

# Victorian Energy Upgrades

Specifications 2018 – Version 17.0

## Author

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## Document Version

Version 17.0 comes into effect from 1 August 2024. Versions 0.1 to 16.0 are no longer in effect as at 1 August 2024.

Version	Amendments	In effect from
17.0	Expanded air conditioner product eligibility and revised business incentives under Part 6. Included clarification and allowance of upgrades from solar water heaters under Part 1 and Part 3. Removed transitional calculations for AS/NZS 4234:2008 which were end dated 30 June 2024 from Part 1 and Part 3. Revised Part 43 activity to adjust incentives for cold room size.	1 August 2024
16.0	Revised Part 6 activity – Space heating and cooling Introduced minor amendments on incentive calculations for multi-split air conditioners. Removed superseded activity scenarios and activities which expired in June 2023 (Part 5, Part 7, Part 9, Part 10 and Part 23).	1 January 2024
15.0	Revised Part 1 and Part 3 water heating activities. Added new Part 6 activity – Space heating and cooling. Added end date of 30 June 2023 for Part 5, Part 7, Part 9, Part 10 and Part 23. Added new Part 45 activity – Home energy rating assessment. Introduced minor amendments to scenario numbers for Part 44 activity.	31 May 2023
14.0	Removed Part 21 activity – Incandescent lighting. Revised Part 27 and Part 35 activities to remove mercury vapour lamp upgrades. Revised Part 34 activity to remove incentives for certain types of building-based lighting upgrades and reduce some asset lifetimes for lamp replacements.	1 February 2023
13.0	Revised specified minimum energy efficiency requirements for Part 37 activity – Gas-fired steam boiler and Part 38 activity – gas-fired water heater. Introduced minor amendments to clarify the relationship between this document and the Regulations.	19 September 2022

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.

DEECA is committed to genuinely partnering with Victorian Traditional Owners and Victoria's Aboriginal community to progress their aspirations.



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# Introduction

Publication of these specifications is authorised by the Secretary of the Department of Energy, Environment and Climate Action under regulation 35 of the Victorian Energy Efficiency Target Regulations 2018 (the Regulations).

It sets out:

- how prescribed activities under regulation 10 of the Regulations can be carried out in a manner that achieves additional abatement, thereby making them eligible for incentives
- how to determine the amount of carbon dioxide equivalent (in tonnes) of greenhouse gas emissions that is reduced by carrying out an activity prescribed in the Regulations
- any other matters left to it by the Regulations.

## Legislation and responsibilities

The Victorian Energy Upgrades program is enabled by the Victorian Energy Efficiency Target Act 2007 (the Act), the Regulations, and the Victorian Energy Efficiency Target (Project-Based Activities) Regulations 2017.

The Department of Energy, Environment and Climate Action (the department) supports the Minister in overseeing this legislation and further developing the policy that underpins it. This includes developing the prescribed activities. Prescribed activities set out the types of energy efficiency upgrades that can be undertaken as part of the Victorian Energy Upgrades program.

The Essential Services Commission (ESC) is the administrator of the Victorian Energy Upgrades program and is responsible for the Victorian Energy Efficiency Target Guidelines. Participants must comply with these Guidelines as well as the other requirements published by the ESC on their website at [www.esc.vic.gov.au/victorian-energy-upgrades-program](http://www.esc.vic.gov.au/victorian-energy-upgrades-program).

In accordance with the Regulations, this document specifies:

- minimum energy efficiency requirements for upgrade technology
- the type of technology that can be upgraded in accordance with a prescribed activity, where this is not set out in the Regulations
- methods and variables for determining abatement (the amount of carbon dioxide equivalent, in tonnes, of greenhouse gas emissions reduced by a prescribed activity)
- other matters, as left for it by the Regulations.

This document also summarises information contained in the Regulations concerning prescribed activities. The authoritative requirements are contained in the Regulations, and take precedence over summary information provided for ease of reference in this document. This document should be read in conjunction with the Act, Regulations and material published by the ESC.

Information contained in the Grey Box at the start of each Part of this document, entitled “Activity description (Guidance)”, is guidance material only to assist in reading and understand this document, and does not form part of the Specifications.



## Using this document

This document is divided into three sections: Definitions, Activity Requirements, and a Location Variable List.

The Definitions section sets out additional definitions not specified in the Act or Regulations and is to be used in interpreting this document.

The Activity Requirements section sets out for each prescribed activity:

- minimum energy efficiency requirements for upgrade technology
- the type of technology that can be used for the upgrade
- other matters that need to be specified
- methods for calculating the abatement
- variable inputs to each method.

The Location Variable List specifies whether the site at which a prescribed activity is undertaken is located in metropolitan or regional Victoria, the climatic region and the climatic zone applicable to the site, and if the site is in a gas-reticulated area. These details impact the values of the Regional Factor, GHG Savings and other variables in GHG equivalent emissions reduction calculations used for prescribed activities.

To accommodate transitional arrangements, parts of this document only operate at specific times. Please refer to the beginning of a Part to determine whether it has any commencement or expiry date.

## Standards

This document incorporates numerous standards, both Australian and international, to assist in explaining technical terms and to set out methodologies for calculating product performance.

Users of the document should note that any reference to a standard in this document should be taken as a reference to that standard as in force at the time these Specifications were last published, unless a contrary intent is shown.

# Definitions

**ACOP** means the Annual Coefficient of Performance and has the same meaning as in AS/NZS 3823.2. This metric is used to determine the energy efficiency of a product for heating;

**AEER** means the Annual Energy Efficiency Ratio and has the same meaning as in AS/NZS 3823.2. This metric is used to determine the energy efficiency of a product for cooling;

**AEF** means the auxiliary energy factor of a solar or heat pump water heater and converts  $B_e$  into kg of greenhouse gas emissions;

**AEMO's NEM load table** means the Australian Energy Market Operator's (AEMO) National Electricity Market Load Tables for Unmetered Connection Points referenced by regulation 16(3) of the Regulations;

**air conditioned** for the purpose of determining the AM in Table 34.3 and Table 34.4 means a service that actively cools or heats the air within a space, but does not include a service that directly maintains specialised conditions for equipment, processes or products, where this is the main purpose of the service;

**AM** means the air conditioner multiplier used to determine the GHG equivalent emissions reduction for lighting upgrades under Part 34 of Schedule 2 of the Regulations;

**AS/NZS 4234:2021** means the combination of both AS/NZS 4234:2021 Heated water systems – calculation of energy consumption and SA/SNZ MP 104:2021 Miscellaneous Publication – Modelling of heated water system in accordance with AS/NZS 4234:2021, using TRNSYS, published on 25 June 2021.

**ballast** means a unit inserted between the electricity supply and one or more discharge lamps which, by means of inductance, capacitance, or a combination of inductance and capacitance, serves mainly to limit the current of lamp(s) to the required value. The ballast may consist of one or more separate components. It may also include means for transforming the supply and voltage, and arrangements which help provide the starting voltage, preheating current, prevent cold starting, reduce stroboscopic effects, correct the power factor and/or suppress radio interference;

**BCA** means the Building Code as defined by the Regulations;

**$B_e$  2021** means the annual electrical energy used by the auxiliary equipment of a solar or heat pump water heater system measured in accordance with AS/NZS 4234:2021 when modelled in climate zone 4 for a solar water heater, and when modelled in climate zone HP4-Au for a heat pump water heater installed in climatic zone 4 or climate zone HP5-Au for a heat pump water heater installed in climatic zone 5. See the Location Variables list to determine what climatic zone applies to any premises;

**$B_s$  2021** means the annual supplementary energy used by a solar or heat pump water heater measured in accordance with AS/NZS 4234:2021 when modelled in climate zone 4 for a solar water heater, and when modelled in climate zone HP4-Au for a heat pump water heater installed in climatic zone 4 or climate zone HP5-Au for a heat pump water heater installed in climatic zone 5. See the Location Variables list to determine what climatic zone applies to any premises;

**BS 845-1** means BS 845-1:2016. Methods for assessing thermal performance of boilers for steam, hot water and high temperature heat transfer fluids – Part 1: Concise procedure, published by the British Standards Institution on 1 June 2016

**BS 845-2** means BS 845-2:1987. Methods for assessing thermal performance of boilers for steam, hot water and high temperature heat transfer fluids – Part 2: Comprehensive procedure, published by the British Standards Institution on 30 June 1987;

**BS 7190** means BS 7190:1989. Method for assessing thermal performance of low temperature hot water boilers using a test rig, published by the British Standards Institution on 31 December 1989;

**capacitor** means a two-terminal circuit device characterised by its capacitance, which is used in circuitry for the operation and power factor correction of gas discharge lamps;

**CEC** means the comparative energy consumption specified on the relevant energy rating label;

**CFL** means a compact fluorescent lamp as defined by the Regulations;

**circular fluorescent lamp** means a double capped fluorescent lamp that is of tubular form and circular shape;

**climatic region** means the geographical area identified by postcodes that are specified as belonging to either a mild, cold or hot climate region in the Location Variable List section of this document;

**climatic zone** means the geographical area identified by postcodes that are specified as belonging to climatic zone 4 or 5 in the Location Variable List section of this document;

**CM** means the control multiplier for a light source;

**Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide** means the commercial and industrial air source heat pump water heater product application guide published by the Essential Services Commission as amended from time to time;

**condensing boiler** means a boiler that is designed so that, under normal operating conditions, the water vapour in the combustion products is partially condensed, in order to make use of the latent heat of this water vapour for heating purposes, and includes a condensing steam boiler, condensing hot water boiler or condensing water heater;

**daylight-linked control** means a product that, using a photoelectric cell, is able to automatically vary the light output of a luminaire to compensate for the availability of daylight;

**DEI** means the default efficiency improvement, in the context of a gas boiler upgrade;

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

From 1 February 2024 to 31 January 2025  $EEF = 0.5334$

From 1 February 2025  $EEF = 0.393$

**EEF<sub>m</sub>** means the modelled electricity emissions factor to be used in greenhouse gas equivalent emissions reduction calculations as follows—

From 1 February 2024 to 31 January 2025  $EEF_m = 0.433$

From 1 February 2025  $EEF_m = 0.393$

**EEl** means the energy efficiency index within the meaning of AS/NZS 4783.2;

**ELC** means extra low voltage lighting converter as defined in the Regulations;

**electric resistance water heater** means, for the purpose of decommissioning:

- a. a system that heats water solely using an electric resistance element; or
- b. an electric boosted solar water heater which only provides heat from the electric resistance element due to a non-functional solar heater exchanger and associated solar heating components where those components are no longer within the relevant warranty period, and at least 5 years has lapsed since the system was installed;

**ESC** means the Essential Services Commission;

**fluorescent lamp** means a discharge lamp of a low-pressure mercury type where most of the light is emitted by one or more layers of phosphors excited by the ultraviolet radiation of the discharge;

**gas or LPG water heater** means, for the purpose of decommissioning:

- a. a system that heats water solely using gas or LPG combustive heating; or
- b. a gas or LPG boosted solar water heater which only heats water from gas or LPG combustive heating due to a non-functional solar heater exchanger and associated solar heating components where those components are no longer within the relevant warranty period, and at least 5 years has lapsed since the system was installed;

**gas reticulated area** means a geographical area identified as such by the Location Variable List section of this document;

**GEF** means the gas emissions factor to be used in greenhouse gas equivalent emissions reduction calculations;

**GEMS Act** means the *Greenhouse and Energy Minimum Standards Act 2012 (Cth)*;

**GEMS Register** means the register kept by the Greenhouse and Energy Minimum Standards Regulator under the GEMS Act and made available to the public at [http://reg.energyrating.gov.au/comparator/product\\_types/](http://reg.energyrating.gov.au/comparator/product_types/);

**GHG** means greenhouse gas;

**GHG equivalent** means the carbon dioxide equivalent (in tonnes) of greenhouse gases;

**Gross thermal efficiency** means the difference between 100% and the total percentage losses based on the gross calorific value of the fuel, as determined in accordance with British Standards BS 845-2 or BS 845-1;

**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;

**high pressure sodium lamp** means a discharge lamp classified as a high-pressure sodium vapour lamp as defined by IEC 60662;

**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;

**induction lamp** means a gas discharge lamp where the power required to generate light is transferred from outside the lamp envelope to the gas via electromagnetic induction;

**lamp circuit power**, in relation to a non-integrated luminaire, means—

- the power drawn by the lamp, and
- the power losses of any associated control gear, which are divided equally between the lamp and any other lamps associated with the control gear;

**lamp circuit power**, in relation to an LED integrated luminaire, means the power drawn by the whole luminaire;

**LCD** means lighting control device as defined in the *Regulations*;

**LCP** means the lamp circuit power for a light source;

**legacy control gear** means the control gear that was used to operate any lighting components that were present prior to an upgrade being carried out pursuant to the Victorian Energy Efficiency Target Regulations 2018;

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

**linear fluorescent lamp** means a fluorescent lamp that has two separate caps and is of linear shape;

**LPG** means liquid petroleum gas;

**LUF** means the load utilisation factor, in the context of a gas boiler upgrade;

**MEPS** means a minimum energy performance standard regulated by the GEMS Act;

**magnetic ballast** means a mains frequency ballast that incorporates an electromagnetic (wire-wound) component;

**maintained emergency lighting** means an exit sign or always-on maintained emergency luminaire as defined in AS 2293.1;

**metal halide lamp** means a discharge lamp classified as a metal halide lamp as defined by IEC 61167;

**metropolitan Victoria** means a geographical area identified as 'Metropolitan' by the Location Variable List section of this document;

**NFIP** means the input power (in Watts) of the new motor that powers a fan once upgraded under Part 33 of Schedule 2 of the Regulations;

**nominal lamp power (NLP)** means the manufacturer's rated value for power drawn by a light source (in Watts);

**non-gas reticulated area** means a geographical area identified as such by the Location Variable List section of this document;

**PAEC** means the projected annual energy consumption in kWh/y and is listed on the energy rating label;

**R** means the rated capacity of the product in kg;

**regional factor** means the factor used in the GHG equivalent emissions reduction method that, given upgrades are undertaken at sites located in different geological areas of Victoria, accounts for fluctuations in average energy usage due to different distribution losses and climates;

**regional Victoria** means a geographical area identified as 'Regional' by the Location Variable List section of this document;

**remote driver** means the external control gear used to operate a non-integrated LED lamp;

**RTHC** means rated total heating capacity;

**RfrgCharge** means the amount of refrigerant, in kilograms, that is used in a product;

**SA** means the area of the screen of a television in cm<sup>2</sup> determined in accordance with AS/NZS 62087.2.2;

**SEF** means the supplementary energy factor of a solar or heat pump water heater and converts the Bs into kg of greenhouse gas emissions;

**SRI** means star rating index;

**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;

**the Regulations** means the Victorian Energy Efficiency Target Regulations 2018;

**VEEC** means a Victorian Energy Efficiency Certificate created under section 17 of the Victorian Energy Efficiency Target Act 2007.

**V<sub>ff</sub>** means the volume in litres of the fresh food compartment of a refrigerator;

**V<sub>fr</sub>** means the volume of the freezer compartment of a two-door refrigerator or freezer;

**warranty**, for the purposes of Part 15 of Schedule 2 of the Regulations activity requirements, means a warranty against defects;

**Water Heating and Space Heating/Cooling Product Application Guide** means the water heating and space heating/cooling product application guide published by the Essential Services Commission as amended from time to time;

**WERS** means the Window Energy Rating Scheme managed by the Australian Window Association;

**ZigBee Smart Energy Profile Specification** means the ZigBee Smart Energy Profile Specification published by the ZigBee Standards Organisation on December 2008;

**ZigBee Smart Energy Standard** means the ZigBee Smart Energy Standard version 1.2a published by the ZigBee Standards Organisation of 3 December 2014

# Activity Requirements

This section summarises the eligible prescribed activities, as set out in Schedule 2 to the Regulations.

The authoritative requirements for eligible prescribed activities are contained in Schedule 2 to the Regulations, and take precedence over the summaries provided here for ease of reference.

This section specifies the minimum energy efficiency requirements for these activities.

This section specifies other matters for these activities, where required by the Regulations.

This section also specifies the methods and variables required to determine the amount of GHG equivalent emissions reduced by each prescribed activity.

# 1. Part 1 Activity– Water heaters, replacing electric resistance water heater

## Activity description (Guidance)

Part 1 of Schedule 2 of the Regulations prescribes the upgrade of an electric resistance water heater as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 1.1 lists the eligible products that may be installed, upgraded or replaced. 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 water heating technologies that reduce GHG equivalent emissions when replacing an electric resistance water heater. In such a case, product requirements and installation requirements for emerging technology will be listed by the department as scenario number 1E 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 1.1 – Eligible Part 1 water heating scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>1</sup>	Product to be installed <sup>2</sup>	Historical schedule number*
1C	1C(i) <sup>3</sup>	Electric resistance water heater	An electric boosted solar water heater that— <ul style="list-style-type: none"> <li>a. is certified by an accredited body as complying with AS/NZS 2712; and</li> <li>b. achieves the specified minimum annual energy savings; and</li> <li>c. has an insulated storage volume not exceeding 700 litres.</li> </ul>	1E
1D	1D(i) <sup>4</sup>	Electric resistance water heater	A heat pump water heater that— <ul style="list-style-type: none"> <li>a. has an insulated storage volume not exceeding 700 litres; and</li> <li>b. is certified by an accredited body as complying with AS/NZS 2712; and</li> <li>c. achieves the specified minimum annual energy savings; and</li> <li>d. is modelled against the specified heat pump modelling requirements; and</li> <li>e. uses a refrigerant that meets the specified refrigerant requirements (see Table 1.3 below).</li> </ul>	1E

\*This is the corresponding schedule number for this type of product in the lapsed 2008 VEET Regulations

<sup>1</sup> The authoritative decommissioning requirements are contained in Part 1 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>2</sup> The authoritative product requirements are contained in Part 1 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>3</sup> See Table 1.2 setting out additional product requirements.

<sup>4</sup> See Table 1.2 setting out additional product requirements.

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 1.2

**Table 1.2 - Additional requirements for water heating equipment to be installed**

Scenario number	Requirement type	Efficiency requirement <sup>5</sup>
1C(i)	Minimum annual energy savings	60%, determined in accordance with AS/NZS 4234:2021 and the Water Heating and Space Heating/Cooling Product Application Guide, when modelled in climate zone 4.  For the purposes of demonstrating compliance with this requirement, a VEU product used for a 'medium upgrade' under this scenario must be modelled at the 'medium' load in AS/NZS 4234:2021 and a VEU product used for a 'small upgrade' under this scenario must be modelled at the 'small' load in AS/NZS 4234:2021.
1D(i)	Minimum annual energy savings	60%, determined in accordance with AS/NZS 4234:2021 and the Water Heating and Space Heating/Cooling Product Application Guide when modelled in climate zone:  a. HP4-Au, if the product is installed in climatic zone 4*; or  b. HP5-Au, if the product is installed in climatic zone 5*.  For the purposes of demonstrating compliance with this requirement, a VEU product used for a 'medium upgrade' under this scenario must be modelled at the 'medium' load under AS/NZS 4234:2021 and a VEU product used for a 'small upgrade' under this scenario must be modelled at the 'small' load under AS/NZS 4234:2021.

\*See the Location Variables list to determine what climatic zone applies to any premises

## Other specified matters

The product installed must meet the additional requirements set out in Table 1.3

**Table 1.3 – Other specified matters for water heaters**

Scenario number	Requirement type	Specification details <sup>6</sup>
1D(i)	Heat pump modelling requirements	The product must be modelled in accordance with AS/NZS 4234:2021 so that minimum annual energy savings are determined for both HP4-Au and HP5-Au climate zones. These must be provided to the ESC.*
1D(i)	Refrigerant requirements**	The GWP of the refrigerant used in the heat pump water heater to be installed must be less than 700.
1C(i) and 1D(i)	Pre-installation and installation requirements – appropriate sizing <b>(residential premises only)</b>	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 1 activity for an energy consumer at a residential premises must, before the energy consumer agrees to undertake that activity:  a. provide the energy consumer with a copy of the current VEU Water Heating Consumer Fact Sheet, as published on the department's website; and

<sup>5</sup> The Secretary is empowered to specify these efficiency requirements under Part 1 of Schedule 2 to the Regulations.

<sup>6</sup> The Secretary is empowered to specify these modelling requirements under Part 1 of Schedule 2 to the Regulations.



Scenario number	Requirement type	Specification details <sup>6</sup>
		<ul style="list-style-type: none"> <li>b. give clear and accurate information to the energy consumer about the suitability of the product to be installed for the hot water needs of the consumer, having regard to the consumer's premises; and</li> <li>c. advise the energy consumer on whether the size of the product to be installed is consistent with the size recommended in the VEU Water Heating Consumer Fact Sheet</li> </ul> <p>For upgrades of a solar water heater with a non-functional solar component, the accredited person or scheme participant must also assess the operation of the solar water heater component and determine it to be non-functional.</p>
1C(i) and 1D(i)	Installation requirements – manifold systems	The product must not be installed together (in-line) with an additional hot water storage tank or hot water system e.g. a 'manifold system'.
1C(i) and 1D(i)	Decommissioning and product disposal requirements	<p>The decommissioned product must be decommissioned in a practical and safe manner to ensure it cannot be re-used again.</p> <p>Any waste or debris generated from the activity, including the decommissioned product (where it is practical and safe to remove the decommissioned product), must be removed from the consumer's premises and disposed of in accordance with all applicable waste management requirements under the Environment Protection Act 2017 and its regulations.</p>

\* See the Location Variables list to determine what climatic zone applies to any premises.

\*\* Applicable from 1 July 2024

## Method for Determining GHG Equivalent Reduction

### Scenario 1C(i): Decommissioning Electric and Installing Electric Boosted Solar

The GHG equivalent emissions reduction for this scenario is given by Equation 1.1, using the variables listed in Table 1.4 for products determined in accordance with AS/NZS 4234:2021.

#### Equation 1.1 – GHG equivalent emissions reduction calculation for Scenario 1C(i)

$$GHG \text{ Eq. Reduction} = EEF \times (\text{Abatement Factor} - (SEF \times B_{s \ 2021}) - (AEF \times B_{e \ 2021}))$$

**Table 1.4 – GHG equivalent emissions reduction variables for Scenario 1C(i)**

Small upgrade: upgrade product is a small system as determined in accordance with AS/NZS 4234:2021 based on the system's peak daily thermal energy load capability characteristics as used to demonstrate compliance with the additional requirements outlined in Table 1.2			
Medium upgrade: upgrade product is a medium system as determined in accordance with AS/NZS 4234:2021 based on the system's peak daily thermal energy load capability characteristics as used to demonstrate compliance with the additional requirements outlined in Table 1.2			
Input type	Condition	Input value	
Abatement Factor	For upgrades in Metropolitan Victoria	Small upgrade	30.42
		Medium upgrade	41.75
	For upgrades in Regional Victoria	Small upgrade	32.29
		Medium upgrade	44.30
SEF	For upgrades in Metropolitan Victoria	4.08	
	For upgrades in Regional Victoria	4.33	
B <sub>s 2021</sub>	Small upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the "very small" load as defined in that standard	
	Medium upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the "small" load as defined in that standard	
AEF	For upgrades in Metropolitan Victoria	4.08	
	For upgrades in Regional Victoria	4.33	
B <sub>e 2021</sub>	Small upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the "very small" load as defined in that standard	
	Medium upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the "very small" load as defined in that standard	

## Scenario 1D(i): Decommissioning Electric and Installing Heat Pump

The GHG equivalent emissions reduction for this scenario is given by Equation 1.2, using the variables listed in Table 1.5 for products determined in accordance with AS/NZS 4234:2021.

### Equation 1.2 – GHG equivalent emissions reduction calculation for Scenario 1D(i)

$$GHG \text{ Eq. Reduction} = (Abatement \text{ Factor} - (SEF \times B_s_{2021}) - (AEF \times B_e_{2021})) \times EEF$$

**Table 1.5 – GHG equivalent emissions reduction variables for Scenario 1C(ii)**

Input type	Condition	Input value	
Abatement Factor	For upgrades in Metropolitan Victoria	Small upgrade	24.34
		Medium upgrade	33.40
	For upgrades in Regional Victoria	Small upgrade	25.83
		Medium upgrade	35.44
SEF	For upgrades in Metropolitan Victoria	3.27	
	For upgrades in Regional Victoria	3.47	
B <sub>s 2021</sub>	Small upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the “very small” load as defined in that standard	
	Medium upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the “small” load as defined in that standard	
AEF	For upgrades in Metropolitan Victoria	3.27	
	For upgrades in Regional Victoria	3.47	
B <sub>e 2021</sub>	Small upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the “very small” load as defined in that standard	
	Medium upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the “small” load as defined in that standard	

\*\*\*There is no Part 2 Activity

### 3. Part 3 Activity– Water heaters, replacing gas/LPG

#### Activity description (Guidance)

Part 3 of Schedule 2 of the Regulations prescribes the upgrade of a gas or LPG water heater as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 3.1 lists the eligible products that may be installed, upgraded or replaced. 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 water heating technologies that reduce GHG equivalent emissions when replacing Gas or LPG water heaters. In such a case, product requirements and installation requirements for emerging technology will be listed by the department as scenario number 3A 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 3.1 – Eligible Part 3 water heating scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>7</sup>	Product to be installed <sup>8</sup>	Historical schedule number*
3C	3C	Gas or LPG water heater	A heat pump water heater that— <ul style="list-style-type: none"> <li>a. has an insulated storage volume not exceeding 700 litres; and</li> <li>b. is certified by an accredited body as complying with AS/NZS 2712; and</li> <li>c. achieves the specified minimum annual energy savings; and</li> <li>d. is modelled against the specified heat pump modelling requirements; and</li> <li>e. uses a refrigerant that meets the specified refrigerant requirements (see Table 3.3 below).</li> </ul>	N/A
3D	3D	Gas or LPG water heater	An electric boosted solar water heater that— <ul style="list-style-type: none"> <li>a. is certified by an accredited body as complying with AS/NZS 2712; and</li> <li>b. achieves the specified minimum annual energy savings; and</li> <li>c. has an insulated storage volume not exceeding 700 litres.</li> </ul>	N/A

\* This is the corresponding schedule number for this type of product in the lapsed 2008 VEET Regulations

<sup>7</sup> The authoritative decommissioning requirements are contained in Part 3 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>8</sup> The authoritative product requirements are contained in Part 3 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 3.2.

**Table 3.2 - Additional requirements for water heating equipment to be installed**

Product category number	Requirement type	Efficiency requirement <sup>9</sup>
3C	Minimum annual energy savings	60%, determined in accordance with AS/NZS 4234:2021 and the Water Heating and Space Heating/Cooling Product Application Guide when modelled in climate zone: <ul style="list-style-type: none"> <li>a. HP4-Au, if the product is installed in climatic zone 4*;</li> <li>b. HP5-Au, if the product is installed in climatic zone 5*.</li> </ul> For the purposes of demonstrating compliance with this requirement, a VEU product used for a 'medium upgrade' under this scenario must be modelled at the 'medium' load under AS/NZS 4234:2021.
3D	Minimum annual energy savings	60%, determined in accordance with AS/NZS 4234:2021 and the Water Heating and Space Heating/Cooling Product Application Guide, when modelled in climate zone 4. For the purposes of demonstrating compliance with this requirement, a VEU product used for a 'medium upgrade' under this scenario must be modelled at the 'medium' load in AS/NZS 4234:2021.

\*See the Location Variables list to determine what climatic zone applies to any premises

## Other specified matters

The product installed must meet the additional requirements set out in Table 3.3.

