Victorian Energy Upgrades

Specifications 2018 - Version 12.0

VICTORIA State Government | Environment, Land, Water and Planning

Author

This document has been prepared by the Department of Environment, Land, Water and Planning.

Document Version

Version 12.0 comes into effect from 1 February 2022. Versions 0.1 to 11.0 are no longer in effect as at 1 February 2022.

Version	Amendments	In effect from
12.0	Revised end date for the existing Part 21 activity from 28 February 2022 to 31 January 2023 Revised Part 34 activity to remove J6 lighting upgrades and adjust mercury vapour, metal halide and high-pressure sodium lamp circuit power calculations in table 34.8 Added new Part 44 Activity – Commercial and Industrial Air Source Heat Pump Water Heaters	1 February 2022
11.0	Revised Part 32 Activity – Refrigerated Cabinet • Scenario 32(A) – applicable to 30 June 2022. Corrected equation 10.5 to include EEF Corrected date for Part 34 activity – applicable to 31 January 2022 Clarified product requirements for Voltage Reduction Units in Table 34.1	30 October 2021
10.0	Added the new Part 43 Activity – Cold Rooms	17 August 2021
9.0	Revised electricity emissions factors for 2021-2025 and revised greenhouse gas equivalent emissions reduction calculations for activities impacting electricity consumption. Removed the end dated Part 34 and Part 21 which expired on 31 March 2021 and 31 July 2021 respectively.	1 August 2021
8.0	Revised end date for the existing Part 21 activity from 30 June 2021 to 31 July 2021	30 June 2021
7.0	Inserted final date for existing Part 21 activity - applicable to 30 June 2021 Inserted amended Part 21 – applicable 1 July 2021 to 31 January 2022 • Revised minimum requirements in table 21.2 and 21.3 • Revised abatement factor inputs and power factor multipliers in table 21.4, 21.5, 21.6, 21.7 and 21.8 Removed Part 19 which ended 9 December 2020 Amended Part 34 • Aligned J6 activities with the National Construction Code Vol. 1 2019 Adjusted mercury vapour, metal halide and high-pressure sodium LCP in table 34.10	25 March 2021
6.0	Reinstated the greenhouse gas equivalent emissions reduction calculations for Part 15, Part 17, Part 21 and Part 30	28 October 2020

Accessibility

If you would like to receive this publication in an alternative format, please telephone the DELWP Customer Service Centre on 136186, email customer.service@delwp.vic.gov.au, or via the National Relay Service on 133 677 www.relayservice.com.au. This document is also available on the internet at www.delwp.vic.gov.au.

Table of Contents

Introduction

Publication of these specifications is authorised by the Secretary of the Department of Environment, Land, Water and Planning 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 Environment, Land, Water and Planning (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.

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, with the content in the Regulations taking precedence. This document should be read in conjunction with the Act, Regulations and material published by the ESC.

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 15(3) of the Regulations;

air conditioned for the purpose of determining the AM in **Error! Reference source not found.** and Table 34.3 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;

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 means the annual electrical energy used by the auxiliary equipment of a solar or heat pump water heater system in accordance with AS/NZS 4234:2008 reissued in 2014 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 means the annual supplementary energy used by a solar or heat pump water heater measured in accordance with AS/NZS 4234:2008 reissued in 2014 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;

cool white means a colour temperature above 3500 Kelvin up to and including 4000 Kelvin;

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 electricity emissions factor to be used in greenhouse gas equivalent emissions reduction calculations as follows—

For Activity 44:

From 1 August 2021 to 31 January 2022	$EEF = 0 \cdot 8055$
From 1 February 2022 to 31 January 2023	$EEF = 0 \cdot 516$
From 1 February 2023 to 31 January 2024	$EEF = 0 \cdot 473$
From 1 February 2024 to 31 January 2025	$EEF = 0 \cdot 433$
From 1 February 2025	$EEF = 0 \cdot 393$

For all other activities:

From 1 August 2021 to 31 January 2022	$EEF = 0 \cdot 9546$
From 1 February 2022 to 31 January 2023	$EEF = 0 \cdot 8142$
From 1 February 2023 to 31 January 2024	$EEF = 0 \cdot 6738$
From 1 February 2024 to 31 January 2025	$EEF = 0 \cdot 5334$
From 1 February 2025	$EEF = 0 \cdot 393$

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

EER means the effective energy efficiency ratio based on measurements of nominal rating (kW) and electricity consumption undertaken according to AS 2913-2000 and calculated according to—

$$EER = 0 \cdot 2 \times EER_{FL} + 0 \cdot 3 \times EER_{50\%} + 0 \cdot 5 \times EER_{20\%}$$

where—

EER_{FL} is the nominal rating (kW) divided by electricity consumption (kW) at rated airflow

$EER_{50\%}$ is the nominal rating (kW) divided by electricity consumption (kW) at 50% rated airflow

$EER_{20\%}$ is the nominal rating (kW) divided by electricity consumption (kW) at 20% rated airflow;

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

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 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/;

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;

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;

IPD means the maximum power density in Watts/metres^2;

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;

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;

mercury vapour lamp means a discharge lamp classified as a high-pressure mercury vapour lamp as defined by IEC 60188;

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;

rating correction means the factor which is multiplied by a gas or liquified petroleum gas instantaneous water heaters' SRI, and results in an increase in the reduction of carbon dioxide equivalents of GHG for this product;

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^2 determined in accordance with AS/NZS 62087.2.2;

self-ballasted mercury vapour lamp means a lamp that contains, in the same envelope, a mercury vapour lamp and an incandescent lamp filament connected in series;

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

SRI means star rating index;

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_{ff} means the volume in litres of the fresh food compartment of a refrigerator;

V_{fr} means the volume of the freezer compartment of a two-door refrigerator or freezer;

warm white means a temperature of at least 2700 up to and including 3500 Kelvin;

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 of the Regulations.

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

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	Product to be installed	Historical schedule number*
1A	1A	Electric resistance water heater	Gas or LPG storage water heater	1A
1B	1B	Electric resistance water heater	Gas or LPG instantaneous water heater	1B
1C	1C	Electric resistance water heater	Electric boosted solar water heater that is: • certified to AS/NZS 2712	1E
1D	1D	Electric resistance water heater	Heat pump water heater that is: • certified to AS/NZS 2712	1E
1F	1F	Electric resistance water heater	Gas or LPG boosted solar water heater that is: • certified to AS/NZS 2712	1F

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

Specified minimum energy efficiency

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

Table 1.2 – Additional requirements for water heating equipment to be installed

Product category number	Requirement type	Efficiency requirement	
1A and 1B	Minimum star rating	5 stars, determined in accordance with AS/NZS 5263.1.2 (to be demonstrated by appropriate certification)	
1C, 1F	Minimum annual energy savings	60%, determined in accordance with AS/NZS 4234 and the Water Heating and Space Heating/Cooling Product Application Guide, when modelled in climate zone 4	
1D	Minimum annual energy savings	If the product is installed in climatic zone 4*	60%, determined in accordance with AS/NZS 4234 and the Water Heating and Space Heating/Cooling Product Application Guide, when modelled in climate zone HP4-Au
		If the product is installed in climatic zone 5*	60%, determined in accordance with AS/NZS 4234 and the Water Heating and Space Heating/Cooling Product Application Guide, when modelled in climate zone HP5-Au

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

Other specified matters

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

Table 1.3 – Other specified matters for water heaters

Product category number	Requirement type	Specification details
1D	Heat pump modelling requirements	The product must be modelled in accordance with AS/NZS 4234 so that minimum annual energy savings are determined for both HP4-Au and HP5-Au climate zones. These must be provided to the ESC.*

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

Method for determining GHG equivalent reduction

Scenario 1A: Decommissioning Electric and Installing Gas Storage

The GHG equivalent emissions reduction for this scenario is given by Equation 1.1, using the variables listed in Table 1.4.

Equation 1.1 – GHG equivalent emissions reduction calculation for Scenario 1A

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

Table 1.4 – GHG equivalent emissions reduction variables for Scenario 1A

Small upgrade: upgrade product has a storage capacity less than 95 litres Medium upgrade: upgrade product has a storage capacity of at least 95 and no more than 140 litres Large upgrade: upgrade product has storage capacity of more than 140 litres		
Input type	**Condition**	**Input value**
Baseline	Small upgrade	1.56
	Medium upgrade	2.67
	Large upgrade	3.39
Upgrade	Small upgrade	0.50
	Medium upgrade	0.66
	Large upgrade	0.82
Lifetime	In every instance	12.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

Scenario 1B: Decommissioning Electric and Installing Gas Instantaneous

The GHG equivalent emissions reduction for this scenario is given by Equation 1.2, using the variables listed in Table 1.5.

Equation 1.2 – GHG equivalent emissions reduction calculation for Scenario 1B

$$GHG\ Eq.Reduction = (Abatement\ Factor + Rating\ Correction \times SRI) \times Regional\ Factor$$

Table 1.5 – GHG equivalent emissions reduction variables for Scenario 1B

Small upgrade: upgrade product has a water heating capacity @ 25°C rise of less than 18 L/min Medium upgrade: upgrade product has a water heating capacity @ 25°C rise of at least 18 L/min and no more than 22 L/min Large upgrade: upgrade product has a water heating capacity @ 25°C rise of more than 22 L/min		
Input type	**Condition**	**Input value**
Abatement Factor	Small upgrade	$(17.83 \times EEF) - 5.63$
	Medium upgrade	$(30.88 \times EEF) - 9.39$
	Large upgrade	$(39.25 \times EEF) - 13.14$
Rating Correction	Small upgrade	0.34
	Medium upgrade	0.56
	Large upgrade	0.78
SRI		Star Rating Index of Product

Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

Scenario 1C: Decommissioning Electric and Installing Electric Boosted Solar

The GHG equivalent emissions reduction for this scenario is given by Equation 1.3, using the variables listed in Table 1.6.

Equation 1.3 – GHG equivalent emissions reduction calculation for Scenario 1C

$$GHG\ Eq.Reduction = EEF \times (Abatement\ Factor - (SEF \times B_s) - (AEF \times B_e))$$

Table 1.6 – GHG equivalent emissions reduction variables for Scenario 1C

Small upgrade: upgrade product is a small system as determined in accordance with AS/NZS 4234 based on the system's peak daily thermal energy load delivery characteristics

Medium upgrade: upgrade product is a medium system as determined in accordance with AS/NZS 4234 based on the system's peak daily thermal energy load delivery characteristics

Input type	Condition		Input value
Abatement Factor	For upgrades in Metropolitan Victoria	Small upgrade	28.67
		Medium upgrade	45.95
	For upgrades in Regional Victoria	Small upgrade	30.42
		Medium upgrade	48.76
SEF	For upgrades in Metropolitan Victoria		1.70
	For upgrades in Regional Victoria		1.81
B_S	In every instance		as determined in accordance with AS/NZS 4234 in GJ/year
AEF	For upgrades in Metropolitan Victoria		1.70
	For upgrades in Regional Victoria		1.81
B_e	In every instance		as determined in accordance with AS/NZS 4234 in GJ/year

Scenario 1D: Decommissioning Electric and Installing Heat Pump

The GHG equivalent emissions reduction for this scenario is given by Equation 1.4, using the variables listed in Table 1.7.

Equation 1.4 – GHG equivalent emissions reduction calculation for Scenario 1D

$$GHG\ Eq.\ Reduction = (Abatement\ Factor - (SEF \times B_s) - (AEF \times B_e)) \times EEF$$

Table 1.7 – GHG equivalent emissions reduction variables for Scenario 1D

Small upgrade: upgrade product is a small system as determined in accordance with AS/NZS 4234 based on the system's peak daily thermal energy load delivery characteristics

Medium upgrade: upgrade product is a medium system as determined in accordance with AS/NZS 4234 based on the system's peak daily thermal energy load delivery characteristics

Input type	Condition		Input value
Abatement Factor	For upgrades in Metropolitan Victoria	Small upgrade	22.62
		Medium upgrade	36.24
	For upgrades in Regional Victoria	Small upgrade	24.01
		Medium upgrade	38.46
SEF	For upgrades in Metropolitan Victoria		1.80
	For upgrades in Regional Victoria		1.91
B_S	In every instance		as determined in accordance with AS/NZS 4234 in GJ/year
AEF	For upgrades in Metropolitan Victoria		1.80
	For upgrades in Regional Victoria		1.91
B_e	In every instance		as determined in accordance with AS/NZS 4234 in GJ/year

Scenario 1F: Decommissioning Electric and Installing Gas Boosted Solar

The GHG equivalent emissions reduction for this scenario is given by Equation 1.5, using the variables listed in Table 1.8.

Equation 1.5 – GHG equivalent emissions reduction calculation for Scenario 1F

$$GHG\ Eq. Reduction = (EEF \times (Abatement\ Factor - (AEF \times B_e)) - (SEF \times B_s)$$

Table 1.8 – GHG equivalent emissions reduction variables for Scenario 1F

Small upgrade: upgrade product is a small system as determined in accordance with AS/NZS 4234 based on the system's peak daily thermal energy load delivery characteristics Medium upgrade: upgrade product is a medium system as determined in accordance with AS/NZS 4234 based on the system's peak daily thermal energy load delivery characteristics			
Input type	**Condition**		**Input value**
Abatement Factor	For upgrades in Metropolitan Victoria	Small upgrade	28.71
		Medium upgrade	46.01
	For upgrades in Regional Victoria	Small upgrade	30.47
		Medium upgrade	48.83
SEF	For upgrades in Metropolitan Victoria		0.35
	For upgrades in Regional Victoria		0.34
B_S	In every instance		as determined in accordance with AS/NZS 4234 in GJ/year
AEF	For upgrades in Metropolitan Victoria		1.71
	For upgrades in Regional Victoria		1.82
B_e	In every instance		as determined in accordance with AS/NZS 4234 in GJ/year

***There is no Part 2 Activity

3: Part 3 Activity– Water heaters, replacing gas/LPG

Activity Description

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	Product to be installed	Historical schedule number
3B	3B	Gas or LPG water heater	Gas or LPG boosted solar water heater that is: • certified to AS/NZS 2712	3B

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 3.2.

