ESSENTIAL SERVICES COMMISSION

Victorian Energy Upgrades

Gas Efficiency Activity Guide

1 March 2019

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Contents

Introduction

Accredited persons (APs) and their installers under the Victorian Energy Upgrades (VEU) program must comply with program requirements when undertaking gas efficiency activities to create Victorian energy efficiency certificates (VEECs).

About this guide

Use this guide for assistance in meeting the specific requirements (products, installation, decommissioning, recommissioning, training, safety and evidentiary) for gas efficiency activities. We have split the guide into seven key sections:

- Section 1: Introduction to gas efficiency activities
- Section 2: Calculating VEECs
- Section 3: Activity requirements for gas efficiency activities
- Section 4: Record keeping and evidence requirements for all gas efficiency activities
- Section 5: Minimum evidence requirements for specific gas efficiency activities
- Section 6: Gas efficiency activity process

You should read this guide in conjunction with our Obligations and Program Guide for Accredited Persons for:

- overarching information about the Victorian Energy Upgrades program
- your obligations under the program
- guidance on how to create VEECs under the program.

Access this document at www.esc.vic.gov.au/veu-accredited-persons

Who should use this guide

You should use this guide if you are:

- seeking accreditation to undertake gas efficiency activities under the program
- accredited to undertake these activities under the program
- an installer seeking to undertake installations for these activities under the program.

This guide will help you to understand the activity, your responsibilities and evidentiary requirements you must meet to create and register VEECs.

To apply for accreditation for these activities, access the required documents at www.esc.vic.gov.au/become-veu-accredited

Seeking assistance

If you are unsure about any aspects of undertaking these activities, and cannot find the answer in this guide or the documents listed above, contact VEU support on (03) 9032 1310 or veu@esc.vic.gov.au.

Legal context for this guide

We have prepared this guide as a general summary of relevant parts of:

- Victorian Energy Efficiency Target Act 2007 (the VEET Act)
- Victorian Energy Efficiency Target Regulations 2018 (the VEET Regulations)
- Victorian Energy Upgrades Specifications 2018 (the VEU specifications)
- Victorian Energy Efficiency Target Guidelines (the VEET guidelines)

View these documents at www.esc.vic.gov.au/veu-legislation

This guide should not be relied upon as substitute for legal advice and should be read in conjunction with the above source documents. In the event of inconsistency between this guide and the source documents, the content in the source documents apply.

Feedback on this guide

We are committed to implementing a risk-based regulatory framework for these activities. In order to achieve this objective, we would like to hear from you if you have any feedback on requirements set out in this guide.

To provide feedback, please contact VEU Support on veu@esc.vic.gov.au or (03) 9032 1310.

1. Introduction to gas efficiency activities

In 2018, the Department of Environment, Land, Water and Planning introduced new deemed gas efficiency activities to the VEET Regulations, including upgrades of existing gas-fired boilers or heaters.

1.1. New gas efficiency activities

There are six new deemed activities which are tailored towards simple replacements or installations. If your gas efficiency upgrade activity is of an intricate nature or linked to other upgrades, we recommend you consider claiming VEECs using one of the program's project-based activities methods.

Find out how to participate in project-based activities at www.esc.vic.gov.au/project-based-activities

The six eligible activities can be summarised in two groups:

- decommissioning and installing primary infrastructure (activities 37, 38 and 41)
- installing secondary components on existing primary infrastructure (activities 39, 40 and 42).

An overview of these new gas efficiency activities is described in Table 1.