**Table 3.3 – Other specified matters for water heaters**

Product category number	Requirement type	Specification Details
3C	Heat pump modelling requirements	The product must be modelled in accordance with AS/NZS 4234:2021 so that minimum annual energy savings are determined for both HP4-Au and HP5-Au climate zones. These must be provided to the ESC.*
3C	Refrigerant Requirements**	The GWP of the refrigerant used in the heat pump water heater to be installed must be less than 700.
3C-3D	Pre-installation and installation requirements – appropriate sizing <b>(residential premises only)</b>	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 3 activity for an energy consumer at a residential premises must, before the energy consumer agrees to undertake that activity: <ul style="list-style-type: none"> <li>a. provide the energy consumer with a copy of the current VEU Water Heating Consumer Fact Sheet, as published on the department's website; and</li> <li>b. give clear and accurate information to the energy consumer about the suitability of the product to be installed for the hot water needs of the consumer, having regard to the consumer's premises; and</li> </ul>

<sup>9</sup> The Secretary is empowered to specify these efficiency requirements under Part 3 of Schedule 2 to the Regulations.

Product category number	Requirement type	Specification Details
		<p>c. advise the energy consumer on whether the size of the product to be installed is consistent with the size recommended in the VEU Water Heating Consumer Fact Sheet.</p> <p>For upgrades of a solar water heater with a non-functional solar component, the accredited person or scheme participant must also assess the operation of the solar water heater and determine it to be non-functional.</p>
3C-3D	Installation requirements – manifold systems	The product must not be installed together (in-line) with an additional hot water storage tank or hot water system e.g. a 'manifold system'.
3C-3D	Decommissioning and product disposal requirements	<p>The decommissioned product must be decommissioned in a practical and safe manner to ensure it cannot be re-used again.</p> <p>Any waste or debris generated from the activity, including the decommissioned product (where it is practical and safe to remove the decommissioned product), must be removed from the consumer's premises and disposed of in accordance with all applicable waste management requirements under the Environment Protection Act 2017 and its regulations.</p>

\*See the Location Variables list to determine what climatic zone applies to any premises

\*\*Applicable from 1 July 2024

## Method for Determining GHG Equivalent Reduction

### Scenario 3C: Decommissioning Gas and installing Heat Pump

The GHG equivalent emissions reduction for this scenario is given by Equation 3.1, using the variables listed in Table 3.4 for products determined in accordance with AS/NZS 4234:2021.

#### Equation 3.1 – GHG equivalent emissions reduction calculation for Scenario 3C

$$GHG \text{ Eq. Reduction} = \text{Abatement Factor} - ((SEF \times B_{s\ 2021}) + (AEF \times B_{e\ 2021})) \times EEF_m$$

**Table 3.4 – GHG equivalent emissions reduction variables for Scenario 3C**

Input Type	Condition	Input Value
Abatement Factor	Medium upgrade	13.23
SEF	In every instance	4.17
B <sub>s 2021</sub>	Medium upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the "small" load as defined in that standard
AEF	In every instance	4.17
B <sub>e 2021</sub>	Medium upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the "small" load as defined in that standard

### Scenario 3D: Decommissioning Gas and installing Electric Boosted Solar

The GHG equivalent emissions reduction for this scenario is given by Equation 3.2, using the variables listed in Table 3.5.

#### Equation 3.2 – GHG equivalent emissions reduction calculation for Scenario 3D

$$GHG \text{ Eq. Reduction} = Abatement \text{ Factor} - ((SEF \times B_{s2021}) + (AEF \times B_{e2021})) \times EEf_m$$

**Table 3.5 – GHG equivalent emissions reduction variables for Scenario 3D**

Medium upgrade: upgrade product is a medium system as determined in accordance with AS/NZS 4234:2021 based on the system's peak daily thermal energy load delivery characteristics as used to demonstrate compliance with the additional requirements outlined in Table 3.2.		
Input Type	Condition	Input Value
Abatement Factor	Medium upgrade	13.23
SEF	In every instance	4.17
B <sub>s 2021</sub>	Medium upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the "small" load as defined in that standard
AEF	In every instance	4.17
B <sub>e 2021</sub>	Medium upgrade	as determined in accordance with AS/NZS 4234:2021 in GJ/year when modelled with the "small" load as defined in that standard

\*\*\*There is no Part 4 or Part 5 Activity

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

### Activity description (Guidance)

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	Decommissioning requirements <sup>10</sup>	Product to be installed <sup>11</sup>	Historical schedule number
6A-G	(i)	Hard-wired resistance electric room heater only (no refrigerative air conditioner) 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. <sup>12</sup>	N/A
	(ii)	<ul style="list-style-type: none"> <li>Hard-wired resistance electric heater which is the main form of heating any premises; and</li> <li>Refrigerative air conditioner (whether ducted or not) that is not located in:                             <ul style="list-style-type: none"> <li>in the case of an air conditioner in residential premises, a bedroom; or</li> <li>in the case of an air conditioner in business or non-residential premises, a room with an area of less than 20 m<sup>2</sup>.</li> </ul> </li> </ul>		
	(iii)	Central electric resistance that provides heating to a space with a floor area of at least 100 m <sup>2</sup> or slab heater only (no refrigerative air conditioner) which is the main form of heating any premises.		
	(iv)	<ul style="list-style-type: none"> <li>Central electric resistance that provides heating to a space with a floor area of at least 100 m<sup>2</sup> or slab heater which is the main form of heating any premises; and</li> <li>Refrigerative air conditioner (whether ducted or not) that is not located in:</li> </ul>		

<sup>10</sup> The authoritative decommissioning requirements are contained in Part 6 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>11</sup> The authoritative product requirements are contained in Part 6 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>12</sup> Note: Product categories 6C and 6G are eligible in business premises only.



Product category number	Scenario number	Decommissioning requirements <sup>10</sup>	Product to be installed <sup>11</sup>	Historical schedule number
		<ul style="list-style-type: none"> <li>– in the case of an air conditioner in residential premises, a bedroom; or</li> <li>– in the case of an air conditioner in business or non-residential premises, a room with an area of less than 20 m2.</li> </ul>		
	(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 air conditioner) which is the main form of heating any premises.		
	(viii)	<ul style="list-style-type: none"> <li>• Ducted gas heater which is the main form of heating any premises; and</li> <li>• Refrigerative air conditioner (whether ducted or not) that is not located in: <ul style="list-style-type: none"> <li>– in the case of an air conditioner in residential premises, a bedroom; or</li> <li>– in the case of an air conditioner in business or non-residential premises, a room with an area of less than 20 m2.</li> </ul> </li> </ul>		
	(ix)	Non-ducted gas heater only (no refrigerative air conditioner).		
	(x)	<ul style="list-style-type: none"> <li>• Non-ducted gas heater; and</li> <li>• Refrigerative air conditioner (whether ducted or not) that is not located in: <ul style="list-style-type: none"> <li>– in the case of an air conditioner in residential premises, a bedroom; or</li> <li>– in the case of an air conditioner in business or non-residential premises, a room with an area of less than 20 m2.</li> </ul> </li> </ul>		
	(xi)	No decommissioning		

## Specified Minimum Energy Efficiency

The product (or products) installed must meet the relevant additional requirements set out 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	<ul style="list-style-type: none"> <li>a. For products registered to the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019 (Cth) after 1 August 2024 that has a HSPF and TCSPF for the specified GEMS Residential or Commercial Cold Zone, the product must:               <ul style="list-style-type: none"> <li>i. achieve the minimum HSPF and TCSPF for the specified GEMS Residential Cold Zone (categories 6A, 6B, 6D, 6E and 6F) specified in Table 6.3;</li> <li>ii. achieve the minimum HSPF and TCSPF for the specified GEMS Commercial Cold Zone (categories 6C and 6G) specified in Table 6.3; and</li> <li>iii. be registered to the relevant class (or classes) under that determination, specified in Table 6.3.</li> </ul> </li> <li>b. For products registered to the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019 (Cth) on or before 1 August 2024 that has a HSPF and TCSPF for the specified GEMS Residential or Commercial Cold Zone, the product must:               <ul style="list-style-type: none"> <li>i. achieve the minimum HSPF and TCSPF for the specified GEMS Residential Cold Zone (categories 6A, 6B, 6D, 6E and 6F) OR the minimum ACOP and AEER specified in Table 6.3;</li> <li>ii. achieve the minimum HSPF and TCSPF for the specified GEMS Commercial Cold Zone (categories 6C and 6G) OR the minimum ACOP and AEER specified in Table 6.3; and</li> <li>iii. be registered to the relevant class (or classes) under that determination, specified in Table 6.3.</li> </ul> </li> <li>c. For products registered to the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019 (Cth) that does not have a HSPF and TCSPF for the specified GEMS Residential or Commercial Cold Zone, the product must:               <ul style="list-style-type: none"> <li>i. achieve the minimum ACOP and AEER specified in Table 6.3; and</li> <li>ii. be registered to the relevant class (or classes) under that determination, specified in Table 6.3.</li> </ul> </li> </ul>

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

\*For the purposes of Table 6.3, "R" refers to the rated standard cooling full capacity as defined in the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019.

## 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	Specification Details
6A-B, 6D-6F	Pre-installation and installation requirements – appropriate sizing (residential premises only)	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: <ul style="list-style-type: none"> <li>a. provide the energy consumer with a copy of the current VEU Space Heating and Cooling Consumer Fact Sheet, as published on the department's public website; and</li> <li>b. give clear and accurate information to the energy consumer about the suitability of the product to be installed for the heating and cooling needs of the consumer having regard to the consumer's premises; and</li> <li>c. advise the energy consumer on whether the size of the product to be installed is consistent with the size recommended in the VEU Space Heating and Cooling Consumer Fact Sheet.</li> </ul>

Product category number	Requirement type	Specification Details
6A-G	Decommissioning and product disposal requirements	<p>The decommissioned product must be:</p> <ol style="list-style-type: none"> <li>decommissioned in a practical and safe manner to ensure it cannot be re-used again; and</li> <li>decommissioned so that any refrigerant contained in the product is disposed of in accordance with the requirements set out under the Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 (Cth) and regulations made under that Act.</li> </ol> <p>Any waste or debris generated from the activity, including the decommissioned product (where it is practical and safe to remove the decommissioned product), must be removed from the consumer's premises and disposed of in accordance with all applicable waste management requirements under the Environment Protection Act 2017 and its regulations.</p>
6A-G	Refrigerant requirements	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.
6A-G	Multi-split air conditioners, manufacturer of indoor and outdoor units	All indoor units installed as part of a multi-split air conditioner must be from the same original equipment manufacturer as the connected outdoor unit.

## Method for Determining GHG Equivalent Reduction

### Scenario 6A to 6G (i-xi): Installing a high efficiency 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)

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

**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 variables listed in Table 6.8
Lifetime	Scenarios (i) to (x)	12 years
Lifetime	Scenarios (xi)	15 years

#### Equation 6.2 – Heating savings calculation

$$\text{Heating Savings} = GSF_{\text{heat}} \times BTL_{\text{heat}} \times \text{Heating Capacity}$$

**Table 6.6 – Heating savings calculation inputs**

Input type	Condition	Input value
$GSF_{\text{heat}}$	In every instance	Is the greenhouse savings factor for heating Given by Equation 6.3, using variables listed in Table 6.7.
$BTL_{\text{heat}}$	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) <sup>13</sup>	The rated heating capacity of the unit installed in kW as listed on the ESC register, up to a maximum of 2.4 kW.
Heating capacity	Scenarios (iii) to (iv) <sup>14</sup>	The rated heating capacity of the unit installed in kW as listed on the ESC register, up to a maximum of 15 kW.
Heating capacity	Scenarios (v) to (xi)	The rated heating capacity of the unit installed in kW as listed on the ESC register.
Heating capacity	Multi-split air conditioners	The sum of the rated heating capacity of all indoor units installed in kW, up to a maximum of the rated heating capacity of the outdoor unit installed, as listed on the ESC register. Heating capacity limits for scenarios (i) to (iv) apply.

<sup>13</sup> Although a unit with a heating capacity larger than 2.4kW can be installed, the maximum input for this scenario is 2.4 kW

<sup>14</sup> 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<sub>heat</sub>) 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 input**

Input type	Condition	Input value
GIH <sub>base</sub>	In every instance	The greenhouse gas intensity heating factor for the baseline heater listed in  Table 6.11.
HSPF <sub>base</sub>	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 <sub>upgrade</sub>	In every instance	The greenhouse gas intensity factor for the upgrade heater listed in  Table 6.11
HSPF <sub>upgrade</sub>	In every instance	The HSPF for the upgrade air-conditioner using as listed on the ESC register: the relevant GEMS 2019 Climate Zone determined by Table 6.10. the relevant residential HSPF for residential upgrades the relevant commercial HSPF for business/non-residential upgrades If HSPF is not listed, HSPF is to be derived by multiplying the product's ACOP value with the relevant conversion factor in Table 6.15 and Table 6.16.
LF	In every instance	The upgrade heater loss factor, listed in Table 6.13

**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 <sub>cool</sub>	In every instance	Is the greenhouse savings factor for cooling Given by Equation 6.5, using variables listed in Table 6.9.
BTL <sub>cool</sub>	In every instance	The deemed building cooling load in MWh per kW rated cooling capacity, using variables listed in Table 6.14.
Cooling capacity	Scenarios (i) to (ii)	The rated cooling capacity of the unit installed in kW as listed on the ESC register, up to a maximum of 2.4 kW.
Cooling capacity	Scenarios (iii) to (iv)	The rated cooling capacity of the unit installed in kW as listed on the ESC register, up to a maximum of 15 kW.
Cooling capacity	Scenarios (v) to (xi)	The rated cooling capacity of the unit installed in kW as listed on the ESC register.

Cooling capacity	Multi-split air conditioners	The sum of the rated cooling capacity of all indoor units installed in kW, up to a maximum of the rated cooling capacity of the outdoor unit installed, as listed on the ESC register. Cooling capacity limits for scenarios (i) to (iv) apply.
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**Equation 6.5 – Deemed greenhouse savings factor for cooling ( $GSF_{cool}$ ) calculation**

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

**Table 6.9 – Cooling savings calculation 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 as listed on the ESC register: the relevant GEMS 2019 Climate Zone determined by Table 6.10. the relevant residential TCSPF for residential upgrades the relevant commercial TCSPF for business/non-residential upgrades If TCSPF is not listed, TCSPF is to be derived by multiplying the product's AEER value with the relevant conversion factor in Table 6.15 and Table 6.16.
LF	In every instance	The upgrade product system loss factor, listed in Table 6.13.

**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<sub>base</sub> and GIC<sub>base</sub> (t CO<sub>2</sub>-e/MWh) and Deemed Baseline HSPF<sub>Base</sub> and TCSPF<sub>Base</sub> Factors**

Scenario	Heating			Cooling			GIH <sub>upgrade</sub> and GIC <sub>upgrade</sub>
	GIH <sub>base</sub>	Deemed HSPF <sub>Base</sub> GEMS Cold Zone	Deemed HSPF <sub>Base</sub> GEMS Mixed Zone	GIC <sub>base</sub>	Deemed TCSPF <sub>Base</sub> GEMS Cold Zone	Deemed TCSPF <sub>Base</sub> GEMS Mixed Zone	
(i)	EEF	1.000	1.000	EEF	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF
(ii)	EEF	1.000	1.000	EEF	3.290	3.264	EEF
(iii)	EEF	0.847	0.847	EEF	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF
(iv)	EEF	0.847	0.847	EEF	2.788	2.766	EEF
(v)	EEF	2.358	2.594	EEF	2.788	2.766	EEF
(vi)	EEF	2.892	3.268	EEF	4.053	3.932	EEF
(vii)	0.198	0.551	0.551	EEF <sub>M</sub>	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF <sub>M</sub>
(viii)	0.198	0.551	0.551	EEF <sub>M</sub>	2.788	2.766	EEF <sub>M</sub>
(ix)	0.198	0.760	0.760	EEF <sub>M</sub>	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF <sub>M</sub>
(x)	0.198	0.760	0.760	EEF <sub>M</sub>	4.053	3.932	EEF <sub>M</sub>
(xi)	EEF	Refer to Table 6.12 (residential) or Table 6.13 (business)		EEF	Given in Table 6.12 (residential) or Table 6.13 (business)		EEF



**Table 6.12 – Deemed Baseline HSPF and TCSPF Factors According to Upgrade (Scenario) Type – Residential\***

Cat.	Upgrade Product	Deemed HSPF <sub>Base</sub> GEMS Cold Zone	Deemed HSPF <sub>Base</sub> GEMS Mixed Zone	Deemed TCSPF <sub>Base</sub> GEMS Cold Zone	Deemed TCSPF <sub>Base</sub> GEMS Mixed Zone	Loss Factor
6A	Ducted air to air R < 10 kW	3.03	3.42	3.66	3.59	1.18
6B(i)	Ducted air to air 10 kW ≤ R < 25 kW	2.86	3.25	3.42	3.35	1.18
6B(ii)	Ducted air to air 25 kW ≤ R ≤ 39 kW	2.86	3.22	3.22	3.05	1.18
6D	Non-ducted air to air R < 4kW	3.89	4.36	5.38	5.23	1.0
6E(i)	Non-ducted air to air 4 kW ≤ R < 7 kW	3.62	4.17	4.91	4.73	1.0
6E(ii)	Non-ducted air to air 7 kW ≤ R < 10 kW	3.50	4.17	4.80	4.73	1.0
6F	Non-ducted air to air 10kW ≤ R ≤ 39kW	3.43	3.98	4.44	4.35	1.0

\*For the purposes of Table 6.12, “R” refers to the rated standard cooling full capacity as defined in the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019.

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

Cat.	Upgrade Product	Deemed HSPF <sub>Base</sub> GEMS Cold Zone	Deemed HSPF <sub>Base</sub> GEMS Mixed Zone	Deemed TCSPF <sub>Base</sub> GEMS Cold Zone	Deemed TCSPF <sub>Base</sub> GEMS Mixed Zone	Loss Factor
6A	Ducted air to air R < 10 Kw	3.24	3.61	4.49	4.24	1.18
6B(i)	Ducted air to air 10 kW ≤ R < 25 kW	3.08	3.46	4.30	4.04	1.18
6B(ii)	Ducted air to air 25 kW ≤ R ≤ 39 kW	3.08	3.22	4.15	3.73	1.18
6C	Ducted air to air 39 kW < R ≤ 65 kW	2.88	3.22	3.56	3.39	1.18
6D	Non-ducted air to air R < 4kW	4.13	4.54	7.85	6.79	1.0
6E(i)	Non-ducted air to air 4 kW ≤ R < 7 kW	3.93	4.44	6.62	5.93	1.0
6E(ii)	Non-ducted air to air 7 kW ≤ R < 10 kW	3.80	4.44	6.50	5.93	1.0
6F	Non-ducted air to air 10kW ≤ R ≤ 39kW	3.77	4.31	5.98	5.52	1.0
6G	Non-ducted air to air 39kW < R ≤ 65kW	2.80	3.30	5.30	4.94	1.0

\*For the purposes of Table 6.13, “R” refers to the rated standard cooling full capacity as defined in the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019.

**Table 6.14 – Deemed Building Thermal Loads – BTL<sub>Heat</sub> and BTL<sub>Cool</sub> for VEU Climatic Regions**

VEU Climatic Region	Residential		Business	
	Heating	Cooling	Heating	Cooling
	BTL <sub>Heat</sub> (MWh/kW)	BTL <sub>Cool</sub> (MWh/kW)	BTL <sub>Heat</sub> (MWh/kW)	BTL <sub>Cool</sub> (MWh/kW)
For upgrades in Metropolitan Victoria – Climatic region mild	1.3144	0.2696	0.7866	0.7175
For upgrades in Metropolitan Victoria – Climatic region cold	1.4458	0.2696	0.8652	0.7175
For upgrades in Regional Victoria – Climatic region mild	1.3144	0.2696	0.7866	0.7175
For upgrades in Regional Victoria – Climatic region cold	1.4458	0.2696	0.8652	0.7175
For upgrades in Regional Victoria – Climatic region hot	0.7211	0.4296	0.5915	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 R < 10 kW	0.934	1.242	1.058	1.218
6B(i)	Ducted air to air 10 kW ≤ R < 25 kW	0.912	1.211	1.039	1.187
6B(ii)	Ducted air to air 25 kW ≤ R ≤ 39 kW	0.912	1.211	1.039	1.187
6D	Non-ducted air to air R < 4kW	0.925	1.371	1.037	1.332
6E(i)	Non-ducted air to air 4 kW ≤ R < 7 kW	0.953	1.382	1.096	1.333
6E(ii)	Non-ducted air to air 7 kW ≤ R < 10 kW	0.953	1.382	1.096	1.333
6F	Non-ducted air to air 10kW ≤ R ≤ 39kW	0.892	1.285	1.035	1.258

\*For the purposes of Table 6.15, “R” refers to the rated standard cooling full capacity as defined in the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019.

**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 R < 10 kW	1.001	1.598	1.114	1.490
6B(i)	Ducted air to air 10 kW ≤ R < 25 kW	0.983	1.524	1.105	1.433
6B(ii)	Ducted air to air 25 kW ≤ R ≤ 39 kW	0.983	1.524	1.105	1.433
6C	Ducted air to air 39kW < R ≤ 65kW	0.968	1.263	1.115	1.190
6D	Non-ducted air to air R < 4kW	0.983	2.001	1.081	1.729
6E(i)	Non-ducted air to air 4 kW ≤ R < 7 kW	1.035	1.864	1.170	1.672
6E(ii)	Non-ducted air to air 7 kW ≤ R < 10 kW	1.035	1.864	1.170	1.672
6F	Non-ducted air to air 10kW ≤ R ≤ 39kW	0.981	1.731	1.122	1.598
6G	Non-ducted air to air 39kW < R ≤ 65kW	0.747	1.563	0.866	1.462

\*For the purposes of Table 6.15, “R” refers to the rated standard cooling full capacity as defined in the Greenhouse and Energy Minimum Standards (Air Conditioners up to 65kW) Determination 2019.



\*\*\*There is no Part 7, Part 8, Part 9, Part 10 or Part 11 Activities.

## 12. Part 12 Activity– Underfloor insulation

### Activity description (Guidance)

Part 12 of Schedule 2 of the Regulations prescribes the upgrade of underfloor insulation as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 12.1 lists the types insulation that may be installed. Each upgrade combination is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

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 12.1 – Eligible underfloor insulation scenarios**

Product category number	Scenario number	Decommissioning requirements	Other requirements <sup>15</sup>	Product to be installed <sup>16</sup>	Historical schedule number
12A	12A	None	Installing a product, or 2 or more products, where the product or products: <ol style="list-style-type: none"> <li>a. are installed in respect of a floor area that is not insulated; and</li> <li>b. are installed for a minimum of 20 m<sup>2</sup> in accordance with AS 3999.</li> </ol>	A product, or two or more products: <ol style="list-style-type: none"> <li>a. that is or are designed so that when installed, or installed together, they comply with the performance requirements of AS/NZS 4859.1 (insulation material); and</li> <li>b. that achieves or together achieve, a minimum R-value when measured and declared in accordance with AS/NZS 4859.1, as specified in Table 12.2 below.</li> </ol>	12A

<sup>15</sup> The authoritative requirements are contained in Part 12 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>16</sup> The authoritative product requirements are contained in Part 12 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

## Specified Minimum Energy Efficiency

The product (or products) installed must meet the additional requirements set out in Table 12.2.

**Table 12.2 - Additional requirements for insulation to be installed**

Product category number	Requirement type	Efficiency requirement <sup>17</sup>
12A	Minimum R-value	Winter value of R2.5, determined in accordance with AS/NZS 4859.1

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

Scenario 12A: Installing underfloor insulation

The GHG equivalent emissions reduction for this scenario is given by Equation 12.1, using the variables listed in Table 12.3.

**Equation 12.1 – GHG equivalent emissions reduction calculation for Scenario 12A**

$$GHG \text{ Eq. Reduction} = GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor} \times Area$$

**Table 12.3 – GHG equivalent emissions reduction variables for Scenario 12A**

Input	Condition	Input value
GHG Savings	In every instance	$2.49 \times 10^{-3} + (1.35 \times 10^{-3} \times EEF)$
Lifetime	In every instance	25.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.06
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.22
	For upgrades in Regional Victoria – Climatic region Mild	0.88
	For upgrades in Regional Victoria – Climatic region Cold	1.25
	For upgrades in Regional Victoria – Climatic region Hot	0.82
Area	In every instance	The area of insulation in m2

<sup>17</sup> The Secretary is empowered to specify these efficiency requirements under Part 12 of Schedule 2 to the Regulations.

# 13. Part 13 Activity– Double glazed windows

## Activity description (Guidance)

Part 13 of Schedule 2 of the Regulations prescribes the upgrade of windows through replacement with glazing as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 13.1 lists the type of glazing product(s) that may replace an old window. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

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 13.1 – Eligible thermally efficient window scenarios**

Scenario number	Decommissioning / other requirement <sup>18</sup>	Product to be installed <sup>19</sup>
13A	Installing a glazing product where the product: a. is installed in place of one or more windows in an external wall; and b. is installed for a minimum 5 m <sup>2</sup> .	A glazing product that: a. achieves a maximum Total U-value as specified in Table 13.2 below; and b. is WERS rated and labelled to a minimum star rating for heating as specified in Table 13.2 below; and c. complies with the performance requirements of AS 2047 and AS 1288.

## Specified Minimum Energy Efficiency

The product (or products) installed must meet the additional requirements set out in Table 13.2.

**Table 13.2 - Additional requirements for windows to be installed**

Product category number	Requirement type	Efficiency requirement <sup>20</sup>
13A	Maximum total U-value	4, determined in accordance with AS 2047
	Minimum star rating for heating	4 stars, determined in accordance with the WERS

## Other specified matters

None.

<sup>18</sup> The authoritative decommissioning and other requirements are contained in Part 13 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>19</sup> The authoritative product requirements are contained in Part 13 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>20</sup> The Secretary is empowered to specify these efficiency requirements under Part 13 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

### Scenario 13A: Upgrading to a WERS rated thermally efficient window

The GHG equivalent emissions reduction for each scenario is given by Equation 13.1, using the variables listed in Table 13.3.

#### Equation 13.1 – GHG equivalent emissions reduction calculation for Scenario 13A

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor} \times Area$$

**Table 13.3 – GHG equivalent emissions reduction variables for Scenario 13A**

Input type	Condition	Input value
GHG Savings	WERS rating between 4-4.9 stars for heating	$9.71 \times 10^{-3} + (5.91 \times 10^{-3} \times EEF)$
	WERS rating between 5-5.9 stars for heating	$1.21 \times 10^{-2} + (7.38 \times 10^{-3} \times EEF)$
	WERS rating of 6 stars for heating or more	$1.46 \times 10^{-2} + (8.86 \times 10^{-3} \times EEF)$
Lifetime	In every instance	25.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.03
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.39
	For upgrades in Regional Victoria – Climatic region Mild	0.93
	For upgrades in Regional Victoria – Climatic region Cold	1.42
	For upgrades in Regional Victoria – Climatic region Hot	0.76
Area	In every instance	The area of glazing installed in m <sup>2</sup>

# 14. Part 14 Activity– Thermally efficient window products

## Activity description (Guidance)

Part 14 of Schedule 2 of the Regulations prescribes the upgrade of a window by installing glazing product(s) as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 14.1 lists the types of glazing products that may be installed on an existing window. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify additional products that meet the requirements for this prescribed activity which will be listed as scenario number 14B 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 14.1 – Eligible glazing product scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>21</sup>	Installation requirements <sup>22</sup>	Product to be installed <sup>23</sup>	Historical schedule number
14A	14A	None	Installing a product where the product: <ol style="list-style-type: none"> <li>a. is installed on one or more single glazed windows in an external wall; and</li> <li>b. is installed for a minimum glazed area of 5 m<sup>2</sup>; and</li> <li>c. when installed, results in a still air gap being created between the single glazed window and the product.</li> </ol>	A product that, when installed on a single glazed window, results in a still air gap being created between the single glazed window and the product and raises the thermal efficiency performance of the window.	14A

## Specified Minimum Energy Efficiency

There are no additional requirements that must be met by the product installed.

