary's</td> </tr> </table>	Appendix B	is capable of both cooling and heating; and	Appendix C requirements; and	achieves the specified minimum performance	Appendix D but less than or equal to 39kW; and	has a rated capacity of more than or equal to 10kW	Appendix E refrigerant requirements; and	uses a refrigerant that meets the specified	Appendix F	meets any specified warranty requirements; and	Appendix G specifications for this product category.	meets any other requirements of the Secretary's
Appendix B	is capable of both cooling and heating; and												
Appendix C requirements; and	achieves the specified minimum performance												
Appendix D but less than or equal to 39kW; and	has a rated capacity of more than or equal to 10kW												
Appendix E refrigerant requirements; and	uses a refrigerant that meets the specified												
Appendix F	meets any specified warranty requirements; and												
Appendix G specifications for this product category.	meets any other requirements of the Secretary's												
6C	<p>A ducted air-to-air air conditioner that:</p>												

-
- (a) is capable of both cooling and heating; and
 - (b) achieves the specified minimum performance requirement; and
 - (c) has a rated capacity of more than 39kW but less than or equal to 65kW; and
 - (d) uses a refrigerant that meets the specified refrigerant requirements; and
 - (e) meets any specified warranty requirements; and
 - (f) meets any other requirements of the Secretary's specifications for this product category.
-

- 6D An air-to-air air conditioner (other than a ducted air-to-air air conditioner) that:
- (a) is capable of both cooling and heating; and
 - (b) achieves the specified minimum performance requirement; and
 - (c) has a rated capacity of less than 4kW; and
 - (d) uses a refrigerant that meets the specified refrigerant requirements; and
 - (e) meets any specified warranty requirements; and
 - (f) meets any other requirements of the Secretary's specifications for this product category.
-

- 6E An air-to-air air conditioner (other than a ducted air-to-air air conditioner) that:
- (a) is capable of both cooling and heating; and
 - (b) achieves the specified minimum performance requirement; and
 - (c) has a rated capacity of more than or equal to 4kW but less than 10kW; and
 - (d) uses a refrigerant that meets the specified refrigerant requirements; and
 - (e) meets any specified warranty requirements; and
 - (f) meets any other requirements of the Secretary's specifications for this product category.
-

- 6F An air-to-air air conditioner (other than a ducted air-to-air air conditioner) that:
- (a) is capable of both cooling and heating; and
 - (b) achieves the specified minimum performance requirement; and
 - (c) has a rated capacity of more than or equal to 10kW but less than or equal to 39kW; and
 - (d) uses a refrigerant that meets the specified refrigerant requirements; and
 - (e) meets any specified warranty requirements; and
 - (f) meets any other requirements of the Secretary's specifications for this product category.
-

- 6G An air-to-air air conditioner (other than a ducted air-to-air air conditioner) that:
- 9. is capable of both cooling and heating; and
 - 10. achieves the specified minimum performance requirement; and
 - 11. has a rated capacity of more than 39kW but less than or equal to 65kW; and
 - 12. uses a refrigerant that meets the specified refrigerant requirements; and
 - 13. meets any specified warranty requirements; and
 - 14. meets any other requirements of the Secretary's specifications for this product category.
-

- 6H A space heating or cooling product that meets the requirements of the Secretary's specifications for this item.
-

Note

There is currently no Part 7, 8, 10 or 11 in this Schedule."

Activity limits - definitions—Schedule 4

In clause 1 of Schedule 4 to the Principal Regulations, in the definition of relevant period, after paragraph (c) **insert**—

"(ca) in respect of a prescribed activity referred to in clause 3, 3A, 4 or 4A, the period beginning on 31 May 2023 and ending immediately before a product is installed as part of a prescribed activity; and".

Activity limits - clause 3 of Schedule 4 substituted

For clause 3 of Schedule 4 to the Principal Regulations substitute—

"3 Ducted heating or cooling products where decommissioning has not occurred

(1) A certificate cannot be created in relation to a prescribed activity involving the installation, in residential premises, of a ducted heating or cooling product specified in Part 5, 6 or 7 of Schedule 2 if—

- (a) a specified controlled heating or cooling product at the premises has not been decommissioned as part of the prescribed activity; and
- (b) during the relevant period, one or more ducted heating or cooling products specified in Part 5, 6, 7 or 23 of Schedule 2 have been installed at the same premises as part of a prescribed activity (whether or not a certificate was created for that activity).