Table 3.2 – Additional requirements for water heating equipment to be installed

Product category number	Requirement type	Efficiency requirement
3B	Minimum annual energy savings	60%, determined in accordance with AS/NZS 4234 and the Water Heating and Space Heating/Cooling Product Application Guide, when modelled in climate zone 4

Other specified matters

None.

Method for Determining GHG Equivalent Reduction

Scenario 3B: Decommissioning Gas and Installing Gas Boosted Solar

The GHG equivalent emissions reduction for this scenario is given by Equation 3.1 using the variables listed in Table 3.3.

Equation 3.1 – GHG equivalent emissions reduction calculation for Scenario 3B

$$GHG\ Eq.Reduction = Abatement\ Factor - (SEF \times B_s) - (EEF \times AEF \times B_e)$$

Table 3.3 – GHG equivalent emissions reduction variables for Scenario 3B

Small upgrade: upgrade product is a small system as determined in accordance with AS/NZS 4234 based on the system's peak daily thermal energy load delivery characteristics

Medium upgrade: upgrade product is a medium system as determined in accordance with AS/NZS 4234 based on the system's peak daily thermal energy load delivery characteristics

Input Type	Condition	Input Value
Abatement Factor	Small upgrade	8.88
	Medium upgrade	12.23
SEF	At every instance	0.35
B_S	In every instance	as determined in accordance with AS/NZS 4234 in GJ/year
AEF	For upgrades in Metropolitan Victoria	1.75
	For upgrades in Regional Victoria	1.85
B_e	In every instance	as determined in accordance with AS/NZS 4234 in GJ/year

***There is no Part 4 Activity

5: Part 5 Activity– Space heating, ducted gas heater

Activity Description

Part 5 of Schedule 2 of the Regulations prescribes the upgrade to a high efficiency ducted gas heater as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 5.1 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 5.1 – Eligible part 5 space heating scenarios

Product category number	Scenario number	Decommissioning requirements	Other requirements	Product to be installed	Historical schedule number
5A	5A(i)	Ducted gas heater	None	Ducted gas heater with: • a minimum thermal output (or capacity) of 10kW	5A
	5A(ii)	Central electric resistance heater that provides heating to a space with a floor area of at least 100m^2	None		6A
	5A(iii)	None	no other space heating or cooling product is installed in premises		20A

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 5.2.

Table 5.2 – Additional requirements for space heating equipment to be installed

Product category number	Requirement type	Efficiency requirement
5A	Minimum star rating	5 stars, determined in accordance with AS/NZS 5263.1.6 (to be demonstrated by appropriate certification)

Other specified matters

None.

Method for Determining GHG Equivalent Reduction

Scenario 5A(i): Decommissioning an existing ducted gas space heater and installing high efficiency ducted gas space heater

The GHG equivalent emissions reduction for this scenario is given by Equation 5.1 using the variables listed in Table 5.3.

Equation 5.1 – GHG equivalent emissions reduction calculation for Scenario 5A(i)

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

Table 5.3 – GHG equivalent emissions reduction variables for Scenario 5A(i)

Measurements, testing and ratings must be in accordance with AS/NZS 5263.1.6
Small upgrade: upgrade product has a thermal output (or capacity) of at least 10 and not more than 18 kW
Medium upgrade: upgrade product has a thermal output (or capacity) of more than 18 and not more than 28 kW
Large upgrade: upgrade product has a thermal output (or capacity) of more than 28 kW

Input type	Condition		Input value
Baseline	Small upgrade		$3.05 + (0.46 \times EEF)$
	Medium upgrade		$3.85 + (0.58 \times EEF)$
	Large upgrade		$4.85 + (0.73 \times EEF)$
Upgrade	Small upgrade	5.00 to less than 5.50 stars	$2.67 + (0.40 \times EEF)$
		5.50 to less than 6 stars	$2.51 + (0.38 \times EEF)$
		6 stars or greater	$2.38 + (0.36 \times EEF)$
	Medium upgrade	5.00 to less than 5.50 stars	$3.37 + (0.51 \times EEF)$
		5.50 to less than 6 stars	$3.17 + (0.48 \times EEF)$
		6 stars or greater	$3.00 + (0.45 \times EEF)$
	Large upgrade	5.00 to less than 5.50 stars	$4.25 + (0.64 \times EEF)$
		5.50 to less than 6 stars	$4.00 + (0.60 \times EEF)$
		6 stars or greater	$3.79 + (0.57 \times EEF)$
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		1.63
	For upgrades in Regional Victoria – Climatic region mild		1.00
	For upgrades in Regional Victoria – Climatic region cold		1.64
	For upgrades in Regional Victoria – Climatic region hot		0.71

Scenario 5A(ii): Decommissioning a central electric resistance heater and installing a high efficiency ducted gas space heater

The GHG equivalent emissions reduction for this scenario is given by Equation 5.2, using the variables listed in Table 5.4.

Equation 5.2 – GHG equivalent emissions reduction calculation for Scenario 5A(ii)

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

Table 5.4 – GHG equivalent emissions reduction variables for Scenario 5A(ii)

Measurements, testing and ratings must be in accordance with AS/NZS 5263.1.6
Small upgrade: upgrade product has a thermal output (or capacity) of at least 10 and not more than 18 kW
Medium upgrade: upgrade product has a thermal output (or capacity) of more than 18 and not more than 28 kW
Large upgrade: upgrade product has a thermal output (or capacity) of more than 28 kW

Input type	Condition		Input value
Baseline	Small upgrade		$9.52 \times EEF$
	Medium upgrade		$12.02 \times EEF$
	Large upgrade		$15.16 \times EEF$
Upgrade	Small upgrade	5.00 to less than 5.50 stars	$2.67 + (0.40 \times EEF)$
		5.50 to less than 6 stars	$2.51 + (0.38 \times EEF)$
		6 stars or greater	$2.38 + (0.36 \times EEF)$
	Medium upgrade	5.00 to less than 5.50 stars	$3.37 + (0.51 \times EEF)$
		5.50 to less than 6 stars	$3.17 + (0.48 \times EEF)$
		6 stars or greater	$3.00 + (0.45 \times EEF)$
	Large upgrade	5.00 to less than 5.50 stars	$4.25 + (0.64 \times EEF)$
		5.50 to less than 6 stars	$4.00 + (0.60 \times EEF)$
		6 stars or greater	$3.79 + (0.57 \times EEF)$
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		1.08
	For upgrades in Regional Victoria – Climatic region cold		1.76
	For upgrades in Regional Victoria – Climatic region hot		0.76

Scenario 5A(iii): Installing a ducted gas heater in a new premises

The GHG equivalent emissions reduction for this scenario is given by Equation 5.3, using the variables listed in Table 5.5.

Equation 5.3 – GHG equivalent emissions reduction calculation for Scenario 5A(iii)

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

Table 5.5 – GHG equivalent emissions reduction variables for Scenario 5A(iii)

Measurements, testing and ratings must be in accordance with AS/NZS 5263.1.6
Small upgrade: upgrade product has a thermal output (or capacity) of at least 10 and not more than 18 kW
Medium upgrade: upgrade product has a thermal output (or capacity) of more than 18 and not more than 28 kW
Large upgrade: upgrade product has a thermal output (or capacity) of more than 28 kW

Input type	Condition		Input value
Baseline	Small upgrade		$1.15 + (0.17 \times EEF)$
	Medium upgrade		$1.15 + (0.17 \times EEF)$
	Large upgrade		$1.52 + (0.23 \times EEF)$
Upgrade	Small upgrade	5.00 to less than 5.50 stars	$0.97 + (0.15 \times EEF)$
		5.50 to less than 6 stars	$0.91 + (0.14 \times EEF)$
		6 stars or greater	$0.86 + (0.13 \times EEF)$
	Medium upgrade	5.00 to less than 5.50 stars	$0.97 + (0.15 \times EEF)$
		5.50 to less than 6 stars	$0.91 + (0.14 \times EEF)$
		6 stars or greater	$0.86 + (0.13 \times EEF)$
	Large upgrade	5.00 to less than 5.50 stars	$1.28 + (0.19 \times EEF)$
		5.50 to less than 6 stars	$1.20 + (0.18 \times EEF)$
		6 stars or greater	$1.14 + (0.17 \times EEF)$
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		1.86
	For upgrades in Regional Victoria – Climatic region mild		1.01
	For upgrades in Regional Victoria – Climatic region cold		1.87
	For upgrades in Regional Victoria – Climatic region hot		0.66

6: Part 6 Activity– Space heating and cooling, general

Activity Description

Part 6 of Schedule 2 of the Regulations prescribes the upgrade of a space heater or cooler of a type specified by the department as an eligible activity for the purposes of the Victorian Energy Upgrades program.

The department has not yet specified any particular type of space heater or cooler for this prescribed activity.

Over time, the department may determine that there are space heating and cooling upgrades that reduce GHG equivalent emissions, other than those listed in parts 5, 7, 9, 10 or 23. In such a case, product requirements and installation requirements for emerging technology and upgrade scenarios will be listed by the department under this part as well as the method by which to determine reduction in GHG equivalent emissions.

Specified Minimum Energy Efficiency

Currently not applicable.

Other specified matters

Currently not applicable.

Method for Determining GHG Equivalent Reduction

Currently not applicable.

7: Part 7 Activity– Space heating, ducted air to air heat pump

Activity Description

Part 7 of Schedule 2 of the Regulations prescribes the upgrade to a high efficiency air to air heat pump as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 7.1 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.

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

Table 7.1 – Eligible space heating scenarios

Product category number	Scenario Number	Decommissioning requirements	Other requirements	Product to be installed	Historical schedule number
7A	7A(i)	Ducted air to air heat pump	None	Ducted air to air heat pump	7A
	7A(ii)	Central electric resistance heater that provides heating to a space with a floor area of at least 100m^2	None		8A
	7A(iii)	None	no other space heating or cooling product is installed in premises		N/A

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 7.2.

Table 7.2 – Additional requirements for space heating equipment to be installed

Product category number	Requirement type	Efficiency requirement
7A	Minimum performance requirement	Product achieves: • a minimum RTHC of 10 kW at the H1 temperature condition • a minimum ACOP of: – 3.9, if RTHC is 18kW or less – 3.7, in any other case Measurement, testings and ratings must be in accordance with the *Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth)*

Other specified matters

None.

Method for Determining GHG Equivalent Reduction

Scenario 7A(i): Decommissioning an existing ducted air to air heat pump and installing a high efficiency ducted air to air heat pump

The GHG equivalent emissions reduction for this scenario is given by Equation 7.1, using the variables listed in Table 7.3.

Equation 7.1 – GHG equivalent emissions reduction calculation for Scenario 7A(i)

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

Table 7.3 – GHG equivalent emissions reduction variables for Scenario 7A(i)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth)

Small upgrade: upgrade product has a RTHC of at least 10 and not more than 18 kW

Medium upgrade: upgrade product has a RTHC of more than 18 and not more than 28 kW

Large upgrade: upgrade product has a RTHC of more than 28 kW

Input type	Condition		Input value
Baseline	Small upgrade		4.72
	Medium upgrade		6.16
	Large upgrade		7.43
Upgrade	Small upgrade	ACOP of 3.90 to less than 4.00	4.49
		ACOP of 4.00 to less than 4.30	4.37
		ACOP of 4.30 to less than 4.60	4.06
		ACOP of 4.60 or greater	3.78
	Medium upgrade	ACOP of 3.70 to less than 4.00	5.85
		ACOP of 4.00 to less than 4.30	5.40
		ACOP of 4.30 to less than 4.60	5.02
		ACOP of 4.60 or greater	4.68
	Large upgrade	ACOP of 3.70 to less than 4.00	6.94
		ACOP of 4.00 to less than 4.30	6.41
		ACOP of 4.30 to less than 4.60	5.95
		ACOP of 4.60 or greater	5.55
Lifetime	In every instance		13.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild		1.00
	For upgrades in Metropolitan Victoria – Climatic region cold		1.32

	For upgrades in Regional Victoria – Climatic region mild	1.06
	For upgrades in Regional Victoria – Climatic region cold	1.40
	For upgrades in Regional Victoria – Climatic region hot	1.34

Scenario 7A(ii): Decommissioning a central electric resistance heater and installing a high efficiency ducted air to air heat pump

The GHG equivalent emissions reduction for this scenario is given by Equation 7.2, using the variables listed in Table 7.4.

Equation 7.2 – GHG equivalent emissions reduction calculation for Scenario 7A(ii)

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

Table 7.4 – GHG equivalent emissions reduction variables for Scenario 7A(ii)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth)

Small upgrade: upgrade product has a RTHC of at least 10 and not more than 18 kW

Medium upgrade: upgrade product has a RTHC of more than 18 and not more than 28 kW

Large upgrade: upgrade product has a RTHC of more than 28 kW

Input type	Condition		Input value
Baseline	Small upgrade		9.35
	Medium upgrade		11.80
	Large upgrade		14.89
Upgrade	Small upgrade	ACOP of 3.90 to less than 4.00	4.49
		ACOP of 4.00 to less than 4.30	4.37
		ACOP of 4.30 to less than 4.60	4.06
		ACOP of 4.60 or greater	3.78
	Medium upgrade	ACOP of 3.70 to less than 4.00	5.85
		ACOP of 4.00 to less than 4.30	5.40
		ACOP of 4.30 to less than 4.60	5.02
		ACOP of 4.60 or greater	4.68
	Large upgrade	ACOP of 3.70 to less than 4.00	6.94
		ACOP of 4.00 to less than 4.30	6.41
		ACOP of 4.30 to less than 4.60	5.95
		ACOP of 4.60 or greater	5.55
Lifetime	In every instance		13.00

Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild	1.00
	For upgrades in Metropolitan Victoria – Climatic region cold	1.85
	For upgrades in Regional Victoria – Climatic region mild	1.06
	For upgrades in Regional Victoria – Climatic region cold	1.96
	For upgrades in Regional Victoria – Climatic region hot	0.30

Scenario 7A(iii): Installing a high efficiency ducted air to air heat pump in a new premises

The GHG equivalent emissions reduction for this scenario is given by Equation 7.3, using the variables listed in Table 7.5.