## Other specified matters

None.

<sup>21</sup> The authoritative decommissioning requirements are contained in Part 14 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>22</sup> The authoritative installation requirements are contained in Part 14 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>23</sup> The authoritative product requirements are contained in Part 14 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.



## Method for Determining GHG Equivalent Reduction

### Scenario 14A: Installing product that creates air gap on single glazed window

The GHG equivalent emissions reduction for each scenario is given by Equation 14.1, using the variables listed in Table 14.2 Table 12.3.

#### Equation 14.1 – GHG equivalent emissions reduction calculation for Scenario 14A

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor} \times Area$$

**Table 14.2 – GHG equivalent emissions reduction variables for Scenario 14A**

Input type	Condition	Input value
GHG Savings		$8.74 \times 10^{-3} + (5.31 \times 10^{-3} \times EEF)$
Lifetime	Glass or acrylic product(s)	15.00
	Window film product(s)	5.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.03
	For upgrades in Metropolitan Victoria - Climatic region Cold	1.39
	For upgrades in Regional Victoria – Climatic region Mild	0.93
	For upgrades in Regional Victoria – Climatic region Cold	1.42
	For upgrades in Regional Victoria – Climatic region Hot	0.76
Area	In every instance	The area of glazing installed in m <sup>2</sup>

# 15. Part 15 Activity– Weather sealing

## Activity description (Guidance)

Part 15 of Schedule 2 of the Regulations prescribes the upgrade of premises by installing weather sealing products as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 15.1 lists the types of weather sealing products that may be installed and what, if any, products they must replace. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify under Item 15.9 of Table 15.1 and under category number 15I under 15.2 contained in Part 15 of Schedule 2 to the Regulations that there are other weather sealing technologies that reduce GHG equivalent emissions by sealing premises. In such a case, product requirements and installation requirements for emerging technology will be specified as scenario number 15I.

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 15.1 – Eligible weather sealing scenarios**

Note: Final upgrade must ensure air change rate at the premises is equal to or more than 0.5 and the premises must comply with Part 3.8.5 of the BCA<sup>24</sup>

Product category number	Scenario number	Decommissioning requirements <sup>25</sup>	Installation requirements <sup>26</sup>	Product to be installed <sup>27</sup>	Historical schedule number
15A	15A	None	Installing a category 15A product, or combination of category 15A products, to the frame of an external door or to each edge of an external door if that installation: <ul style="list-style-type: none"> <li>a. is in accordance with the manufacturer’s instructions; and</li> <li>b. restricts airflow along the entire perimeter of the door; and</li> <li>c. does not impair the normal operation of the door.</li> </ul>	A door sealing product or door weather stripping product, or a combination of those products each of which is covered by a warranty against defects for a period of at least 2 years from the date of installation.	15A
15B	15B	None	Installing a category 15B product, or combination of category 15B products, to the frame of an external window if that installation:	A window sealing product or window weather stripping product, or a combination of those products, each of which is covered by a warranty	15B

<sup>24</sup> The authoritative requirements are contained in Part 15 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>25</sup> The authoritative decommissioning requirements are contained in Part 15 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>26</sup> The authoritative installation requirements are contained in Part 15 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>27</sup> The authoritative product requirements are contained in Part 15 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

Note: Final upgrade must ensure air change rate at the premises is equal to or more than 0.5 and the premises must comply with Part 3.8.5 of the BCA<sup>24</sup>

Product category number	Scenario number	Decommissioning requirements <sup>25</sup>	Installation requirements <sup>26</sup>	Product to be installed <sup>27</sup>	Historical schedule number
			<ul style="list-style-type: none"> <li>a. is in accordance with the manufacturer's instructions; and</li> <li>b. restricts airflow through the window; and</li> <li>c. does not impair the normal operation of the window.</li> </ul>	against defects for a period of at least 2 years from the date of installation	
15C	15C	Removing and decommissioning a ceiling or wall exhaust fan that does not comply with the criteria for a category 15C product.	Installing, in accordance with the manufacturer's instructions and in the place of the decommissioned fan, a category 15C product.	<p>A product that:</p> <ul style="list-style-type: none"> <li>a. is a ceiling or wall exhaust fan; and</li> <li>b. expels air either outside or into the roof space of the premises it is installed in; and</li> <li>c. is fitted with a self-closing damper, flap, filter or other sealing product that is designed to: <ul style="list-style-type: none"> <li>i. allow airflow through the exhaust of the fan when the fan is operating; and</li> <li>ii. restrict airflow when the fan is not operating; and</li> </ul> </li> <li>d. is covered by a warranty against defects for a period of at least 2 years from the date of installation.</li> </ul>	15C
15D	15D	None	<p>Installing a category 15D product:</p> <ul style="list-style-type: none"> <li>a. in accordance with the manufacturer's instructions; and</li> <li>b. on a ceiling or wall exhaust fan that expels air either outside or into the roof space of the premises and on which a category</li> </ul>	<p>A product that:</p> <ul style="list-style-type: none"> <li>a. is a self-closing damper, flap, filter or other sealing product; and</li> <li>b. is designed so that when installed on a ceiling or wall exhaust fan, it allows airflow through the exhaust of the fan</li> </ul>	15D

Note: Final upgrade must ensure air change rate at the premises is equal to or more than 0.5 and the premises must comply with Part 3.8.5 of the BCA<sup>24</sup>

Product category number	Scenario number	Decommissioning requirements <sup>25</sup>	Installation requirements <sup>26</sup>	Product to be installed <sup>27</sup>	Historical schedule number
			<p>15D product is not already installed; and</p> <p>c. so that when installed on a ceiling or wall exhaust fan, the product allows airflow through the exhaust of the fan when the fan is operating and restricts airflow when the fan is not operating.</p>	<p>when the fan is operating and restricts airflow when the fan is not operating; and</p> <p>c. is covered by a warranty against defects for a period of at least 2 years from the date of installation.</p>	
15E	15E	None	<p>Installing a category 15E product:</p> <p>a. in accordance with the manufacturer's instruction; and</p> <p>b. in an unsealed wall vent; and</p> <p>c. with the result that a ventilation opening in an external wall is sealed or closed.</p>	<p>A product that:</p> <p>a. is made of a robust non-shrinking sealing material; and</p> <p>b. is covered by a warranty against defects for a period of at least 2 years from the date of installation.</p>	15E
15F	15F	None	<p>Installing a category 15F product:</p> <p>(a) in accordance with the manufacturer's instructions; and</p> <p>(b) in an unsealed chimney or flue of an open fireplace in which category 15F product is not already installed; and</p> <p>(c) so that when fitted to a chimney or flue of an open fireplace used to burn solid fuel, the product:</p> <p>(i) restricts the airflow into or out of the chimney or flue when closed; and</p> <p>(ii) allows the fireplace to operate safely</p>	<p>A product that:</p> <p>(a) is designed so that when fitted to a chimney or flue of an open fireplace used to burn solid fuel, the product:</p> <p>(i) restricts the airflow into or out of the chimney or flue when closed and;</p> <p>(ii) allows the fireplace to operate safely and effectively when open; and</p> <p>(b) is designed to be fitted permanently to the chimney or flue; and</p> <p>(c) is covered by a warranty against defects for a</p>	15F

Note: Final upgrade must ensure air change rate at the premises is equal to or more than 0.5 and the premises must comply with Part 3.8.5 of the BCA<sup>24</sup>

Product category number	Scenario number	Decommissioning requirements <sup>25</sup>	Installation requirements <sup>26</sup>	Product to be installed <sup>27</sup>	Historical schedule number
			and effectively when open; and (d) so that is fitted permanently to the chimney or flue.	period of at least 5 years from the date of installation.	
15G	15G	None	Installing a category 15G product (not being the reinstalling of a category 15G product): (a) in accordance with the manufacturer's instructions; and (b) to an unsealed chimney or flue of a fireplace in which category 15G product is not already installed; and (c) so that when fitted to a chimney or flue of an open fireplace used to burn solid fuel, the product restricts the airflow into or out of the chimney or flue; and (d) with signage that includes instructions for removing the product.	A product that: (a) is designed so that when fitted to a chimney or flue of an fireplace used to burn solid fuel, the product restricts the airflow into or out the chimney or flue; and (b) is designed to be installed on a temporary or seasonal basis; and (c) is covered by a warranty against defects for a period of at least 2 years from the date of installation; and (d) is not a chimney or flue balloon.	15G
15H	15H	None	Installing a category 15H product (not being the reinstalling of a category 15H product): (a) in accordance with the manufacturer's instruction; and (b) so that the product covers the ceiling outlet of a ducted evaporative cooling system, the product restricts airflow from inside the residential premises into the evaporative cooling ductwork and (c) that is supplied for installation with instructions regarding: (i) the installation and removal of	A product that: (a) is designed so that when installed to cover the ceiling outlet of a ducted evaporative cooling system, the product restricts airflow from inside the residential premises into the evaporative cooling ductwork; and (b) is designed to be installed on a temporary or seasonal basis; and (c) is covered by a warranty against defects for a period at least 2 years from the date of installation; and	15H

Note: Final upgrade must ensure air change rate at the premises is equal to or more than 0.5 and the premises must comply with Part 3.8.5 of the BCA<sup>24</sup>

Product category number	Scenario number	Decommissioning requirements <sup>25</sup>	Installation requirements <sup>26</sup>	Product to be installed <sup>27</sup>	Historical schedule number
			(ii) the product; and the time of year that product should be installed and removed.	(d) is supplied for installation with instructions regarding: (i) the installation and removal of the product (ii) the time of year that the product should be installed and removed.	

## Specified Minimum Energy Efficiency

There are no additional requirements that must be met by the product installed.

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

Note: For this activity, if multiple scenarios are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades.

### Scenario 15A: Door sealing upgrade

The GHG equivalent emissions reduction for each scenario is given by Equation 15.1, using the variables listed in Table 15.2.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

#### Equation 15.1 – GHG equivalent emissions reduction calculation for Scenario 15A

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 15.2 – GHG equivalent emissions reduction variables for Scenario 15A**

Input type	Condition	Input value
GHG Savings	In every instance	$3.15 \times 10^{-2} + (2.66 \times 10^{-2} \times EEF)$
Lifetime	Product warranty of at least 2 years, but less than 5 years	5.00
	Product warranty of at least 5 years	10.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.05
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.30
	For upgrades in Regional Victoria – Climatic region Mild	0.84
	For upgrades in Regional Victoria – Climatic region Cold	1.33
	For upgrades in Regional Victoria – Climatic region Hot	0.63

### Scenario 15B: Window sealing upgrade

The GHG equivalent emissions reduction for each scenario is given by Equation 15.2, using the variables listed in Table 15.3.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

**Equation 15.2 – GHG equivalent emissions reduction calculation for Scenario 15B**

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor} \times Area$$

**Table 15.3 – GHG equivalent emissions reduction variables for Scenario 15B**

Input type	Condition	Input value
GHG Savings	In every instance	$1.47 \times 10^{-3} + (1.16 \times 10^{-3} \times EEF)$
Lifetime	Product warranty of at least 2 years, but less than 5 years	5.00
	Product warranty of at least 5 years	10.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.05
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.30
	For upgrades in Regional Victoria – Climatic region Mild	0.84
	For upgrades in Regional Victoria – Climatic region Cold	1.33
	For upgrades in Regional Victoria – Climatic region Hot	0.63
Area	In every instance	The area of window in m <sup>2</sup>

## Scenario 15C: Ceiling or wall exhaust fan upgrade

The GHG equivalent emissions reduction for each scenario is given by Equation 15.3, using the variables listed in Table 15.4.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

**Equation 15.3 – GHG equivalent emissions reduction calculation for Scenario 15C**

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor}$$

**Table 15.4 – GHG equivalent emissions reduction variables for Scenario 15C**

Input type	Condition	Input value
GHG Savings	In every instance	$5.04 \times 10^{-2} + (3.87 \times 10^{-2} \times EEF)$
Lifetime	Product warranty of at least 2 years, but less than 5 years	5.00
	Product warranty of at least 5 years	10.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.05
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.30
	For upgrades in Regional Victoria – Climatic region Mild	0.84
	For upgrades in Regional Victoria – Climatic region Cold	1.33
	For upgrades in Regional Victoria – Climatic region Hot	0.63

## Scenario 15D: Damper, flap and filter upgrade

The GHG equivalent emissions reduction for each scenario is given by Equation 15.4, using the variables listed in Table 15.5.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

**Equation 15.4 – GHG equivalent emissions reduction calculation for Scenario 15D**

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor}$$



**Table 15.5 – GHG equivalent emissions reduction variables for Scenario 15D**

Input type	Condition	Input value
GHG Savings	In every instance	$9.63 \times 10^{-2} + (7.42 \times 10^{-2} \times EEF)$
Lifetime	Product warranty of at least 2 years, but less than 5 years	5.00
	Product warranty of at least 5 years	10.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.05
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.30
	For upgrades in Regional Victoria – Climatic region Mild	0.84
	For upgrades in Regional Victoria – Climatic region Cold	1.33
	For upgrades in Regional Victoria – Climatic region Hot	0.63

### Scenario 15E: Robust non-shrinking sealing material upgrade

The GHG equivalent emissions reduction for each scenario is given by Equation 15.5, using the variables listed in Table 15.6Table 15.3.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

**Equation 15.5 – GHG equivalent emissions reduction calculation for Scenario 15E**

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor}$$

**Table 15.6 – GHG equivalent emissions reduction variables for Scenario 15E**

Input type	Condition	Input value
GHG Savings	In every instance	$1.27 \times 10^{-2} + (9.91 \times 10^{-3} \times EEF)$
Lifetime	Product warranty of at least 2 years, but less than 5 years	5.00
	Product warranty of at least 5 years	10.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.05
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.30
	For upgrades in Regional Victoria – Climatic region Mild	0.84
	For upgrades in Regional Victoria – Climatic region Cold	1.33
	For upgrades in Regional Victoria – Climatic region Hot	0.63

## Scenario 15F: Permanent chimney sealing upgrade

The GHG equivalent emissions reduction for each scenario is given by Equation 15.6, using the variables listed in Table 15.7.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

**Equation 15.6 – GHG equivalent emissions reduction calculation for Scenario 15F**

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor}$$

**Table 15.7 – GHG equivalent emissions reduction variables for Scenario 15F**

Input type	Condition	Input value
GHG Savings	In every instance	$2.83 \times 10^{-1} + (2.19 \times 10^{-1} \times EEF)$
Lifetime	In every instance	10.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.05
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.30
	For upgrades in Regional Victoria – Climatic region Mild	0.84
	For upgrades in Regional Victoria – Climatic region Cold	1.33
	For upgrades in Regional Victoria – Climatic region Hot	0.63

## Scenario 15G: Temporary chimney sealing upgrade

The GHG equivalent emissions reduction for each scenario is given by Equation 15.7, using the variables listed in Table 15.8.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

**Equation 15.7 – GHG equivalent emissions reduction calculation for Scenario 15G**

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times Lifetime \times Regional \text{ Factor}$$

**Table 15.8 – GHG equivalent emissions reduction variables for Scenario 15G**

Input type	Condition	Input value
GHG Savings	In every instance	$2.83 \times 10^{-1} + (2.19 \times 10^{-1} \times EEF)$
Lifetime	In every instance	5.00

Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.05
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.30
	For upgrades in Regional Victoria – Climatic region Mild	0.84
	For upgrades in Regional Victoria – Climatic region Cold	1.33
	For upgrades in Regional Victoria – Climatic region Hot	0.63

### Scenario 15H: Ceiling outlet sealing upgrade

The GHG equivalent emissions reduction for each scenario is given by Equation 15.8, using the variables listed in Table 15.9.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

#### Equation 15.8 – GHG equivalent emissions reduction calculation for Scenario 15H

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} GHG \text{ Savings} \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 15.9 – GHG equivalent emissions reduction variables for Scenario 15H**

Input type	Condition	Input value
GHG Savings	In every instance	$1.31 \times 10^{-2} + (9.85 \times 10^{-3} \times EEF)$
Lifetime	Product warranty of at least 2 years, but less than 5 years	5.00
	Product warranty of at least 5 years	10.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region Mild	1.05
	For upgrades in Metropolitan Victoria – Climatic region Cold	1.88
	For upgrades in Regional Victoria – Climatic region Mild	0.84
	For upgrades in Regional Victoria – Climatic region Cold	1.93
	For upgrades in Regional Victoria – Climatic region Hot	0.55

\*\*\*There is no Part 16 Activity.

# 17. Part 17 Activity– Low flow shower rose

## Activity description (Guidance)

Part 17 of Schedule 2 of the Regulations prescribes the upgrade of a shower rose as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 17.1 lists the types of shower rose products that may replace inefficient shower roses. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

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 17.1 – Eligible shower rose scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>28</sup>	Product to be installed <sup>29</sup>	Historical schedule number
17A	17A	A shower rose with a flow rate above 9 L/min.	A shower rose complying with the requirements of AS/NZS 3662 that achieves a minimum star rating as specified in Table 17.2 below when assessed, registered and labelled in accordance with AS/NZS 6400.	17A

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 17.2.

**Table 17.2 – Additional requirements for shower roses to be installed**

Product category number	Requirement type	Efficiency requirement <sup>30</sup>
17A	Minimum star rating	3 stars and a flow rate of range E, determined in accordance with AS/NZS 6400

## Other specified matters

None.

<sup>28</sup> The authoritative decommissioning requirements are contained in Part 17 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>29</sup> The authoritative product requirements are contained in Part 17 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>30</sup> The Secretary is empowered to specify these efficiency requirements under Part 17 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

**Scenario 17A: A shower rose with a flow rate above 9 L/min replaced with a low flow shower rose**

The GHG equivalent emissions reduction for each scenario is given by Equation 17.1, using the variables listed in Table 17.3.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

### Equation 17.1 – GHG equivalent emissions reduction calculation for Scenario 17A

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} (\text{Baseline} - \text{Upgrade}) \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 17.3 – GHG equivalent emissions reduction variables for Scenario 17A**

Input Type	Condition	Input Value
Baseline	In every instance	$9.78 \times 10^{-2} + (0.223 \times EEF)$
Upgrade	In every instance	$6.99 \times 10^{-2} + (0.159 \times EEF)$
Lifetime	In every instance	15.00
Regional Factor	If the product is installed in Metropolitan Victoria	0.92
	If the product is installed in Regional Victoria	1.21

\*\*\*There is no Part 18, Part 19, Part 20 or Part 21 Activities.

## 22. Part 22 Activity– High efficiency refrigerators and freezers

### Activity description (Guidance)

Part 22 of Schedule 2 of the Regulations prescribes the upgrade of refrigerator and freezers as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 22.1 lists the types of refrigerators and freezers that can be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify that there are other refrigerators and freezers that reduce GHG equivalent emissions when installed. In such a case, product requirements and installation requirements for emerging technology will be specified as scenario number 22E.

Products installed must be listed on the GEMS Register at the time of installation.

**Table 22.1 – Eligible high efficiency refrigerator and freezer scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>31</sup>	Historical schedule number
22A	22A	None	A single door refrigerator that achieves the minimum performance requirement for a category 22A product specified in Table 22.2 below.	22A
22B	22B	None	A two-door refrigerator that achieves the minimum performance requirement for a category 22B product specified in Table 22.2 below.	22B
22C	22C	None	A chest freezer that achieves the minimum performance requirement for a category 22C product specified in Table 22.2 below.	22C
22D	22D	None	An upright freezer that achieves the minimum performance requirement for a category 22D product specified in Table 22.2 below.	22D

### Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 22.2.

**Table 22.2 – Additional requirements for refrigerators and freezers to be installed**

Product category number	Requirement type	Efficiency requirement <sup>32</sup>
22A	Minimum performance requirement	<ul style="list-style-type: none"> <li>Group 1 refrigerator as defined by Greenhouse and Energy Minimum Standards (Household Refrigerating Appliances) Determination 2012 (Cth)</li> <li>total storage volume of not less than 100 litres and not more than 700 litres (as defined by AS/NZS 4474.1:2007)</li> <li>Star rating index of 2.5, determined in accordance with AS/NZS 4474.2.</li> </ul>

<sup>31</sup> The authoritative product requirements are contained in Part 22 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>32</sup> The Secretary is empowered to specify these efficiency requirements under Part 3 of Schedule 2 to the Regulations.

22B	Minimum performance requirement	<ul style="list-style-type: none"> <li>Group 4, 5B, 5S or 5T refrigerator as defined by Greenhouse and Energy Minimum Standards (Household Refrigerating Appliances) Determination 2012 (Cth)</li> <li>total storage volume of not less than 100 litres and not more than 700 litres (as defined by AS/NZS 4474.1:2007)</li> <li>Star rating index of 3.5, determined in accordance with AS/NZS 4474.2.</li> </ul>
22C	Minimum performance requirement	<ul style="list-style-type: none"> <li>Group 6C product as defined by Greenhouse and Energy Minimum Standards (Household Refrigerating Appliances) Determination 2012 (Cth)</li> <li>total storage volume of not less than 100 litres and not more than 700 litres (as defined by AS/NZS 4474.1:2007)</li> <li>Star rating index of 3.5, determined in accordance with AS/NZS 4474.2.</li> </ul>
22D	Minimum performance requirement	<ul style="list-style-type: none"> <li>Group 6U or 7 product as defined by Greenhouse and Energy Minimum Standards (Household Refrigerating Appliances) Determination 2012 (Cth)</li> <li>total storage volume of not less than 100 litres and not more than 700 litres (as defined by AS/NZS 4474.1:2007)</li> <li>Star rating index of 3.0, determined in accordance with AS/NZS 4474.2.</li> </ul>

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

### Scenario 22A: Installing a single door refrigerator

The GHG equivalent emissions reduction for each scenario is given by Equation 22.1, using the variables listed in Table 22.3.

#### Equation 22.1 – GHG equivalent emissions reduction calculation for Scenario 22A

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

Table 22.3 – GHG equivalent emissions reduction variables for Scenario 22A

Input Type	Condition	Input Value
Baseline	In every instance	$(200 + 4 \times V_{ff}^{0.67}) \times 5.86 \times 10^{-4}$
Upgrade	In every instance	$CEC \times 8.50 \times 10^{-4}$
Lifetime	In every instance	17.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04



## Scenario 22B: Installing a two-door refrigerator

The GHG equivalent emissions reduction for each scenario is given by Equation 22.2, using the variables listed in Table 22.4.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

**Equation 22.2 – GHG equivalent emissions reduction calculation for Scenario 22B**

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} (\text{Baseline} - \text{Upgrade}) \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 22.4 – GHG equivalent emissions reduction variables for Scenario 22B**

Input Type	Condition	Input Value
Baseline	In every instance	$\{150 + 8.8 \times [V_{ff} + (1.6 \times V_{fr})]^{0.67}\} \times 4.46 \times 10^{-4}$
Upgrade	In every instance	$CEC \times 8.50 \times 10^{-4}$
Lifetime	In every instance	17.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

## Scenario 22C: Installing a chest freezer

The GHG equivalent emissions reduction for each scenario is given by Equation 22.3, using the variables listed in Table 22.5.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

**Equation 22.3 – GHG equivalent emissions reduction calculation for Scenario 22C**

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} (\text{Baseline} - \text{Upgrade}) \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 22.5 – GHG equivalent emissions reduction variables for Scenario 22C**

Input Type	Condition	Input Value
Baseline	In every instance	$[150 + 7.5 \times (1.6 \times V_{fr})^{0.67}] \times 4.69 \times 10^{-4}$
Upgrade	In every instance	$CEC \times 8.50 \times 10^{-4}$
Lifetime	In every instance	21.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04



## Scenario 22D: Installing an upright freezer

The GHG equivalent emissions reduction for each scenario is given by Equation 22.4, using the variables listed in Table 22.6.

If multiple installations are carried out at the same site and within the same period, please be aware that the total GHG equivalent emissions equal the sum of the GHG equivalent emissions reductions for all upgrades of the same scenario type.

### Equation 22.4 – GHG equivalent emissions reduction calculation for Scenario 22D

$$GHG \text{ Eq. Reduction} = \sum_{\text{installation}} (\text{Baseline} - \text{Upgrade}) \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

Table 22.6 – GHG equivalent emissions reduction variables for Scenario 22D

Input Type	Condition	Input Value
Baseline	In every instance	$\left[150 + 7.5 \times (1.6 \times V_{fr})^{0.67}\right] \times 5.29 \times 10^{-4}$
Upgrade	In every instance	$CEC \times 8.50 \times 10^{-4}$
Lifetime	In every instance	21.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

\*\*\*There is no Part 23 Activity

## 24. Part 24 Activity– High efficiency televisions

### Activity description (Guidance)

Part 24 of Schedule 2 of the Regulations prescribes the upgrade of a high efficiency television as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 24.1 lists the types of televisions that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

Products installed must be listed on the GEMS Register at the time of installation.

**Table 24.1 – Eligible high efficiency television scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>33</sup>	Historical schedule number
24A	24A	None	A television that achieves the minimum performance requirement specified in Table 24.2 below.	24A

### Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 24.2.

**Table 24.2 – Additional requirements for televisions to be installed**

Product category number	Requirement type	Efficiency requirement <sup>34</sup>
24A	Minimum performance requirement	a. Star rating of 7 stars b. CEC on the energy rating label of not more than 300 kWh/y. Measurement, testings and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Television) Determination 2013 (No.2)

### Other specified matters

None.

<sup>33</sup> The authoritative product requirements are contained in Part 24 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>34</sup> The Secretary is empowered to specify these efficiency requirements under in Part 24 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

### Scenario 24A: Installing a high efficiency television

The GHG equivalent emissions reduction for each scenario is given by Equation 24.1, using the variables listed in Table 24.3.

#### Equation 24.1 – GHG equivalent emissions reduction calculation for Scenario 24A

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 24.3 – GHG equivalent emissions reduction variables for Scenario 24A**

Measurement, testings and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Television) Determination 2013 (No.2)		
Input Type	Condition	Input Value
Baseline	In every instance	$[65.4080 + (0.09344 \times SA)] \times 1.8 \times 10^{-4}$
Upgrade	In every instance	$CEC \times 5.50 \times 10^{-4}$
Lifetime	In every instance	16.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04



# 25. Part 25 Activity– Energy efficient (low greenhouse intensity) clothes dryers

## Activity description (Guidance)

Part 25 of Schedule 2 of the Regulations prescribes the upgrade of clothes dryers as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 25.1 lists the types of clothes dryers that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify requirements for additional clothes dryers that may be installed as a prescribed activity under Part 25 of Schedule 2 of the Regulations, which will be listed as scenario number 25B once specified.

Products installed must be listed on the GEMS Register at the time of installation.

**Table 25.1 – Eligible clothes dryer scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>35</sup>	Historical schedule number
25A	25A	None	An electric clothes dryer that: <ul style="list-style-type: none"> <li>a. achieves the minimum performance requirement specified in Table 25.2 below; and</li> <li>b. is not part of a combination washer or dryer.</li> </ul>	25A

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 25.2.

**Table 25.2 – Additional requirements for clothes dryers to be installed**

Product category number	Requirement type	Efficiency requirement <sup>36</sup>
25A	Minimum performance requirement	<ul style="list-style-type: none"> <li>a. Registered for energy labelling</li> <li>b. Star rating of 7 stars</li> </ul> Measurement, testings and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Rotary Clothes Dryers) Determination 2015

## Other specified matters

None.