(2) A certificate cannot be created in relation to a prescribed activity involving the installation, in non-residential premises, of a ducted heating or cooling product specified in Part 5, 6 or 7 of Schedule 2 if—

- (a) a specified controlled heating or cooling product at the premises has not been decommissioned as part of the prescribed activity; and
- (b) during the relevant period, 2 or more ducted heating or cooling products specified in Part 5, 6, 7 or 23 of Schedule 2 have been installed at the same premises as part of a prescribed activity (whether or not a certificate was created for that activity).

3A Ducted heating or cooling products where decommissioning has occurred

(1) A certificate cannot be created in relation to a prescribed activity involving the installation, in residential premises, of a ducted heating or cooling product specified in Part 5, 6 or 7 of Schedule 2 if—

- (a) a specified controlled heating or cooling product at the premises has been decommissioned as part of the prescribed activity; and
- (b) during the relevant period, one or more ducted heating or cooling products specified in Part 5, 6, 7 or 23 of Schedule 2 have been installed at the same premises as part of a prescribed activity (whether or not a certificate was created for that activity).

(2) A certificate cannot be created in relation to a prescribed activity involving the installation, in non-residential premises, of a ducted heating or cooling product specified in Part 5, 6 or 7 of Schedule 2 if—

- (a) a specified controlled heating or cooling product at the premises has been decommissioned as part of the prescribed activity; and
- (b) during the relevant period, 5 or more ducted heating or cooling products specified in Part 5, 6 or 23 of Schedule 2 have been installed at the same premises as part of a prescribed activity (whether or not a certificate was created for that activity)."

23 Clause 4 of Schedule 4 substituted

For clause 4 of Schedule 4 to the Principal Regulations **substitute—**

"4 Heating or cooling products (other than ducted heating or cooling products) where decommissioning has not occurred

(1) A certificate cannot be created in relation to a prescribed activity involving the installation, in residential premises, of a heating or cooling product specified in Part 6, 9 or 10 of Schedule 2 (other than a ducted heating or cooling product) if—

- (a) a controlled heating or cooling product at the premises has not been decommissioned as part of the prescribed activity; and
- (b) during the relevant period, 3 or more heating or cooling products specified in Part 6, 9 or 10 of Schedule 2 (other than a ducted heating or cooling product) have been installed at the same premises as part of a prescribed activity (whether or not a certificate was created for that activity).

(2) A certificate cannot be created in relation to a prescribed activity involving the installation, in non-residential premises, of a heating or cooling product specified in Part 6, 9 or 10 of Schedule 2 (other than a ducted heating or cooling product) if—

- (a) a controlled heating or cooling product at the premises has not been decommissioned as part of the prescribed activity; and
- (b) during the relevant period, 3 or more heating or cooling products specified in Part 6, 9 or 10 of Schedule 2 (other than a ducted heating or cooling product) have been installed at the same premises as part of a prescribed activity (whether or not a certificate was created for that activity).

4A Heating or cooling products (other than ducted heating or cooling products) where decommissioning has occurred

(1) A certificate cannot be created in relation to a prescribed activity involving the installation, in residential premises, of a heating or cooling product specified in Part 6, 9 or 10 of Schedule 2 (other than a ducted heating or cooling product) if—

- (a) a specified controlled heating or cooling product at the premises has been decommissioned as part of the prescribed activity; and
- (b) during the relevant period, 5 or more heating or cooling products specified in Part 6, 9 or 10 of Schedule 2 (other than a ducted heating or cooling product) have been installed at the same premises as part of a prescribed activity (whether or not a certificate was created for that activity).