Equation 7.3 – GHG equivalent emissions reduction calculation for Scenario 7A(iii)

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

Table 7.5 – GHG equivalent emissions reduction variables for Scenario 7A(iii)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth)

Small upgrade: upgrade product has a RTHC of at least 10 and not more than 18 kW

Medium upgrade: upgrade product has a RTHC of more than 18 and not more than 28 kW

Large upgrade: upgrade product has a RTHC of more than 28 kW

Input type	Condition		Input value
Baseline	Small upgrade		2.04
	Medium upgrade		2.13
	Large upgrade		2.81
Upgrade	Small upgrade	ACOP of 3.90 to less than 4.00	1.94
		ACOP of 4.00 to less than 4.30	1.89
		ACOP of 4.30 to less than 4.60	1.75
		ACOP of 4.60 or greater	1.63
	Medium upgrade	ACOP of 3.70 to less than 4.00	2.02
		ACOP of 4.00 to less than 4.30	1.87
		ACOP of 4.30 to less than 4.60	1.73
		ACOP of 4.60 or greater	1.62
	Large upgrade	ACOP of 3.70 to less than 4.00	2.62
		ACOP of 4.00 to less than 4.30	2.42
		ACOP of 4.30 to less than 4.60	2.24
		ACOP of 4.60 or greater	2.09

Lifetime	In every instance	13.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild	1.00
	For upgrades in Metropolitan Victoria – Climatic region cold	1.37
	For upgrades in Regional Victoria – Climatic region mild	1.06
	For upgrades in Regional Victoria – Climatic region cold	1.45
	For upgrades in Regional Victoria – Climatic region hot	1.49

***There is no Part 8 Activity

9: Part 9 Activity– Space heating, room gas/LPG heater

Activity Description

Part 9 of Schedule 2 of the Regulations prescribes the upgrade to a high efficiency room gas or LPG space heater as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 9.1 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 9.1 – Eligible space heating scenarios

Product category number	Scenario Number	Decommissioning requirements	Product to be installed	Historical schedule number
9A	9A(i)	Hard-wired electric room heater used as the main form of heating the premises.	Gas or LPG room heater with: • a minimum thermal output (or capacity) of 2 kW	9A
	9A(ii)	Gas or LPG room heater, or other type of room heating		9A
	9A(iii)	Plug in electric heater when used as the main form of heating the premises, or wood fired room heater used as the main form of heating: • an entire Class 1a, 4, 5, 6, 7b or 8 Building • an entire dwelling within a Class 1b or 2 Building • a room within a Class 3 or 9 Building as per the BCA”		9A

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 9.2.

Table 9.2 – Additional requirements for space heating equipment to be installed

Product category number	Requirement type	Efficiency requirement
9A	Minimum star rating	4 stars, determined in accordance with AS/NZS 5263.1.3 (to be demonstrated by appropriate certification)

Other specified matters

The products installed or decommissioned must meet the relevant additional requirements listed in Table 9.3.

Table 9.3 – Other specified matters for space heating equipment

Product category number	Requirement type	Specification details
9A	space heating product for the purposes of the definition of controlled heating or cooling product in the Regulations	For the purposes of scenario number 9A(ii) the department hereby specifies that any room heaters that are not otherwise listed may also be decommissioned
9A	Specified flue design requirements	Room sealed flue

Method for Determining GHG Equivalent Reduction

Scenario 9A(i): Decommissioning a hard-wired electric room heater and installing a high efficiency gas room heater

The GHG equivalent emissions reduction for this scenario is given by Equation 9.1, using the variables listed in Table 9.4.

Equation 9.1 – GHG equivalent emissions reduction calculation for Scenario 9A(i)

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

Table 9.4 – GHG equivalent emissions reduction variables for Scenario 9A(i)

Measurements, testing and ratings must be in accordance with AS/NZS 5263.1.3
Small upgrade: upgrade product has a thermal output (or capacity) of at least 2 and not more than 3 kW
Medium upgrade: upgrade product has a thermal output (or capacity) of more than 3 and not more than 6 kW
Large upgrade: upgrade product has a thermal output (or capacity) of more than 6 kW

Input type	Condition		Input value
Baseline	Small upgrade		$1.52 \times EEF$
	Medium upgrade		$2.88 \times EEF$
	Large upgrade		$3.63 \times EEF$
Upgrade	Small upgrade	4.00 to less than 5 stars	0.40
		5.00 stars or greater	0.37
	Medium upgrade	4.00 to less than 5 stars	0.75
		5.00 stars or greater	0.70
	Large upgrade	4.00 to less than 5 stars	0.95
		5.00 stars or greater	0.88
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	1.33
	For upgrades in Regional Victoria – Climatic region mild	1.08
	For upgrades in Regional Victoria – Climatic region cold	1.75
	For upgrades in Regional Victoria – Climatic region hot	0.76

Scenario 9A(ii): Decommissioning an existing gas room heater or other heater and installing a high efficiency gas room heater

The GHG equivalent emissions reduction for this scenario is given by Equation 9.2, using the variables listed in Table 9.5.

Equation 9.2 – GHG equivalent emissions reduction calculation for Scenario 9A(ii)

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

Table 9.5 – GHG equivalent emissions reduction variables for Scenario 9A(ii)

Measurements, testing and ratings must be in accordance with AS/NZS 5263.1.3
Small upgrade: upgrade product has a thermal output (or capacity) of at least 2 and not more than 3 kW
Medium upgrade: upgrade product has a thermal output (or capacity) of more than 3 and not more than 6 kW
Large upgrade: upgrade product has a thermal output (or capacity) of more than 6 kW

Input type	Condition		Input value
Baseline	Small upgrade		0.45
	Medium upgrade		0.85
	Large upgrade		1.07
Upgrade	Small upgrade	4.00 to less than 5 stars	0.40
		5.00 stars or greater	0.37
	Medium upgrade	4.00 to less than 5 stars	0.75
		5.00 stars or greater	0.70
	Large upgrade	4.00 to less than 5 stars	0.95
		5.00 stars or greater	0.88
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		1.00
	For upgrades in Regional Victoria – Climatic region cold		1.62
	For upgrades in Regional Victoria – Climatic region hot		0.70

Scenario 9A(iii): Decommissioning an existing plug-in electric room heater or wood heater and installing a high efficiency gas room heater

The GHG equivalent emissions reduction for this scenario is given by Equation 9.3, using the variables listed in Table 9.6.

Equation 9.3 – GHG equivalent emissions reduction calculation for Scenario 9A(iii)

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

Table 9.6 – GHG equivalent emissions reduction variables for Scenario 9A(iii)

Measurements, testing and ratings must be in accordance with AS/NZS 5263.1.3		
Input Type	**Condition**	**Input Value**
Baseline	In every instance	$1.22 \times EEF$
Upgrade	4.00 to less than 5 stars	0.32
	5.00 stars or greater	0.30
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	1.33
	For upgrades in Regional Victoria – Climatic region mild	1.08
	For upgrades in Regional Victoria – Climatic region cold	1.75
	For upgrades in Regional Victoria – Climatic region hot	0.76

10: Part 10 Activity– Space heating, room air to air heat pump

Activity Description

Part 10 of Schedule 2 of the Regulations prescribes the upgrade to a room air to air pump as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 10.1 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.

For the purposes of scenario number 10A(ii) the department hereby specifies that room heaters that are not otherwise listed, may be decommissioned instead of a room air to air heat pump.

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

Table 10.1 – Eligible space heating scenarios

Product category number	Scenario Number	Decommissioning requirements	Product to be installed	Historical schedule number
10A	10A(i)	Hard-wired electric room heater used as the main form of heating the premises.	Room air to air heat pump (other than a ducted air to air heat pump)	10A
	10A(ii)	Room air to air heat pump or other room heater		10A
	10A(iii)	Plug in electric heater used as the main form of heating the premises, or wood fired room heater used as the main form of heating: • an entire Class 1a, 4, 5, 6, 7b or 8 Building • an entire dwelling within a Class 1b or 2 Building • a room within a Class 3 or 9 Building as per the BCA"		10A
	10A(iv)	Refrigerative air conditioner (non-ducted) that is not located in • if in residential premises, a bedroom, or • otherwise, a room with an area less than 20m^2 and a hard-wired electric room heater used as the main form of heating the premises		10A
	10A(v)	Refrigerative air conditioner (non-ducted) that is not located in • if in residential premises, a bedroom, or • otherwise, a room with an area less than 20m^2 and a plug in electric room heater used as the main form of heating the premises		10A
	10A(vi)	Refrigerative room air conditioner that is not located in • if in residential premises, a bedroom, or • otherwise, a room with an area less than 20m^2 and a gas or LPG room heater		10A

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 10.2.

Table 10.2 – Additional requirements for space heating equipment to be installed

Product category number	Requirement type	Efficiency requirement
10A	Minimum performance requirement	Product achieves: • a minimum RTHC of 2 kW at the H1 temperature condition • a minimum ACOP of – 4.2, if RTHC is 3 kW or less – 4, in any other case Measurement, testings and ratings must be in accordance with the *Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth)*

Other specified matters

The product decommissioned must meet the relevant additional requirements listed in Table 10.3.

Table 10.3 – Other specified matters for space heating equipment

Product category number	Requirement type	Specification details
10A	Space heating product for the purposes of the definition of controlled heating or cooling product in the Regulations	For the purposes of scenario number 10A(ii) the department hereby specifies that any room heaters that are not otherwise listed may also be decommissioned

Method for Determining GHG Equivalent Reduction

Scenario 10A(i): Decommissioning hard-wired electric room heater and installing a high efficiency room air to air heat pump

The GHG equivalent emissions reduction for this scenario is given by Equation 10.1 using the variables listed in Table 10.4.

Equation 10.1 – GHG equivalent emissions reduction calculation for Scenario 10A(i)

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

Table 10.4 – GHG equivalent emissions reduction variables for Scenario 10A(i)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth) Small upgrade: upgrade product has a RTHC of at least 2 and not more than 3 kW Medium upgrade: upgrade product has a RTHC of more than 3 and not more than 6 kW Large upgrade: upgrade product has a RTHC of more than 6 kW			
Input type	**Condition**		**Input value**
Baseline	Small upgrade		1.53
	Medium upgrade		2.89
	Large upgrade		3.65
Upgrade	Small upgrade	ACOP of 4.20 to less than 4.50	0.57
		ACOP of 4.50 to less than 5.00	0.52
		ACOP of 5.00 to less than 5.50	0.47
		ACOP of 5.50 or greater	0.43
	Medium upgrade	ACOP of 4.00 to less than 4.50	1.11
		ACOP of 4.50 to less than 5.00	0.99
		ACOP of 5.00 to less than 5.50	0.89
		ACOP of 5.50 or greater	0.81
	Large upgrade	ACOP of 4.00 to less than 4.50	1.32
		ACOP of 4.50 to less than 5.00	1.17
		ACOP of 5.00 to less than 5.50	1.05
		ACOP of 5.5 or greater	0.95
Lifetime	In every instance		12.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild		1.00
	For upgrades in Metropolitan Victoria – Climatic region cold		1.79
	For upgrades in Regional Victoria – Climatic region mild		1.06
	For upgrades in Regional Victoria – Climatic region cold		1.90
	For upgrades in Regional Victoria – Climatic region hot		0.48

Scenario 10A(ii): Decommissioning room air to air heat pump and installing a high efficiency room air to air heat pump

The GHG equivalent emissions reduction for this scenario is given by Equation 10.2, using the variables listed in Table 10.5.

Equation 10.2 – GHG equivalent emissions reduction calculation for Scenario 10A(ii)

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

Table 10.5 – GHG equivalent emissions reduction variables for Scenario 10A(ii)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth)

Small upgrade: upgrade product has a RTHC of at least 2 and not more than 3 kW

Medium upgrade: upgrade product has a RTHC of more than 3 and not more than 6 kW

Large upgrade: upgrade product has a RTHC of more than 6 kW

Input type	Condition		Input value
Baseline	Small upgrade		0.58
	Medium upgrade		1.14
	Large upgrade		1.47
Upgrade	Small upgrade	ACOP of 4.20 to less than 4.50	0.57
		ACOP of 4.50 to less than 5.00	0.52
		ACOP of 5.00 to less than 5.50	0.47
		ACOP of 5.50 or greater	0.43
	Medium upgrade	ACOP of 4.00 to less than 4.50	1.11
		ACOP of 4.50 to less than 5.00	0.99
		ACOP of 5.00 to less than 5.50	0.89
		ACOP of 5.50 or greater	0.81
	Large upgrade	ACOP of 4.00 to less than 4.50	1.32
		ACOP of 4.50 to less than 5.00	1.17
		ACOP of 5.00 to less than 5.50	1.05
		ACOP of 5.5 or greater	0.95
Lifetime	In every instance		12.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild		1.00
	For upgrades in Metropolitan Victoria – Climatic region cold		1.27
	For upgrades in Regional Victoria – Climatic region mild		1.06
	For upgrades in Regional Victoria – Climatic region cold		1.35
	For upgrades in Regional Victoria – Climatic region hot		1.30

Scenario 10A(iii): Decommissioning plug in electric heater or a wood heater and installing a high efficiency room air to air heat pump

The GHG equivalent emissions reduction for this scenario is given by Equation 10.3, using the variables listed in Table 10.6.