<sup>35</sup> The authoritative decommissioning requirements are contained in Part 25 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>36</sup> The Secretary is empowered to specify these efficiency requirements under Part 25 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

### Scenario 25A: Installing an energy efficiency clothes dryer

The GHG equivalent emissions reduction for each scenario is given by Equation 25.1, using the variables listed in Table 25.3.

#### Equation 25.1 – GHG equivalent emissions reduction calculation for Scenario 25A

$$\text{GHG Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times \text{EEF} \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 25.3 – GHG equivalent emissions reduction variables for Scenario 25A**

Measurement, testings and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Rotary Clothes Dryers) Determination 2015		
Input Type	Condition	Input Value
Baseline	In every instance	$R \times 2.14 \times 10^{-2}$
Upgrade	In every instance	$CEC \times 5.19 \times 10^{-4}$
Lifetime	In every instance	12.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04



## 26. Part 26 Activity– High efficiency pool pumps

### Activity description (Guidance)

Part 26 of Schedule 2 of the Regulations prescribes the upgrade of pool pumps as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 26.1 lists the types of pool pumps that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify requirements for other types of pool pumps that may be installed as a prescribed activity under Part 25 of Schedule of the Regulations, which will be listed as scenario number 26B 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 26.1 – Eligible pool pump scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>37</sup>	Historical schedule number
26A	26A	None	<p>A product for use with a domestic pool or spa that:</p> <ul style="list-style-type: none"> <li>a. is single phase, single speed, dual speed, multiple speed, or variable speed pump unit; and</li> <li>b. has an input power of not less than 100W and not more than 2500W when tested in accordance with AS 5102.1; and</li> <li>c. is listed as part of a labelling scheme determined in accordance with the Equipment Energy Efficiency (E3) Committee’s Voluntary Energy Rating Labelling Program for Swimming Pool Pump-units: Rules for Participation, amended in November 2010, and achieves the specified minimum star rating set out in Table 26.2 when determined in accordance with AS 5102.2; or</li> <li>d. is registered for energy labelling and achieves the minimum star rating specified in Table 26.2 when determined in accordance with AS 5102.2.</li> </ul>	26A

### Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 26.2.

**Table 26.2 – Additional requirements for pool pumps to be installed**

Product category number	Requirement type	Efficiency requirement <sup>38</sup>
26A	Minimum star rating	7 stars, determined in accordance with AS 5102.2

<sup>37</sup> The authoritative product requirements are contained in Part 26 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>38</sup> The Secretary is empowered to specify these efficiency requirements under Part 26 of Schedule 2 to the Regulations.

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

Scenario 25A: Installing a high efficiency pool or spa pump

The GHG equivalent emissions reduction for each scenario is given by Equation 26.1, using the variables listed in Table 26.3.

### Equation 26.1 – GHG equivalent emissions reduction calculation for Scenario 26A

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

Table 26.3 – GHG equivalent emissions reduction variables for Scenario 26A

Measurement, testings and ratings must be in accordance with AS 5102.2		
Input Type	Condition	Input Value
Baseline	In every instance	1.16
Upgrade	In every instance	$PAEC \times 1 \times 10^{-3}$
Lifetime	In every instance	7.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04



## 27. Part 27 Activity– Public lighting upgrade

### Activity description (Guidance)

Part 27 of Schedule 2 of the Regulations prescribes the upgrade of public lighting as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 27.1 lists the types of lighting products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

VEECs cannot be created for this activity unless products installed under scenario 27A and 27B are listed on the ESC Register by the time VEECs are created or on the AEMO NEM load table by the time products are installed. 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 27.1 – Eligible public lighting scenarios**

Product category number	Scenario number	Decommissioning or removal requirements <sup>39</sup>	Product / installation requirements <sup>40</sup>	Historical schedule number
27A	27A	None*	A lighting control device, other than a voltage reduction unit, that is certified by the manufacturer as appropriate for use with the type of luminaire it will be required to control	34B
27B	27B	Decommissioning any removed lighting equipment	Any other lighting equipment that: <ol style="list-style-type: none"> <li>Meets the minimum standards determined for the product by the ESC under regulation 36(6) when tested by an approved laboratory in accordance with the laboratory test approved for the equipment by the ESC in determination under that regulation; and</li> <li>is not a T5 adaptor.</li> </ol> A category 27B product must be installed so that it meets the minimum power factor determined for the product by the ESC under regulation 36(6).	34D
N/A	27C	Removing and not replacing: <ol style="list-style-type: none"> <li>a LED integrated luminaire, or</li> <li>the lamp and control gear associated with a non-integrated luminaire.</li> </ol>	None	Regulation 6(2)(d) and 6(3)(d)

\* It is not envisaged that lighting equipment would be removed as part of this scenario, but if it is, it is required to be decommissioned.

<sup>39</sup> The authoritative decommissioning and removal requirements are contained in Part 27 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>40</sup> The authoritative product and installation requirements are contained in Part 27 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.



## Specified Minimum Energy Efficiency

There are no additional requirements that must be met by the product installed.

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

### Scenario 27A to 27C: Public Lighting Upgrades

The GHG equivalent emissions reduction for each scenario is given by Equation 27.1, using the variables listed in Table 27.2.

#### Equation 27.1 – GHG equivalent emissions reduction calculation for Scenarios 27A to 27C

$$GHG \text{ Eq. Reduction} = (Baseline - Upgrade) \times Lifetime \times Regional \text{ Factor}$$

Table 27.2 – GHG equivalent emissions reduction variables for Scenarios 27A to 27C

Input Type	Condition	Input Value
Baseline	In every instance	Given by Equation 27.2, using variables listed in Table 27.3
Upgrade	In every instance	Equation 27.3, using variables listed in Table 27.4
Lifetime	In every instance	Equation 27.4 using variables listed in Table 27.5
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

#### Equation 27.2 – Baseline calculation for all public lighting upgrades

$$Baseline = \sum_{\text{each incumbent light source}} LCP \times CM \times EEF$$

Table 27.3 – Baseline calculation variables for all public lighting upgrades

Input Type	Condition	Input Value
LCP	If the Victorian load is listed*	The Victorian load (W)*
	If the Victorian load is not listed*	The nominal device rating (W)*
	If the Victorian load or nominal device rating is not listed*	The value determined by Table 27.6 for the relevant incumbent light source
	If the Victorian load or nominal device rating is not listed and the light source is not in Table 27.6	The value determined by the ESC for that type of incumbent light source

CM (or 'control multiplier')	In every instance	As determined by Table 27.7
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\*Regulation 15(3) of the Regulations incorporates the latest version of the AEMO Load Table, on which these inputs will be listed.

#### Equation 27.3 – Upgrade calculation for all public lighting upgrades

$$Upgrade = \sum_{\text{each upgrade light source}} LCP \times CM \times EEF$$

**Table 27.4 – Upgrade calculation variables for all public lighting upgrades**

Input Type	Condition	Input Value
LCP	If the Victorian load is listed*	The Victorian load (W)*
	If the Victorian load is not listed*	The nominal device rating (W)*
	If the Victorian load or nominal device rating is not listed*	The value determined by Table 27.6 for the relevant incumbent light source
	If the Victorian load or nominal device rating is not listed and the light source is not in Table 27.6	The value determined by the ESC for that type of incumbent light source
CM (or 'control multiplier')	In every instance	As determined by Table 27.7

\*\* Regulation 15(3) of the Regulations incorporates the latest version of the AEMO Load Table, on which these inputs will be listed

#### Equation 27.4 – Lifetime calculation for all public lighting upgrades

$$Lifetime = Asset Lifetime \times Annual Operating Hours \times 10^{-6}$$

**Table 27.5 – Lifetime calculation variables for all public lighting upgrades**

Input Type	Condition	Input Value
Asset Lifetime	In every instance	As determined by Table 27.8
Annual Operating Hours	In every instance	As determined by Table 27.8

## Additional variables for determining GHG reduction

**Table 27.6 – Lamp circuit power (LCP) calculations for baseline and upgrade calculations for public lighting upgrades**

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
T8 or T12 linear fluorescent or circular fluorescent lamp with ballast (EEL of A or electronic with no EEL marked)	NLP	NLP

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
T8 or T12 linear fluorescent or circular fluorescent lamp with ballast (EEI of > B or magnetic with no EEI marked)	NLP + 6	NLP + 6
T5 linear fluorescent lamp with T5 adaptor and magnetic ballast***	NLP x 0.94 + 1.78	N/A
T5 linear fluorescent or circular fluorescent lamp with ballast	NLP x 1.08 + 1.5	NLP x 1.08 + 1.5
Compact fluorescent lamp with non-integral ballast (EEI of A or electronic with no EEI marked)	NLP + 1	NLP + 1
Compact fluorescent lamp with non-integral ballast (EEI > B or magnetic ballast with no EEI marked)	NLP + 5	NLP + 5
Compact fluorescent lamp with integral ballast	NLP	NLP
Tungsten incandescent or halogen lamp (mains voltage)	NLP x 0.7	NLP
Tungsten incandescent or halogen lamp with ELC	NLP (being no greater than 37 watts) x 1.163	NLP x 1.163
Metal halide lamp with magnetic ballast	NLP x 1.058 + 18	NLP x 1.058 + 18
Metal halide lamp with electronic ballast	NLP x 1.096 + 0.9	NLP x 1.096 + 0.9
High pressure sodium lamp with magnetic ballast	NLP x 1.051 + 13	NLP x 1.051 + 13
LED lamp with integrated driver with no associated legacy ballast connected	NLP	NLP
Non-integrated LED lamp with remote driver or ELC	NLP x 1.1	NLP x 1.1
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of A or electronic ballast with no EEI marked	NLP	NLP
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of > B or magnetic ballast with no EEI marked	NLP + 6	NLP + 6
LED lamp with integrated driver, connected with a legacy ballast used for a T5 linear or circular fluorescent lamp	NLP x 1.08 + 1.5	NLP x 1.08 + 1.5
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with EEI of A or electronic ballast with no EEI marked	NLP + 1	NLP + 1
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with an EEI of >B or a magnetic ballast with no EEI marked	NLP + 5	NLP + 5
LED integrated luminaire	NLP	NLP
Non-integrated LED luminaire with remote driver	NLP x 1.1	NLP x 1.1
LED lamp with integrated driver, connected with a legacy magnetic ballast used for HID lamps	1.033 x NLP + 11	1.033 x NLP + 11
LED lamp with integrated driver, connected with a legacy electronic ballast used for HID lamps	1.096 x NLP + 0.9	1.096 x NLP + 0.9
Induction lamp with integrated ballast	NLP	NLP
Induction lamp with non-integrated ballast	NLP x 1.056	NLP x 1.056
Other	As determined by the ESC	As determined by the ESC

\*\*\* T5 adaptors as a light source are not an eligible type of upgrade lighting equipment for this activity.

**Table 27.7 – CM (or ‘control multiplier’) values for baseline and upgrade calculations for public lighting upgrades, depending on the number and types of lighting control devices (LCDs)**

Number of LCDs	Type(s) of LCDs	Control multiplier
None	N/A	1
One	Occupancy sensor that controls 1 to 2 luminaires	0.55
	Occupancy sensor that controls 3 to 6 luminaires	0.70
	Occupancy sensor that controls more than 6 luminaires	0.90
	Programmable dimmer	0.85
More than one	A combination of one occupancy sensor that controls 1 to 2 luminaires, and any other LCD(s)	0.40 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs
	A combination of one occupancy sensor that controls 3 to 6 luminaires, and any other LCD(s)	0.50 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs
	Any LCDs, except occupancy sensors that control 1 to 6 luminaires	0.60 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs

**Table 27.8 – Asset lifetime for lifetime calculations for public lighting upgrades**

Condition met by Lighting Upgrade	Asset lifetime (years)
Luminaire replacement: the existing luminaire is replaced	10.00
Lighting control device: a lighting control device is installed, and no lighting equipment of any other type is installed in the space	5.00
Luminaire decommissioning: the lamp is removed and not replaced, and either the luminaire or all legacy control gear is removed from the site or from the electrical circuit so that it does not draw any power	10.00

**Table 27.9 – Annual operating hours for public lighting upgrades**

Type of area	Annual operating hours (per year)
Road, other than the replacement or installation of traffic signals	4500
A public or outdoor space that is not a sports field	4500



## 28. Part 28 Activity– Gas heating ductwork

### Activity description (Guidance)

Part 28 of Schedule 2 of the Regulations prescribes the upgrade of gas heating ductwork as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 28.1 lists the eligible products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

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 28.1 – Eligible gas heating ductwork scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>41</sup>	Product / installation requirements <sup>42</sup>	Historical schedule number
28A	28A	Gas heating ductwork that is connected to a ducted gas heater	Flexible ductwork that: <ol style="list-style-type: none"> <li>a. is tested and certified by an approved laboratory as complying with AS 4254.1 and is labelled in accordance with that Standard; and</li> <li>b. is insulated using bulk insulation that is certified by an accredited body or an approved laboratory as complying with AS/NZS 4859.1 and achieves the specified minimum R-value for that ductwork set out in Table 28.2 below when measured in accordance with that Standard.</li> <li>c. is constructed and installed in accordance with the requirements set out in AS 4254.1 and uses fittings that               <ol style="list-style-type: none"> <li>i. for a building classified as a Class 1 or 10 building under Part A6 of Volume One of the Building Code, achieve at least the R-value specified by Table 3.12.5.2 of Volume Two of the Building Code; and</li> <li>ii. for a building classified as a Class 2 to 9 building under Part A6 of Volume 1 of the Building Code, achieve the minimum total R-value specified by Specification J5.2b of Volume One of the Building Code.</li> </ol> </li> </ol>	28A
28B	28B	Gas heating ductwork that is connected to a ducted gas heater	Rigid ductwork that: <ol style="list-style-type: none"> <li>a. is tested and certified by an approved laboratory as complying with AS 4254.2; and</li> <li>b. is insulated using bulk insulation that is certified by an accredited body or approved laboratory as complying with AS/NZS 4859.1 and achieves the specified minimum R-value set out in Table 28.2 for that ductwork when measured in accordance with AS/NZS 4859.7; and</li> </ol>	28A

<sup>41</sup> The authoritative decommissioning requirements are contained in Part 28 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>42</sup> The authoritative product and installation requirements are contained in Part 12 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

- 
- c. is longitudinally labelled at intervals of not more than 1.5 meters, in characters that are clearly legible and at least 18mm high stating:
    - i. the duct manufacturer's or assembler's name; and
    - ii. the diameter of the duct core; and
    - iii. the R-value of the bulk insulation; and
    - iv. whether the ductwork complies with AS 4254.2; and
  - d. is constructed and installed in accordance with the requirements set out in AS 4254.2 and uses fittings that:
    - i. for a building classified as a Class 1 or 10 building under Part A6 of Volume One of the Building Code, achieve at least the R-value specified by Table 3.12.5.2 of Volume Two of the Building Code; and
    - ii. for a building classified as a Class 2 to 9 building under Part A6 of Volume 1 of the Building Code, achieve the minimum total R-value specified by Specification J5.2b of Volume One of the Building Code.
- 

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 28.2.

**Table 28.2 – Additional requirements for ductwork to be installed**

Product category number	Requirement type	Efficiency requirement <sup>43</sup>
28A	Minimum R-value	1.5, determined in accordance with AS/NZS 4859.1
28B	Minimum R-value	1.5, determined in accordance with AS/NZS 4859.1

## Other Specified matters

None.

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<sup>43</sup> The Secretary is empowered to specify these efficiency requirements under Part 28 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

### Scenario 27A and 28B: Retrofitting gas ductwork with flexible or rigid ductwork

The GHG equivalent emissions reduction for each scenario is given by Equation 28.1, using the variables listed in Table 28.3.

#### Equation 28.1 – GHG equivalent emissions reduction calculation for Scenarios 28A and 28B

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 28.3 – GHG equivalent emissions reduction variables for Scenarios 28A and 28B**

Measurements of thermal output (or capacity) of the heater must be in accordance with AS/NZS 5263.1.6		
Small upgrade: ductwork connected to heater with thermal output (or capacity) of at least 10 and not more than 18 kW		
Medium upgrade: ductwork connected to heater with thermal output (or capacity) over 18 and not more than 28 kW		
Large upgrade: ductwork connected to heater with thermal output (or capacity) of more than 28 kW		
Unknown upgrade: ductwork connected to heater with unknown thermal output (or capacity)		
Input Type	Condition	Input Value
Baseline	Small upgrade	$2.59 + (0.26 \times EEF)$
	Medium upgrade	$3.27 + (0.33 \times EEF)$
	Large upgrade	$4.13 + (0.42 \times EEF)$
	Unknown upgrade	$2.59 + (0.26 \times EEF)$
Upgrade	Small upgrade	$2.04 + (0.20 \times EEF)$
	Medium upgrade	$2.57 + (0.26 \times EEF)$
	Large upgrade	$3.24 + (0.33 \times EEF)$
	Unknown upgrade	$2.04 + (0.20 \times EEF)$
Lifetime	In every instance	14.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild	1.00
	For upgrades in Metropolitan Victoria – Climatic region cold	1.62
	For upgrades in Regional Victoria – Climatic region mild	1.01
	For upgrades in Regional Victoria – Climatic region cold	1.63
	For upgrades in Regional Victoria – Climatic region hot	0.70

\*\*\*There is no Part 29 Activity

## 30. Part 30 Activity– In-home display unit

### Activity description (Guidance)

Part 30 of Schedule 2 of the Regulations prescribes the upgrade of an in-home display unit as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 30.1 lists the types of in-home display units that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify requirements for other products that may be installed as a prescribed activity under Part 30 of Schedule 2 to the Regulations, which will be listed as Scenario 30C 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 30.1 – Eligible in-home display unit scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>44</sup>	Historical schedule number
30A	30A	None	<p>An in-home display unit that when installed in relation to an AMI metering installation in residential premises provides information on the total electricity consumption of the residential premises directly to the consumer, and complies with the ZigBee Smart Energy Profile Specification<sup>45</sup> and the ZigBee Smart Energy Standard version 1.2<sup>46</sup>, and when tested<sup>47</sup>:</p> <ol style="list-style-type: none"> <li>a. determines electricity consumption information from the sensing apparatus at least every 30 seconds; and</li> <li>b. stores electricity energy consumption information from the previous 45 days; and</li> <li>c. displays to the consumer (or relays to a device that displays to the consumer) in a numerical format, and in a non-numerical format in a manner that allows the consumer to easily distinguish between low and high consumption the: <ol style="list-style-type: none"> <li>i. electricity energy consumption information from the previous 45 days in intervals no longer than one hour per day of information displayed and one day per week of information displayed</li> <li>ii. average total household electrical power consumption (in Watts) for the displayed period, which must be updated at least every 30 seconds</li> <li>iii. total household electricity energy consumption (in kWh) for the displayed</li> </ol> </li> </ol>	30A

<sup>44</sup> The authoritative product requirements are contained in Part 30 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>45</sup> Published by Zigbee Standards Organization on 1 December 2008.

<sup>46</sup> Published by the ZigBee Standards Organization on 3 December 2014.

<sup>47</sup> Tested by an approved laboratory in accordance with the laboratory test approved for that display unit by the ESC in a determination under regulation 36(6).



Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>44</sup>	Historical schedule number
			<p>period and the cost of that consumption, which must be updated at least every 30 seconds</p> <ul style="list-style-type: none"> <li>d. displays to the consumer (or relays to a device that does this) the tariff (in cost per unit of energy consumed) and the total cost of electricity consumed for the period displayed; and</li> <li>e. can permanently erase all consumption and tariff information held by the product including information entered by the consumer</li> <li>f. has an average electric power consumption of not more than 0.6 Watts when operating under normal circumstances</li> <li>g. if battery powered, uses a battery that has a manufacturer's rated lifetime of at least 5 years when operating under normal circumstances.</li> </ul>	
30B	30B	None	<p>An in-home display unit that when installed in relation to any sensing apparatus in residential premises provides information on the total electricity consumption of the residential premises directly to the consumer, and when tested<sup>48</sup>:</p> <ul style="list-style-type: none"> <li>a. determines electricity consumption information from the sensing apparatus at least every 30 seconds; and</li> <li>b. stores electricity energy consumption information from the previous 45 days; and</li> <li>c. displays to the consumer (or relays to a device that displays to the consumer) in a numerical format, and in a non-numerical format that allows the consumer to easily distinguish between low and high consumption the: <ul style="list-style-type: none"> <li>i. electricity energy consumption information from the previous 45 days in intervals no longer than one hour per day of information displayed and one day per week of information displayed; and</li> <li>ii. the average total household electrical power consumption (in Watts) for the displayed period, which must be updated at least every 30 seconds; and</li> <li>iii. the total household electricity energy consumption (in kWh) for the displayed period and the cost of that consumption, which must be updated at least every 30 seconds; and</li> </ul> </li> <li>d. displays to the consumer (or relays to a device that does this) the tariff (in cost per unit of energy consumed) and the total cost of electricity consumed, for the period displayed;</li> </ul>	30B

<sup>48</sup> By an approved laboratory in accordance with the laboratory test approved for that display unit by the ESC in a determination under regulation 36(6) for the purposes of this item.

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>44</sup>	Historical schedule number
			<ul style="list-style-type: none"> <li>e. can permanently erase all consumption and tariff information held by the product including information entered by the consumer; and</li> <li>f. has an average electric power consumption of not more than 0.6 Watts when operating under normal circumstances ; and</li> <li>g. provides electricity energy consumption information that is accurate to within 5% of actual electricity consumption; and</li> <li>h. if battery powered, uses a battery that has a manufacturer’s rated lifetime of at least 5 years when operating under normal circumstances; and</li> <li>i. uses, for its communications with the sensing apparatus and any display device, an encrypted communication protocol that is approved by the ESC.<sup>49</sup></li> </ul>	

## Specified Minimum Energy Efficiency

There are no additional requirements that must be met by the product installed.

## Other Specified matters

None.

<sup>49</sup> In a determination made under regulation 36(6).

## Method for Determining GHG Equivalent Reduction

### Scenario 30A and 30B: Installing an in-home display unit

The GHG equivalent emissions reduction for each scenario is given by Equation 30.1, using the variables listed in Table 30.2.

#### Equation 30.1 – GHG equivalent emissions reduction calculation for Scenarios 30A and 30B

$$GHG \text{ Eq. Reduction} = \text{Electricity Savings} \times EEF \times Lifetime \times Regional \text{ Factor}$$

Table 30.2 – GHG equivalent emissions reduction variables for Scenarios 30A and 30B

Input Type	Condition	Input Value
Electricity Savings	For upgrades in a gas-reticulated area	0.39
	For upgrades in a non-gas reticulated area	0.51
Lifetime	In every instance	5.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04



# 31. Part 31 Activity– High efficiency motor

## Activity description (Guidance)

Part 31 of Schedule 2 of the Regulations prescribes the upgrade of motors as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 31.1 lists the types of motors which may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify requirements for another motor or motors that may be installed in accordance with the Secretary’s specifications as a prescribed activity under Part 31 of Schedule 2 to the Regulations, which will be listed by the department as scenario number 31C once specified.

VEECs cannot be created for this activity unless products installed with the category number 31B or 31C 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. Products installed with product category number 31A must be listed on the GEMS Register at the time of installation.

**Table 31.1 – Eligible high efficiency motor upgrade scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>50</sup>	Historical schedule number
31A	31A	None	A three-phase cage induction motor that: <ul style="list-style-type: none"> <li>a. achieves the minimum performance requirement specified table 31.2; and</li> <li>b. has 2,4,6 or 8 poles.</li> </ul>	31A
31B	31B	None	A three-phase cage induction motor that: <ul style="list-style-type: none"> <li>a. has a rated output, as determined in accordance with AS 60034.1-2009 as published on 15 July 2009 of not less than 0.75 and not more than 185 kW; and</li> <li>b. meets the requirements for an IE4 (super-premium) efficiency level motor proposed in Annex A of IEC/TS 60034-31 when tested in accordance with IEC 60034-2-1; and</li> <li>c. has 2,4 or 6 poles.</li> </ul>	31B

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 31.2.

<sup>50</sup> The authoritative product requirements are contained in Part 31 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

**Table 31.2 – Additional requirements for motors to be installed**

Product category number	Requirement type	Efficiency requirements
31A	Minimum performance requirement	<ul style="list-style-type: none"> <li>a. GEMS registration</li> <li>b. A rated output of not less than 0.75 and not more than 185 kW in accordance with AS 60034.1</li> <li>c. Labelled as a high efficiency motor</li> <li>d. Measurement, testings and ratings must be in accordance with the <i>Greenhouse and Energy Minimum Standards (Three Phase Cage Induction Motors) Determination 2012</i> unless otherwise stated</li> </ul>
31B	Not Applicable	No additional requirements

## Other Specified matters

None.

## Method for Determining GHG Equivalent Reduction

Scenario 31A: High Efficiency MEPS listed motor installation

The GHG equivalent emissions reduction for each scenario is given by Equation 31.1, using the variables listed in Table 31.3.

**Equation 31.1 – GHG equivalent emissions reduction calculation for Scenarios 31A**

$$GHG \text{ Eq. Reduction} = \text{Electricity Savings} \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 31.3 – GHG equivalent emissions reduction variables for Scenarios 31A**

Measurement, testings and ratings must be in accordance with AS 60034.1		
Input Type	Condition	Input Value
Electricity Savings	Minimum rated output of 0.75 kW	$2.58 \times 10^{-2}$
	Minimum rated output of 1.1 kW	$3.33 \times 10^{-2}$
	Minimum rated output of 1.5 kW	$4.07 \times 10^{-2}$
	Minimum rated output of 2.2 kW	$5.28 \times 10^{-2}$
	Minimum rated output of 3 kW	$7.11 \times 10^{-2}$
	Minimum rated output of 4 kW	$8.65 \times 10^{-2}$
	Minimum rated output of 5.5 kW	$1.08 \times 10^{-1}$
	Minimum rated output of 7.5 kW	$1.32 \times 10^{-1}$
	Minimum rated output of 11 kW	$1.85 \times 10^{-1}$
	Minimum rated output of 15 kW	$2.29 \times 10^{-1}$
	Minimum rated output of 18.5 kW	$2.63 \times 10^{-1}$

	Minimum rated output of 22 kW	$2.95 \times 10^{-1}$
	Minimum rated output of 30 kW	$3.70 \times 10^{-1}$
	Minimum rated output of 37 kW	$4.16 \times 10^{-1}$
	Minimum rated output of 45 kW	$5.70 \times 10^{-1}$
	Minimum rated output of 55 kW	$6.56 \times 10^{-1}$
	Minimum rated output of 75 kW	$8.12 \times 10^{-1}$
	Minimum rated output of 90 kW	$8.69 \times 10^{-1}$
	Minimum rated output of 110 kW	1.20
	Minimum rated output of 132 kW	1.31
	Minimum rated output of 150 kW	1.40
	Minimum rated output of 185 kW	1.73
Lifetime	Minimum rated output of 0.75 kW	12.00
	Minimum rated output of 1.1 kW	
	Minimum rated output of 1.5 kW	
	Minimum rated output of 2.2 kW	
	Minimum rated output of 3 kW	15.00
	Minimum rated output of 4 kW	
	Minimum rated output of 5.5 kW	
	Minimum rated output of 7.5 kW	
	Minimum rated output of 11 kW	20.00
	Minimum rated output of 15 kW	
	Minimum rated output of 18.5 kW	
	Minimum rated output of 22 kW	
	Minimum rated output of 30 kW	
	Minimum rated output of 37 kW	
	Minimum rated output of 45 kW	22.00
	Minimum rated output of 55 kW	
	Minimum rated output of 75 kW	
	Minimum rated output of 90 kW	
	Minimum rated output of 110 kW	25.00
	Minimum rated output of 132 kW	
Minimum rated output of 150 kW		
Minimum rated output of 185 kW		
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04



## Scenario 31B: Installation of super-premium motors

The GHG equivalent emissions reduction for each scenario is given by Equation 31.2, using the variables listed in Table 31.4.