(2) A certificate cannot be created in relation to a prescribed activity involving the installation, in non-residential premises, of a heating or cooling product specified in Part 6, 9 or 10 of Schedule 2 (other than a ducted heating or cooling product) if—

- (a) a specified controlled heating or cooling product at the premises has been decommissioned as part of the prescribed activity; and
- (b) during the relevant period, 10 or more heating or cooling products specified in Part 6 or 9 of Schedule 2 (other than a ducted heating or cooling product) have been installed at the same premises as part of a prescribed activity (whether or not a certificate was created for that activity).".

Parts 5, 7, 9, 10 and 23 are revoked (from 30 June 2023)

Parts 5, 7, 9, 10 and 23 of Schedule 2 to the Principal Regulations are revoked.

Appendix A(ii) – Draft Space Heating and Cooling – High Efficiency Air Conditioner – Specifications

Definitions

EEF_r means the accurate electricity emissions factor to be used in greenhouse gas equivalent emissions reduction calculations as follows—

From 1 February 2022 to 31 January 2023	$EEF = 0.516$
From 1 February 2023 to 31 January 2024	$EEF = 0.473$
From 1 February 2024 to 31 January 2025	$EEF = 0.433$
From 1 February 2025	$EEF = 0.393$

EEF_s means the smoothed electricity emissions factor to be used in greenhouse gas equivalent emissions reduction calculations as follows—

From 1 February 2022 to 31 January 2023	$EEF = 0.8142$
From 1 February 2023 to 31 January 2024	$EEF = 0.6738$
From 1 February 2024 to 31 January 2025	$EEF = 0.5334$
From 1 February 2025	$EEF = 0.393$

GWP means the global warming potential of a refrigerant gas used in a product as listed in:

- the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report, 2007 (AR4); or
- where the global warming potential of the refrigerant gas is not listed in the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report, 2007 (AR4), the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide;

HSPF means the Heating Seasonal Performance Factor which is the ratio of the total annual amount of heat, including make-up heat, that the equipment can add to the conditioned space when operated for heating in active mode to the total annual amount of energy consumed by the equipment during the same period;

LF means the loss factor which represents efficiency losses in space heating or cooling equipment which distribute heat through ductwork;

TCSPF means the Total Cooling Seasonal Performance Factor which 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, including the active and inactive energy consumption;

Part 6 Activity – Space heating and cooling, installing a high efficiency air-conditioner

Part 6 of Schedule 2 of the Regulations prescribes the upgrade to a high efficiency air-conditioner as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 6.1 lists the eligible products that may be decommissioned, upgraded or replaced in any premises. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

Over time, the department may determine that there are other space heating or cooling technologies that reduce GHG equivalent emissions. In such a case, product requirements and installation requirements for emerging technology will be listed by the department as scenario number 6H once specified.

VEECs cannot be created for this activity unless products installed are listed on the ESC Register by the time VEECs are created. Products already on the register at the time of installation can be taken as satisfying all those product requirements that can be determined prior to the installation of a product.

Table 6.1 – Eligible space heating and cooling scenarios

Product category number	Scenario number	Product to be decommissioned	Product to be installed	Historical schedule number
6A-G	(i)	Hard-wired resistance electric room heater only (no refrigerative cooler) which is the main form of heating any premises.	Any eligible product belonging to product categories 6A to 6G that is installed in accordance with the specified pre-installation and specified installation requirements set out in Table 6.4 below. ¹⁰	n/a
	(ii)	<ul style="list-style-type: none"> • Hard-wired resistance electric heater which is the main form of heating any premises; and • Refrigerative air conditioner (whether ducted or not) that is not located in: <ul style="list-style-type: none"> ○ in the case of an air conditioner in residential premises, a bedroom; or ○ in the case of an air conditioner in business or non-residential premises, a room with an area of less than 20 m². 		
	(iii)	Central electric resistance that provides heating to a space with a floor area of at least 100 m ² or slab heater only (no refrigerative cooler) which is the main form of heating any premises.		
	(iv)	<ul style="list-style-type: none"> • Central electric resistance that provides heating to a space with a floor area of at least 100 m² or slab heater which is the main form of heating any premises; and 		