Equation 10.3 – GHG equivalent emissions reduction calculation for Scenario 10A(iii)

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

Table 10.6 – GHG equivalent emissions reduction variables for Scenario 10A(iii)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth)		
Input type	**Condition**	**Input value**
Baseline	In every instance	1.22
Upgrade	ACOP of 4.20 to less than 4.50	0.46
	ACOP of 4.50 to less than 5.00	0.42
	ACOP of 5.00 to less than 5.50	0.38
	ACOP of 5.50 or greater	0.34
Lifetime	In every instance	12.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild	1.00
	For upgrades in Metropolitan Victoria – Climatic region cold	1.79
	For upgrades in Regional Victoria – Climatic region mild	1.06
	For upgrades in Regional Victoria – Climatic region cold	1.90
	For upgrades in Regional Victoria – Climatic region hot	0.48

Scenario 10A(iv): Decommissioning a room refrigerative air conditioner and hard-wired electric room heater and installing a high efficiency room air to air heat pump

The GHG equivalent emissions reduction for this scenario is given by Equation 10.4, using the variables listed in Table 10.7.

Equation 10.4 – GHG equivalent emissions reduction calculation for Scenario 10A(iv)

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

Table 10.7 – GHG equivalent emissions reduction variables for Scenario 10A(iv)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth) Small upgrade: upgrade product has a RTHC of at least 2 and not more than 3 kW Medium upgrade: upgrade product has a RTHC of more than 3 and not more than 6 kW Large upgrade: upgrade product has a RTHC of more than 6 kW			
Input type	**Condition**		**Input value**
Baseline	Small upgrade		1.73
	Medium upgrade		3.296
	Large upgrade		4.10
Upgrade	Small upgrade	ACOP of 4.20 to less than 4.50	0.57
		ACOP of 4.50 to less than 5.00	0.52
		ACOP of 5.00 to less than 5.50	0.47
		ACOP of 5.50 or greater	0.43
	Medium upgrade	ACOP of 4.00 to less than 4.50	1.11
		ACOP of 4.50 to less than 5.00	0.99
		ACOP of 5.00 to less than 5.50	0.89
		ACOP of 5.50 or greater	0.81
	Large upgrade	ACOP of 4.00 to less than 4.50	1.32
		ACOP of 4.50 to less than 5.00	1.17
		ACOP of 5.00 to less than 5.50	1.05
		ACOP of 5.5 or greater	0.95
Lifetime	In every instance		12.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild		1.00
	For upgrades in Metropolitan Victoria – Climatic region cold		1.60
	For upgrades in Regional Victoria – Climatic region mild		1.06
	For upgrades in Regional Victoria – Climatic region cold		1.69
	For upgrades in Regional Victoria – Climatic region hot		0.79

Scenario 10A(v): Decommissioning room refrigerative air conditioner and a plug in electric room heater and installing a high efficiency room air to air heat pump

The GHG equivalent emissions reduction for this scenario is given by Equation 10.5, using the variables listed in Table 10.8.

Equation 10.5 – GHG equivalent emissions reduction calculation for Scenario 10A(v)

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

Table 10.8 – GHG equivalent emissions reduction variables for Scenario 10A(v)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth)		
Input type	**Condition**	**Input value**
Baseline	In every instance	1.38
Upgrade	ACOP of 4.20 to less than 4.50	0.46
	ACOP of 4.50 to less than 5.00	0.42
	ACOP of 5.00 to less than 5.50	0.38
	ACOP of 5.50 or greater	0.34
Lifetime	In every instance	12.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild	1.00
	For upgrades in Metropolitan Victoria – Climatic region cold	1.60
	For upgrades in Regional Victoria – Climatic region mild	1.06
	For upgrades in Regional Victoria – Climatic region cold	1.69
	For upgrades in Regional Victoria – Climatic region hot	0.79

Scenario 10A(vi): Decommissioning room refrigerative air conditioner and a gas room space heater and installing a high efficiency room air to air heat pump

The GHG equivalent emissions reduction for this scenario is given by Equation 10.6, using the variables listed in Table 10.9.

Equation 10.6 – GHG equivalent emissions reduction calculation for Scenario 10A(vi)

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

Table 10.9 – GHG equivalent emissions reduction variables for Scenario 10A(vi)

Measurements, testing and ratings must be in accordance with the Greenhouse and Energy Minimum Standards (Air Conditioners and Heat Pumps) Determination 2013 (Cth) Small upgrade: upgrade product has a RTHC of at least 2 and not more than 3 kW Medium upgrade: upgrade product has a RTHC of more than 3 and not more than 6 kW Large upgrade: upgrade product has a RTHC of more than 6 kW			
Input type	**Condition**		**Input value**
Baseline	Small upgrade		$0.45 + (0.21 \times EEF)$
	Medium upgrade		$0.85 + (0.40 \times EEF)$
	Large upgrade		$1.07 + (0.45 \times EEF)$
Upgrade	Small upgrade	ACOP of 4.20 to less than 4.50	$0.57 \times EEF$
		ACOP of 4.50 to less than 5.00	$0.52 \times EEF$
		ACOP of 5.00 to less than 5.50	$0.47 \times EEF$
		ACOP of 5.50 or greater	$0.43 \times EEF$
	Medium upgrade	ACOP of 4.00 to less than 4.50	$1.11 \times EEF$
		ACOP of 4.50 to less than 5.00	$0.99 \times EEF$
		ACOP of 5.00 to less than 5.50	$0.89 \times EEF$
		ACOP of 5.50 or greater	$0.81 \times EEF$
	Large upgrade	ACOP of 4.00 to less than 4.50	$1.32 \times EEF$
		ACOP of 4.50 to less than 5.00	$1.17 \times EEF$
		ACOP of 5.00 to less than 5.50	$1.05 \times EEF$
		ACOP of 5.5 or greater	$0.95 \times EEF$
Lifetime	In every instance		12.00
Regional Factor	For upgrades in Metropolitan Victoria – Climatic region mild		1.00
	For upgrades in Metropolitan Victoria – Climatic region cold		1.33
	For upgrades in Regional Victoria – Climatic region mild		0.76
	For upgrades in Regional Victoria – Climatic region cold		0.93
	For upgrades in Regional Victoria – Climatic region hot		1.02

***There is no Part 11 Activity

12: Part 12 Activity– Underfloor insulation

Activity Description

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	Product to be installed	Historical schedule number
12A	12A	None	A product (or multiple products) that: • is/are installed in a floor area that is not insulated for a minimum of 20 m^2 in accordance with AS 3999 • complies (or together comply) with AS/NZS 4859.1 performance requirements once installed	12A

Specified Minimum Energy Efficiency

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

Table 12.2 – Additional requirements for insulation to be installed

Product category number	Requirement type	Efficiency requirement
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 each 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

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

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

Input type	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 m^2

13: Part 13 Activity– Double glazed windows

Activity Description

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 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 efficiency window scenarios

Product category number	Scenario number	Removal requirements	Product to be installed	Historical schedule number
13A	13A	An existing window	Glazing product: • of which at least 5 m^2 is installed in place of one or more windows in an external wall • that complies with AS 2047 and AS 1288 performance requirements • that is WERS rated	13A

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 13.2.

Table 13.2 – Additional requirements for thermally efficient windows to be installed

Product category number	Requirement type	Efficiency requirement
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.

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

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

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^2

14: Part 14 Activity– Thermally efficient window products

Activity Description

Part 14 of Schedule 2 of the Regulations prescribes the upgrade of a window by installing glazing product 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.

Over time, the department may determine that there are other products that enhance the thermal efficiency of a window and thereby 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 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	Product to be installed	Historical schedule number
14A	14A	None	A product that raises the thermal efficiency of the single glazed window it is installed onto and: • when installed creates a still air gap between it and the single glazed window • is installed on at least 5 m2 of the window, which must be on an external wall	14A

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 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.

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

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

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

Input type	Condition	Input value
GHG Savings	In every instance	$8.74 \times 10^{-3} + (5.31 \times 10^{-3} \times EEF)$
Lifetime	Glass or acrylic product	15.00
	Window film product	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^2

15: Part 15 Activity– Weather sealing

Activity Description

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.

Over time, the department may determine 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 listed by the department as scenario number 15I 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 15.1 – Eligible weather sealing scenarios

Note: Final upgrade must ensure air change rate of premises is less than 0.5 and must comply with Part 3.8.5 of the BCA

Product category number	Scenario number	Decommissioning requirements	Product to be installed	Historical schedule number
15A	15A	None	Door sealing or weather stripping product(s) installed to frame of, or each edge of, an external door in accordance with the manufacturer's instructions so it restricts airflow around the entire perimeter of the door and which: • does not impair normal operation of the door • is covered by warranty against defects for at least 2 years	15A
15B	15B	None	Window sealing or weather stripping product(s) installed to frame of, or each edge of, an external window in accordance with the manufacturer's instructions so it restricts airflow around the relevant edges of the window and which: • does not impair normal operation of the window • is covered by warranty against defects for at least 2 years	15B
15C	15C	A ceiling or wall exhaust fan that does not meet criteria for product to be installed	Ceiling or wall exhaust fan that • is installed in accordance with the manufacturer's instructions and in place of the decommissioned fan • expels air either outside or into the roof space of the premises • is fitted with a self-closing damper, flap, filter or other sealing product that allows airflow through the exhaust of	15C

Note: Final upgrade must ensure air change rate of premises is less than 0.5 and must comply with Part 3.8.5 of the BCA

Product category number	Scenario number	Decommissioning requirements	Product to be installed	Historical schedule number
			the fan when the fan is operating, but restricts airflow when the fan is not operating • is covered by warranty against defects for at least 2 years	
15D	15D	None	A self-closing damper, flap, filter or other sealing product on a ceiling or wall exhaust fan that expels air either outside or into the roof space of the premises and on which no such product is already installed that • is installed in accordance with the manufacturer's instructions • when installed, allows airflow through the exhaust of the fan when the fan is operating and restricts airflow when the fan is not operating • is covered by warranty against defects for at least 2 years	15D
15E	15E	None	A product made of robust non-shrinking sealing material in an unsealed wall vent with the result that a ventilation opening in an external wall is sealed or closed that: • is installed in accordance with the manufacturer's instructions • is covered by warranty against defects for at least 2 years	15E
15F	15F	None	A product that is permanently installed to an unsealed chimney or flue of a fireplace to which no such product is already installed and: • when fitted to a chimney or flue of an open fireplace used to burn solid fuel – restricts the airflow into or out of the chimney or flue when closed – allows the fireplace to operate safely and effectively when open • is designed to be installed permanently • is installed in accordance with the manufacturer's instructions • is covered by warranty against defects for at least 5 years	15F
15G	15G	None	A product that is installed to an unsealed chimney or flue of a fireplace to which no such product is already installed and: • is not a chimney or flue balloon • when fitted to a chimney or flue of an open fireplace used to burn solid fuel when closed restricts the airflow into or out of the chimney or flue	15G

Note: Final upgrade must ensure air change rate of premises is less than 0.5 and must comply with Part 3.8.5 of the BCA

Product category number	Scenario number	Decommissioning requirements	Product to be installed	Historical schedule number
			• is designed to be installed on a temporary or seasonal basis • is installed in accordance with the manufacturer's instructions and with signage that has instructions for removal of the product • is covered by warranty against defects for at least 2 years	
15H	15H	None	A product that is installed so it covers the ceiling outlet of a ducted evaporative cooling system to which no such product is already installed and: • restricts airflow from inside the residential premises into the evaporative cooling ductwork • is designed to be installed on a temporary or seasonal basis • is installed in accordance with the manufacturer's instructions • comes with instructions regarding its installation and removal and the time of the year that the product should be installed and removed • is covered by warranty against defects for at least 2 years	15H

Specified Minimum Energy Efficiency

There are no additional requirements that must be met by the products 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

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

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

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

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^2

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

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

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

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

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 15.6.

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 15.5 – GHG equivalent emissions reduction calculation for Scenario 15E

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

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

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

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

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

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

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

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

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	Product to be installed	Historical schedule number
17A	17A	A shower rose with a flow rate above 9L/min	A shower rose that: • complies with AS/NZS 3662	17A

Specified Minimum Energy Efficiency

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

Table 17.2 – Additional requirements for shower roses to be installed

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

Other specified matters

None.

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

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

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 are no Part 18, Part 19 or Part 20 Activities

21: Part 21 Activity– Incandescent lighting – applicable 1 August 2021 to 31 January 2023

Activity Description

Part 21 of Schedule 2 of the Regulations prescribes the upgrade of incandescent lighting as an eligible activity for the purposes of the Victorian Energy Upgrades program.

Table 21.1 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.

The information in this part of the Specifications should only be used between 1 August 2021 and 31 January 2023.