Table 1: Overview of baseline and upgrade requirements for new gas efficiency activities

Activity	Baseline	Upgrade
37	Decommissioning an existing inefficient gas-fired steam boiler	Energy efficient gas-fired steam boiler
38	Decommissioning an existing inefficient gas-fired Type B appliance (hot water boiler or water heater)	Energy efficient gas-fired hot water boiler or water heater
39	Burner on a gas-fired Type B appliance (steam boiler, hot water boiler or water heater)	Installing electronic gas/air ratio control on that burner
40	Burner on a gas-fired Type B appliance (steam boiler, hot water boiler or water heater) which has an existing gas/air ratio controller	Installing combustion trim control on that burner
41	Decommissioning an existing inefficient old burner on a gas-fired Type B appliance (steam boiler, hot water boiler or water heater).	Installing a new burner
42	Gas-fired Type B appliance (steam boiler, hot water boiler or water heater)	Installing an economizer

1.2. Which activities are eligible?

For your gas efficiency upgrade activity to be eligible under the VEU program:

- the activity must take place in an eligible site

- the product installed must be eligible
- the upgrade activity must be approved by Energy Safe Victoria
- you must be accredited with relevant approvals to undertake gas efficiency activities
- the upgrade activity must be undertaken in accordance with activity requirements (see sections 3, 4 and 5).

1.2.1. Eligible sites

To be eligible, the activity must be undertaken in a business/non-residential premises or in a Class 2/3 building (as classified under Part A3 of Volume One of the Building Code)[1].

Further information about Class 2 or 3 buildings is available at https://www.abcb.gov.au

1.2.2. Eligible products

Products are not required to be listed in our Register of Products or any other product registers. Only Type B appliances or the installation of components on a Type B appliance are allowed under the VEU Program.

The Gas Safety Act 1997 defines a Type B appliance as an appliance (including a second-hand appliance) with gas consumption in excess of 10 MJ/h, including any component and fittings downstream of and including the appliance manual shut-off valve, but does not include a Type A appliance.

As a result, the installation and commissioning of all products and components that meet the product criteria listed in Table 2 must be approved by Energy Save Victoria.

Table 2: Product criteria

Activity	Product criteria
37	A gas-fired steam boiler 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 • the minimum thermal efficiency is at least 80 per cent when at a firing rate with an output that is at least 100 per cent but not more than 105 per cent of the manufacturer's rated heat output as determined in accordance with BS 845-2 (pre-commissioning) or BS 845-1 (post-commissioning).

[1] A residential premises may be eligible provided the activity relates to common services within the building. For example, an activity can involve the upgrade of residential common area services such as the car park of an apartment building, but it cannot involve the upgrade of services to a single apartment within the building.

Activity	Product criteria
38	A gas-fired hot water boiler or gas-fired water heater 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 has sensor for combustion trim purposes • the minimum thermal efficiency is at least 80 per cent when at a firing rate with an output that is at least 100 per cent but not more than 105 per cent of the manufacturer's rated heat output as determined in accordance with BS 7190 (pre-commissioning) or BS 845-1 (post-commissioning).
39	An electronic gas/air ratio control which is designed to be installed on a Type B appliance as part of the burner's gas/air ratio control system.
40	A combustion trim system which: • includes a flue gas sensor connected to a control panel, capable of sending a signal to a control damper on the burner air supply and/or variable speed drive on the fan motor • is designed to be installed on a gas-fired steam boiler, water boiler or 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.
41	A gas-fired burner which: • is installed on a Type B appliance that is a gas-fired steam boiler, hot water boiler or water heater • 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.
42	An economizer which: • 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 • complies with AS 1228 • if of a condensing kind, provides for the products of combustion to be expelled into a flue-gas stack constructed from stainless steel • unless the product is specifically designed to run dry, is installed with a control system for minimum flow rates that does not require manual intervention for operation.

1.2.3. Approval by Energy Safe Victoria

For an upgrade activity to be eligible:

- An application for acceptance of complex gas installations and/or Type B appliances must be submitted to and approved by Energy Save Victoria.

- VEECs can only be claimed once Energy Save Victoria provides a Final Acceptance Letter and the baseline product has been decommissioned, where applicable.
- You must have all necessary documentation to verify the pre-upgrade (baseline) environment.