¹⁰ Note: Product categories 6A and 6G are eligible in business premises only

	<ul style="list-style-type: none"> • Refrigerative air conditioner (whether ducted or not) that is not located in: <ul style="list-style-type: none"> ○ in the case of an air conditioner in residential premises, a bedroom; or ○ in the case of an air conditioner in business or non-residential premises, a room with an area of less than 20 m². 	
(v)	Ducted air-conditioner - reverse cycle – which is the main form of heating any premises.	
(vi)	Non-ducted air-conditioner - reverse cycle	
(vii)	Ducted gas heater only (no refrigerative cooler) which is the main form of heating any premises.	
(viii)	<ul style="list-style-type: none"> • Ducted gas heater which is the main form of heating any premises; and • Refrigerative air conditioner (whether ducted or not) that is not located in: <ul style="list-style-type: none"> ○ in the case of an air conditioner in residential premises, a bedroom; or ○ in the case of an air conditioner in business or non-residential premises, a room with an area of less than 20 m². 	
(ix)	Non-ducted gas heater only (no refrigerative cooler)	
(x)	<ul style="list-style-type: none"> • Non-ducted gas heater; and • Refrigerative air conditioner (whether ducted or not) that is not located in: <ul style="list-style-type: none"> • in the case of an air conditioner in residential premises, a bedroom; or • in the case of an air conditioner in business or non-residential premises, a room with an area of less than 20 m². 	
(xi)	None of the combinations specified above, or a new system	

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 6.2.

Table 6.2 – Additional requirements for air conditioners to be installed

Product Category Number	Requirement Type	Efficiency Requirement
6A-G	Minimum Performance Requirements	<p>(a) For products registered to the <i>Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019 (Cth)</i>, the product must:</p> <ul style="list-style-type: none"> (i) achieve the minimum HSPF and TCSPF for the specified GEMS Residential or Commercial Cold Zone; and (ii) be registered to the relevant class (or classes) under that determination, specified in Table 6.3. <p>(b) For products registered to the <i>Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019 (Cth)</i> that does not have a HSPF and TCSPF for the specified GEMS Residential or Commercial Cold Zone, the product must:</p> <ul style="list-style-type: none"> (i) achieve the minimum ACOP and AEER (ii) be registered to the relevant class (or classes) under that determination, specified in Table 6.3

Table 6.3 – Minimum efficiency requirements for air conditioners to be installed

Cat.	Product Description	GEMS 2019 Class	GEMS 2019 min HSPF	GEMS 2019 min TCSPF	GEMS 2019 min ACOP	GEMS 2019 min AEER
6A	Ducted air to air < 10 kW	Classes 10 or 15	3.6	4.4	3.9	3.5
6B	Ducted air to air 10 kW ≤ to < 25 kW	Classes 6 (ducted units only), 11 or 16	3.4	4.2	3.7	3.4
6B	Ducted air to air 25 kW ≤ to < 39 kW	Classes 6 (ducted units only), 11 or 16	3.2	3.6	3.7	3.4
6C	Ducted air to air 39 kW < to ≤ 65 kW	Classes 7 (ducted units only), 12 or 17	3.2	4.8	3.5	3.2
6D	Non-ducted air to air < 4 kW	Classes 8, 13 or 18	4.2	5.4	4.4	4.1
6E	Non-ducted air to air 4 kW ≤ to < 7 kW	Classes 9, 14 or 19	3.7	5.0	4.0	3.7
6E	Non-ducted air to air 7 kW ≤ to < 10 kW	Classes 9, 14 or 19	3.6	4.8	3.9	3.7
6F	Non-ducted air to air 10kW ≤ to < 39kW	Classes 6 (non-ducted units only), 11, 16 or 20	3.6	4.6	3.9	3.6
6G	Non-ducted air to air 39kW < to ≤ 65kW	Classes 7 (non-ducted units only), 12, 17 or 21	2.7	5.3	3.8	3.4

Note: Air conditioners must meet the seasonal performance factors for the residential cold zone, other than categories 6C and 6G which use seasonal performance factors for the commercial cold zone.

Other specified matters

The product installed must meet the relevant additional requirements listed in Table 6.4.