Table 21.1 – Eligible incandescent lighting scenarios

Product category number	Scenario number	Decommissioning requirements	Product to be installed	Historical schedule number
21A	21A	Mains voltage incandescent GLS lamp of at least 25 Watts (tungsten filament lamp) or 18 Watts (tungsten halogen lamp) or a mains voltage compact fluorescent lamp of at least 5 Watts	LED GLS lamp that: • has a light output equivalent to or higher than the decommissioned lamp • meets ESC performance requirements • if installed in a dimmable circuit, is approved by the manufacturers are suitable for such a circuit • has a colour temperature of (or capable of being set to) warm white or cool white	21A
21B	21B	Mains voltage incandescent reflector lamp	LED lamp which: • is determined suitable for the same purpose as the decommissioned lamp by the ESC • has a light output equivalent to the decommissioned lamp • meets ESC performance requirements • if installed in a dimmable circuit, is approved by the manufacturers are suitable for such a circuit • has a colour temperature of (or capable of being set to) warm white or cool white	21B
21C	21C	12 volt tungsten halogen lamp of at least 35 Watts	Non-integrated LED lamp compatible with the type of ELC used with the replaced lamp and: • is installed by a licensed electrician • if installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit • meets ESC performance requirements • has a minimum light output of 420 lumens	21C

Product category number	Scenario number	Decommissioning requirements	Product to be installed	Historical schedule number
			• has a colour temperature of (or capable of being set to) warm white or cool white	
21D	21D	12 volt tungsten halogen downlight luminaire that uses a 12 volt tungsten halogen lamp of at least 35 Watts, as well as any transformer associated with it	Mains voltage downlight LED luminaire (integrated or non-integrated) which: • is installed by a licensed electrician • if installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit • meets ESC performance requirements • with a minimum light output of 400 lumens • with a colour temperature of (or capable of being set to) warm white or cool white	21D
21E	21E	Mains voltage tungsten halogen lamp of at least 35 Watts with a GU10 base	LED lamp with integrated driver that has a GU10 base which: • is installed by a licensed electrician • if installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit • meets ESC performance requirements • has a minimum light output of 400 lumens • has a colour temperature of (or capable of being set to) warm white or cool white	21E
21F	21F	Mains voltage tungsten halogen downlight luminaire that uses a tungsten halogen lamp of at least 35 Watts with a GU10 base	Mains voltage downlight LED integrated luminaire that: • is installed by a licensed electrician • if installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit • meets ESC performance requirements • has a minimum light output of 400 lumens • has a colour temperature of (or capable of being set to) warm white or cool white	21F

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 21.2.

Table 21.2 – Additional requirements for lighting products to be installed

Product category number	Requirement type	Requirements
21A	Minimum light source efficacy levels	84 lumens/watt
21B	Minimum light source efficacy levels	78 lumens/watt
21C	Minimum light source efficacy levels	62 lumens/watt
21D, 21E and 21F	Minimum light source efficacy levels	58 lumens/watt
Note: Measurements and testing for the above must be in accordance with ESC's performance requirements		

Other specified matters

The product installed must meet the relevant additional requirements listed in Table 21.3.

Table 21.3 - Other requirements for lighting products to be installed

Product category number	Requirement type	Specification details
21A	Minimum lifetime rating	Lifetime of 15,000 hours
21B	Minimum lifetime rating	Lifetime of 15,000 hours
21C	Minimum beam angle	55 degrees, determined in accordance with IEC/TR 61341 Edition 2.0) – applies to products installed in residential premises
	Minimum lifetime rating	Lifetime of 15,000 hours
21D, 21F	Minimum beam angle	40 degrees, determined in accordance with IEC/TR 61341 Edition 2.0) – applies to products installed in residential premises
	Minimum lifetime rating	Lifetime of 15,000 hours
21E	Minimum beam angle	55 degrees, determined in accordance with IEC/TR 61341 Edition 2.0) – applies to products installed in residential premises
	Minimum lifetime rating	Lifetime of 15,000 hours
Note: Measurements and testing for the above must be in accordance with ESC's performance requirements		

Method for Determining GHG Equivalent Reduction

Scenario 21A: Replacing incandescent GLS lamp or CFL with LED GLS lamp

The GHG equivalent emissions reduction for each scenario is given by Equation 21.1, using the variables listed in Table 21.4.

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 21.1 – GHG equivalent emissions reduction calculation for Scenario 21A

$$GHG\ Eq.Reduction = \sum_{installation} Abatement\ Factor \times EEF \times PF\ Multiplier \times Regional\ Factor$$

Table 21.4 – GHG equivalent emissions reduction variables for Scenario 21A

Measurements, testing and ratings must be in accordance with the ESC's performance requirements			
Input type	**Condition**		**Input value**
Abatement Factor	Upgrade product has a minimum light source efficacy of 84 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.05
		Lifetime is at least 20,000 and less than 25,000 hours	0.07
		Lifetime is at least 25,000 hours	0.08
	Upgrade product has a minimum light source efficacy of 100 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.09
		Lifetime is at least 20,000 and less than 25,000 hours	0.12
		Lifetime is at least 25,000 hours	0.16
	Upgrade product has a minimum light source efficacy of 120 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.15
		Lifetime is at least 20,000 and less than 25,000 hours	0.20
		Lifetime is 25,000 hours or more	0.25
	Upgrade product has a minimum light source efficacy of 140 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.21
		Lifetime is at least 20,000 and less than 25,000 hours	0.27
		Lifetime is 25,000 hours or more	0.34
PF Multiplier	Power factor of the upgrade product is less than 0.80		0.80
	Power factor of the upgrade product is at least 0.80		1.00
Regional Factor	For upgrades in Metropolitan Victoria		0.98
	For upgrades in Regional Victoria		1.04

Scenario 21B: Replacing incandescent reflector lamp with LED lamp

The GHG equivalent emissions reduction for each scenario is given by Equation 21.2, using the variables listed in Table 21.5.

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 21.2 – GHG equivalent emissions reduction calculation for Scenario 21B

$$GHG\ Eq.\ Reduction = \sum_{installation} Abatement\ Factor \times EEF \times PF\ Multiplier \times Regional\ Factor$$

Table 21.5 – GHG equivalent emissions reduction variables for Scenario 21B

Measurements, testing and ratings must be in accordance with the ESC's performance requirements			
Input type	**Condition**		**Input value**
Abatement Factor	Upgrade product has a minimum light source efficacy of 78 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.31
		Lifetime is at least 20,000 and less than 25,000 hours	0.42
		Lifetime is at least 25,000 hours	0.52
PF Multiplier	Power factor of the upgrade product is less than 0.80		0.80
	Power factor of the upgrade product is at least 0.80		1.00
Regional Factor	For upgrades in Metropolitan Victoria		0.98
	For upgrades in Regional Victoria		1.04

Scenario 21C: Replacing 12-volt halogen lamp with non-integrated LED lamp

The GHG equivalent emissions reduction for each scenario is given by Equation 21.3, using the variables listed in Table 21.6.

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 21.3 – GHG equivalent emissions reduction calculation for Scenario 21C

$$GHG\ Eq.Reduction = \sum_{installation} Abatement\ Factor \times EEF \times PF\ Multiplier \times Regional\ Factor$$

Table 21.6 – GHG equivalent emissions reduction variables for Scenario 21C

Measurements, testing and ratings must be in accordance with the ESC's performance requirements			
Input type	**Condition**		**Input value**
Abatement Factor	Upgrade product has a minimum light source efficacy of 62 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.28
		Lifetime is at least 20,000 and less than 25,000 hours	0.37
		Lifetime is at least 25,000 hours	0.46
	Upgrade product has a minimum light source efficacy of 75 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.29
		Lifetime is at least 20,000 and less than 25,000 hours	0.39
		Lifetime is at least 25,000 hours	0.49
	Upgrade product has a minimum light source efficacy of 90 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.30
		Lifetime is at least 20,000 and less than 25,000 hours	0.0
		Lifetime is at least 25,000 hours	0.50
PF Multiplier	Power factor of the upgrade product is less than 0.80		0.80
	Power factor of the upgrade product is at least 0.80		1.00
Regional Factor	For upgrades in Metropolitan Victoria		0.98
	For upgrades in Regional Victoria		1.04

Scenario 21D: Replacing 12 volt halogen lamp and luminaire with downlight LED luminaire

The GHG equivalent emissions reduction for each scenario is given by Equation 21.4, using the variables listed in Table 21.7.

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 21.4 – GHG equivalent emissions reduction calculation for Scenario 21D

$$GHG\ Eq.Reduction = \sum_{installation} Abatement\ Factor \times EEF \times PF\ Multiplier \times Regional\ Factor$$

Table 21.7 – GHG equivalent emissions reduction variables for Scenario 21D

Measurements, testing and ratings must be in accordance with the ESC's performance requirements			
Input type	**Condition**		**Input value**
Abatement Factor	Upgrade product has a minimum light source efficacy of 58 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.28
		Lifetime is at least 20,000 and less than 25,000 hours	0.38
		Lifetime is at least 25,000 hours	0.47
	Upgrade product has a minimum light source efficacy of 69 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.30
		Lifetime is at least 20,000 and less than 25,000 hours	0.40
		Lifetime is at least 25,000 hours	0.49
	Upgrade product has a minimum light source efficacy of 83 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.31
		Lifetime is at least 20,000 and less than 25,000 hours	0.41
		Lifetime is at least 25,000 hours	0.51
	Upgrade product has a minimum light source efficacy of 100 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.31
		Lifetime is at least 20,000 and less than 25,000 hours	0.42
		Lifetime is at least 25,000 hours	0.52
PF Multiplier	Power factor of the upgrade product is less than 0.80		0.80
	Power factor of the upgrade product is at least 0.80		1.00
Regional Factor	For upgrades in Metropolitan Victoria		0.98
	For upgrades in Regional Victoria		1.04

Scenarios 21E and 21F: Replacing halogen lamp with GU10 base with LED lamp, or replacing halogen lamp with GU10 base and luminaire with downlight LED luminaire

The GHG equivalent emissions reduction for each scenario is given by Equation 21.5, using the variables listed in Table 21.8.

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 21.5 – GHG equivalent emissions reduction calculation for Scenarios 21E and 21F

$$GHG\ Eq.\ Reduction = \sum_{installation} Abatement\ Factor \times EEF \times PF\ Multiplier \times Regional\ Factor$$

Table 21.8 – GHG equivalent emissions reduction variables for Scenarios 21E and 21F

Measurements, testing and ratings must be in accordance with the ESC's performance requirements			
Input Type	**Condition**		**Input value**
Abatement Factor	Upgrade product has a minimum light source efficacy of 58 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.34
		Lifetime is at least 20,000 and less than 25,000 hours	0.46
		Lifetime is at least 25,000 hours	0.58
	Upgrade product has a minimum light source efficacy of 69 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.36
		Lifetime is at least 20,000 and less than 25,000 hours	0.47
		Lifetime is at least 25,000 hours	0.59
	Upgrade product has a minimum light source efficacy of 83 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.37
		Lifetime is at least 20,000 and less than 25,000 hours	0.49
		Lifetime is at least 25,000 hours	0.61
	Upgrade product has a minimum light source efficacy of 100 lumens/watt	Lifetime is at least 15,000 and less than 20,000 hours	0.37
		Lifetime is at least 20,000 and less than 25,000 hours	0.50
		Lifetime is at least 25,000 hours	0.62
PF Multiplier	Power factor of the upgrade product is less than 0.80		0.80
	Power factor of the upgrade product is at least 0.80		1.00
Regional Factor	For upgrades in Metropolitan Victoria		0.98
	For upgrades in Regional Victoria		1.04

22: Part 22 Activity– High efficiency refrigerators and freezers

Activity Description

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.

Over time, the department may determine 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 listed by the department as scenario number 22E once specified.

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	Historical schedule number
22A	22A	None	Single door refrigerator	22A
22B	22B	None	Two door refrigerator	22B
22C	22C	None	A chest freezer	22C
22D	22D	None	An upright freezer	22D

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 22.2.

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

Product category number	Requirement type	Efficiency requirement
22A	Minimum performance requirement	• Group 1 refrigerator as defined by *Greenhouse and Energy Minimum Standards (Household Refrigerating Appliances) Determination 2012 (Cth)* • total storage volume of not less than 100 litres and not more than 700 litres (as defined by AS/NZS 4474.1:2007) • Star rating index of 2.5, determined in accordance with AS/NZS 4474.2
22B	Minimum performance requirement	• Group 4, 5B, 5S or 5T refrigerator as defined by *Greenhouse and Energy Minimum Standards (Household Refrigerating Appliances) Determination 2012 (Cth)* • total storage volume of not less than 100 litres and not more than 700 litres (as defined by AS/NZS 4474.1:2007) • Star rating index of 3.5, determined in accordance with AS/NZS 4474.2
22C	Minimum performance requirement	• Group 6C product as defined by *Greenhouse and Energy Minimum Standards (Household Refrigerating Appliances) Determination 2012 (Cth)* • total storage volume of not less than 100 litres and not more than 700 litres (as defined by AS/NZS 4474.1:2007)

Product category number	Requirement type	Efficiency requirement
		• Star rating index of 3.5, determined in accordance with AS/NZS 4474.2
22D	Minimum performance requirement	• Group 6U or 7 product as defined by *Greenhouse and Energy Minimum Standards (Household Refrigerating Appliances) Determination 2012 (Cth)* • total storage volume of not less than 100 litres and not more than 700 litres (as defined by AS/NZS 4474.1:2007) • Star rating index of 3.0, determined in accordance with AS/NZS 4474.2

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

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

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

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

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

Input Type	Condition	Input Value
Baseline	In every instance	$\left\{150 + 8.8 \times \left[V_{ff} + \left(1.6 \times V_{fr}\right)\right]^{0.67}\right\} \times 4.46 \times 10^{-4}$
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

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

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

Input Type	Condition	Input Value
Baseline	In every instance	$\left[150 + 7.5 \times \left(1.6 \times V_{fr}\right)^{0.67}\right] \times 4.69 \times 10^{-4}$
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

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

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

Input Type	Condition	Input Value
Baseline	In every instance	$\left[150 + 7.5 \times \left(1.6 \times V_{fr}\right)^{0.67}\right] \times 5.29 \times 10^{-4}$
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

23: Part 23 Activity– Space heating and cooling, ducted evaporative cooler

Activity Description

Part 23 of Schedule 2 of the Regulations prescribes an activity involving installation of a ducted evaporative cooler as eligible for the creation of VEECs.