### Equation 31.2 – GHG equivalent emissions reduction calculation for Scenarios 31B

$$GHG \text{ Eq. Reduction} = \text{Electricity Savings} \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 31.4 – GHG equivalent emissions reduction variables for Scenarios 31B**

Measurement, testings and ratings must be in accordance with AS 60034.1		
Input Type	Condition	Input Value
Electricity Savings (MWh)	Minimum rated output of 0.75 kW	$4.67 \times 10^{-2}$
	Minimum rated output of 1.1 kW	$6.11 \times 10^{-2}$
	Minimum rated output of 1.5 kW	$7.42 \times 10^{-2}$
	Minimum rated output of 2.2 kW	$9.94 \times 10^{-2}$
	Minimum rated output of 3 kW	$1.35 \times 10^{-1}$
	Minimum rated output of 4 kW	$1.60 \times 10^{-1}$
	Minimum rated output of 5.5 kW	$2.14 \times 10^{-1}$
	Minimum rated output of 7.5 kW	$2.66 \times 10^{-1}$
	Minimum rated output of 11 kW	$3.96 \times 10^{-1}$
	Minimum rated output of 15 kW	$4.69 \times 10^{-1}$
	Minimum rated output of 18.5 kW	$5.42 \times 10^{-1}$
	Minimum rated output of 22 kW	$6.31 \times 10^{-1}$
	Minimum rated output of 30 kW	$7.23 \times 10^{-1}$
	Minimum rated output of 37 kW	$8.10 \times 10^{-1}$
	Minimum rated output of 45 kW	1.10
	Minimum rated output of 55 kW	1.27
	Minimum rated output of 75 kW	1.38
	Minimum rated output of 90 kW	1.47
	Minimum rated output of 110 kW	1.80
	Minimum rated output of 132 kW	1.84
Minimum rated output of 150 kW	1.90	
Minimum rated output of 185 kW	2.60	
Lifetime	Minimum rated output of 0.75 kW	12.00
	Minimum rated output of 1.1 kW	
	Minimum rated output of 1.5 kW	
	Minimum rated output of 2.2 kW	

	Minimum rated output of 3 kW	15.00
	Minimum rated output of 4 kW	
	Minimum rated output of 5.5 kW	
	Minimum rated output of 7.5 kW	
	Minimum rated output of 11 kW	20.00
	Minimum rated output of 15 kW	
	Minimum rated output of 18.5 kW	
	Minimum rated output of 22 kW	
	Minimum rated output of 30 kW	
	Minimum rated output of 37 kW	
	Minimum rated output of 45 kW	22.00
	Minimum rated output of 55 kW	
	Minimum rated output of 75 kW	
	Minimum rated output of 90 kW	
	Minimum rated output of 110 kW	25.00
	Minimum rated output of 132 kW	
	Minimum rated output of 150 kW	
	Minimum rated output of 185 kW	
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04





## 32. Part 32 Activity– Refrigerated cabinet

### Activity description (Guidance)

Part 32 of Schedule 2 of the Regulations prescribes the upgrade of a refrigerated cabinet as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 32.1 lists the types of refrigerated cabinet that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

Products installed must be listed on the GEMS Register at the time of installation.

**Scenario 32A expires end of day 30 June 2022.**

**Table 32.1 – Eligible refrigerated cabinet scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>51</sup>	Historical schedule number
32A	32A*	None	A refrigerated display cabinet (RDC)	32A
32A	32A(i)	None	A refrigerated display cabinet (RDC) or a gelato or ice-cream scooping cabinet	32A**
32A	32A(ii)	None	An ice cream freezer cabinet	-
32A	32A(iii)	None	A refrigerated storage cabinet (RSC)	-

\* Scenario 32A expires end of day 30 June 2022

\*\* This Scenario also now includes an expanded range of products

### Specified Minimum Energy Efficiency

The product installed must meet the requirements set out in Table 32.2.

**Table 32.2 - Additional requirements for refrigerated cabinets to be installed**

Scenario number	Requirement type	Efficiency requirement <sup>52</sup>
32A*	Minimum performance requirement	Achieves the high efficiency level within the meaning of <i>Greenhouse and Energy Minimum Standards (Refrigerated Display Cabinets) Determination 2012</i>
32A(i-iii)	Minimum performance requirement	Achieves an Energy Efficiency Index within the meaning of <i>Greenhouse and Energy Minimum Standards (Refrigerated Cabinets) Determination 2020</i> below the Upgrade Energy Efficiency Index (EEI) specified for the relevant product class in Table 32.4, Table 32.5 or Table 32.6.

\* Scenario 32A expires end of day 30 June 2022

### Other specified matters

None.

<sup>51</sup> The authoritative product requirements are contained in Part 32 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>52</sup> The Secretary is empowered to specify the minimum performance requirement under Part 32 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

Scenario 32A: Installing a refrigerated display cabinet – expires end of day 30 June 2022

The GHG equivalent emissions reduction for each scenario is given by Equation 32.2, using the variables listed in Table 32.4.

### Equation 32.1 – GHG equivalent emissions reduction calculation for Scenarios 32A

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times \text{Lifetime} \times \text{EEF} \times \text{Regional Factor} \times \text{TDA}$$

**Table 32.3 – GHG equivalent emissions reduction variables for Scenario 32A**

Measurement, testings and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Refrigerated Display Cabinets) Determination 2012		
Input Type	Condition	Input Value
Baseline	RS 1 – unlit shelves	3.67
	RS 1 – lit shelves	5.19
	RS 2 – unlit shelves	3.72
	RS 2 – lit shelves	4.96
	RS 3 – unlit shelves	4.34
	RS 3 – lit shelves	5.37
	RS 4 – glass door	2.84
	RS 6 – gravity coil	4.15
	RS 6 – fan coil	4.14
	RS 7 – fan coil	4.32
	RS 8 – gravity coil	3.58
	RS 8 – fan coil	3.85
	RS 9 – fan coil	3.53
	RS 10 – low	5.46
	RS 11	11.14
	RS 12	19.38
	RS 13 – solid sided	5.69
	RS 13 – glass sided	5.72
	RS 14 – solid sided	4.53
	RS 14 – glass sided	10.83
	RS 15 – glass door	10.83
RS 16 – glass door	11.85	
RS 18	14.20	
RS 19	10.56	
HC1	3.36	
HC4	4.53	
VC1	9.57	

	VC2	7.67
	VC4 – solid door	5.04
	VC4 – glass door	5.04
	HF4	7.74
	HF6	2.34
	VF4 – solid door	12.13
	VF4 – glass door	12.13
Upgrade	RS 1 – unlit shelves	2.45
	RS 1 – lit shelves	3.11
	RS 2 – unlit shelves	2.48
	RS 2 – lit shelves	3.31
	RS 3 – unlit shelves	3.02
	RS 3 – lit shelves	3.58
	RS 4 – glass door	1.98
	RS 6 – gravity coil	2.89
	RS 6 – fan coil	2.88
	RS 7 – fan coil	2.88
	RS 8 – gravity coil	2.49
	RS 8 – fan coil	2.68
	RS 9 – fan coil	2.36
	RS 10 – low	3.80
	RS 11	7.75
	RS 12	13.48
	RS 13 – solid sided	3.80
	RS 13 – glass sided	3.98
	RS 14 – solid sided	3.35
	RS 14 – glass sided	3.76
	RS 15 – glass door	8.01
	RS 16 – glass door	8.76
	RS 18	11.61
	RS 19	8.64
	HC1	2.48
	HC4	3.33
	VC1	7.04
	VC2	5.65
	VC4 – solid door	2.13
	VC4 – glass door	3.13
	HF4	5.70
	HF6	1.72
	VF4 – solid door	8.93

	VF4 – glass door	8.93
TDA		Total display area in m <sup>2</sup> of the installed item
Lifetime	In every instance	8.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04



Scenario 32A(i): Installing a refrigerated display cabinet or a gelato or ice-cream scooping cabinet

The GHG equivalent emissions reduction for each scenario is given by Equation 32.2, using the variables listed in Table 32.4.

Equation 32.2 – GHG equivalent emissions reduction calculation for Scenario 32A(i)

$$GHG \text{ Eq. Reduction} = \left( \frac{\text{Baseline} - \text{Upgrade}}{1000} \right) \times 365.24 \times \text{Lifetime} \times \text{Regional Factor} \times \text{EEF}$$

Table 32.4 – GHG equivalent emissions reduction variables for Scenarios 32A(i)

Measurement, testings and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Refrigerated Cabinets) Determination 2020								
Where –								
M and N are the coefficients for the cabinet’s product class, as given by Schedule 1 in the GEMS (Refrigerated Cabinets) Determination 2020.								
Input Type	Condition			Input Value				
Baseline	In all cases			$\text{Baseline EEI} \times \left( \frac{(M + (N \times TDA))}{100} \right)$				
Upgrade	In all cases			TEC				
Baseline EEI, M and N, Lifetime	GEMS 2020 Product class	GEMS 2020 Characteristics (code)	Upgrade EEI	Baseline EEI	M	N	Lifetime (years) (TDA<3.3m <sup>2</sup> )	Lifetime (years) (TDA≥3.3m <sup>2</sup> )
	Class 1	IRH	81	130	3.7	3.5	8	8
	Class 2	IFH	81	92	4.2	9.8	8	8
	Class 6	GSC or ISC	81	76	10.4	30.4	8	8
	Class 7	IRV	81	90	9.1	9.1	8	12
	Class 8	IFV	81	97	1.6	19.1	8	12
	Class 11	IRV-4	81	130	0.69	5.97	8	12
	Class 12	RRH	81	130	3.7	3.5	12	12
	Class 13	RFH	81	80	4.2	9.8	12	12
	Class 14	RRV or RRV-2	81	91	9.1	9.1	12	12
Class 15	RFV	81	106	1.6	19.1	12	12	
TDA	Total Display Area in m <sup>2</sup> of the installed product as recorded in the GEMS Registry							
TEC	Total Energy Consumption, in kWh/day, of the installed product as recorded in the GEMS Registry							
Regional Factor	For upgrades in Metropolitan Victoria			0.98				
	For upgrades in Regional Victoria			1.04				

## Scenario 32A(ii): Installing an ice cream freezer cabinet

The GHG equivalent emissions reduction for each scenario is given by Equation 32.3, using the variables listed in Table 32.5.

### Equation 32.3 – GHG equivalent emissions reduction calculation for Scenario 32A(ii)

$$GHG \text{ Eq. Reduction} = \left( \frac{\text{Baseline} - \text{Upgrade}}{1000} \right) \times 365.24 \times \text{Lifetime} \times \text{Regional Factor} \times \text{EEF}$$

Table 32.5 – GHG equivalent emissions reduction variables for Scenario 32A(ii)

<b>Measurement, testings and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Refrigerated Cabinets) Determination 2020</b>						
<b>Where –</b>						
M and N are the coefficients for the cabinet's product class, as given by Schedule 1 in the GEMS (Refrigerated Cabinets) Determination 2020.						
<b>Input Type</b>	<b>Condition</b>			<b>Input Value</b>		
Baseline	In all cases			$Baseline \text{ EEI} \times \left( \frac{(M + (N \times V_n))}{100} \right)$		
Upgrade	In all cases			TEC		
Baseline EEI, M and N, Lifetime	GEMS 2020 Product class	GEMS 2020 Characteristics (code)	Upgrade EEI	Baseline EEI	M	N
	Class 5	IFH-5	51	130	1	0.009
V <sub>n</sub>	Net Volume, in litres, of the installed product as recorded in the GEMS Registry					
TEC	Total Energy Consumption, in kWh/day, of the installed product as recorded in the GEMS Registry					
Lifetime	In all cases			8.00		
Regional Factor	For upgrades in Metropolitan Victoria			0.98		
	For upgrades in Regional Victoria			1.04		

## Scenario 32A(iii): Installing a refrigerated storage cabinet

The GHG equivalent emissions reduction for each scenario is given by Equation 32.4, using the variables listed in Table 32.6.

**Equation 32.4 – GHG equivalent emissions reduction calculation for Scenario 32A(iii)**

$$GHG \text{ Eq. Reduction} = \left( \frac{\text{Baseline} - \text{Upgrade}}{1000} \right) \times \text{Lifetime} \times \text{Regional Factor} \times \text{EEF}$$

**Table 32.6 – GHG equivalent emissions reduction variables for Scenario 32A(iii)**

<b>Measurement, testings and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Refrigerated Cabinets) Determination 2020</b>							
<b>Where –</b>							
M and N are the coefficients for the cabinet's product class, as given by Schedule 1 in the GEMS (Refrigerated Cabinets) Determination 2020.							
<b>Input Type</b>	<b>Condition</b>			<b>Input Value</b>			
Baseline	In all cases			$Baseline \text{ EEI} \times \left( \frac{N + (M \times Vn)}{100} \right)$			
Upgrade	In all cases			$TEC \times af \times 365.24$			
Baseline EEI, M and N, Lifetime	GEMS 2020 Product class	GEMS 2020 Characteristics (code)	Upgrade EEI	Baseline EEI		M	N
				Heavy Duty	Normal and Light Duty		
	Class 3	SRH	81	73	71	2.555	1,790
	Class 4	SFH	81	89	80	5.84	2,380
	Class 9	SRV	81	91	79	1.643	609
	Class 10	SFV	81	96	80	4.928	1,472
Vn	Net Volume, in litres, of the installed product as recorded in the GEMS Registry						
TEC	Total Energy Consumption, in kWh/day, of the installed product as recorded in the GEMS Registry						
af	Adjustment factor for refrigerated storage cabinets as determined by Table 32.7						
Lifetime	In all cases			8.00			
Regional Factor	For upgrades in Metropolitan Victoria			0.98			
	For upgrades in Regional Victoria			1.04			

**Table 32.7 – af input value for Scenario 32A(iii)**

<b>Input Type</b>	<b>Condition</b>	<b>Input Value</b>
af	Light Duty (LD) chiller	1.2
	Light Duty (LD) freezer	1.1
	Normal Duty (ND) chiller or freezer	1.0
	Heavy Duty (HD) chiller or freezer	1.0

## 33. Part 33 Activity– Refrigeration fan motor and ventilation fan motor

### Activity description (Guidance)

Part 33 of Schedule 2 of the Regulations prescribes the upgrade of fan motors used for refrigeration or ventilation as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 33.1 lists the types of fan motors that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify requirements for a fan motor or fan motors that may be installed in accordance with the Secretary's installation specifications as a prescribed activity under Part 33 of Schedule 2 to the Regulations, which will be listed as scenario number 33C 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 33.1 – Eligible fan motor scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>53</sup>	Historical schedule number
33A	33A	None	A fan motor, installed into a fan in a refrigerated cabinet or cold room, that: <ol style="list-style-type: none"> <li>a. is an electronically commutated motor (being a permanent magnet motor with electronic commutation) that has:               <ol style="list-style-type: none"> <li>i. in the case of an internal rotor motor, has a rated motor output of not more than 600 Watts; or</li> <li>ii. in the case of an external rotor motor, has a rated motor input of not more than 800 Watts; and</li> </ol> </li> <li>b. is designed to be installed into a fan in a refrigerated cabinet or cold room.</li> </ol>	33A
33B	33B	None	A fan motor, installed into a ducted fan or partition fan in an air-handling system as defined in ISO 13349:2010, that: <ol style="list-style-type: none"> <li>a. is an electronically commutated motor (being a permanent magnet motor with electronic commutation) that has:               <ol style="list-style-type: none"> <li>i. in the case of an internal rotor motor, has a rated motor output of not more than 600 Watts; or</li> <li>ii. in the case of an external rotor motor, has a rated motor input of not more than 800 Watts; and</li> </ol> </li> <li>b. is designed to be installed into a ducted fan or partition fan in an air-handling system as defined in ISO 13349:2010.</li> </ol>	33B

<sup>53</sup> The authoritative product and installation requirements are contained in Part 33 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document



## Specified Minimum Energy Efficiency

There are no additional requirements that must be met by the product installed.

## Other Specified matters

None.

## Method for Determining GHG Equivalent Reduction

Scenario 33A: Installing motored fans in refrigerated cabinet or cold room

The GHG equivalent emissions reduction for each scenario is given by Equation 33.1, using the variables listed in Table 33.2..

### Equation 33.1 – GHG equivalent emissions reduction calculation for Scenario 33A

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

Table 33.2 – GHG equivalent emissions reduction variables for Scenario 33A

Input Type	Condition	Input Value
Baseline*	In every instance	$4.38 \times 10^{-3} \times (NFIP \times 1.77 + 19.39) \times \left(1 + \frac{1}{COP}\right)$
Upgrade*	In every instance	$4.38 \times 10^{-3} \times NFIP \times \left(1 + \frac{1}{COP}\right)$
Lifetime	In every instance	7.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

\*The COP is determined from Table 33.3

Table 33.3 – Coefficient of performance (COP) values for Scenario 33A

Refrigerator type	COP
Refrigerated cabinet	2.80
Cold Rooms operating below 0oC (freezers)	1.80
Cold Rooms operating at or above 0oC	2.56



## Scenario 33B: Installing motored fans in an air-handling system

The GHG equivalent emissions reduction for each scenario is given by Equation 33.2, using the variables listed in Table 33.4

### Equation 33.2 – GHG equivalent emissions reduction calculation for Scenario 33B

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times EEF \times \text{Lifetime} \times \text{Regional Factor}$$

Table 33.4 – GHG equivalent emissions reduction variables for Scenario 33B

Input Type	Condition	Input Value
Baseline	In every instance	$4.38 \times 10^{-3} \times (NFIP \times 1.77 + 19.39)$
Upgrade	In every instance	$4.38 \times 10^{-3} \times NFIP$
Lifetime	In every instance	7.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

\*The COP is determined from Table 33.3



## 34. Part 34 Activity– Building based lighting upgrade

### Activity description (Guidance)

Part 34 of Schedule 2 of the Regulations prescribes the upgrade of building based lighting as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 34.1 lists the types of lighting products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

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 34.1 – Eligible building based lighting scenarios**

Product category number	Scenario number	Decommissioning or removal requirements <sup>54</sup>	Product to be installed and installation requirements <sup>55</sup>	Historical schedule number
34A	34A	None*	A lighting control device, other than a voltage reduction unit, that is certified by the manufacturer as appropriate for use with the type of luminaire it will control	34B
34B	34B	None*	A voltage reduction unit that: <ol style="list-style-type: none"> <li>has an alternating current output voltage ascertained by an approved laboratory in accordance with the laboratory test approved for the unit by the ESC<sup>56</sup>; and</li> <li>is not installed in conjunction with electronic ballasts or drivers, or LED lighting.</li> </ol>	34C
34C	34C		Any other lighting equipment that: <ol style="list-style-type: none"> <li>when installed, meets the minimum power factor determined by the ESC<sup>57</sup>;</li> <li>meets minimum standards determined by the ESC when tested by an approved laboratory in accordance with the laboratory test approved by the ESC<sup>58</sup>; and</li> <li>is not a T5 adaptor.</li> </ol>	34D
N/A	34D	Removing and not replacing not more than half the lamps from a luminaire that houses multiple lamps and decommissioning any associated control gear	None	Regulation 6(2)(d) and 6(3)(d)

<sup>54</sup> The authoritative decommissioning and removal requirements are contained in Part 34 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>55</sup> The authoritative product and installation requirements are contained in Part 34 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>56</sup> In a determination under regulation 36(6).

<sup>57</sup> In a determination under regulation 36(6).

<sup>58</sup> In a determination under regulation 36(6).

Product category number	Scenario number	Decommissioning or removal requirements <sup>54</sup>	Product to be installed and installation requirements <sup>55</sup>	Historical schedule number
N/A	34E	Removing and not replacing: <ul style="list-style-type: none"> <li>a. a LED integrated luminaire, or</li> <li>b. the lamp and control gear associated with a non-integrated luminaire</li> </ul>	None	Regulation 6(2)(d) and 6(3)(d)

\* It is not envisaged that lighting equipment would be removed as part of this scenario, but if it is, it is required to be decommissioned.

## Specified Minimum Energy Efficiency

There are no additional requirements that must be met by the product installed.

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

Scenario 34A to 34E: All building based lighting upgrades

The GHG equivalent emissions reduction for each scenario is given by Equation 34.1 Equation 33.1, using the variables listed in Table 34.2.

### Equation 34.1 – GHG equivalent emissions reduction calculation for Scenarios 34A to 34E

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 34.2 – GHG equivalent emissions reduction variables for Scenarios 34A to 34E**

Input Type	Condition	Input Value
Baseline	Upgrade is not part of a site refurbishment that is required to comply with Part J6 of the Building Code as amended from time to time	Given by Equation 34.2, using variables listed in Table 34.3
Upgrade	In every instance	Given by Equation 34.3, using variables listed in Table 34.4
Lifetime	In every instance	Given by Equation 34.4, using variables listed in Table 34.5
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

**Equation 34.2 – Baseline calculation at sites not required to comply with Part J6 of the Building Code**

$$Baseline = \sum_{\text{each incumbent light source}} LCP \times CM \times AM \times EEF$$

**Table 34.3 – Baseline calculation variables for sites not required to comply with Part J6 of the Building Code**

Input Type	Condition	Input Value
LCP	Light source is listed in Table 34.8	As determined by Table 34.8
CM (or 'control multiplier')	In every instance	As determined by Table 34.7
AM	For an upgrade in a space that is air conditioned	1.05
	For an upgrade in a space that is not air conditioned	1.00

**Equation 34.3 – Upgrade calculation at sites not required to comply with Part J6 of the Building Code**

$$Upgrade = \sum_{\text{each upgrade light source}} LCP \times CM \times AM \times EEF$$

**Table 34.4 – Upgrade calculation variables for sites not required to comply with Part J6 of the Building Code**

Input Type	Condition	Input Value
LCP	Light source is listed in Table 34.8	As determined by Table 34.8
	Light source is not listed in Table 34.8	The value determined by the ESC for that type of light source
CM (or 'control multiplier')	In every instance	As determined by Table 34.7
AM	For an upgrade in a space that is air conditioned	1.05
	For an upgrade in a space that is not air conditioned	1.00

**Equation 34.4 – Lifetime calculation at all sites**

$$Lifetime = Asset Lifetime \times Annual Operating Hours \times 10^{-6}$$

**Table 34.5 – Lifetime calculation variables for all sites**

Input Type	Condition	Input Value
Asset Lifetime	In every instance	As determined by Table 34.9
Annual Operating Hours	Activity is not part of refurbishment that is required to comply with Part J6 of the Building Code as amended from time to time	As determined by Table 34.10

## Additional variables for determining GHG reduction

**Table 34.6 – Annual operating hours for space types determined by reference to the building classification under the Building Code**

Type of space	Annual operating hours (per year)
A space in the common area of a building that is classified as Class 2 under Part A3 of the Building Code as amended from time to time	7000
A space in the common area of a building that is classified as Class 3 under Part A3 of the Building Code as amended from time to time	7000
A space in a building that is classified as Class 3 under Part A3 of the Building Code as amended from time to time (other than a space in the common area of the building)	3000
A space in a building that is classified as Class 5 under Part A3 of the Building Code as amended from time to time	3000
A space in a building that is classified as Class 6 under Part A3 of the Building Code as amended from time to time	5000
A space in an open air car park that is classified as Class 7a under Part A3 of the Building Code as amended from time to time	4500
A space in a car park (other than an open air car park) that is classified as Class 7a under Part A3 of the Building Code as amended from time to time	7000
A space in a building that is classified as Class 7b under Part A3 of the Building Code as amended from time to time	5000
A space in a laboratory or building that is classified as Class 8 under Part A3 of the Building Code as amended from time to time and that is also classified as Division C in the Australian and New Zealand Standard Industrial Classification issued on 26 June 2013	5000
A space in a laboratory or building that is classified as Class 8 under Part A3 of the Building Code as amended from time to time and that is not classified as Division C in the Australian and New Zealand Standard Industrial Classification issued on 26 June 2013	3000
A space in a building that is classified as Class 9a under Part A3 of the Building Code as amended from time to time	6000
A space in a building that is classified as Class 9b under Part A3 of the Building Code as amended from time to time	2000
A space in a building that is classified as Class 9c under Part A3 of the Building Code as amended from time to time	6000
A space in a building that is classified as Class 10a under Part A3 of the Building Code as amended from time to time	1000
A space in a structure that is classified as Class 10b under Part A3 of the Building Code as amended from time to time	1000

**Table 34.7 – CM (or ‘control multiplier’) values for baseline and upgrade calculations at all sites, depending on the number and types of lighting control devices (LCDs)**

Number of LCDs	Types(s) of LCDs	Control multiplier
None	N/A	1.00
One	Occupancy sensor that controls 1 to 2 luminaires	0.55
	Occupancy sensor that controls 3 to 6 luminaires	0.70
	Occupancy sensor that controls more than 6 luminaires	0.90
	Daylight-linked control	0.70
	Programmable dimmer	0.85
	Manual dimmer	0.90
	Voltage reduction unit	$V^2 \div 240^2$ , where $V$ , is the output voltage of the voltage reduction unit
More than one	A combination of one occupancy sensor that controls 1 to 2 luminaires, and any other LCD(s)	0.4 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs
	A combination of one occupancy sensor that controls 3 to 6 luminaires, and any other LCD(s)	0.5 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs
	Any LCDs, except occupancy sensors that control 1 to 6 luminaires	0.6 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs

**Table 34.8 – Lamp circuit power (LCP) calculations for baseline and upgrade calculations at sites not required to comply with Part J6 of the Building Code**

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
T8 or T12 linear fluorescent or circular fluorescent lamp with ballast (EEI of A or electronic with no EEI marked)	NLP	NLP
T8 or T12 linear fluorescent or circular fluorescent lamp with ballast (EEI of > B or magnetic with no EEI marked)	NLP + 6	NLP + 6
T5 linear fluorescent lamp with T5 adaptor and magnetic ballast	$NLP \times 0.94 + 1.78$	N/A
T5 linear fluorescent or circular fluorescent lamp with ballast	$NLP \times 1.08 + 1.5$	$NLP \times 1.08 + 1.5$
Compact fluorescent lamp with non-integral ballast (EEI of A or electronic with no EEI marked)	NLP + 1	NLP + 1
Compact fluorescent lamp with non-integral ballast (EEI > B or magnetic ballast with no EEI marked)	NLP + 5	NLP + 5
LED lamp with integrated driver with no associated legacy ballast connected	NLP**	NLP
Non-integrated LED lamp with remote driver or ELC	$NLP \times 1.1^{**}$	$NLP \times 1.1$
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of A or electronic ballast with no EEI marked	NLP**	NLP
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of > B or magnetic ballast with no EEI marked	NLP + 6**	NLP + 6

LED lamp with integrated driver, connected with a legacy ballast used for a T5 linear or circular fluorescent lamp	$NLP \times 1.08 + 1.5^{**}$	$NLP \times 1.08 + 1.5$
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with EEI of A or electronic ballast with no EEI marked	$NLP + 1^{**}$	$NLP + 1$
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with an EEI of >B or a magnetic ballast with no EEI marked	$NLP + 5^{**}$	$NLP + 5$
LED integrated luminaire	$NLP^{**}$	$NLP$
Non-integrated LED luminaire with remote driver	$NLP \times 1.1^{**}$	$NLP \times 1.1$
LED lamp with integrated driver, connected with a legacy magnetic ballast used for HID lamps	$1.033 \times NLP + 11^{**}$	$1.033 \times NLP + 11$
LED lamp with integrated driver, connected with a legacy electronic ballast used for HID lamps	$1.096 \times NLP + 0.9^{**}$	$1.096 \times NLP + 0.9$

\* T5 adaptors as a light source are not an eligible type of upgrade lighting equipment for this activity.