Table 6.4 – Other specified matters for space heating equipment to be installed

Product Category Number	Requirement Type	Efficiency Requirement
6 A-G	Pre-installation and installation requirements – appropriate sizing (residential premises only)	<p>In addition to the applicable requirements set out under the Code of Conduct (at Schedule 6 of the Regulations), the accredited person or scheme participant carrying out a prescribed Part 6 activity for an energy consumer at a residential premises must, before the energy consumer agrees to undertake that activity:</p> <ul style="list-style-type: none"> (a) provide the energy consumer with a copy of the VEU Space Heating and Cooling Consumer Fact Sheet; and (b) give clear and accurate information to the energy consumer about the suitability of the product for the heating and cooling needs of the consumer and the consumer's premises; and (c) advise the energy consumer on whether or not the size of the installed product is consistent with the size recommended in the VEU Space Heating and Cooling Consumer Fact Sheet for a premises of a similar size and nature to the energy consumer's premises; and (d) if the size of the installed product is not consistent with the recommended size set out in the VEU Space Heating and Cooling Consumer Fact Sheet, then the accredited person or scheme participant must take reasonable steps to ensure that the energy consumer understands that the installed product is unlikely to meet the heating and cooling needs of a similar household to that of the energy consumer.
6 A-G	Decommissioning and product disposal requirements	<p>The decommissioned product must be:</p> <ul style="list-style-type: none"> (a) decommissioned in accordance with the Water Heating and Space Heating/Cooling Activity Guide published by the ESC; and (b) decommissioned so that any refrigerant contained in the product is disposed of in accordance with the requirements set out under the <i>Ozone Protection and Synthetic Greenhouse Gas Management Act 1989</i> (Cth); and (c) removed from the premises (along with any other waste or debris from the activity), provided removal is practical and safe to do so (as provided for in the ESC activity guide) and disposed of at a waste disposal facility that is of a class determined by the ESC under regulation 36(3); and (d) otherwise disposed of in accordance with all relevant legislation.
6 A-G	Refrigerant requirements	<p>The GWP of the refrigerant used in an air-conditioner to be installed with a rated cooling capacity below 15kW must be less than 700.</p>

Method for Determining GHG Equivalent Reduction

Scenario 6A to 6G (i-xi): Installing a high efficiency GEMS registered air-conditioner

The equation used to calculate emissions savings for the space heating and cooling activity is given by Equation 6.1 below, using the variables listed in Table 6.5.

Equation 6.1 - GHG equivalent emissions reduction calculation for Scenarios 6A to 6G (i-xi)

$$\text{GHG Eq. Reduction} = ((\text{Heating Savings} + \text{Cooling Savings}) \times \text{Lifetime})$$

Table 6.5 - GHG equivalent emissions reduction variables for Scenarios 6A to 6G (i-xi)

Input Type	Condition	Input Value
Heating savings	In every instance	Given by Equation 6.2, using variables listed in Table 6.6
Cooling savings	In every instance	Given by Equation 6.4 using variable listed in Table 6.8
Lifetime	Scenarios (i) to (x)	12 years
Lifetime	Scenarios (xi)	15 years

Equation 6.2 – Heating savings calculation

$$\text{Heating Savings} = \text{GSF}_{\text{heat}} \times \text{BTL}_{\text{heat}} \times \text{Heating Capacity}$$

Table 6.6 – Heating savings calculation inputs

Input Type	Condition	Input Value
GSF_{heat}	In every instance	Is the greenhouse savings factor for heating Given by Equation 6.3, using variables listed in Table 6.7
BTL_{heat}	In every instance	The deemed building heating load in MWh per kW rated heating capacity, using variables listed in Table 6.14.
Heating capacity	Scenarios (i) to (ii) ¹¹	The rated heating capacity of the unit installed in kW as listed on the GEMS register, up to a maximum of 2.4kW.
Heating capacity	Scenarios (iii) to (iv) ¹²	The rated heating capacity of the unit installed in kW as listed on the GEMS register, up to a maximum of 15kW.
Heating capacity	Scenarios (v) to (xi)	The rated heating capacity of the unit installed in kW as listed on the GEMS register.