Further information related to gas technical information, licensing and regulation, applying for a gas installation and AS/NZ standards are available at https://www.esv.vic.gov.au.

1.2.4. Appropriate accreditation and approvals from us

You must be accredited by us and approved for gas efficiency activities in order to create VEECs using these activities.

Find out how to become accredited for these activities at https://www.esc.vic.gov.au/become-veu-accredited.

2. Calculating VEECs

The number of VEECs you receive for a given activity is based on the deemed abatement associated with the upgrade activity.

The deemed abatement is calculated using assumptions about an activity's energy saving factors (such as the nominal gas consumption and deemed improvement in the energy efficiency of the boiler or heater). Due to these assumptions, the deemed abatement calculated may vary from the actual abatement achieved. However, if you wish to claim VEECs using a more accurate abatement value, one of the program's project-based activities methods is an available option.

The key variables used to calculate the number of VEECs for gas efficiency activities are:

- nominal gas consumption
- default efficiency improvement
- load utilisation factor, and
- lifetime

The VEEC calculation method is further explained in parts 37 to 42 of the VEU specifications and in appendix A. Examples of how to calculate VEECs for these activities are provided in appendix B.

An explanation of some of the key calculation variables is provided in the next section.

2.1. Calculation variables

2.1.1. Load utilisation factor

The load utilisation factor is the gas usage of a boiler or water heater in a year compared to the gas usage if it had been operating at 100 per cent capacity for the year (8,760 hours).

The load utilisation factor value is 0.206 in every instance across activities 37 to 42.

If your utilisation factor is significantly higher, you may wish to claim VEECs using one of the program's project-based activities methods instead.

2.1.2. Default efficiency improvement

The default energy improvement for each activity is the deemed improvement in the energy efficiency of the boiler or water heater. Its values are reproduced from the VEU specifications in appendix A.

The default energy improvement value is a variable for activities that involve decommissioning of Type B appliances. For the upgrade of a gas-fired steam boiler (activity 37), gas-fired hot water

boiler or gas-fired water heater (activity 38), the default energy improvement is determined by the following factors:

- the year of manufacture of the baseline appliance
- the year that the burner was installed on the Type B appliance
- the gross thermal efficiency of the upgrade appliance, and
- whether the installation of a gas-fired water heater is an air-conditioning upgrade as part of refurbishment that must comply with Part 5.2d of the Building Code.

For the installation of a combustion trim (activity 40) or an economizer (activity 42), the default energy improvement value varies depending upon whether the equipment is installed on a gas-fired steam boiler, a gas-fired hot water boiler or a gas-fired water heater. For the installation of an electronic gas/air ratio control (activity 39) and replacement of a gas-fired burner (activity 41), the default energy improvement is a singular value.

2.1.3. Lifetime

The asset lifetime is 20 years for the replacement of a gas-fired steam boiler (activity 37), gas-fired hot water boiler or gas-fired water heater (activity 38), a burner on a Type B appliance (activity 41), and installation of an electronic gas/air ratio controller (activity 39).

The asset lifetime is 10 years for the installation of combustion trim on a burner (activity 40) and that of an economizer on a Type B appliance (activity 42).

3. Activity requirements for gas efficiency activities

You should be aware of, and adhere to, common activity requirements that apply to all gas efficiency activities to ensure that you comply with legislation.

3.1. Assignment of rights to create VEECs

A consumer may assign their right to create VEECs to an AP. A VEEC assignment form must be completed for you to create VEECs and demonstrate compliance with the legislation.

Download the VEEC assignment form template for this activity at www.esc.vic.gov.au/gas-efficiency-activities

You must give the energy consumer a copy of the VEEC assignment form at the time of signing (for written forms) or within 10 business days (for electronic forms). You must also ensure that all personal information collected in the VEEC assignment form is held in accordance with the Information Privacy Principles under the Privacy and Data Protection Act 2014 (Vic).