\*\* The lamp circuit power values for incumbent LED products are only eligible to be used for Scenario 34A.

**Table 34.9 – Asset lifetime for lifetime calculations at all sites**

Condition met by Lighting Upgrade	Asset lifetime (years)
Luminaire replacement: the existing luminaire is replaced	10.00
Modification: the incumbent lamp is replaced and all legacy control gear not essential for the operation of the upgrade lamp is either removed from the site or from the electrical circuit so that it does not draw any power	4.00
Retrofit: the incumbent lamp is replaced and any wiring or structure of the luminaire is kept intact, other than the removal, replacement or modification of the starter and the removal of the legacy capacitor	Lifetime for the upgrade lamp, determined in accordance with ESC's performance requirements (in hours and not exceeding 30,000 hours), divided by annual operating hours, to a maximum of 4 years
Delamping: the lamp is removed from a luminaire that houses multiple lamps, where no more than half of the lamps are removed; all legacy control gear not essential for the operation of remaining lamp(s) is either removed from the site or from the electrical circuit so that it does not draw any power	5.00
Lighting control device: a lighting control device is installed and no lighting equipment of any other type is installed in the space	5.00
Luminaire decommissioning: the lamp is removed and not replaced, and either the luminaire or all legacy control gear is removed from the site or from the electrical circuit so that it does not draw any power	10.00
In any other case	Manufacturer's rated lifetime (in hours and not exceeding 30,000 hours) for the incumbent lamp divided by annual operating hours, to a maximum of 4 years



**Table 34.10 - Annual operating hours at sites not required to comply with Part J6 of the Building Code**

Type of Space	Annual operating hours (per year)
Auditorium, church and public hall	2000
Board room and conference room	3000
Carpark—general (undercover) and carpark—entry zone (first 20 m of travel)	7000
Common rooms, spaces and corridors in a Class 2 building	7000
Control room, switch room and the like in a Class 2 building	As determined by Table 34.6
Corridors	As determined by Table 34.6
Courtroom	2000
Dormitory of a Class 3 building used for sleeping only or sleeping and study	3000
Health care – children’s ward and examination room, patient ward, all patient care areas including corridors where cyanosis lamps are used	6000
Kitchen and food preparation area	As determined by Table 34.6
Laboratory—artificially lit to an ambient level of 400 lx or more	3000
Library—stack and shelving area, reading room and general areas	3000
Lounge area for communal use in a Class 3 building or Class 9c aged care building	7000
Maintained emergency lighting	8500
Museum and gallery—circulation, cleaning and service lighting	2000
Office	3000
Plant room	As determined by Table 34.6
A space for the serving and consumption of food or drinks to the public that fall under Division H - Accommodation and food services as defined in the Australian and New Zealand Standard Industrial Classification <b>Note:</b> excludes all operations that fall under class 4513 (catering services)	5000
A space for the serving and consumption of food or drinks to the public that also fall under Division R – Arts and Recreation Services as defined in the Australian and New Zealand Standard Industrial Classification	2000
Retail space including a museum and gallery whose purpose is the sale of objects	5000
School—general purpose learning areas and tutorial rooms	3000
Sole-occupancy unit of a Class 3 building	3000
Sole-occupancy unit of a Class 9c aged care building	6000
Storage space or a wholesale storage and display area	As determined by Table 34.6
Service area, cleaner’s room and the like	As determined by Table 34.6
Toilet, locker room, staff room, rest room and the like	As determined by Table 34.6
Health and fitness centres and gymnasias operations, classified as Division R (9111) in the Australian and New Zealand Standard Industrial Classification <b>Note:</b> this only includes health and fitness centres and gymnasias operations that are membership based and whose membership’s primary purpose is to frequent these operations	5100
A space type that is not listed in Table 34.10	As determined by Table 34.6

# 35. Part 35 Activity– Non-building based lighting upgrade

## Activity description (Guidance)

Part 35 of Schedule 2 of the Regulations prescribes the upgrade of non-building based lighting as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 35.1 lists the types of lighting products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

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 35.1 – Eligible non-building based lighting scenarios**

Product category number	Scenario number	Decommissioning or removal requirements <sup>59</sup>	Product to be installed and installation requirements <sup>60</sup>	Historical schedule number
35A	35A	None*	A lighting control device, other than a voltage reduction unit, that is certified by the manufacturer as appropriate for use with the type of luminaire it will be required to control	34B
35B	35B	Decommissioning any removed lighting equipment	Any other lighting equipment that: <ol style="list-style-type: none"> <li>when installed, meets the minimum power factor determined by the ESC</li> <li>meets minimum standards determined by the ESC when tested by an approved laboratory in accordance with a laboratory test approved by the ESC<sup>61</sup></li> <li>is not a T5 adaptor.</li> </ol>	34D
N/A	35C	Removing no more than half the lamps from a luminaire that houses multiple lamps and decommissioning any associated control gear	None	Regulation 6(3)(d)
N/A	35D	Removing and not replacing: <ol style="list-style-type: none"> <li>a LED integrated luminaire, or</li> <li>the lamp and control gear associated with a non-integrated luminaire</li> </ol>	None	Regulation 6(3)(d)

\* It is not envisaged that lighting equipment would be removed as part of this scenario, but if it is, it is required to be decommissioned.

<sup>59</sup> The authoritative decommissioning and removal requirements are contained in Part 34 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>60</sup> The authoritative product and installation requirements are contained in Part 34 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>61</sup> In a determination under regulation 36(6).

## Specified Minimum Energy Efficiency

There are no additional requirements that must be met by the product installed.

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

### Scenario 35A to 35D: Non-building based lighting upgrades

The GHG equivalent emissions reduction for each scenario is given by Equation 35.1 Equation 33.1, using the variables listed in Table 35.2.

#### Equation 35.1 – GHG equivalent emissions reduction calculation for Scenarios 35A to 35D

$$GHG \text{ Eq. Reduction} = (Baseline - Upgrade) \times Lifetime \times Regional \text{ Factor}$$

**Table 35.2 – GHG equivalent emissions reduction variables for Scenarios 35A to 35D**

Input Type	Condition	Input Value
Baseline	In every instance	Given by Equation 35.2, using variables listed in Table 35.3
Upgrade	In every instance	Given by Equation 35.3, using variables listed in Table 35.4
Lifetime	In every instance	Given by Equation 35.4, using variables listed in Table 35.5
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

#### Equation 35.2 – Baseline calculation for all non-building based lighting upgrades

$$Baseline = \sum_{\text{each incumbent light source}} LCP \times CM \times EEF$$

**Table 35.3 – Baseline calculation variables for all non-building based lighting upgrades**

Input Type	Condition	Input Value
LCP	Light source is listed in Table 35.6	As determined by Table 35.6
	Light source is not listed in Table 35.6	The value determined by the ESC for that type of light source
CM	In every instance	As determined by Table 35.7

**Equation 35.3 – Upgrade calculation for all non-building based lighting upgrades**

$$Upgrade = \sum_{\text{each upgrade light source}} LCP \times CM \times EEF$$

**Table 35.4 – Upgrade calculation variables for all non-building based lighting upgrades**

Input Type	Condition	Input Value
LCP	Light source is listed in Table 35.6	As determined by Table 35.6
	Light source is not listed in Table 35.6	The value determined by the ESC for that type of light source
CM (or 'control modifier')	In every instance	As determined by Table 35.7

**Equation 35.4 – Lifetime calculation for all non-building based lighting upgrades**

$$Lifetime = Asset Lifetime \times Annual Operating Hours \times 10^{-6}$$

**Table 35.5 – Lifetime calculation variables for all non-building based lighting upgrades**

Input Type	Condition	Input Value
Asset Lifetime	In every instance	As determined by Table 35.8
Annual Operating Hours	In every instance	As determined by Table 35.9

## Additional variables for determining GHG reduction

**Table 35.6 – Lamp circuit power (LCP) calculations for baseline and upgrade calculations for non-building based lighting upgrades**

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
T8 or T12 linear fluorescent or circular fluorescent lamp with ballast (EEI of A or electronic with no EEI marked)	NLP	NLP
T8 or T12 linear fluorescent or circular fluorescent lamp with ballast (EEI of > B or magnetic with no EEI marked)	NLP + 6	NLP + 6
T5 linear fluorescent lamp with T5 adaptor and magnetic ballast*	NLP x 0.94 + 1.78	N/A
T5 linear fluorescent or circular fluorescent lamp with ballast	NLP x 1.08 + 1.5	NLP x 1.08 + 1.5
Compact fluorescent lamp with non-integral ballast (EEI of A or electronic with no EEI marked)	NLP + 1	NLP + 1
Compact fluorescent lamp with non-integral ballast (EEI > B or magnetic ballast with no EEI marked)	NLP + 5	NLP + 5
Compact fluorescent lamp with integral ballast	NLP	NLP
Tungsten incandescent or halogen lamp (mains voltage)	NLP x 0.7	NLP
Tungsten incandescent or halogen lamp with ELC	NLP (being no greater than 37 Watts) x 1.163	NLP x 1.163
Metal halide lamp with magnetic ballast	NLP x 1.058 + 18	NLP x 1.058 + 18
Metal halide lamp with electronic ballast	NLP x 1.096 + 0.9	NLP x 1.096 + 0.9

High pressure sodium lamp with magnetic ballast	$NLP \times 1.051 + 13$	$NLP \times 1.051 + 13$
LED lamp with integrated driver with no associated legacy ballast connected	NLP	NLP
Non-integrated LED lamp with remote driver or ELC	$NLP \times 1.1$	$NLP \times 1.1$
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of A or electronic ballast with no EEI marked	NLP	NLP
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of > B or magnetic ballast with no EEI marked	$NLP + 6$	$NLP + 6$
LED lamp with integrated driver, connected with a legacy ballast used for a T5 linear or circular fluorescent lamp	$NLP \times 1.08 + 1.5$	$NLP \times 1.08 + 1.5$
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with EEI of A or electronic ballast with no EEI marked	$NLP + 1$	$NLP + 1$
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with an EEI of >B or a magnetic ballast with no EEI marked	$NLP + 5$	$NLP + 5$
LED integrated luminaire	NLP	NLP
Non-integrated LED luminaire with remote driver	$NLP \times 1.1$	$NLP \times 1.1$
LED lamp with integrated driver, connected with a legacy magnetic ballast used for HID lamps	$1.033 \times NLP + 11$	$1.033 \times NLP + 11$
LED lamp with integrated driver, connected with a legacy electronic ballast used for HID lamps	$1.096 \times NLP + 0.9$	$1.096 \times NLP + 0.9$
Induction lamp with integrated ballast	NLP	NLP
Induction lamp with non-integrated ballast	$NLP \times 1.056$	$NLP \times 1.056$
Other	As determined by the ESC	As determined by the ESC

\* T5 adaptors as a light source are not an eligible type of upgrade lighting equipment for this activity.

**Table 35.7 – CM (or ‘control multiplier’) values for baseline and upgrade calculations for non-building based lighting upgrades, depending on the number and types of lighting control devices (LCDs)**

Number of LCDs	Types(s) of LCDs	Control multiplier
None	N/A	1.00
One	Occupancy sensor that controls 1 to 2 luminaires	0.55
	Occupancy sensor that controls 3 to 6 luminaires	0.70
	Occupancy sensor that controls more than 6 luminaires	0.90
	Programmable dimmer	0.85
More than one	A combination of one occupancy sensor that controls 1 to 2 luminaires, and any other LCD(s)	0.40 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs
	A combination of one occupancy sensor that controls 3 to 6 luminaires, and any other LCD(s)	0.50 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs
	Any LCDs, except occupancy sensors that control 1 to 6 luminaires	0.60 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs

**Table 35.8 – Asset lifetime for lifetime calculations for non-building based lighting upgrades**

Condition met by Lighting Upgrade	Asset lifetime (years)
Luminaire replacement: the existing luminaire is replaced	10.00
Modification: the incumbent lamp is replaced and all legacy control gear not essential for the operation of the upgrade lamp is either removed from the site or from the electrical circuit so that it does not draw any power	5.00
Retrofit: the incumbent lamp is replaced and any wiring or structure of the luminaire is kept intact, other than the removal, replacement or modification of the starter and the removal of the legacy capacitor	Lifetime for the upgrade lamp, determined in accordance with ESC's performance requirements (in hours and not exceeding 30,000 hours), divided by annual operating hours, to a maximum of 5 years
Delamping: the lamp is removed from a luminaire that houses multiple lamps, where no more than half of the lamps are removed; all legacy control gear not essential for the operation of remaining lamp(s) is either removed from the site or from the electrical circuit so that it does not draw any power	5.00
Lighting control device: a lighting control device is installed and no lighting equipment of any other type is installed in the space	5.00
Luminaire decommissioning: the lamp is removed and not replaced, and either the luminaire or all legacy control gear is removed from the site or from the electrical circuit so that it does not draw any power	10.00
In any other case	Manufacturer's rated lifetime (in hours and not exceeding 30,000 hours) for the incumbent lamp divided by annual operating hours, to a maximum of 5 years

**Table 35.9 – Annual operating hours for non-building based lighting upgrades**

Type of area	Annual operating hours (per year)
Road, other than the replacement or installation of traffic signals	4500
A public or outdoor space that is not a sports field	4500
In any other case	1000



## 36. Part 36 Activity– Water efficient pre-rinse spray valve

### Activity description (Guidance)

Part 36 of Schedule 2 of the Regulations prescribes the upgrade of tap equipment through the installation of a high efficiency pre-rinse spray valve as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 36.1 lists the eligible products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

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 36.1 – Eligible pre-rinse spray valve scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>62</sup>	Installation requirements <sup>63</sup>	Product to be installed <sup>64</sup>	Historical schedule number
36A	36A(i)	Decommissioning a pre-rinse spray valve that is not rated as having a 4 star or higher water efficiency when assessed and labelled in accordance with AS/NZS 6400	Installing the product in accordance with AS/NZS 3500 and the Plumbing Regulations 2008.	A pre-rinse spray valve that: <ol style="list-style-type: none"> <li>is rated as having a minimum star rating for water efficiency as specified in Table 36.2 below, when assessed and labelled in accordance with AS/NZ 6400; and</li> <li>is tap equipment that is determined to be a WELS product under the Water Efficiency Labelling and Standards Determination 2013 (No.2) made under sections 18, 19 and 26 of the Water Efficiency Labelling Standards Act 2005 of the Commonwealth.</li> </ol>	36A
	36A(ii)	None	On an existing fitting for a pre-rinse spray valve on which no existing pre-rinse spray valve has been installed, installing the product in accordance with AS/NZS 3500 and the Plumbing Regulations 2008.		

<sup>62</sup> The authoritative decommissioning requirements are contained in Part 36 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>63</sup> The authoritative installation requirements are contained in Part 36 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>64</sup> The authoritative product requirements are contained in Part 36 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 36.2

**Table 36.2 – Additional requirements for pre-rinse spray valve activities**

Product Category number	Requirement Type	Efficiency Requirement <sup>65</sup>
36A	Minimum star rating	6 stars, when assessed and labelled in accordance with AS/NZS 6400

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

Scenario 36A: Installing a WELS high efficiency pre-rinse spray valve

The GHG equivalent emissions reduction for each scenario is given by Equation 36.1 Equation 33.1, using the variables listed in Table 36.3.

**Equation 36.1 – GHG equivalent emissions reduction calculation for Scenarios 36A(i) and 36A(ii)**

$$GHG \text{ Eq. Reduction} = (\text{Baseline} - \text{Upgrade}) \times \text{Lifetime} \times \text{Regional Factor}$$

**Table 36.3 – GHG equivalent emissions reduction variables for Scenarios 36A(i) and 36A(ii)**

Input Type	Condition	Input Value
Baseline	In every instance	$0.53 + (1.21 \times EEF)$
Upgrade	In every instance	$0.24 + (0.54 \times EEF)$
Lifetime	In every instance	5.00
Regional Factor	For upgrades in Metropolitan Victoria	0.92
	For upgrades in Regional Victoria	1.21

<sup>65</sup> The Secretary is empowered to specify these efficiency requirements under Part 36 of Schedule 2 to the Regulations.



## 37. Part 37 Activity– Gas-fired steam boiler

### Activity description (Guidance)

Part 37 of Schedule 2 of the Regulations prescribes the upgrade of gas-fired steam boilers as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 37.1 lists the eligible products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

**Table 37.1 – Eligible steam boiler scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>66</sup>	Product to be installed <sup>67</sup>	Historical schedule number
37A	37A	Decommissioning one or more gas-fired steam boilers each of which was manufactured at least 10 years before the date it is decommissioned.	Installing one or more new gas-fired steam boilers each of which: <ul style="list-style-type: none"> <li>a. is a Type B appliance and meets the minimum thermal efficiency requirements specified in Table 37.2 below; and</li> <li>b. if the product has a nominal gas consumption:               <ul style="list-style-type: none"> <li>i. exceeding 3700 MJ/h but not exceeding 7500 MJ/h, has an electronic gas/air ratio control system; or</li> <li>ii. exceeding 7500 MJ/h, has an electronic gas/air ratio control system that receives a signal from a flue gas sensor for combustion trim purposes.</li> </ul> </li> </ul>	N/A

<sup>66</sup> The authoritative decommissioning requirements are contained in Part 37 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>67</sup> The authoritative product requirements are contained in Part 37 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 37.2

**Table 37.2 – Additional requirements for steam boiler activities**

Product Category number	Requirement Type	Efficiency Requirement <sup>68</sup>
37A	Minimum gross thermal efficiency requirements	<p>A product installed under this activity must meet at least one of the following criteria:</p> <ul style="list-style-type: none"><li>a. the product must have a gross thermal efficiency of at least 80% when at a firing rate with an output that is at least 100% but not more than 105% of the manufacturer's rated gross heat output as determined in accordance with:<ul style="list-style-type: none"><li>i. BS 845-2 (pre-commissioning); or</li><li>ii. BS 845-1 (post-commissioning); or</li><li>iii. another standard that is approved by the Essential Services Commission as being a standard that, in the reasonable opinion of the Essential Services Commission, is equivalent to BS 845-2 or BS 845-1; or</li></ul></li><li>b. the product must have a gross thermal efficiency that is certified as complying with the thermal efficiency requirements prescribed in Commission Regulation (EU) No 813/2013; or</li><li>c. the product must be a condensing boiler that has a gross thermal efficiency of at least 80% when at a firing rate with an output that is at least 100% of the manufacturer's rated gross heat output as demonstrated by the manufacturer's technical specification for that product.</li></ul>

### Other specified matters

None.

<sup>68</sup> The Secretary is empowered to specify these efficiency requirements under Part 37 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

### Scenario 37A: Upgrading to a high efficiency gas-fired steam boiler

The GHG equivalent emissions reduction for each scenario is given by Equation 37.1 Equation 33.1, using the variables listed in Table 37.3.

#### Equation 37.1 – GHG equivalent emissions reduction calculation for Scenario 37A

$$GHG \text{ Eq. Reduction} = Consumption \times DEI \times LUF \times 8760 \times Lifetime$$

Table 37.3 – GHG equivalent emissions reduction variables for Scenario 37A

Input Type	Condition		Input Value	
Consumption	In every instance		the lower of the total nominal gas consumption (MJ/h) of the replacement equipment or of the incumbent equipment;	
DEI	Year of manufacture of the incumbent boiler marked as 1989 or earlier, and the burner was installed over 10 years ago	New steam boiler has a gross thermal efficiency of 80% to less than 85%	$2.71 \times 10^{-6}$	
		New steam boiler has a gross thermal efficiency of 85% or greater	$5.47 \times 10^{-6}$	
	Year of manufacture of the incumbent boiler marked as 1989 or earlier, and the burner was installed up to and including 10 years ago	New steam boiler has a gross thermal efficiency of 80% to less than 85%	$2.22 \times 10^{-6}$	
		New steam boiler has a gross thermal efficiency of 85% or greater	$4.98 \times 10^{-6}$	
	Year of manufacture of the incumbent boiler marked as 1990 or later, and the burner was installed over 10 years ago	New steam boiler has a gross thermal efficiency of 80% to less than 85%	$2.49 \times 10^{-6}$	
		New steam boiler has a gross thermal efficiency of 85% or greater	$5.25 \times 10^{-6}$	
	Year of manufacture of the incumbent boiler marked as 1990 or later, and the burner was installed up to and including 10 years ago	New steam boiler has a gross thermal efficiency of 80% to less than 85%	$2.00 \times 10^{-6}$	
		New steam boiler has a gross thermal efficiency of 85% or greater	$4.76 \times 10^{-6}$	
	LUF	In every instance		0.206
	Lifetime	In every instance		20.00



## 38. Part 38 Activity– Gas-fired hot water boiler or gas-fired water heater

### Activity description (Guidance)

Part 38 of Schedule 2 of the Regulations prescribes the upgrade of hot water boilers and water heaters as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 38.1 lists the eligible products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

**Table 38.1 – Eligible hot water boiler and water heater scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>69</sup>	Product to be installed <sup>70</sup>	Historical schedule number
38A	38A(i)	Decommissioning one or more gas-fired steam boilers each of which was manufactured at least 10 years before the date it is decommissioned.	One or more new gas-fired hot water boilers or gas-fired water heaters each of which: <ol style="list-style-type: none"> <li>a. is a Type B appliance and meets the minimum thermal efficiency requirements specified in Table 38.2; and</li> <li>b. if the boiler has a nominal gas consumption:               <ol style="list-style-type: none"> <li>i. exceeding 3,700 MJ/h but not exceeding 7,500 MJ/h, has an electronic gas/air ratio control system; or</li> <li>ii. exceeding 7,500 MJ/h, has an electronic gas/air ratio control system that receives a signal from a flue gas sensor for combustion trim purposes.</li> </ol> </li> </ol>	N/A
	38A(ii)	Decommissioning one or more gas-fired hot water boilers each of which was manufactured at least 10 years before the date it is decommissioned.		
	38A(iii)	Decommissioning one or more gas-fired water heaters each of which was manufactured at least 10 years before the date it is decommissioned.		

### Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 38.2.

<sup>69</sup> The authoritative decommissioning requirements are contained in Part 38 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>70</sup> The authoritative product requirements are contained in Part 38 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document

**Table 38.2 – Additional requirements for hot water boiler and water heater activities**

Product Category number	Requirement Type	Efficiency Requirement <sup>71</sup>
38A	Minimum gross thermal efficiency requirements	<p>A product installed under this activity must meet at least one of the following criteria:</p> <ul style="list-style-type: none"> <li>a. the product must have a gross thermal efficiency of at least 80% when at a firing rate with an output that is at least 100% but not more than 105% of the manufacturer’s rated gross heat output as determined in accordance with: <ul style="list-style-type: none"> <li>i. BS 845-2 (pre-commissioning); or</li> <li>ii. BS 845-1 (post-commissioning); or</li> <li>iii. another standard that is approved by the Essential Services Commission as being a standard that, in the reasonable opinion of the Essential Services Commission, is equivalent to BS 845-2 or BS 845-1; or</li> </ul> </li> <li>b. the product must have a gross thermal efficiency that is certified as complying with the thermal efficiency requirements prescribed in Commission Regulation (EU) No 813/2013; or</li> <li>c. the product must be a condensing boiler that has a gross thermal efficiency of at least 80% when at a firing rate with an output that is at least 100% of the manufacturer’s rated gross heat output as demonstrated by the manufacturer’s technical specification for that product.</li> </ul>

### Other specified matters

None.

<sup>71</sup> The Secretary is empowered to specify these efficiency requirements under Part 38 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

Scenario 38A(i) to 38A(iii): Upgrading to a high efficiency gas-fired hot water boiler or heater

The GHG equivalent emissions reduction for each scenario is given by Equation 38.1 Equation 33.1, using the variables listed in Table 38.3.

**Equation 38.1 – GHG equivalent emissions reduction calculation for Scenarios 38A(i) to 38A(iii)**

$$GHG \text{ Eq. Reduction} = \text{Consumption} \times DEI \times LUF \times 8760 \times \text{Lifetime}$$

**Table 38.3 – GHG equivalent emissions reduction variables for Scenarios 38A(i) to 38A(iii)**

Input Type	Condition		Input Value
Consumption	In every instance		the lower of the total nominal gas consumption (MJ/h) of the replacement equipment or of the incumbent equipment
DEI	Year of manufacture of the incumbent boiler or heater marked as 1989 or earlier, and the burner was installed over 10 years ago	New hot water boiler or water heater has a gross thermal efficiency of 85% to less than 90%	$2.58 \times 10^{-6}$
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	$5.34 \times 10^{-6}$
	Year of manufacture of the incumbent boiler or heater marked as 1989 or earlier, and the burner was installed up to and including 10 years ago	New hot water boiler or water heater has a gross thermal efficiency of 85% to less than 90%	$2.06 \times 10^{-6}$
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	$4.82 \times 10^{-6}$
	Year of manufacture of the incumbent boiler or heater marked as 1990 or later, and the burner was installed over 10 years ago	New hot water boiler or water heater has a gross thermal efficiency of 85% to less than 90%	$2.29 \times 10^{-6}$
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	$5.06 \times 10^{-6}$
	Year of manufacture of the incumbent boiler or heater marked as 1990 or later, and the burner was installed up to and including 10 years ago	New hot water boiler or water heater has a gross thermal efficiency of 85% to less than 90%	$1.78 \times 10^{-6}$
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	$4.54 \times 10^{-6}$
	Hot water boiler or water heater to be installed is part of an air-conditioning system that services an area upgraded as part of upgrades refurbishment that is required to comply with Part 5.2d of the Building Code as amended from time to time	New hot water boiler or water heater has a gross thermal efficiency of 85% to less than 90%	$1.10 \times 10^{-6}$
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	$3.87 \times 10^{-6}$
LUF	In every instance		0.206
Lifetime	In every instance		20.00

# 39. Part 39 Activity– Electronic gas/air ratio control

## Activity description (Guidance)

Part 39 of Schedule 2 of the Regulations prescribes the upgrade of gas boilers through installing an electronic gas/air ratio control as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 39.1 lists the eligible products that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

**Table 39.1 – Eligible electronic gas/air ration control scenarios**

Product category number	Scenario number	Decommissioning requirements	Product / installation requirements <sup>72</sup>	Historical schedule number
39A	39A	None	Installing on the burner of a Type B appliance that is a gas-fired steam boiler, gas-fired hot water boiler or gas-fired water heater an electronic gas/air ratio control that is designed to be installed on a burner of a gas-fired stream boiler, gas-fired water boiler or gas-fired water heater that is a Type B appliance as part of the burner's gas/air ratio control system.	N/A

## Specified Minimum Energy Efficiency

There are no further requirements that must be specified for the installed product.

## Other specified matters

None.

<sup>72</sup> The authoritative product and installation requirements are contained in Part 39 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document

## Method for Determining GHG Equivalent Reduction

### Scenario 39A: Installing an electronic gas/air ratio control

The GHG equivalent emissions reduction for each scenario is given by Equation 39.1 Equation 33.1, using the variables listed in Table 39.2.