Table 23.1 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 23.1 – Eligible space heating scenarios

Product category number	Scenario Number	Decommissioning requirements	Product to be installed	Historical schedule number
23A	23A	Refrigerative air conditioner (whether ducted or not) that is not located in • if in residential premises, a bedroom, or • otherwise, a room with an area less than 20m^2	Ducted evaporative cooler • that complies with AS 2913 • with a minimum 7kW rated output	23A

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 23.2.

Table 23.2 – Additional requirements for space cooling equipment to be installed

Product category number	Requirement type	Efficiency requirement
23A	Minimum effective energy efficiency ratio	20, based on measurements of nominal rating and electricity consumption determined in accordance with AS 2913

Other specified matters

None.

Method for Determining GHG Equivalent Reduction

Scenario 23A: Decommissioning a refrigerative air conditioner and installing a ducted evaporative cooler

The GHG equivalent emissions reduction for this scenario is given by Equation 23.1, using the variables listed in Table 23.3.

Equation 23.1 – GHG equivalent emissions reduction calculation for Scenario 23A

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

Table 23.3 – GHG equivalent emissions reduction variables for Scenario 23A

Measurements, testing and ratings must be in accordance with AS 2913
Small upgrade: upgrade product has nominal rating at full load of at least 7 and less than 10 kW
Medium upgrade: upgrade product has nominal rating at full load of at least 10 and less than 13 kW
Large upgrade: upgrade product has nominal rating at full load of at least 13 kW

Input type	Condition		Input value
Baseline	Small upgrade	Non-ducted refrigerative system	0.29
		Ducted refrigerative system	0.62
	Medium upgrade	Non-ducted refrigerative system	0.29
		Ducted refrigerative system	1.03
	Large upgrade	Non-ducted refrigerative system	0.29
		Ducted refrigerative system	1.54
Upgrade	Small upgrade	EER of at least 20 and less than 30	0.10
		EER of at least 30 and less than 40	0.07
		EER of at least 40	0.05
	Medium upgrade	EER of at least 20 and less than 30	0.17
		EER of at least 30 and less than 40	0.11
		EER of at least 40	0.08
	Large upgrade	EER of at least 20 and less than 30	0.25
		EER of at least 30 and less than 40	0.17
		EER of at least 40	0.13
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	Non-ducted refrigerative system	0.56
		Ducted refrigerative system	0.81
	For upgrades in Regional Victoria – Climatic region mild		1.06
	For upgrades in Regional Victoria – Climatic region cold	Non-ducted refrigerative system	0.56
		Ducted refrigerative system	0.86
	For upgrades in Regional Victoria – Climatic region hot	Non-ducted refrigerative system	2.45
		Ducted refrigerative system	2.35

24: Part 24 Activity– High efficiency televisions

Activity Description

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	Historical schedule number
24A	24A	None	Television	24A

Specified Minimum Energy Efficiency

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

Table 24.2 – Additional requirements for televisions to be installed

Product category number	Requirement type	Efficiency requirement
24A	Minimum performance requirement	• Star rating of 7 stars • 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.

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

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

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

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.

Over time, the department may determine that there are other clothes dryers that reduce GHG equivalent emissions when installed. In such a case, product requirements and installation requirements for emerging technology will be listed by the department 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	Historical schedule number
25A	25A	None	Stand-alone electric clothes dryer (not part of a combination washer/dryer)	25A

Specified Minimum Energy Efficiency

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

Table 25.2 – Additional requirements for clothes dryers to be installed

Product category number	Requirement type	Efficiency requirement
25A	Minimum performance requirement	• Registered for energy labelling • Star rating of 7 stars Measurement, testings and ratings must be in accordance with the *Greenhouse and Energy Minimum Standards (Rotary Clothes Dryers) Determination 2015*

Other specified matters

None.

Method for Determining GHG Equivalent Reduction

Scenario 25A: Installing an energy efficient electric 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

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

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 factor	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

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.

Over time, the department may determine that there are other types of pool pumps that reduce GHG equivalent emissions when installed. In such a case, product requirements and installation requirements for emerging technology will be listed by the department 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	Historical schedule number
26A	26A	None	A domestic pool or spa pump that has a single phase, single speed, dual speed, multiple speed or a variable speed pump unit that: • has an input power of not less than 100W and not more than 2500W, when determined in accordance with AS 5102.1 • is part of the E3 Committee's voluntary energy rating labelling program for swimming pool pump-units (Rules for participation November 2010), or else registered for energy labelling under AS 5102.2	26A

Specified Minimum Energy Efficiency

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

Table 26.2 – Additional requirements for pool pumps to be installed

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

Other specified matters

None.

Method for Determining GHG Equivalent Reduction

Scenario 26A: 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 in Table 26.3.

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

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

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 factor	In every instance	7.00
Regional Factor	If the product is installed in Metropolitan Victoria	0.98
	If the product is installed in Regional Victoria	1.04

27: Part 27 Activity– Public lighting upgrade

Activity Description

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 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 upgrade scenarios.

Product category number	Scenario number	Decommissioning or removal requirements	Product to be installed	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: • when installed, meets the minimum power factor determined by the ESC • meets minimum standards determined by the ESC when tested by an approved laboratory in accordance with a laboratory test approved by the ESC • is not a T5 adaptor	34D
N/A	27C	Removing and not replacing: • a LED integrated luminaire, or • the lamp and control gear associated with a non-integrated luminaire	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

Scenarios 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 variables for Scenarios 27A to 27C

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

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

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

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	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 27.3 – Upgrade calculation for all public lighting upgrades

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

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 upgrade 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 upgrade light source
CM	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 calculations 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 27.9

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 (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 × 0·7	NLP

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
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
Mercury vapour lamp with ballast	NLP x 1·033 + 11	NLP x 1·033 + 11
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
Self-ballasted Mercury Vapour lamp	NLP	NLP
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 – 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

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	Product to be installed	Historical schedule number
28A	28A	Ductwork that is connected to a ducted gas heater	Flexible ductwork that: • is certified by an approved laboratory as complying with AS 4254.1 and is labelled in accordance with that standard • is insulated using bulk insulation that is certified by an approved laboratory as complying with AS/NZS 4859.1 • is constructed and installed in accordance with AS 4254.1 and uses fittings that – if installed in a class 1 or 10 Building, achieves at least the R-value specified by Table 3.12.5.2 of Volume Two of the BCA – if installed in a class 2 to 9 Building, achieves the minimum total R value specified by Specification J5.2b of Volume One of the BCA	28A
28B	28B		Rigid ductwork that: • is certified by an approved laboratory as complying with AS 4254.2 • is insulated using bulk insulation that is certified by an approved laboratory as complying with AS/NZS 4859.1 • is longitudinally labelled at intervals of no more than 1.5 meters in characters that are clearly legible and at least 18mm high and state the duct manufacturer's or assembler's name, the diameter of the duct core, the R-value of the bulk insulation and whether the ductwork complies with AS 4254.2 • is constructed and installed in accordance with AS 4254.2 and uses fittings that	28A

	– if installed in a class 1 or 10 Building, achieves at least the R-value specified by Table 3.12.5.2 of Volume Two of the BCA – if installed in a class 2 to 9 Building, achieves the minimum total R value specified by Specification J5.2b of Volume One of the BCA

Specified Minimum Energy Efficiency

The product installed must meet the relevant additional requirements listed in Table 28.2.

Table 28.2 – Additional requirements for ductwork to be installed

Product category number	Requirement type	Efficiency requirement
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.

Method for Determining GHG Equivalent Reduction

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

The GHG equivalent emissions reduction for these scenarios 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

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

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

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.

Over time, the department may determine that there are other in-home display units 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 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	Historical schedule number
30A	30A	None	An in-home display unit that when installed in relation to an AMI metering installation provides information on the total electricity consumption of the residential premises directly to the consumer, complies with the ZigBee Smart Energy Profile Specification and ZigBee Smart Energy Standard, and when tested in a manner approved by the ESC: • determines electricity consumption information from the sensing apparatus at least every 30 seconds • stores electricity energy consumption information from the previous 45 days • displays to the consumer (or relays to a device that displays to the consumer) in a numerical format and non-numerical format and in a manner that allows the consumer to easily distinguish between low and high consumption the: – 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 – average total household electrical power consumption (in Watts) for the displayed period, which must be updated at least every 30 seconds – 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 • displays to the consumer (or relays to a device that does this) the tariff (in cost per unit of energy consumed) and	30A

Product category number	Scenario number	Decommissioning requirements	Product to be installed	Historical schedule number
			the total cost of electricity consumed for the period displayed • permanently erases all consumption and tariff information held by the product including information entered by the consumer • has an average electric power consumption of not more than 0.6 Watts when operating under normal circumstances • if battery powered, uses a battery that has a manufacturer's rated lifetime of at least 5 years when operating under normal circumstances	
30B	30B	None	An in-home display unit that when installed in relation to any sensing apparatus provides information on the total electricity consumption of the residential premises directly to the consumer, and when tested in a manner approved by the ESC that: • determines electricity consumption information from the sensing apparatus at least every 30 seconds • stores electricity energy consumption information from the previous 45 days • displays to the consumer (or relays to a device that displays to the consumer) in a numerical format and non-numerical format and in a manner that allows the consumer to easily distinguish between low and high consumption the: – 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 – the average total household electrical power consumption (in Watts) for the displayed period, which must be updated at least every 30 seconds – 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 • 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 • permanently erases all consumption and tariff information held by the product including information entered by the consumer • has an average electric power consumption of not more than 0.6 Watts when operating under normal circumstances	30B

Product category number	Scenario number	Decommissioning requirements	Product to be installed	Historical schedule number
			• provides electricity energy consumption information that is accurate to within 5% of actual electricity consumption • if battery powered, uses a battery that has a manufacturer's rated lifetime of at least 5 years when operating under normal circumstances • uses, for its communications with the sensing apparatus and any display device, an encrypted communication protocol that is approved by the ESC	

Specified Minimum Energy Efficiency

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

Other specified matters

None.

Method for Determining GHG Equivalent Reduction

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

The GHG equivalent 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

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

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

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.

Over time, the department may determine that there are other motors that reduce GHG equivalent emissions when installed or replaced. In such a case, product requirements and installation requirements for emerging technology 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	Historical schedule number
31A	31A	None	A three-phase cage induction motor that has 2,4,6 or 8 poles	31A
31B	31B	None	A three-phase cage induction motor that: • has a rated output of not less than 0.75 and not more than 185 kW (as determined in accordance with AS 60034.1-2009 as published on 15 July 2009) • 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) • has 2,4 or 6 poles	31B

Specified Minimum Energy Efficiency

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

Table 31.2 – Additional requirements for motors to be installed

Product category number	Requirement type	Efficiency requirements
31A	Minimum performance requirement	• GEMS registration • A rated output of not less than 0.75 and not more than 185 kW in accordance with AS 60034.1 • Labelled as a high efficiency motor

Product category number	Requirement type	Efficiency requirements
		Measurement, testings and ratings must be in accordance with the *Greenhouse and Energy Minimum Standards (Three Phase Cage Induction Motors) Determination 2012* unless otherwise stated
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 Scenario 31A

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

Table 31.3 – GHG equivalent emissions reduction variables for Scenario 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	2.58×10^{-2}
	Minimum rated output of 1.1 kW	3.33×10^{-2}
	Minimum rated output of 1.5 kW	4.07×10^{-2}
	Minimum rated output of 2.2 kW	5.28×10^{-2}
	Minimum rated output of 3 kW	7.11×10^{-2}
	Minimum rated output of 4 kW	$8.65. \times 10^{-2}$
	Minimum rated output of 5.5 kW	1.08×10^{-1}
	Minimum rated output of 7.5 kW	1.32×10^{-1}
	Minimum rated output of 11 kW	1.85×10^{-1}
	Minimum rated output of 15 kW	2.29×10^{-1}
	Minimum rated output of 18.5 kW	2.63×10^{-1}
	Minimum rated output of 22 kW	2.95×10^{-1}
	Minimum rated output of 30 kW	3.70×10^{-1}
	Minimum rated output of 37 kW	4.16×10^{-1}
	Minimum rated output of 45 kW	5.70×10^{-1}

	Minimum rated output of 55 kW	6.56×10^{-1}
	Minimum rated output of 75 kW	8.12×10^{-1}
	Minimum rated output of 90 kW	8.69×10^{-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 Scenario 31B

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

Table 31.4 – GHG equivalent emissions reduction variables for Scenario 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	4.67×10^{-2}
	Minimum rated output of 1.1 kW	6.11×10^{-2}
	Minimum rated output of 1.5 kW	7.42×10^{-2}
	Minimum rated output of 2.2 kW	9.94×10^{-2}
	Minimum rated output of 3 kW	1.35×10^{-1}
	Minimum rated output of 4 kW	1.60×10^{-1}
	Minimum rated output of 5.5 kW	2.14×10^{-1}
	Minimum rated output of 7.5 kW	2.66×10^{-1}
	Minimum rated output of 11 kW	3.96×10^{-1}
	Minimum rated output of 15 kW	4.69×10^{-1}
	Minimum rated output of 18.5 kW	5.42×10^{-1}
	Minimum rated output of 22 kW	6.31×10^{-1}
	Minimum rated output of 30 kW	7.23×10^{-1}
	Minimum rated output of 37 kW	8.10×10^{-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

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	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 listed in Table 32.2.