Details of how to comply can be found at https://ovic.vic.gov.au/privacy

3.2. Decommissioning requirements

Gas efficiency activities need to meet relevant baseline and decommissioning[2] requirements.

If your upgrade involves decommissioning a baseline appliance, you must decommission that appliance prior to certificate creation. Details of your decommissioning practices must be supplied to us for review before you are accredited to undertake gas efficiency activities. Requirements for evidence showing proper decommissioning of a baseline appliance is set out in Section 5 below.

3.3. Meeting your decommissioning declaration requirements

You, or your associate, or an entity under your instructions, must not alter the baseline environment for a given installation for the purposes of inflating the VEEC claim.

In practical terms, for gas efficiency activities involving the decommissioning of product(s) (activities 37, 38 and 41), you, your installer, and the consumer will need to provide a declaration to us stating that the decommissioned product was not installed for the purposes of decommissioning it as part of this activity under the program. This declaration must be made:

[2] With the exception of electronic gas/air ratio control, combustion trim and economizers (activities 39, 40 and 42) which do not have a decommissioning requirement.

- as part of your VEEC assignment form (by the energy consumer and your installer) – either in electronic or in written form
- as part of you accepting the terms and conditions of your VEEC creation claim made via your VEU account.

4. Record keeping and evidence requirements for all gas efficiency activities

You must collect evidence in order to demonstrate that each upgrade has been undertaken in accordance with the VEET Regulations and VEU specifications. You are also required to maintain documentation for each upgrade and provide it to us upon request.

4.1. Record keeping obligations

You must keep appropriate records to verify all details of the upgrade which relate to the calculation of greenhouse gas abatement and the creation of VEECs.

We may ask to review these records prior to or up to six years after VEECs are registered, as evidence that your upgrade complies with the legislation.

Your records must be an auditable record of the work undertaken in each area of the site. If your documentation fails to provide an auditable record of the work undertaken, you may be required to surrender VEECs equivalent to those which we cannot verify.

4.2. Geo-tagged photograph obligations

You are required to take geo-tagged photographs to verify that the upgrading of all equipment has been performed in accordance with the VEET Regulations. Geo-tagged photographs must:

- be clear and in focus
- include any relevant markings
- include a date stamp showing the date the photographs were taken
- include the GPS derived latitude and longitude coordinates. This should be stored in the metadata and generated automatically by the device used to take the geo-tagged photographs.

4.3. Evidence of assignment of rights to create VEECs

You must ensure the VEEC assignment form captures all the installation information.

Table 3: Evidence of assignment of rights to create VEECs

Documentation	Description
VEEC assignment form	All fields in the VEEC assignment form must be completed and correctly filled in.

4.4. Evidence of commercial transaction and energy consumer

You must have proof of the commercial transaction relating to the installation, including evidence of the energy consumer[3]

Table 4: Evidence of commercial transaction and energy consumer

Documentation	Description
Tax invoice	A valid tax invoice for the work carried out must include: • the name, address and Australian Business Number (ABN)/Australian Company Number (ACN) of the energy consumer • the date of issue of the invoice • the date of installation • the installation address • the name, address and ABN of the installer business • the installed equipment including brand(s) and model(s) names.

4.5. Evidence of documents provided to Energy Save Victoria and/or the Victorian Building Authority

You must maintain all documents submitted to Energy Save Victoria and/or the Victorian Building Authority for acceptance of a Type B appliance installation.