#### Equation 39.1 – GHG equivalent emissions reduction calculation for Scenario 39A

$$GHG \text{ Eq. Reduction} = Consumption \times DEI \times LUF \times 8760 \times Lifetime$$

Table 39.2 – GHG equivalent emissions reduction variables for Scenario 39A

Input Type	Condition	Input Value
Consumption	Nominal gas consumption of the boiler or heater on which the product is installed is less than 11,400 MJ/h	the nominal gas consumption (MJ/h) of that steam boiler, water boiler or water heater
	Nominal gas consumption of the boiler or heater on which the product is installed is at least 11,400 MJ/h	11,400
DEI	In every instance	$0.65 \times 10^{-6}$
LUF	In every instance	0.206
Lifetime	In every instance	20.00





# 40. Part 40 Activity– Combustion trim

## Activity description (Guidance)

Part 40 of Schedule 2 of the Regulations prescribes the upgrade of gas boilers through installing a combustion trim system in a gas/air ratio control system as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 40.1 lists the eligible products that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

**Table 40.1 – Eligible combustion trim scenarios**

Product category number	Scenario number	Decommissioning requirements	Product / installation requirements <sup>73</sup>	Historical schedule number
40A	40A	None	Installing on a gas fired steam boiler, a gas-fired hot water boiler or gas-fired water heater that is a Type B appliance and has an electronic gas/air ratio control system capable of receiving a signal from a flue gas sensor for combustion trim purposes, a combustion trim system that: <ul style="list-style-type: none"><li>a. includes a flue gas sensor connected to a control panel, capable of sending a signal to a control damper on the burner air supply or variable speed drive on the fan motor; and</li><li>b. is designed to be installed on a gas-fired steam boiler, gas fired water boiler or gas-fired water heater that has an electronic gas/air ratio control system capable of receiving a signal from a flue gas sensor for combustion trim purposes.</li></ul>	N/A

## Specified Minimum Energy Efficiency

There are no further requirements that must be specified for the installed product.

## Other specified matters

None.

<sup>73</sup> The authoritative product and installation requirements are contained in Part 41 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

## Method for Determining GHG Equivalent Reduction

### Scenario 40A: Installing a combustion trim system

The GHG equivalent emissions reduction for each scenario is given by Equation 40.1 Equation 33.1, using the variables listed in Table 40.2.

#### Equation 40.1 – GHG equivalent emissions reduction calculation for Scenario 40A

$$GHG \text{ Eq. Reduction} = Consumption \times DEI \times LUF \times 8760 \times Lifetime$$

**Table 40.2 – GHG equivalent emissions reduction variables for Scenario 40A**

Input Type	Condition	Input Value
Consumption	Nominal gas consumption of the boiler or heater on which the product is installed is less than 11,400 MJ/h	the nominal gas consumption (MJ/h) of that steam boiler, water boiler or water heater
	Nominal gas consumption of the boiler or heater on which the product is installed is at least 11,400 MJ/h	11,400
DEI	If the product is installed on a steam boiler	$0.80 \times 10^{-6}$
	If the product is installed on a hot water boiler or water heater	$0.70 \times 10^{-6}$
LUF	In every instance	0.206
Lifetime	In every instance	10.00



# 41. Part 41 Activity– Gas-fired burners

## Activity description (Guidance)

Part 41 of Schedule 2 of the Regulations prescribes the upgrade of gas-fired burners as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 41.1 lists the eligible products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

**Table 41.1 – Eligible burner scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>74</sup>	Product / installation requirements <sup>75</sup>	Historical schedule number
41A	41A	<p>A gas-fired burner that:</p> <ul style="list-style-type: none"> <li>a. is on a gas-fired steam boiler, a gas-fired hot water boiler or a gas-fired water heater; and</li> <li>b. was manufactured at least 10 years before the date is decommissioned.</li> </ul>	<p>Installing on a Type B appliance that is a gas-fired steam boiler, a gas-fired hot water boiler or a gas-fired water heater a product that:</p> <ul style="list-style-type: none"> <li>a. is a gas-fire burner; and</li> <li>b. if the product has a nominal gas consumption exceeding 3700 MJ/h, has an electronic gas/air ratio control system capable of receiving a signal from a flue gas sensor for gas/air ratio control purposes.</li> </ul>	N/A

## Specified Minimum Energy Efficiency

There are no further requirements that must be specified for the installed product.

## Other specified matters

None.

<sup>74</sup> The authoritative decommissioning requirements are contained in Part 41 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

<sup>75</sup> The authoritative decommissioning requirements are contained in Part 41 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

## Method for Determining GHG Equivalent Reduction

### Scenario 41A: Upgrading a gas-fired burner

The GHG equivalent emissions reduction for each scenario is given by Equation 41.1 using the variables listed in Table 41.2.

#### Equation 41.1 – GHG equivalent emissions reduction calculation for Scenario 41A

$$GHG \text{ Eq. Reduction} = Consumption \times DEI \times LUF \times 8760 \times Lifetime$$

**Table 41.2 – GHG equivalent emissions reduction variables for Scenario 41A**

Input Type	Condition	Input Value
Consumption	Nominal gas consumption of the boiler or heater on which the product is installed is less than 11,400 MJ/h	The lower of the nominal gas consumption (MJ/h) of: <ul style="list-style-type: none"> <li>a. the boiler or heater with the replacement equipment installed, or</li> <li>b. the boiler or heater with the incumbent equipment installed</li> </ul>
	Nominal gas consumption of the boiler or heater on which the product is installed is at least 11,400 MJ/h	11,400
DEI	In every instance	$1.07 \times 10^{-6}$
LUF	In every instance	0.206
Lifetime	In every instance	20.00



## 42. Part 42 Activity– Economizers

### Activity description (Guidance)

Part 42 of Schedule 2 of the Regulations prescribes the upgrade of gas boilers through the installation of economizers as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 42.1 lists the eligible products that may be installed. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

**Table 42.1 – Eligible economizer scenarios**

Product category number	Scenario number	Decommissioning requirements	Product / installation requirements <sup>76</sup>	Historical schedule number
42A	42A(i)	None	<p>Installing on a gas-fired steam boiler, a gas fired hot water boiler or gas-fired water heater that is a Type B appliance (other than a condensing steam boiler, condensing hot water boiler or condensing water heater) an economizer that:</p> <ol style="list-style-type: none"> <li>is of the condensing type;</li> <li>is a heat exchanger that uses the products of combustion from a gas-fired steam boiler, a gas-fired hot water boiler or gas-fired water heater to heat boiler feedwater; and</li> <li>complies with AS 1228; and</li> <li>provides for the products of combustion to be expelled into a stack constructed from stainless steel; and</li> <li>unless the product is specifically designed to run dry, has a control system for minimum flow rates that does not require manual intervention for operation.</li> </ol>	N/A
42A	42A(ii)	None	<p>Installing on a on a gas-fired steam boiler that is a Type B appliance (other than a condensing water boiler or condensing water heater) An economizer that:</p> <ol style="list-style-type: none"> <li>is not of the condensing type</li> <li>is a heat exchanger that uses the products of combustion from a gas-fired steam boiler, a gas-fired water heater to heat boiler feedwater; and</li> <li>complies with AS 1228; and</li> <li>unless the product is specifically designed to run dry, has a control system for minimum flow rates that does not require manual intervention for operation.</li> </ol>	N/A

<sup>76</sup> The authoritative product and installation requirements are contained in Part 42 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

## Specified Minimum Energy Efficiency

There are no further requirements that must be specified for the installed product.

## Other specified matters

None.

## Method for Determining GHG Equivalent Reduction

Scenario 42A: Upgrading boilers through installation of an economizer

The GHG equivalent emissions reduction for each scenario is given by Equation 42.1 using the variables listed in Table 42.2.

### Equation 42.1 – GHG equivalent emissions reduction calculation for Scenario 42A

$$GHG \text{ Eq. Reduction} = Consumption \times DEI \times LUF \times 8760 \times Lifetime$$

Table 42.2 – GHG equivalent emissions reduction variables for Scenario 42A

Input Type	Condition	Input Value
Consumption	In every instance	The nominal gas consumption (MJ/h) of the boiler or heater on which the product is installed
DEI	Installed on a steam boiler	$1.81 \times 10^{-6}$
	Installed on a hot water boiler or water heater	$1.41 \times 10^{-6}$
LUF	In every instance	0.206
Lifetime	In every instance	10.00



# 43. Part 43 Activity– Cold Rooms

## Activity description (Guidance)

Part 43 of Schedule 2 of the Regulations prescribes the upgrade of parts of refrigeration systems for walk-in cold rooms or the installation of refrigeration systems for cold rooms as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 43.1 lists the types of upgrade installations that may occur. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

At a later date, the Secretary may specify requirements for additional products that may be installed as a prescribed activity under Part 43 of Schedule 2 to the Regulations, which will be listed as scenario number 43C once specified.

**Table 43.1 – Eligible Cold Room Upgrade scenarios**

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>77</sup>	Historical schedule number
43A	43A	None	Installing for a cold room, with a minimum internal floor area of 4m <sup>2</sup> , an electronic expansion valve and compatible superheat controller that: <ul style="list-style-type: none"> <li>a. are designed to be installed together in the refrigeration system of a cold room; and</li> <li>b. when installed together into a refrigeration system can and will automatically control the superheat of the refrigeration system.</li> </ul>	N/A
43B	43B(i)	None	Installing for a cold room, with a minimum internal floor area of 4m <sup>2</sup> , a refrigeration system that includes at least three of the parts set out in this Table for Activity 43B(ii), provided that at least one of the three parts must be: <ul style="list-style-type: none"> <li>a. technology capable of varying condensing temperature with ambient temperature to improve system performance; or</li> <li>b. compressors with variable capacity modulation such as variable speed capacity control, other than               <ul style="list-style-type: none"> <li>i. on/off capacity control on single compressor systems</li> <li>ii. hot gas bypass</li> <li>iii. fixed stage cylinder unloading</li> </ul> </li> </ul>	N/A
43B	43B(ii)	None	Installing for a cold room, with a minimum internal floor area of 4m <sup>2</sup> , a refrigeration system that includes all of the following parts: <ul style="list-style-type: none"> <li>a. technology capable of varying condensing temperature with ambient temperature to improve system performance</li> <li>b. compressors with variable capacity modulation such as variable speed capacity control, other than</li> </ul>	N/A

<sup>77</sup> The authoritative product and installation requirements are contained in Part 43 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

Product category number	Scenario number	Decommissioning requirements	Product to be installed <sup>77</sup>	Historical schedule number
			<ul style="list-style-type: none"> <li>i. on/off capacity control on single compressor systems</li> <li>ii. hot gas bypass</li> <li>iii. fixed stage cylinder unloading</li> <li>c. electronic expansion valve and compatible superheat controller that meet the requirements of Activity 43A</li> <li>d. speed controlled condensing fans, that               <ul style="list-style-type: none"> <li>i. are electronically commutated (EC) fans, or</li> <li>ii. are variable speed drive (VSD) driven fans</li> </ul> </li> <li>e. evaporator fans, that are electronically commutated (EC) fans.</li> </ul>	

## Specified Minimum Energy Efficiency

There are no further requirements that must be specified for the installed product.

## Other specified matters

None.



## Method for Determining GHG Equivalent Reduction

Scenario 43A: Installing an electronic expansion valve and superheat controller into a refrigeration system

The GHG equivalent emissions reduction for each scenario is given by Equation 43.1 using the variables listed in Table 43.2.

### Equation 43.1 – GHG equivalent emissions reduction calculation for Scenario 43A

**GHG Eq. Reduction**

$$= \sum \text{Systems} [ [ \text{Energy Savings} \times \text{Lifetime} \times \text{EEF} \times \text{Temperature Factor} \times \text{Regional Factor} \times \text{Size Factor} ] ]$$

**Table 43.2 – GHG equivalent emissions reduction variables for Scenarios 43A**

Input Type	Condition	Input Value
Energy Savings	In every instance	1.7
Lifetime	In every instance	12
Temperature Factor	For Cold Rooms operating at or above 0°C	1.0
	For Cold Rooms installed or upgraded for the purposes of operating below 0°C (freezers)	1.4
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04
Size Factor	For Cold Rooms between 4m <sup>2</sup> and 9m <sup>2</sup> internal floor area	0.5
	For Cold Rooms greater than 9m <sup>2</sup> and less than 24m <sup>2</sup> internal floor area	1.0
	For Cold Rooms greater than 24m <sup>2</sup> internal floor area	2
	For Cold Rooms less than 4m <sup>2</sup>	0



Scenario 43B(i): A refrigeration system that includes at a minimum three of the specified parts

The GHG equivalent emissions reduction for each scenario is given by Equation 43.2 using the variables listed in Table 43.3

**Equation 43.2 – GHG equivalent emissions reduction calculation for Scenario 43B(i)**

***GHG Eq. Reduction***

$$= \sum \text{Systems} [ [ \text{Energy Savings} \times \text{Lifetime} \times \text{EEF} \times \text{Temperature Factor} \times \text{Regional Factor} \times \text{Size Factor} ] ]$$

**Table 43.3 – GHG equivalent emissions reduction variables for Scenario 43B(i)**

Input Type	Condition	Input Value
Energy Savings	In every instance	3.4
Lifetime	In every instance	12
Temperature Factor	For Cold Rooms operating at or above 0°C	1.0
	For Cold Rooms installed or upgraded for the purposes of operating below 0°C (freezers)	1.4
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04
Size Factor	For Cold Rooms between 4m <sup>2</sup> and 9m <sup>2</sup> internal floor area	0.5
	For Cold Rooms greater than 9m <sup>2</sup> and less than 24m <sup>2</sup> internal floor area	1.0
	For Cold Rooms greater than 24m <sup>2</sup> internal floor area	2
	For Cold Rooms less than 4m <sup>2</sup>	0



Scenario 43B(ii): A refrigeration system that includes at a minimum all of the specified parts

The GHG equivalent emissions reduction for each scenario is given by Equation 43.3 using the variables listed in Table 43.4

**Equation 43.3 – GHG equivalent emissions reduction calculation for Scenario 43B(ii)**

***GHG Eq. Reduction***

$$= \sum \text{Systems} [ [ \text{Energy Savings} \times \text{Lifetime} \times \text{EEF} \times \text{Temperature Factor} \times \text{Regional Factor} \times \text{Size Factor} ] ]$$

**Table 43.4 – GHG equivalent emissions reduction variables for Scenario 43B(ii)**

Input Type	Condition	Input Value
Energy Savings	In every instance	5.1
Lifetime	In every instance	12
Temperature Factor	For Cold Rooms operating at or above 0°C	1.0
	For Cold Rooms installed or upgraded for the purposes of operating below 0°C (freezers)	1.4
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04
Size Factor	For Cold Rooms between 4m <sup>2</sup> and 9m <sup>2</sup> internal floor area	0.5
	For Cold Rooms greater than 9m <sup>2</sup> and less than 24m <sup>2</sup> internal floor area	1.0
	For Cold Rooms greater than 24m <sup>2</sup> internal floor area	2
	For Cold Rooms less than 4m <sup>2</sup>	0



# 44. Part 44 Activity– Commercial and industrial air source heat pump water heaters

## Activity description (Guidance)

Part 44 of Schedule 2 of the Regulations prescribes the upgrade to an air source heat pump water heater for commercial (including multi-residential) and industrial applications as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 44.1 lists the decommissioning requirements and the eligible products that may be installed, upgraded or replaced. Each type of upgrade is known as a scenario. Each scenario has its own method for determining GHG equivalent reduction.

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 44.1 – Eligible Commercial and industrial air source heat pump water heater scenarios**

Product category number	Scenario number	Decommissioning requirements <sup>78</sup>	Product to be installed <sup>79</sup>	Historical schedule number
44A	44A(i)	<p>One or more:</p> <ul style="list-style-type: none"> <li>a. gas-fired hot water boilers; or</li> <li>b. gas-fired water heaters.</li> </ul> <p>Hot water boiler or heater to be decommissioned, excluding the insulated storage tank that forms part of the product, must be in working order and at least 10 years old at the date it is decommissioned.</p>	<p>One or more air source heat pump water heaters</p> <ul style="list-style-type: none"> <li>a. that each: <ul style="list-style-type: none"> <li>i. have an insulated storage volume not exceeding 700 litres; and</li> <li>ii. are certified by an accredited body as complying with AS/NZS 2712; and</li> <li>iii. provide a minimum delivery temperature of 45°C; and</li> <li>iv. are installed by a licensed or registered plumber; and</li> <li>v. achieves the minimum annual energy savings specified in Table 44.2; and</li> <li>vi. is modelled against the heat pump modelling requirements specified in Table 44.3; or</li> </ul> </li> <li>b. that each: <ul style="list-style-type: none"> <li>i. have an insulated storage volume exceeding 700 litres; and</li> <li>ii. provide a minimum delivery temperature of 45°C; and</li> <li>iii. are installed by a licensed or registered plumber; and</li> <li>iv. achieves the minimum annual energy savings specified in Table 44.2 ; and</li> <li>v. is modelled against the heat pump modelling requirements specified in Table 44.3.</li> </ul> </li> </ul>	N/A

<sup>78</sup> The authoritative decommissioning requirements are contained in Part 44 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document..

<sup>79</sup> The authoritative product requirements are contained in Part 44 of Schedule 2 to the Regulations, and take precedence over summary information provided for ease of reference in this document.

Product category number	Scenario number	Decommissioning requirements <sup>78</sup>	Product to be installed <sup>79</sup>	Historical schedule number
44A	44A(ii)	<p>One or more:</p> <ul style="list-style-type: none"> <li>a. electric resistance hot water boilers; or</li> <li>b. electric resistance water heaters.</li> </ul> <p>Hot water boiler or heater to be decommissioned, excluding the insulated storage tank that forms part of the product, must be in working order and at least 10 years old at the date it is decommissioned.</p>	<p>One or more air source heat pump water heaters:</p> <ul style="list-style-type: none"> <li>a. that each: <ul style="list-style-type: none"> <li>i. have an insulated storage volume not exceeding 700 litres; and</li> <li>ii. are certified by an accredited body as complying with AS/NZS 2712; and</li> <li>iii. provide a minimum delivery temperature of 45°C; and</li> <li>iv. are installed by a licensed or registered plumber; and</li> <li>v. achieves the minimum annual energy savings specified in Table 44.2; and</li> <li>vi. is modelled against the heat pump modelling requirements specified in Table 44.3; or</li> </ul> </li> <li>b. that each: <ul style="list-style-type: none"> <li>i. have an insulated storage volume exceeding 700 litres; and</li> <li>ii. provide a minimum delivery temperature of 45°C; and</li> <li>iii. are installed by a licensed or registered plumber; and</li> <li>iv. achieves the minimum annual energy savings specified in Table 44.2; and</li> <li>v. is modelled against the heat pump modelling requirements specified in Table 44.3.</li> </ul> </li> </ul>	N/A
44A	44A(iii)	None	<p>One or more air source heat pump water heaters:</p> <ul style="list-style-type: none"> <li>a. that each: <ul style="list-style-type: none"> <li>i. have an insulated storage volume not exceeding 700 litres; and</li> <li>ii. are certified to AS/NZS 2712; and</li> <li>iii. provide a minimum delivery temperature of 45°C; and</li> <li>iv. are installed by a licensed or registered plumber; and</li> <li>v. achieves the minimum annual energy savings specified in Table 44.2; and</li> <li>vi. is modelled against the heat pump modelling requirements specified in Table 44.3; or</li> </ul> </li> <li>b. that each: <ul style="list-style-type: none"> <li>i. have an insulated storage volume exceeding 700 litres; and</li> <li>ii. provide a minimum delivery temperature of 45°C; and</li> <li>iii. are installed by a licensed or registered plumber; and</li> </ul> </li> </ul>	N/A

Product category number	Scenario number	Decommissioning requirements <sup>78</sup>	Product to be installed <sup>79</sup>	Historical schedule number
			<ul style="list-style-type: none"> <li>iv. achieves the minimum annual energy savings specified in Table 44.2; and</li> <li>v. is modelled against the heat pump modelling requirements specified in Table 44.3.</li> </ul>	

## Specified Minimum Energy Efficiency

The product installed must meet the additional requirements set out in Table 44.2.

**Table 44.2 – Additional requirements for commercial and industrial air source heat pump water heaters to be installed**

Product category number	Requirement type	Efficiency requirement <sup>80</sup>	
44A	Minimum annual energy savings	If the product is installed in climatic zone 4*	60%, determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide, when modelled in climate zone HP4-Au.
		If the product is installed in climatic zone 5*	60%, determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide, when modelled in climate zone HP5-Au.

\*See the Location Variables list to determine what climatic zone applies to any premises.

## Specified Heat Pump modelling requirements and Other specified matters

The product installed must meet the additional requirements set out in Table 44.3.

**Table 44.3 – Other specified matters for commercial and industrial air source heat pump water heaters**

Scenario number	Requirement type	Specification details <sup>81</sup>
44A(i), 44A(ii) and 44A(iii)	Heat pump modelling requirements	<p>The product must be modelled in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide so that minimum annual energy savings are determined for both HP4-Au and HP5-Au climate zones. Outputs and necessary data from the modelling must be provided to the ESC.*</p> <p>In order to achieve the specified minimum annual energy savings, the product must be installed as modelled.</p>
44A(i) and 44A(ii)	Installation requirements where using an existing storage tank	<p>The product must be installed as modelled except that an existing storage tank may be used as storage in place of a modelled component if evidence is provided to the ESC that the tank:</p> <ul style="list-style-type: none"> <li>a. was manufactured less than 10 years before the existing product is decommissioned; and</li> <li>b. has a volume that is greater than or equal to the volume of the modelled component; and</li> <li>c. is insulated.</li> </ul>

\*See the Location Variables list to determine what climatic zone applies to any premises.

<sup>80</sup> The Secretary is empowered to specify these efficiency requirements under Part 44 of Schedule 2 to the Regulations

<sup>81</sup> The Secretary is empowered to specify these matters under Part 44 of Schedule 2 to the Regulations.

## Method for Determining GHG Equivalent Reduction

Scenario 44A(i): Decommissioning a gas product and installing an air source heat pump water heater

The GHG equivalent emissions reduction for each scenario is given by Equation 44.1 using the variables listed in Table 44.4.

**Equation 44.1 – GHG equivalent emissions reduction calculation for Scenario 44A(i)**

$$\begin{aligned}
 \text{GHG Eq. Reduction} = & \\
 \sum_{\text{systems}} \left[ & \text{GEF} \times \left( \frac{\text{RefElec}}{\text{RepEff}} \right) - \text{GEF} \times \text{HPGas} \right. \\
 & \left. - \text{EEF}_m \times \text{RegionalFactor} \times \left( \frac{\text{HPElec}}{3.6} \right) \right] \times \text{CapacityFactor} \times \text{Lifetime} \\
 & + \sum_{\text{systems}} [ (1430 - \text{GWP}) \times \text{RFE} \times \text{RfrgCharge} ]
 \end{aligned}$$

**Table 44.4 – GHG equivalent emissions reduction variables for Scenario 44A(i)**

Input Type	Condition	Input Value
Lifetime	If using existing storage with a new system	10
	In any other case	15
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04
GEF	In every instance	0.05523
RFE	In every instance	5 x 10 <sup>-4</sup>
GWP	In every instance	Refrigerant 100-year global warming potential as listed in the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report, 2007 (AR4) or, if applicable, as listed in the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide.
RfrgCharge	In every instance	Refrigerant charge (kg) of the heat pump water heater unit as specified by the manufacturer.
Capacity Factor	If new heat pump thermal capacity (kW) ≤ existing system thermal capacity (kW)	1
	If new heat pump thermal capacity (kW) > existing system thermal capacity (kW)	$\frac{\text{Existing system thermal capacity (kW)}}{\text{Heat pump thermal capacity (kW)}}$
HPElec	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.
HPGas	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.
RepEff	In every instance	0.788
RefElec	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.

\*See the Location Variables list to determine what climatic zone applies to any premises.

**Scenario 44A(ii): Decommissioning an electric product and installing an air source heat pump water heater**

The GHG equivalent emissions reduction for each scenario is given by Equation 44.2 using the variables listed in Table 44.5.

**Equation 44.2 – GHG equivalent emissions reduction calculation for Scenario 44A(ii)**

**GHG Eq. Reduction=**

$$\begin{aligned} & \sum_{\text{systems}} \left[ \text{EEF}_m \times \left( \frac{\text{RefElec}}{3.6} \right) \times \text{RegionalFactor} - \text{GEF} \times \text{HPGas} \right. \\ & \quad \left. - \text{EEF}_m \times \text{RegionalFactor} \times \left( \frac{\text{HPElec}}{3.6} \right) \right] \times \text{CapacityFactor} \times \text{Lifetime} \\ & + \sum_{\text{systems}} [ (1430 - \text{GWP}) \times \text{RFE} \times \text{RfrgCharge} ] \end{aligned}$$

**Table 44.5 – GHG equivalent emissions reduction variables for Scenario 44A(ii)**

Input Type	Condition	Input Value
Lifetime	If using existing storage with a new system	10
	In any other case	15
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04
GEF	In every instance	0.05523
RFE	In every instance	5 x 10 <sup>-4</sup>
GWP	In every instance	Refrigerant 100-year global warming potential as listed in the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report, 2007 (AR4) or, if applicable, as listed in the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide.
RfrgCharge	In every instance	Refrigerant charge (kg) of the heat pump water heater unit as specified by the manufacturer.
Capacity Factor	If new heat pump thermal capacity (kW) ≤ existing system thermal capacity (kW)	1
	If new heat pump thermal capacity (kW) > existing system thermal capacity (kW)	$\frac{\text{Existing system thermal capacity (kW)}}{\text{Heat pump thermal capacity (kW)}}$
HPElec	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.
HPGas	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.
RefElec	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.

\*See the Location Variables list to determine what climatic zone applies to any premises.



## Scenario 44A(iii): Decommissioning an air source heat pump water heater

The GHG equivalent emissions reduction for each scenario is given by Equation 44.3 using the variables listed in Table 44.6.

**Equation 44.3 – GHG equivalent emissions reduction calculation for Scenario 44A(iii)**

**GHG Eq. Reduction=**

$$\sum_{\text{systems}} \left[ \text{GEF} \times \left( \frac{\text{RefElec}}{\text{NewEff}} \right) - \text{GEF} \times \text{HPGas} - \text{EEF}_m \times \text{RegionalFactor} \times \left( \frac{\text{HPElec}}{3.6} \right) \right] \times \text{Lifetime} \\ + \sum_{\text{systems}} [ (1430 - \text{GWP}) \times \text{RFE} \times \text{RfrgCharge} ]$$

**Table 44.6 – GHG equivalent emissions reduction variables for Scenario 44A(iii)**

Input Type	Condition	Input Value
Lifetime	If using existing storage with a new system	10
	In any other case	15
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04
GEF	In every instance	0.05523
RFE	In every instance	5 x 10 <sup>-4</sup>
GWP	In every instance	Refrigerant 100-year global warming potential as listed in the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report, 2007 (AR4) or, if applicable, as listed in the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide.
RfrgCharge	In every instance	Refrigerant charge (kg) of the heat pump water heater unit as specified by the manufacturer.
HPElec	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.
HPGas	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.
NewEff	In every instance	0.85
RefElec	In every instance	As determined in accordance with the Commercial and Industrial Air Source Heat Pump Water Heater Product Application Guide in GJ/year.

\*See the Location Variables list to determine what climatic zone applies to any premises.



## 45. Part 45 Activity– Home energy rating assessment

### Activity description (Guidance)

Part 45 of Schedule 2 of the Regulations prescribes the provision of a home energy rating assessment as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 45.1 lists the types of home energy rating assessment that may occur.

Over time, the department may determine that there are other home energy rating assessment activities that reduce GHG equivalent emissions. In such a case, assessment requirements for these changes will be listed by the department as scenario number 45B once specified.

**Table 45.1 – Eligible Home energy rating assessment scenarios**

Product category number	Scenario number	Decommissioning requirements	Activity to be completed	Historical schedule number
45A	45A <sup>82</sup>	None	<p>A Residential Efficiency Scorecard assessment, being the home energy rating assessment of that name that is:</p> <ul style="list-style-type: none"> <li>a. endorsed or accredited by the Nationwide House Energy Rating Scheme (NatHERS) as an In Home assessment; and</li> <li>b. validly undertaken in compliance with: <ul style="list-style-type: none"> <li>i. the 'Residential Efficiency Scorecard Software Manual for Scorecard Assessors'; and</li> <li>ii. the 'Residential Efficiency Scorecard Assessor Manual for Scorecard Assessors'.</li> </ul> </li> </ul>	N/A

### Specified Minimum Energy Efficiency

There are no further requirements that must be specified for the assessment.