Table 32.2 – Additional requirements for refrigerated cabinets to be installed

Scenario number	Requirement type	Efficiency requirement
32A*	Minimum performance requirement	Achieves the high efficiency level within the meaning of *Greenhouse and Energy Minimum Standards (Refrigerated Display Cabinets) Determination 2012*
32A(i-iii)	Minimum performance requirement	Achieves an Energy Efficiency Index within the meaning of *Greenhouse and Energy Minimum Standards (Refrigerated Cabinets) Determination 2020* 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.

Method for Determining GHG Equivalent Reduction

SCENARIO 32A: *INSTALLING A REFRIGERATED DISPLAY CABINET*
EXPIRES END OF DAY 30 JUNE 2022

Scenario 32A: Installing a refrigerated display cabinet

The GHG equivalent emissions reduction for each scenario is given by Equation 32.1, using the variables listed in Table 32.3.

Equation 32.1 – GHG equivalent emissions reduction calculation for Scenario 32A

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

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^2 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)

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

Table 32.4 – GHG equivalent emissions reduction variables for Scenario 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			$Baseline\ EEI \times \left(\frac{(M + (N \times TDA))}{100}\right)$				
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^2)	Lifetime (years) (TDA≥ 3.3m^2)
	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^2 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)

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

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

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			$Baseline\ EEI \times \left(\frac{(M + (N \times Vn))}{100}\right)$		
Upgrade	In all cases			TEC		
Baseline EEI, M and N	GEMS 2020: Product class	GEMS 2020: Characteristics (code)	Upgrade EEI:	Baseline EEI	M	N
	Class 5	IFH-5	51	130	1	0.009
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		
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)

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

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

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			$Baseline\ EEI \times \left(\frac{(N + (M \times Vn))}{100}\right)$			
Upgrade	In all cases			$TEC \times af \times 365.24$			
Baseline EEI, M and N	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 values for Scenario 32A(iii)

Input type	Condition	Input value
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

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.

Over time, the department may determine that there are other fan motors that reduce GHG equivalent emissions when installed or upgraded. In such a case, product requirements and installation requirements for emerging technology will be listed by the department 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	Historical schedule number
33A	33A	None	A fan motor installed in a fan in a refrigerated cabinet or cold room that is: • an electronically commutated motor (being a permanent magnet motor with electronic commutation) and – if an internal rotor motor, has a rated motor output of not more than 600 Watts – if an external rotor motor, has a rated motor input of not more than 800 Watts	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 is: • an electronically commutated motor (being a permanent magnet motor with electronic commutation) and – if an internal rotor motor, has a rated motor output of not more than 600 Watts – if an external rotor motor, has a rated motor input of not more than 800 Watts	N/A

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 and Table 33.3.

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

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

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

Scenarios 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

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

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 Factor	In every instance	7.00
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

34: Part 34 Activity– Building based lighting upgrade – applicable to 31 January 2023

Activity Description

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 upgrade scenarios

Product category number	Scenario number	Decommissioning or removal requirements	Product to be installed	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 be required to control	34B
34B	34B	None*	A voltage reduction unit that: • has an alternating current output voltage ascertained by an approved laboratory in accordance with a laboratory test approved by the ESC • is not installed in conjunction with electronic ballasts or drivers, or LED lighting	34C
34C	34C	Decommissioning any removed lighting equipment	Any other lighting equipment that: • when installed, meets the minimum power factor determined by the ESC • meets minimum standards determined by the ESC when tested by an approved laboratory in accordance with a laboratory test approved by the ESC • is not a T5 adaptor	34D
N/A	34D	Removing no 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)
N/A	34E	Removing and not replacing: • a LED integrated luminaire, or	None	Regulation 6(2)(d) and 6(3)(d)

Product category number	Scenario number	Decommissioning or removal requirements	Product to be installed	Historical schedule number
		• the lamp and control gear associated with a non-integrated luminaire		

* 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

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

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

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

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

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 <u>not</u> required to comply with Part J6 of the Building Code

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

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
	Light source is not listed in Table 34.8	The value determined by the ESC for that type of light source
CM	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

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

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	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 – 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 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 × 0·7	NLP
Tungsten incandescent or halogen lamp with ELC	NLP (being no greater than 37 Watts) x 1.163	NLP x 1.163

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
Metal halide lamp with magnetic ballast	NLP x 0.656 + 11.2	NLP x 0.656 + 11.2
Metal halide lamp with electronic ballast	NLP x 0.68 + 0·6	NLP x 0.68 + 0·6
Mercury vapour lamp with ballast	NLP x 0.609 + 6.5	NLP x 0.609 + 6.5
High pressure sodium lamp with magnetic ballast	NLP x 0.631 + 7.8	NLP x 0.631 + 7.8
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 $\geq$ 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 $\geq$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
Self-ballasted Mercury Vapour lamp	NLP x 0.59	NLP x 0.59
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 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	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 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

Type of space	Annual operating hours (per year)
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 **Note**: 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 gymnasia operations, classified as Division R (9111) in the Australian and New Zealand Standard Industrial Classification **Note**: this only includes health and fitness centres and gymnasia 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

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 upgrade scenarios

Product category number	Scenario number	Decommissioning or removal requirements	Product to be installed	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: • when installed, meets the minimum power factor determined by the ESC • meets minimum standards determined by the ESC when tested by an approved laboratory in accordance with a laboratory test approved by the ESC • is not a T5 adaptor	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: • a LED integrated luminaire, or • the lamp and control gear associated with a non-integrated luminaire	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.

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

Scenarios 35A to 35D: Non-building based lighting upgrades

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

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

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

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

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

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

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

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	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 × 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
Mercury vapour lamp with ballast	NLP x 1·033 + 11	NLP x 1·033 + 11

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
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
Self-ballasted Mercury Vapour lamp	NLP	NLP
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 – 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	Type(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 remove; 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

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	Other	Product to be installed	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 or labelled in accordance with AS/NZS 6400)	None	A pre-rinse spray valve that: • is described as "tap equipment" in the *Water Efficiency Labelling and Standards Determination 2013 (No. 2)* made under the Water Efficiency Labelling and Standards Act 2005 (Cth) • is installed in accordance with AS/NZS 3500 and the Plumbing Regulations 2008	36A
	36A(ii)	None	There is an existing fitting for a pre-rinse spray valve on which no existing pre-rinse spray valve is installed		

Specified Minimum Energy Efficiency

The product installed must meet the additional requirements listed in Table 36.2.

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

Product category number	Requirement Type	Efficiency Requirement
36A	Minimum star rating	6 stars, determined 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, using the variables listed in Table 36.3.

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

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

Table 36.3 – GHG equivalent emissions reduction variables for Scenario 36A(i) and (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

37: Part 37 Activity– Gas-fired steam boiler

Activity Description

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	Product to be installed	Historical schedule number
37A	37A	One or more gas-fired steam boilers each of which is at least 10 years old	One or more gas-fired steam boilers each of which: • is a Type B appliance • if the boiler has a nominal gas consumption above 3,700 MJ/h but not above 7,500 MJ/h, has an electronic gas/air ratio control system • if the boiler has a nominal gas consumption above 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	N/A

Specified Minimum Energy Efficiency

The product installed must meet the additional requirements listed in Table 37.2.

Table 37.2 - Additional requirements for steam boiler activities

Product category number	Requirement Type	Efficiency Requirement
37A	Minimum gross thermal efficiency requirements	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 BS 845-2 (pre-commissioning) or BS 845-1 (post-commissioning)

Other specified matters

None.

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, using the variables listed in Table 37.3.

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

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

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%	2.71×10^{-6}
		New steam boiler has a gross thermal efficiency of 85% or greater	5.47×10^{-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%	2.22×10^{-6}
		New steam boiler has a gross thermal efficiency of 85% or greater	4.98×10^{-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%	2.49×10^{-6}
		New steam boiler has a gross thermal efficiency of 85% or greater	5.25×10^{-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%	2.00×10^{-6}
		New steam boiler has a gross thermal efficiency of 85% or greater	4.76×10^{-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

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	Product to be installed	Historical schedule number
38A	38A(i)	One or more gas-fired steam boilers each of which is at least 10 years old	One or more gas-fired hot water boilers or gas-fired water heaters each of which: • is a Type B appliance • if the boiler has a nominal gas consumption above 3,700 MJ/h but not above 7,500 MJ/h, has an electronic gas/air ratio control system • if the boiler has a nominal gas consumption above 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	N/A
	38A(ii)	One or more gas-fired hot water boilers each of which is at least 10 years old		N/A
	38A(iii)	One or more gas-fired water heaters each of which is at least 10 years old		N/A

Specified Minimum Energy Efficiency

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

Table 38.2 - Additional requirements for hot water boiler and water heater activities

Product category number	Requirement Type	Efficiency Requirement
38A	Minimum gross thermal efficiency requirements	A gross thermal efficiency of at least 85% 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 BS 7190 (pre-commissioning) or BS 845-1 (post-commissioning)

Other specified matters

None.

Method for Determining GHG Equivalent Reduction

Scenarios 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, using the variables listed in Table 38.3.

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

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

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%	2.58×10^{-6}
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	5.34×10^{-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%	2.06×10^{-6}
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	4.82×10^{-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%	2.29×10^{-6}
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	5.06×10^{-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%	1.78×10^{-6}
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	4.54×10^{-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%	1.10×10^{-6}
		New hot water boiler or water heater has a gross thermal efficiency of 90% or greater	3.87×10^{-6}
LUF	In every instance		0.206
Lifetime	In every instance		20.00

39: Part 39 Activity– Electronic gas/air ratio control

Activity Description

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 ratio control scenarios

Product category number	Scenario number	Decommissioning Requirements	Product to be installed	Historical schedule number
39A	39A	None	An electronic gas/air ratio control that: • is installed on a burner of a Type B appliance that is a gas-fired steam boiler, gas-fired hot water boiler or gas-fired water heater	N/A

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 39A: Installing an electronic gas/air ratio control

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

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

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

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	0.65×10^{-6}
LUF	In every instance	0.206
Lifetime	In every instance	20.00

40: Part 40 Activity– Combustion trim

Activity Description

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 to be installed	Historical schedule number
40A	40A	None	A combustion trim system that: • 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 • is installed on a Type B appliance that is a gas-fired steam boiler, gas-fired water boiler of 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	N/A

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 40A: Installing a combustion trim system

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

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

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

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	0.80×10^{-6}
	If the product is installed on a hot water boiler or water heater	0.70×10^{-6}
LUF	In every instance	0.206
Lifetime	In every instance	10.00

41: Part 41 Activity– Gas-fired burners

Activity Description

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	Product to be installed	Historical schedule number
41A	41A	A gas-fired burner that is at least 10 years old and is on a Type B: • gas-fired steam boiler, or • gas-fired hot water boiler, or • gas-fired water heater	A gas-fired burner that: • is installed on the same Type B appliance that the decommissioned burner was removed from, and • if nominal gas consumption is above 3,700 MJ/h, has an electronic gas/air ratio control system that is capable of receiving a signal from a flue gas sensor for combustion trim purposes	N/A

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 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

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

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: • the boiler or heater with the replacement equipment installed, or • the boiler or heater with the incumbent equipment installed
	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	1.07×10^{-6}
LUF	In every instance	0.206
Lifetime	In every instance	20 .00

42: Part 42 Activity– Economizers

Activity Description

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 to be installed	Historical schedule number
42A	42A	None	An economizer that: • is installed on a Type B appliance that is a gas-fired steam boiler, a gas-fired hot water boiler or gas-fired water heater (other than a condensing steam boiler, condensing hot water boiler or condensing water heater) • is a heat exchanger that uses the products of combustion from a gas-fired steam boiler, gas-fired hot water boiler or gas-fired water heater to heat boiler feedwater • if of a condensing kind, is installed on a gas-fired steam boiler and provides for the products of combustion to be expelled into a stack constructed from stainless steel • unless it is specifically designed to run dry, is installed with a control system for minimum flow rates that does not require manual intervention for operation • complies with AS 1228	N/A

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

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

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	1.81×10^{-6}
	Installed on a hot water boiler or water heater	1.41×10^{-6}
LUF	In every instance	0.206
Lifetime	In every instance	10.00

43: Part 43 Activity – Cold Rooms

Activity Description

Part 43 of Schedule 2 of the Regulations prescribes the upgrade of parts of refrigeration systems for 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.

Over time, the department may determine that there are other equipment changes that reduce GHG equivalent emissions when implemented. In such a case, product requirements and installation requirements for these changes will be listed by the department 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	Historical schedule number
43A	43A	None	An electronic expansion valve and compatible superheat controller that: (a) are designed to be installed together in the refrigeration system of a cold room; and (b) when installed together into a refrigeration system can and will automatically control the superheat of the refrigeration system.	N/A
43B	43B(i)	None	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: (a) technology capable of varying condensing temperature with ambient temperature to improve system performance; or (b) compressors with variable capacity modulation such as variable speed capacity control, other than (i) on/off capacity control on single compressor systems (ii) hot gas bypass (iii) fixed stage cylinder unloading	N/A
43B	43B(ii)	None	A refrigeration system that includes all of the following parts: (a) technology capable of varying condensing temperature with ambient temperature to improve system performance (b) compressors with variable capacity modulation such as variable speed capacity control, other than (i) on/off capacity control on single compressor systems (ii) hot gas bypass (iii) fixed stage cylinder unloading (c) electronic expansion valve and compatible superheat controller that meet the requirements of Activity 43A (d) speed controlled condensing fans, that (i) are electronically commutated (EC) fans, or	N/A

Product category number	Scenario number	Decommissioning requirements	Product to be installed	Historical schedule number
			(ii) are variable speed drive (VSD) driven fans (e) evaporator fans, that are electronically commutated (EC) fans.	