11. Although a unit with a heating capacity larger than 2.5kW can be installed, the maximum input for this scenario is 2.4 kW.

12. Although a unit with a heating capacity larger than 15 kW can be installed, the maximum input for this scenario is 15 kW.

Equation 6.3 – Deemed greenhouse savings factor for heating (GSF_{heat}) calculation

$$GSF_{heat} = \left(\frac{GIH_{base}}{HSPF_{base}} \right) - \left(\frac{GIH_{upgrade} \times LF}{HSPF_{upgrade}} \right)$$

Table 6.7 — Greenhouse savings factor for heating inputs

Input Type	Condition	Input Value
GIH _{base}	In every instance	The greenhouse gas intensity heating factor for the baseline heater listed in Table 6.11.
HSPF _{base}	In every instance	The deemed HSPF for the baseline heater listed in Table 6.11 for the relevant GEMS 2019 climate zone determined by Table 6.10.
GIH _{upgrade}	In every instance	The greenhouse gas intensity factor for the upgrade heater listed in Table 6.11.
HSPF _{upgrade}	In every instance	The HSPF for the upgrade air-conditioner using as listed on the GEMS register for the relevant GEMS 2019 Climate Zone determined by Table 6.10. – If using ACOP, this must be converted using the relevant conversion factor in Table 6.14 and Table 6.15.
LF	In every instance	The upgrade heater loss factor, listed in Table 6.12.

Equation 6.4 – Deemed cooling savings calculation

$$Cooling\ Savings = GSF_{cool} \times BTL_{cool} \times Cooling\ Capacity$$

Table 6.8 – Cooling savings calculation inputs

Input Type	Condition	Input Value
GSF _{cool}	In every instance	Is the greenhouse savings factor for cooling Given by Equation 6.5, using variables listed in Table 6.9
BTL _{cool}	In every instance	The deemed building cooling load in MWh per kW rated cooling capacity, using variables listed in Table 6.13.
Cooling capacity	Scenarios (i) to (ii)	The rated cooling capacity of the unit installed in kW as listed on the GEMS register, up to a maximum of 2.4kW.
Cooling capacity	Scenarios (iii) to (iv)	The rated cooling capacity of the unit installed in kW as listed on the GEMS register, up to a maximum of 15kW.
Cooling capacity	Scenarios (v) to (xi)	The rated cooling capacity of the unit installed in kW as listed on the GEMS register.

Equation 6.5 – Deemed greenhouse savings factor for cooling (GSFcooling) calculation

$$GSF_{cool} = \left(\frac{GIC_{base}}{TCSPF_{base}} \right) - \left(\frac{GIC_{upgrade} \times LF}{TCSPF_{upgrade}} \right)$$

Table 6.9 — Greenhouse savings factor for heating inputs

Input Type	Condition	Input Value
GIC _{base}	In every instance	The greenhouse gas intensity cooling factor for the baseline cooling equipment using variables listed in Table 6.11.
TCSPF _{base}	In every instance	The deemed TCSPF for the baseline cooling equipment listed in Table 6.11 for the relevant GEMS 2019 Climate Zone determined by Table 6.10.
GIC _{upgrade}	In every instance	The greenhouse gas intensity factor for the upgrade cooling equipment listed in Table 6.11.
TCSPF _{upgrade}	In every instance	The TCSPF for the upgrade air-conditioner using GEMS registry data for the relevant GEMS 2019 Climate Zone determined by Table 6.10. <ul style="list-style-type: none"> – If using EER, this must be converted using the relevant conversion factor in Table 6.14 and Table 6.15.
LF	In every instance	The upgrade product system loss factor, listed in Table 6.12.