### Other specified matters

An assessor conducting a home energy rating assessment belonging to the scenario number listed in column 2 must meet the requirements set out in Table 45.2 in respect of that home energy rating assessment.

**Table 45.2 – Other specified matter for home energy rating assessments**

Activity category number	Scenario number	Assessor requirements
45A	45A	An assessor conducting a Residential Efficiency Scorecard assessment must be an accredited Scorecard assessor and be listed on the public Scorecard website.

<sup>82</sup> Home energy rating assessments under this scenario number are taken to be an activity referred to at Schedule 2, Part 45, clause 45(a) of the Regulations. The Secretary has the power to specify additional home energy rating assessments as being eligible for inclusion under this activity (provided they are NatHERS-endorsed). If the Secretary exercises this power, any additional tools will be included in future updates to these specifications.

## Method for Determining GHG Equivalent Reduction

### Scenario 45: Home Energy Rating Assessment

The GHG equivalent emissions reduction for each scenario is given by Equation 45.1 using the variables listed in Table 45.3.

#### Equation 45.1 – GHG equivalent emissions reduction calculation for Scenario 45A

$$GHG \text{ Eq. Reduction} = GHG \text{ Savings} \times Lifetime$$

Table 45.3 – GHG equivalent emissions reduction variables for Scenario 45A

Input Type	Condition	Input Value
GHG Savings	For upgrades in Metropolitan Victoria	$(0.34 \times EEF \times 0.98) + 0.23$
	For upgrades in Regional Victorian	$(0.47 \times EEF \times 1.04) + 0.22$
Lifetime	In every instance	5



# Location Variable List

The section is used to determine the which values of Regional Factor GHG Savings and other variables are applied to GHG equivalent emissions reduction calculations for prescribed activities carried out in compliance with the Victorian Energy Efficiency Target Act 2007, associated Regulations and these Specifications.

Table A specifies whether upgrades are located in Metropolitan or Regional Victoria, whether a Mild, Cold or Hot climatic region is applicable, whether a zone 4 or 5 climatic zone is applicable and whether the area is a reticulated gas area.

**Table A – List of postcodes**

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
3000	Metropolitan	Yes	Mild	4
3001	Metropolitan	Yes	Mild	4
3002	Metropolitan	Yes	Mild	4
3003	Metropolitan	Yes	Mild	4
3004	Metropolitan	Yes	Mild	4
3006	Metropolitan	Yes	Mild	4
3008	Metropolitan	Yes	Mild	4
3010	Metropolitan	Yes	Mild	4
3011	Metropolitan	Yes	Mild	4
3012	Metropolitan	Yes	Mild	4
3013	Metropolitan	Yes	Mild	4
3015	Metropolitan	Yes	Mild	4
3016	Metropolitan	Yes	Mild	4
3018	Metropolitan	Yes	Mild	4
3019	Metropolitan	Yes	Mild	4
3020	Metropolitan	Yes	Mild	4
3021	Metropolitan	Yes	Mild	4
3022	Metropolitan	Yes	Mild	4
3023	Metropolitan	Yes	Mild	4
3024	Metropolitan	Yes	Mild	4
3025	Metropolitan	Yes	Mild	4
3026	Metropolitan	Yes	Mild	4
3027	Metropolitan	Yes	Mild	4
3028	Metropolitan	Yes	Mild	4
3029	Metropolitan	Yes	Mild	4
3030	Metropolitan	Yes	Mild	4

3031	Metropolitan	Yes	Mild	4
3032	Metropolitan	Yes	Mild	4
3033	Metropolitan	Yes	Mild	4
3034	Metropolitan	Yes	Mild	4
3036	Metropolitan	Yes	Mild	4
3037	Metropolitan	Yes	Mild	4
3038	Metropolitan	Yes	Mild	4
3039	Metropolitan	Yes	Mild	4
3040	Metropolitan	Yes	Mild	4
3041	Metropolitan	Yes	Mild	4
3042	Metropolitan	Yes	Mild	4
3043	Metropolitan	Yes	Mild	4
3044	Metropolitan	Yes	Mild	4
3045	Metropolitan	Yes	Mild	4
3046	Metropolitan	Yes	Mild	4
3047	Metropolitan	Yes	Mild	4
3048	Metropolitan	Yes	Mild	4
3049	Metropolitan	Yes	Mild	4
3050	Metropolitan	Yes	Mild	4
3051	Metropolitan	Yes	Mild	4
3052	Metropolitan	Yes	Mild	4
3053	Metropolitan	Yes	Mild	4
3054	Metropolitan	Yes	Mild	4
3055	Metropolitan	Yes	Mild	4
3056	Metropolitan	Yes	Mild	4
3057	Metropolitan	Yes	Mild	4
3058	Metropolitan	Yes	Mild	4
3059	Metropolitan	Yes	Mild	4
3060	Metropolitan	Yes	Mild	4
3061	Metropolitan	Yes	Mild	4
3062	Metropolitan	Yes	Mild	4
3063	Metropolitan	Yes	Mild	4
3064	Metropolitan	Yes	Mild	4
3065	Metropolitan	Yes	Mild	4
3066	Metropolitan	Yes	Mild	4
3067	Metropolitan	Yes	Mild	4
3068	Metropolitan	Yes	Mild	4

3070	Metropolitan	Yes	Mild	4
3071	Metropolitan	Yes	Mild	4
3072	Metropolitan	Yes	Mild	4
3073	Metropolitan	Yes	Mild	4
3074	Metropolitan	Yes	Mild	4
3075	Metropolitan	Yes	Mild	4
3076	Metropolitan	Yes	Mild	4
3078	Metropolitan	Yes	Mild	4
3079	Metropolitan	Yes	Mild	4
3081	Metropolitan	Yes	Mild	4
3082	Metropolitan	Yes	Mild	4
3083	Metropolitan	Yes	Mild	4
3084	Metropolitan	Yes	Mild	4
3085	Metropolitan	Yes	Mild	4
3086	Metropolitan	Yes	Mild	4
3087	Metropolitan	Yes	Mild	4
3088	Metropolitan	Yes	Mild	4
3089	Metropolitan	Yes	Mild	4
3090	Metropolitan	Yes	Mild	4
3091	Metropolitan	Yes	Mild	4
3093	Metropolitan	Yes	Mild	4
3094	Metropolitan	Yes	Mild	4
3095	Metropolitan	Yes	Mild	4
3096	Metropolitan	Yes	Mild	4
3097	Metropolitan	Yes	Mild	4
3099	Metropolitan	Yes	Mild	4
3101	Metropolitan	Yes	Mild	4
3102	Metropolitan	Yes	Mild	4
3103	Metropolitan	Yes	Mild	4
3104	Metropolitan	Yes	Mild	4
3105	Metropolitan	Yes	Mild	4
3106	Metropolitan	Yes	Mild	4
3107	Metropolitan	Yes	Mild	4
3108	Metropolitan	Yes	Mild	4
3109	Metropolitan	Yes	Mild	4
3111	Metropolitan	Yes	Mild	4
3113	Metropolitan	Yes	Mild	4

3114	Metropolitan	Yes	Mild	4
3115	Metropolitan	Yes	Mild	4
3116	Metropolitan	Yes	Mild	4
3121	Metropolitan	Yes	Mild	4
3122	Metropolitan	Yes	Mild	4
3123	Metropolitan	Yes	Mild	4
3124	Metropolitan	Yes	Mild	4
3125	Metropolitan	Yes	Mild	4
3126	Metropolitan	Yes	Mild	4
3127	Metropolitan	Yes	Mild	4
3128	Metropolitan	Yes	Mild	4
3129	Metropolitan	Yes	Mild	4
3130	Metropolitan	Yes	Mild	4
3131	Metropolitan	Yes	Mild	4
3132	Metropolitan	Yes	Mild	4
3133	Metropolitan	Yes	Mild	4
3134	Metropolitan	Yes	Mild	4
3135	Metropolitan	Yes	Mild	4
3136	Metropolitan	Yes	Mild	4
3137	Metropolitan	Yes	Mild	4
3138	Metropolitan	Yes	Mild	4
3139	Metropolitan	Yes	Mild	5
3140	Metropolitan	Yes	Mild	5
3141	Metropolitan	Yes	Mild	4
3142	Metropolitan	Yes	Mild	4
3143	Metropolitan	Yes	Mild	4
3144	Metropolitan	Yes	Mild	4
3145	Metropolitan	Yes	Mild	4
3146	Metropolitan	Yes	Mild	4
3147	Metropolitan	Yes	Mild	4
3148	Metropolitan	Yes	Mild	4
3149	Metropolitan	Yes	Mild	4
3150	Metropolitan	Yes	Mild	4
3151	Metropolitan	Yes	Mild	4
3152	Metropolitan	Yes	Mild	4
3153	Metropolitan	Yes	Mild	4
3154	Metropolitan	Yes	Mild	4

3155	Metropolitan	Yes	Mild	4
3156	Metropolitan	Yes	Mild	4
3158	Metropolitan	Yes	Mild	5
3159	Metropolitan	Yes	Mild	4
3160	Metropolitan	Yes	Mild	5
3161	Metropolitan	Yes	Mild	4
3162	Metropolitan	Yes	Mild	4
3163	Metropolitan	Yes	Mild	4
3164	Metropolitan	Yes	Mild	4
3165	Metropolitan	Yes	Mild	4
3166	Metropolitan	Yes	Mild	4
3167	Metropolitan	Yes	Mild	4
3168	Metropolitan	Yes	Mild	4
3169	Metropolitan	Yes	Mild	4
3170	Metropolitan	Yes	Mild	4
3171	Metropolitan	Yes	Mild	4
3172	Metropolitan	Yes	Mild	4
3173	Metropolitan	Yes	Mild	4
3174	Metropolitan	Yes	Mild	4
3175	Metropolitan	Yes	Mild	4
3176	Metropolitan	Yes	Mild	4
3177	Metropolitan	Yes	Mild	4
3178	Metropolitan	Yes	Mild	4
3179	Metropolitan	Yes	Mild	4
3180	Metropolitan	Yes	Mild	4
3181	Metropolitan	Yes	Mild	4
3182	Metropolitan	Yes	Mild	4
3183	Metropolitan	Yes	Mild	4
3184	Metropolitan	Yes	Mild	4
3185	Metropolitan	Yes	Mild	4
3186	Metropolitan	Yes	Mild	4
3187	Metropolitan	Yes	Mild	4
3188	Metropolitan	Yes	Mild	4
3189	Metropolitan	Yes	Mild	4
3190	Metropolitan	Yes	Mild	4
3191	Metropolitan	Yes	Mild	4
3192	Metropolitan	Yes	Mild	4



3193	Metropolitan	Yes	Mild	4
3194	Metropolitan	Yes	Mild	4
3195	Metropolitan	Yes	Mild	4
3196	Metropolitan	Yes	Mild	4
3197	Metropolitan	Yes	Mild	4
3198	Metropolitan	Yes	Mild	4
3199	Metropolitan	Yes	Mild	4
3200	Metropolitan	Yes	Mild	4
3201	Metropolitan	Yes	Mild	4
3202	Metropolitan	Yes	Mild	4
3204	Metropolitan	Yes	Mild	4
3205	Metropolitan	Yes	Mild	4
3206	Metropolitan	Yes	Mild	4
3207	Metropolitan	Yes	Mild	4
3211	Regional	Yes	Mild	4
3212	Regional	Yes	Mild	4
3213	Regional	No	Mild	4
3214	Regional	Yes	Mild	4
3215	Regional	Yes	Mild	4
3216	Regional	Yes	Mild	4
3217	Regional	Yes	Mild	4
3218	Regional	Yes	Mild	4
3219	Regional	Yes	Mild	4
3220	Regional	Yes	Mild	4
3221	Regional	Yes	Mild	4
3222	Regional	Yes	Mild	4
3223	Regional	Yes	Mild	4
3224	Regional	Yes	Mild	4
3225	Regional	Yes	Mild	4
3226	Regional	Yes	Mild	4
3227	Regional	Yes	Mild	4
3228	Regional	Yes	Mild	4
3230	Regional	Yes	Mild	4
3231	Regional	Yes	Mild	4
3232	Regional	No	Mild	4
3233	Regional	No	Mild	4
3234	Regional	No	Mild	4

3235	Regional	No	Mild	4
3236	Regional	No	Mild	4
3237	Regional	No	Mild	4
3238	Regional	No	Mild	4
3239	Regional	No	Mild	4
3240	Regional	No	Mild	4
3241	Regional	No	Mild	4
3242	Regional	No	Mild	4
3243	Regional	No	Mild	4
3249	Regional	Yes	Mild	4
3250	Regional	Yes	Mild	4
3251	Regional	Yes	Mild	4
3254	Regional	No	Mild	4
3260	Regional	Yes	Mild	4
3264	Regional	No	Mild	4
3265	Regional	Yes	Mild	4
3266	Regional	Yes	Mild	4
3267	Regional	No	Mild	4
3268	Regional	No	Mild	4
3269	Regional	No	Mild	4
3270	Regional	No	Mild	4
3271	Regional	No	Mild	4
3272	Regional	No	Mild	4
3273	Regional	No	Mild	4
3274	Regional	No	Mild	4
3275	Regional	No	Mild	4
3276	Regional	No	Mild	4
3277	Regional	Yes	Mild	4
3278	Regional	No	Mild	4
3279	Regional	No	Mild	4
3280	Regional	Yes	Mild	4
3281	Regional	No	Mild	4
3282	Regional	Yes	Mild	4
3283	Regional	No	Mild	4
3284	Regional	Yes	Mild	4
3285	Regional	No	Mild	4
3286	Regional	No	Mild	4

3287	Regional	No	Mild	4
3289	Regional	No	Cold	5
3292	Regional	No	Mild	4
3293	Regional	No	Cold	5
3294	Regional	No	Cold	5
3300	Regional	Yes	Cold	5
3301	Regional	No	Mild	5
3302	Regional	No	Mild	5
3303	Regional	No	Mild	4
3304	Regional	No	Mild	4
3305	Regional	Yes	Mild	4
3309	Regional	No	Mild	4
3310	Regional	No	Cold	4
3311	Regional	No	Cold	4
3312	Regional	No	Cold	4
3314	Regional	No	Cold	5
3315	Regional	No	Cold	5
3317	Regional	No	Cold	4
3318	Regional	No	Cold	4
3319	Regional	No	Cold	4
3321	Regional	No	Mild	4
3322	Regional	No	Mild	4
3323	Regional	No	Cold	4
3324	Regional	No	Cold	4
3325	Regional	No	Mild	4
3328	Regional	No	Mild	4
3329	Regional	No	Mild	4
3330	Regional	No	Cold	4
3331	Regional	No	Mild	4
3332	Regional	No	Mild	4
3333	Regional	No	Mild	4
3334	Regional	No	Cold	4
3335	Metropolitan	Yes	Mild	4
3336	Metropolitan	Yes	Mild	4
3337	Metropolitan	Yes	Mild	4
3338	Metropolitan	Yes	Mild	4
3340	Regional	Yes	Mild	4

3341	Regional	No	Cold	4
3342	Regional	Yes	Cold	4
3345	Regional	No	Cold	4
3350	Regional	Yes	Cold	5
3351	Regional	No	Cold	5
3352	Regional	Yes	Cold	5
3353	Regional	No	Cold	5
3354	Regional	No	Cold	5
3355	Regional	Yes	Cold	5
3356	Regional	Yes	Cold	5
3357	Regional	Yes	Cold	5
3358	Regional	Yes	Cold	4
3360	Regional	No	Cold	4
3361	Regional	No	Cold	4
3363	Regional	Yes	Cold	5
3364	Regional	Yes	Cold	5
3370	Regional	No	Cold	5
3371	Regional	No	Cold	4
3373	Regional	No	Cold	5
3374	Regional	No	Cold	4
3375	Regional	No	Cold	5
3377	Regional	Yes	Cold	5
3378	Regional	No	Cold	5
3379	Regional	No	Cold	5
3380	Regional	Yes	Cold	4
3381	Regional	No	Cold	5
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3385	Regional	No	Cold	4
3387	Regional	No	Cold	4
3388	Regional	No	Cold	4
3390	Regional	No	Cold	4
3391	Regional	No	Cold	4
3392	Regional	No	Cold	4
3393	Regional	No	Cold	4
3395	Regional	No	Cold	4
3396	Regional	No	Cold	4
3400	Regional	Yes	Cold	4

3401	Regional	Yes	Cold	4
3402	Regional	Yes	Cold	4
3407	Regional	No	Cold	5
3409	Regional	No	Cold	4
3412	Regional	No	Cold	4
3413	Regional	No	Cold	4
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3419	Regional	No	Cold	4
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3423	Regional	No	Cold	4
3424	Regional	No	Cold	4
3427	Metropolitan	Yes	Mild	4
3428	Metropolitan	Yes	Mild	4
3429	Metropolitan	Yes	Mild	4
3430	Metropolitan	No	Mild	5
3431	Metropolitan	Yes	Cold	5
3432	Metropolitan	No	Cold	5
3433	Metropolitan	No	Cold	5
3434	Metropolitan	Yes	Cold	5
3435	Regional	Yes	Cold	5
3437	Regional	Yes	Cold	5
3438	Metropolitan	Yes	Cold	5
3440	Regional	Yes	Cold	4
3441	Metropolitan	Yes	Cold	4
3442	Regional	Yes	Cold	4
3444	Regional	Yes	Cold	4
3446	Regional	No	Cold	4
3447	Regional	No	Cold	4
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3450	Regional	Yes	Cold	5
3451	Regional	Yes	Cold	5
3453	Regional	No	Cold	5
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3460	Regional	Yes	Cold	5
3461	Regional	Yes	Cold	5

3462	Regional	No	Cold	5
3463	Regional	No	Cold	5
3464	Regional	Yes	Cold	4
3465	Regional	Yes	Cold	4
3467	Regional	No	Cold	5
3468	Regional	No	Cold	5
3469	Regional	No	Cold	5
3472	Regional	No	Cold	4
3475	Regional	No	Cold	4
3477	Regional	No	Cold	4
3478	Regional	No	Cold	4
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3485	Regional	No	Cold	4
3487	Regional	No	Hot	4
3488	Regional	No	Hot	4
3489	Regional	No	Hot	4
3490	Regional	No	Hot	4
3491	Regional	No	Hot	4
3494	Regional	Yes	Hot	4
3496	Regional	Yes	Hot	4
3498	Regional	Yes	Hot	4
3500	Regional	Yes	Hot	4
3501	Regional	Yes	Hot	4
3502	Regional	Yes	Hot	4
3505	Regional	Yes	Hot	4
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3509	Regional	No	Hot	4
3512	Regional	No	Hot	4
3515	Regional	No	Cold	4
3516	Regional	No	Cold	4
3517	Regional	No	Cold	4
3518	Regional	No	Cold	4
3520	Regional	No	Cold	4
3521	Regional	No	Cold	4

3522	Regional	No	Cold	4
3523	Regional	No	Cold	4
3525	Regional	No	Cold	4
3527	Regional	No	Cold	4
3529	Regional	No	Hot	4
3530	Regional	No	Hot	4
3531	Regional	No	Hot	4
3533	Regional	No	Hot	4
3537	Regional	No	Hot	4
3540	Regional	No	Hot	4
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3567	Regional	No	Hot	4
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3570	Regional	No	Cold	4
3571	Regional	No	Cold	4
3572	Regional	No	Cold	4
3573	Regional	No	Cold	4
3575	Regional	No	Hot	4
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3579	Regional	No	Hot	4
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3630	Regional	Yes	Cold	4
3631	Regional	Yes	Cold	4
3632	Regional	No	Cold	4
3633	Regional	No	Cold	4
3634	Regional	No	Cold	4
3635	Regional	No	Cold	4



3636	Regional	Yes	Cold	4
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3638	Regional	No	Cold	4
3639	Regional	No	Cold	4
3640	Regional	Yes	Cold	4
3641	Regional	Yes	Cold	4
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3672	Regional	Yes	Cold	4
3673	Regional	No	Cold	4
3675	Regional	No	Cold	5
3676	Regional	No	Cold	5
3677	Regional	Yes	Cold	5
3678	Regional	Yes	Cold	5
3682	Regional	No	Cold	4
3683	Regional	Yes	Cold	4
3685	Regional	Yes	Cold	4
3687	Regional	Yes	Cold	4
3688	Regional	No	Cold	4
3689	Regional	No	Cold	4
3690	Regional	Yes	Cold	4
3691	Regional	Yes	Cold	4

3694	Regional	Yes	Cold	4
3695	Regional	No	Cold	4
3697	Regional	No	Cold	5
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3699	Regional	No	Cold	5
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3724	Regional	No	Cold	5
3725	Regional	No	Cold	4
3726	Regional	No	Cold	4
3727	Regional	No	Cold	4
3728	Regional	No	Cold	4
3730	Regional	Yes	Cold	4
3732	Regional	No	Cold	5
3733	Regional	No	Cold	5
3735	Regional	No	Cold	5
3736	Regional	No	Cold	5
3737	Regional	No	Cold	5
3738	Regional	No	Cold	5
3739	Regional	No	Cold	5
3740	Regional	No	Cold	5

3741	Regional	No	Cold	5
3744	Regional	No	Cold	5
3746	Regional	No	Cold	5
3747	Regional	No	Cold	4
3749	Regional	No	Cold	4
3750	Metropolitan	Yes	Mild	4
3751	Metropolitan	Yes	Mild	4
3752	Metropolitan	Yes	Mild	4
3753	Metropolitan	Yes	Mild	4
3754	Metropolitan	Yes	Mild	4
3755	Metropolitan	Yes	Mild	4
3756	Metropolitan	Yes	Mild	4
3757	Metropolitan	Yes	Mild	4
3758	Metropolitan	No	Mild	4
3759	Metropolitan	Yes	Mild	4
3760	Metropolitan	Yes	Mild	4
3761	Metropolitan	Yes	Mild	4
3762	Metropolitan	No	Cold	4
3763	Metropolitan	Yes	Cold	4
3764	Regional	Yes	Cold	4
3765	Metropolitan	Yes	Mild	4
3766	Metropolitan	Yes	Cold	4
3767	Metropolitan	Yes	Cold	4
3770	Metropolitan	Yes	Cold	5
3775	Metropolitan	Yes	Cold	5
3777	Metropolitan	Yes	Cold	5
3778	Regional	No	Cold	5
3779	Regional	No	Cold	5
3781	Metropolitan	Yes	Mild	4
3782	Metropolitan	Yes	Mild	4
3783	Metropolitan	Yes	Mild	4
3785	Metropolitan	Yes	Cold	4
3786	Metropolitan	Yes	Cold	4
3787	Metropolitan	Yes	Cold	4
3788	Metropolitan	Yes	Cold	4
3789	Metropolitan	Yes	Cold	4
3791	Metropolitan	Yes	Mild	4

3792	Metropolitan	Yes	Cold	4
3793	Metropolitan	Yes	Cold	4
3795	Metropolitan	Yes	Cold	4
3796	Metropolitan	Yes	Cold	4
3797	Metropolitan	Yes	Mild	4
3799	Regional	Yes	Cold	4
3800	Metropolitan	Yes	Mild	4
3802	Metropolitan	Yes	Mild	4
3803	Metropolitan	Yes	Mild	4
3804	Metropolitan	Yes	Mild	4
3805	Metropolitan	Yes	Mild	4
3806	Metropolitan	Yes	Mild	4
3807	Metropolitan	Yes	Mild	4
3808	Metropolitan	Yes	Mild	4
3809	Metropolitan	Yes	Mild	4
3810	Metropolitan	Yes	Mild	4
3812	Metropolitan	Yes	Mild	4
3813	Metropolitan	Yes	Mild	4
3814	Metropolitan	Yes	Mild	4
3815	Metropolitan	Yes	Mild	4
3816	Regional	Yes	Mild	5
3818	Regional	Yes	Mild	5
3820	Regional	Yes	Mild	5
3821	Regional	No	Mild	5
3822	Regional	Yes	Mild	5
3823	Regional	Yes	Mild	5
3824	Regional	Yes	Mild	5
3825	Regional	Yes	Mild	5
3831	Regional	No	Mild	5
3832	Regional	No	Mild	5
3833	Regional	No	Cold	5
3835	Regional	No	Mild	5
3840	Regional	Yes	Mild	4
3841	Regional	No	Mild	4
3842	Regional	Yes	Mild	4
3844	Regional	Yes	Mild	4
3847	Regional	Yes	Mild	4

3850	Regional	Yes	Mild	4
3851	Regional	Yes	Mild	4
3852	Regional	Yes	Mild	4
3853	Regional	Yes	Mild	4
3854	Regional	No	Mild	4
3856	Regional	No	Mild	4
3857	Regional	No	Mild	4
3858	Regional	No	Mild	5
3859	Regional	No	Mild	4
3860	Regional	Yes	Cold	4
3862	Regional	No	Cold	5
3864	Regional	No	Cold	4
3865	Regional	No	Mild	4
3869	Regional	No	Mild	4
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3873	Regional	No	Mild	4
3874	Regional	No	Mild	4
3875	Regional	Yes	Mild	4
3878	Regional	Yes	Mild	4
3880	Regional	Yes	Mild	4
3882	Regional	No	Mild	4
3885	Regional	No	Mild	5
3886	Regional	No	Mild	4
3887	Regional	No	Mild	4
3888	Regional	No	Mild	4
3889	Regional	No	Cold	4
3890	Regional	No	Mild	4
3891	Regional	No	Mild	4
3892	Regional	No	Mild	4
3893	Regional	No	Cold	5
3895	Regional	No	Cold	5
3896	Regional	No	Cold	5
3898	Regional	No	Cold	5
3900	Regional	No	Cold	5
3902	Regional	No	Mild	4
3903	Regional	No	Mild	4

3904	Regional	No	Mild	4
3909	Regional	No	Mild	4
3910	Metropolitan	Yes	Mild	4
3911	Metropolitan	Yes	Mild	4
3912	Metropolitan	Yes	Mild	4
3913	Metropolitan	Yes	Mild	4
3915	Metropolitan	Yes	Mild	4
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3918	Metropolitan	Yes	Mild	4
3919	Metropolitan	Yes	Mild	4
3920	Metropolitan	Yes	Mild	4
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3922	Regional	No	Mild	4
3923	Regional	No	Mild	4
3925	Regional	No	Mild	4
3926	Metropolitan	Yes	Mild	4
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3945	Regional	No	Mild	4
3946	Regional	No	Cold	4
3950	Regional	Yes	Mild	4
3951	Regional	No	Mild	4
3953	Regional	Yes	Mild	4

3954	Regional	No	Mild	4
3956	Regional	No	Mild	4
3957	Regional	No	Mild	4
3958	Regional	No	Cold	4
3959	Regional	No	Mild	4
3960	Regional	No	Mild	4
3962	Regional	No	Mild	4
3964	Regional	No	Cold	4
3965	Regional	No	Mild	4
3966	Regional	No	Cold	4
3967	Regional	No	Cold	4
3971	Regional	No	Cold	4
3975	Metropolitan	Yes	Mild	4
3976	Metropolitan	Yes	Mild	4
3977	Metropolitan	Yes	Mild	4
3978	Metropolitan	Yes	Mild	4
3979	Regional	No	Mild	4
3980	Metropolitan	Yes	Cold	4
3981	Regional	Yes	Cold	4
3984	Regional	Yes	Mild	4
3987	Regional	Yes	Mild	4
3988	Regional	No	Cold	4
3990	Regional	No	Mild	4
3991	Regional	No	Mild	4
3992	Regional	No	Mild	4
3995	Regional	Yes	Mild	4
3996	Regional	Yes	Mild	4