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 scenario 43A 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

$$GHG\ Eq.Reduction = Energy\ Savings \times Lifetime \times EEF \times Temperature\ Factor \times Regional\ Factor$$

Table 43.2 – GHG equivalent emissions reduction variables for Scenario 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 operating below 0°C (freezers)	1.4
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

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

The GHG equivalent emissions reduction for scenario 43B(i) 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)

$$GHG\ Eq.Reduction = Energy\ Savings \times Lifetime \times EEF \times Temperature\ Factor \times Regional\ Factor$$

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 0ºC	1.0
	For Cold Rooms operating below 0ºC (freezers)	1.4
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

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

The GHG equivalent emissions reduction for scenario 43B(ii) 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)

$$GHG\ Eq.Reduction = Energy\ Savings \times Lifetime \times EEF \times Temperature\ Factor \times Regional\ Factor$$

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 0ºC	1.0
	For Cold Rooms operating below 0ºC (freezers)	1.4
Regional Factor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04

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

Activity Description

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[1]	Product to be installed[2]	Historical schedule number
44A	44A	One or more: • gas-fired hot water boilers; or • gas-fired water heaters. 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.	One or more air source heat pump water heaters: • that each: ○ have an insulated storage volume not exceeding 700 litres; and ○ are certified by an accredited body as complying with AS/NZS 2712; and ○ provide a minimum delivery temperature of 45°C; and ○ are installed by a licensed or registered plumber; and ○ achieves the specified minimum annual energy savings; and ○ is modelled against the specified heat pump modelling requirements; or • that each: ○ have an insulated storage volume exceeding 700 litres; and ○ provide a minimum delivery temperature of 45°C; and ○ are installed by a licensed or registered plumber; and ○ achieves the specified minimum annual energy savings; and	N/A

[1] This is only a summary of the decommissioning requirements for this activity. The decommissioning requirements set out at Schedule 2, regulation 35 of the Regulations take precedence over information contained in this document.

[2] This is only a summary of the product requirements for this activity. The product requirements set out at Schedule 2, regulation 35 of the Regulations take precedence over information contained in this document.

Product category number	Scenario number	Decommissioning requirements[1]	Product to be installed[2]	Historical schedule number
			○ is modelled against the specified heat pump modelling requirements.	
44B	44B	One or more: • electric resistance hot water boilers; or • electric resistance water heaters. 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.	One or more air source heat pump water heaters: • that each: ○ have an insulated storage volume not exceeding 700 litres; and ○ are certified by an accredited body as complying with AS/NZS 2712; and ○ provide a minimum delivery temperature of 45°C; and ○ are installed by a licensed or registered plumber; and ○ achieves the specified minimum annual energy savings; and ○ is modelled against the specified heat pump modelling requirements; or • that each: ○ have an insulated storage volume exceeding 700 litres; and ○ provide a minimum delivery temperature of 45°C; and ○ are installed by a licensed or registered plumber; and ○ achieves the specified minimum annual energy savings; and ○ is modelled against the specified heat pump modelling requirements.	N/A
44C	44C	None	One or more air source heat pump water heaters: • that each: ○ have an insulated storage volume not exceeding 700 litres; and ○ are certified to AS/NZS 2712; and ○ provide a minimum delivery temperature of 45°C; and ○ are installed by a licensed or registered plumber; and ○ achieves the specified minimum annual energy savings; and ○ is modelled against the specified heat pump modelling requirements; or • that each: ○ have an insulated storage volume exceeding 700 litres; and	

Product category number	Scenario number	Decommissioning requirements[1]	Product to be installed[2]	Historical schedule number
			○ provide a minimum delivery temperature of 45°C; and ○ are installed by a licensed or registered plumber; and ○ achieves the specified minimum annual energy savings; and ○ is modelled against the specified heat pump modelling requirements.	

Specified Minimum Energy Efficiency

The product installed must meet the relevant 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	
44A, 44B, and 44C	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.

Other specified matters

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

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

Product category number / scenario number	Requirement type	Specification details
44A, 44B and 44C	Heat pump modelling requirements	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.* In order to achieve the specified minimum annual energy savings, the product must be installed as modelled.

Product category number / scenario number	Requirement type	Specification details
44A and 44B	Installation requirements where using an existing storage tank	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: • was manufactured less than 10 years before the existing product is decommissioned; and • has a volume that is greater than or equal to the volume of the modelled component; and • is insulated.

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

Method for Determining GHG Equivalent Reduction

Scenario 44A: Decommissioning a gas product and installing an air source heat pump water heater

The GHG equivalent emissions reduction for this 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

$$GHG\ Eq.Reduction\ = \sum systems\ \left[GEF\ x\ \left(\frac{RefElec}{RepEff}\right) - GEF\ x\ HPGas - EEF\ x\ RegionalFactor\ x\ \left(\frac{HPElec}{3.6}\right)\right] x\ CapacityFactor\ x\ Lifetime + \sum systems\ [\ (1430 - GWP)\ x\ RFE\ x\ RfrgCharge\ ]$$

Table 44.4– GHG equivalent emissions reduction variables for Scenario 44A

Input Type	Condition	Input Value
Lifetime	If using existing storage with a new system	10
	In any other case	15
EEF	In every Instance	The electricity emissions factor to be used in greenhouse gas equivalent emissions reduction calculations.
RegionalFactor	For upgrades in Metropolitan Victoria	0.98
	For upgrades in Regional Victoria	1.04
GEF	In every instance	0.05523
RFE	In every instance	5×10^{-4}
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.
CapacityFactor	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)	$\frac{Existing\ system\ thermal\ capacity\ (kW)}{Heat\ pump\ thermal\ capacity\ (kW)}$
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 44B: Decommissioning an electric product and installing an air source heat pump water heater

The GHG equivalent emissions reduction for this 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 44B

$$GHG\ Eq.\ Reduction = \sum systems \left[EEF \times \left(\frac{RefElec}{3.6}\right) \times RegionalFactor - GEF \times HPGas - EEF \times RegionalFactor \times \left(\frac{HPElec}{3.6}\right) \right] \times CapacityFactor \times Lifetime + \sum systems\ [\ (1430 - GWP) \times RFE \times RfrgCharge\ ]$$

Table 44.5 – GHG equivalent emissions reduction variables for Scenario 44B

Input Type	Condition	Input Value
Lifetime	If using existing storage with a new system	10
	In any other case	15
EEF	In every Instance	The electricity emissions factor to be used in greenhouse gas equivalent emissions reduction calculations.
RegionalFactor	For upgrades in Metropolitan Victoria*	0.98
	For upgrades in Regional Victoria*	1.04
GEF	In every instance	0.05523
RFE	In every instance	5×10^{-4}
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 determined by the department 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.
CapacityFactor	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)	$\frac{Existing\ system\ thermal\ capacity\ (kW)}{Heat\ pump\ thermal\ capacity\ (kW)}$
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 44C: Installing an air source heat pump water heater

The GHG equivalent emissions reduction for this 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 44C

$$GHG\ Eq.\ Reduction = \sum systems \left[GEF \times \left(\frac{RefElec}{NewEff}\right) - GEF \times HPGas - EEF \times RegionalFactor \times \left(\frac{HPElec}{3.6}\right) \right] \times Lifetime + \sum systems \left[(1430 - GWP) \times RFE \times RfrgCharge \right]$$

Table 44.6 – GHG equivalent emissions reduction variables for Scenario 43C

Input Type	Condition	Input Value
Lifetime	If using existing storage with a new system	10
	In any other case	15
EEF	In every Instance	The electricity emissions factor to be used in greenhouse gas equivalent emissions reduction calculations.
RegionalFactor	For upgrades in Metropolitan Victoria*	0.98
	For upgrades in Regional Victoria*	1.04
GEF	In every instance	0.05523
RFE	In every instance	5×10^{-4}
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.

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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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
3384	Regional	No	Cold	4

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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
3414	Regional	No	Cold	4
3415	Regional	No	Cold	4
3418	Regional	No	Cold	4
3419	Regional	No	Cold	4
3420	Regional	No	Cold	4
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
3442	Regional	Yes	Cold	4
3444	Regional	Yes	Cold	4
3446	Regional	No	Cold	4
3447	Regional	No	Cold	4
3448	Regional	No	Cold	4
3450	Regional	Yes	Cold	5
3451	Regional	Yes	Cold	5
3453	Regional	No	Cold	5
3458	Regional	No	Cold	5
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
3480	Regional	No	Cold	4
3482	Regional	No	Cold	4
3483	Regional	No	Cold	4
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
3502	Regional	Yes	Hot	4
3505	Regional	Yes	Hot	4
3506	Regional	No	Hot	4
3507	Regional	No	Hot	4
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
3542	Regional	No	Hot	4
3544	Regional	No	Hot	4
3546	Regional	No	Hot	4
3549	Regional	No	Hot	4
3550	Regional	Yes	Cold	4
3551	Regional	Yes	Cold	4
3552	Regional	No	Cold	4
3554	Regional	No	Cold	4
3555	Regional	Yes	Cold	4
3556	Regional	Yes	Cold	4
3557	Regional	No	Cold	4
3558	Regional	No	Cold	4
3559	Regional	No	Cold	4
3561	Regional	Yes	Cold	4

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
3562	Regional	No	Cold	4
3563	Regional	Yes	Cold	4
3564	Regional	Yes	Cold	4
3565	Regional	No	Cold	4
3566	Regional	Yes	Hot	4
3567	Regional	No	Hot	4
3568	Regional	No	Hot	4
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
3576	Regional	No	Hot	4
3579	Regional	No	Hot	4
3580	Regional	No	Hot	4
3581	Regional	No	Hot	4
3583	Regional	No	Hot	4
3584	Regional	No	Hot	4
3585	Regional	No	Hot	4
3586	Regional	No	Hot	4
3588	Regional	No	Hot	4
3589	Regional	No	Hot	4
3590	Regional	No	Hot	4
3591	Regional	No	Hot	4
3594	Regional	No	Hot	4
3595	Regional	No	Hot	4
3596	Regional	No	Hot	4
3597	Regional	No	Hot	4
3599	Regional	No	Hot	4
3607	Regional	No	Cold	4
3608	Regional	No	Cold	4
3610	Regional	Yes	Cold	4
3612	Regional	No	Cold	4
3614	Regional	No	Cold	4
3616	Regional	Yes	Cold	4
3617	Regional	No	Cold	4

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
3618	Regional	Yes	Cold	4
3619	Regional	No	Cold	4
3620	Regional	Yes	Cold	4
3621	Regional	Yes	Cold	4
3622	Regional	No	Cold	4
3623	Regional	Yes	Cold	4
3624	Regional	Yes	Cold	4
3629	Regional	Yes	Cold	4
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
3637	Regional	No	Cold	4
3638	Regional	No	Cold	4
3639	Regional	No	Cold	4
3640	Regional	Yes	Cold	4
3641	Regional	Yes	Cold	4
3643	Regional	Yes	Cold	4
3644	Regional	Yes	Cold	4
3646	Regional	No	Cold	4
3647	Regional	No	Cold	4
3649	Regional	No	Cold	4
3658	Regional	Yes	Cold	4
3659	Regional	Yes	Cold	4
3660	Regional	Yes	Cold	4
3661	Regional	No	Cold	4
3662	Regional	No	Cold	4
3663	Regional	No	Cold	4
3664	Regional	No	Cold	4
3665	Regional	No	Cold	4
3666	Regional	Yes	Cold	4
3669	Regional	No	Cold	4
3670	Regional	No	Cold	4

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
3671	Regional	No	Cold	4
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
3698	Regional	No	Cold	5
3699	Regional	No	Cold	5
3700	Regional	No	Cold	5
3701	Regional	No	Cold	5
3704	Regional	No	Cold	5
3705	Regional	No	Cold	5
3707	Regional	No	Cold	5
3708	Regional	No	Cold	5
3709	Regional	No	Cold	5
3711	Regional	No	Cold	5
3712	Regional	No	Cold	5
3713	Regional	No	Cold	5
3714	Regional	No	Cold	5
3715	Regional	No	Cold	5
3717	Regional	No	Cold	5
3718	Regional	No	Cold	5
3719	Regional	No	Cold	5
3720	Regional	No	Cold	5

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
3722	Regional	No	Cold	5
3723	Regional	No	Cold	5
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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
3870	Regional	No	Mild	4
3871	Regional	No	Mild	4
3873	Regional	No	Mild	4
3874	Regional	No	Mild	4

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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
3916	Metropolitan	Yes	Mild	4
3918	Metropolitan	Yes	Mild	4
3919	Metropolitan	Yes	Mild	4
3920	Metropolitan	Yes	Mild	4
3921	Regional	Yes	Mild	4
3922	Regional	No	Mild	4
3923	Regional	No	Mild	4
3925	Regional	No	Mild	4
3926	Metropolitan	Yes	Mild	4
3927	Metropolitan	Yes	Mild	4

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
3928	Metropolitan	Yes	Mild	4
3929	Metropolitan	Yes	Mild	4
3930	Metropolitan	Yes	Mild	4
3931	Metropolitan	Yes	Mild	4
3933	Metropolitan	Yes	Mild	4
3934	Metropolitan	Yes	Mild	4
3936	Metropolitan	Yes	Mild	4
3937	Metropolitan	Yes	Mild	4
3938	Metropolitan	Yes	Mild	4
3939	Metropolitan	Yes	Mild	4
3940	Metropolitan	Yes	Mild	4
3941	Metropolitan	Yes	Mild	4
3942	Metropolitan	Yes	Mild	4
3943	Metropolitan	Yes	Mild	4
3944	Metropolitan	Yes	Mild	4
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

Postcode	Regional/Metropolitan	Reticulated gas	Climatic region	Climatic zone
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