Table 6.10: VEU Climatic regions and GEMS 2019 Climate Zones

VEU Climatic Region	GEMS 2019 Climate Zone
For upgrades in Metropolitan Victoria – Climatic region mild	COLD
For upgrades in Metropolitan Victoria – Climatic region cold	COLD
For upgrades in Regional Victoria – Climatic region mild	COLD
For upgrades in Regional Victoria – Climatic region cold	COLD
For upgrades in Regional Victoria – Climatic region hot	MIXED

Table 6.11: Incumbent System GIH_{base} and GIC_{base} (t CO_{2-e}/MWh) and Deemed Baseline HSPF_{Base1} and TCSPF_{Base1} Factors

Scenario	Heating			Cooling			GIH _{upgrade} and GIC _{upgrade}
	GIH _{base}	Deemed HSPF _{Base} GEMS Cold zone	Deemed HSPF _{Base} GEMS Mixed Zone	GIC _{base}	Deemed TCSPF _{Base} GEMS Cold zone	Deemed TCSPF _{Base} GEMS Mixed Zone	
(i) Hard-wired resistance electric heater only (no refrigerative)	EEF _s	1.000	1.000	EEF _s	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF _s
(ii) Hard-wired resistance electric heater and refrigerative	EEF _s	1.000	1.000	EEF _s	3.290	3.264	EEF _s
(iii) Hard-wired resistance ducted or slab heater only (no refrigerative)	EEF _s	0.847	0.847	EEF _s	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF _s
(iv) Hard-wired resistance ducted or slab heater and refrigerative	EEF _s	0.847	0.847	EEF _s	2.788	2.766	EEF _s
(v) Ducted air-conditioner - reverse cycle	EEF _s	2.358	2.594	EEF _s	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF _s
(vi) Non-ducted air-conditioner - reverse cycle	EEF _s	2.892	3.268	EEF _s	4.053	3.932	EEF _s
(vii) Ducted gas heater only (no refrigerative)	0.198	0.551	0.551	EEF _R	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF _R
(viii) Ducted gas heater and refrigerative	0.198	0.551	0.551	EEF _R	2.788	2.766	EEF _R
(ix) Non-ducted gas heater only (no refrigerative)	0.198	0.760	0.760	EEF _R	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF _R
(x) Non-ducted gas heater and refrigerative	0.198	0.760	0.760	EEF _R	4.053	3.932	EEF _R
(xi) None of the combinations specified above, or a new system	EEF _s	Refer to table 6.12 (residential) or 6.13 (business)	Refer to table 6.12 (residential) or 6.13 (business)	EEF _s	Refer to table 6.12 (residential) or 6.13 (business)	Refer to table 6.12 (residential) or 6.13 (business)	EEF _s

HSPF Base and TCSPF Base values in these cases are based on the system proposed to be installed and are calculated by dividing the relevant (base 2) value in tables 6.12 (residential) or 6.13 (business) for the installed system type by the relevant loss factor for the installed system type.

Table 6.12: Deemed Baseline HSPF and TCSPF Factors According to Upgrade (Scenario) Type - Residential

Cat.	Upgrade Product	Deemed	Deemed	Deemed	Deemed	Loss Factor
		HSPF _{Base}	HSPF _{Base}	TCSPF _{Base}	TCSPF _{Base}	
		GEMS Cold Zone	GEMS Mixed Zone	GEMS Cold Zone	Mixed Zone	
6A	Ducted air to air < 10 kW	3.57	4.04	4.32	4.24	1.18
6B	Ducted air to air 10 kW ≤ to < 25 kW	3.37	3.84	4.03	3.95	1.18
6B	Ducted air to air 25 kW ≤ to < 39 kW	3.37	3.80	3.80	3.60	1.18
6D	Non-ducted air to air < 4 kW	3.89	4.36	5.38	5.23	1.0
6E	Non-ducted air to air 4 kW ≤ to < 7 kW	3.62	4.17	4.91	4.73	1.0
6E	Non-ducted air to air 7 kW ≤ to < 10 kW	3.50	4.17	4.80	4.73	1.0
6F	Non-ducted air to air 10kW ≤ to ≤ 39kW	3.43	3.98	4.44	4.35	1.0

Table 6.13: Deemed Baseline HSPF and TCSPF Factors According to Upgrade (Scenario) Type - Business

Cat.	Upgrade Product	Deemed	Deemed	Deemed	Deemed	Loss Factor
		HSPF _{Base}	HSPF _{Base}	TCSPF _{Base}	TCSPF _{Base}	
		Cold Zone	Mixed Zone	Cold Zone	Mixed Zone	
6A	Ducted air to air < 10 kW	3.82	4.26	5.30	5.00	1.18
6B	Ducted air to air 10 kW ≤ to < 25 kW	3.63	4.08	5.07	4.77	1.18
6B	Ducted air to air 25 kW ≤ to < 39 kW	3.63	3.80	4.90	4.40	1.18
6C	Ducted air to air 39 kW < to ≤ 65 kW	3.40	3.80	4.20	4.00	1.18
6D	Non-ducted air to air < 4 kW	4.13	4.54	7.85	6.79	1.0
6E	Non-ducted air to air 4 kW ≤ to < 7 kW	3.93	4.44	6.62	5.93	1.0
6E	Non-ducted air to air 7 kW ≤ to < 10 kW	3.80	4.44	6.50	5.93	1.0
6F	Non-ducted air to air 10kW ≤ to ≤ 39kW	3.77	4.31	5.98	5.52	1.0
6G	Non-ducted air to air 39kW < to ≤ 65kW	2.80	3.30	5.30	4.94	1.0

Table 6.14: Deemed Building Thermal Loads - BTL_{Heat} and BTL_{Cool} , for VEU Climatic Regions

VEU Climatic Region	Residential		Business	
	Heating	Cooling	Heating	Cooling
	BTL_{Heat}	BTL_{Cool}	BTL_{Heat}	BTL_{Cool}
	(MWh/kW)	(MWh/kW)	(MWh/kW)	(MWh/kW)
For upgrades in Metropolitan Victoria – Climatic region mild	1.3144	0.2696	0.4495	0.7175
For upgrades in Metropolitan Victoria – Climatic region cold	1.4458	0.2696	0.4944	0.7175
For upgrades in Regional Victoria – Climatic region mild	1.3144	0.2696	0.4495	0.7175
For upgrades in Regional Victoria – Climatic region cold	1.4458	0.2696	0.4944	0.7175
For upgrades in Regional Victoria – Climatic region hot	0.7211	0.4296	0.3380	0.8910

Table 6.15: Conversion factors (CF) to derive seasonal performance factors from ACOP and AEER – Residential

Cat.	Upgrade Product	VEU Cold and Mild Climatic Regions		VEU Hot Climatic Region	
		Heating CFH	Cooling CFC	Heating CFH	Cooling CFC
6A	Ducted air to air < 10 kW	0.934	1.242	1.058	1.218
6B	Ducted air to air 10 kW ≤ to ≤ 39 kW	0.912	1.211	1.039	1.187
6D	Non-ducted air to air < 4 kW	0.925	1.371	1.037	1.332
6E	Non-ducted air to air 4 kW ≤ to < 10 kW	0.953	1.382	1.096	1.333
6F	Non-ducted air to air 10kW ≤ to ≤ 39kW	0.892	1.285	1.035	1.258

Table 6.16: Conversion factors (CF) to derive seasonal performance factors from ACOP and AEER – Business

Cat.	Upgrade Product	VEU Cold and Mild Climatic Regions		VEU Hot Climatic Region	
		Heating CFH	Cooling CFC	Heating CFH	Cooling CFC
6A	Ducted air to air < 10 kW	1.001	1.598	1.114	1.490
6B	Ducted air to air 10 kW ≤ to ≤ 39 kW	0.983	1.524	1.105	1.433
6C	Ducted air to air 39 kW < to ≤ 65 kW	0.968	1.263	1.115	1.190
6D	Non-ducted air to air < 4 kW	0.983	2.001	1.081	1.729
6E	Non-ducted air to air 4 kW ≤ to < 10 kW	1.035	1.864	1.170	1.672
6F	Non-ducted air to air 10kW ≤ to ≤ 39kW	0.981	1.731	1.122	1.598
6G	Non-ducted air to air 39kW < to ≤ 65kW	0.747	1.563	0.866	1.462