Table 5: Evidence of documents provided to Energy Save Victoria and/or the Victorian Building Authority

Documentation	Description
Evidence of application for acceptance of a Type B appliance installation	The following documents must be provided: • Manufacturer specifications of the upgrade appliance • The application which was submitted to Energy Save Victoria and/or the Victorian Building Authority for acceptance of a Type B appliance installation, which includes, but are not limited to: – appliance details (i.e. manufacturer's name, model number, nominal gas consumption (MJ/h), serial number, date of manufacture, flueing details, manufacturer's data report for pressure vessels and any other relevant information)

[3] In accordance with Section 16 of the VEET Act, the energy consumer is the consumer of electricity or gas in respect of whom the prescribed activity is undertaken. In instances, where there are multiple energy consumers, a lead energy consumer must be identified. A lead energy consumer is the nominated energy consumer for the purposes of assigning rights for the VEECs created by a gas efficiency upgrade activity, where multiple bodies or persons are responsible for the payment of gas for the asset to be upgraded. The onus is on the AP to provide evidence of the energy consumer.

  - description of the appliance function and any associated industrial process with which the appliance is integrated, together with an engineering drawing indicating the general arrangement
  - valve train schematic diagram
  - commissioning procedures and operating instructions.
- Energy Save Victoria's compliance plate and final acceptance letter.

5. Minimum evidence requirements for specific gas efficiency activities

For each upgrade, APs must collect:

- the evidence described in Section 4, and
- the evidence described in this section relevant to the specific activity being implemented.

5.1. Replacement of a gas-fired steam boiler with a high efficiency gas-fired steam boiler (activity 37)

Table 6: Evidence requirements for replacement of a gas-fired steam boiler with a high efficiency gas-fired steam boiler

Requirements	Documentation	Description
Eligibility	VEEC assignment form	A declaration, signed by the AP or the installer, declaring that: • the building where the activity takes place is a Class 2 or 3 building (as per the Building Code of Australia) or a non-residential premises • the existing boiler is at least 10 years old.
Baseline	Geo-tagged photographs of the baseline appliance nameplate	The photographs must clearly show: • the model number • the serial number • the year of manufacture • the nominal gas consumption of the boiler.
	Geo-tagged photographs of the burner nameplate	The photographs must clearly show the year that the burner was installed on the baseline appliance.
	Manufacturer's specifications	The manufacturer's specifications must show all required baseline information that is not clearly visible on the nameplates.
Upgrade	Geo-tagged photographs of the upgrade appliance nameplate	The photographs must clearly show: • the model number • the serial number • the nominal gas consumption of the boiler.
	Geo-tagged photographs of the burner nameplate	The photographs must clearly show the manufacturing date of the burner.
	Manufacturer's specifications	The manufacturer's specifications must show all required upgrade information that is not clearly visible on the nameplates, as well as either

Requirements	Documentation	Description
		• for a boiler with a nominal gas consumption above 3,700 MJ/h but not above 7,500 MJ/h, that it has an electronic gas/air ratio control system • for a boiler with a nominal gas consumption above 7,500 MJ/h, that it has an electronic gas/air ratio control system which receives a signal from a flue gas sensor for combustion trim purposes.
	Thermal efficiency test report	The report must be completed to BS 845 standard by a National Association of Testing Authorities accredited laboratory or equivalent, and clearly show: • the minimum gross thermal efficiency is at least 80 per cent when at a firing rate with an output that is at least 100 per cent but not more than 105 per cent of the manufacturer's rated heat output as determined in accordance with BS 845-2 (pre-commissioning) or BS 845-1 (post-commissioning) • original measurements • conditions of the measurements (diagram of the system being tested and protocol followed, and range of heat outputs tested) • any modelling or data extrapolation undertaken • all calculations and assumptions.
Decommissioning	Geo-tagged photographs	The photographs must clearly show: • the baseline appliance rendered permanently inoperable • the whole baseline appliance in its surrounding environment after being rendered permanently inoperable.
Installation	Geo-tagged photographs	The photographs must clearly show: • the baseline appliance in place at the premises before installation • the upgrade appliance after installation.
	Schematic diagram	Schematic showing all Type B appliances located at the premises highlighting those that have been upgraded as part of the claimed upgrade/installation.

5.2. Replacement of a gas-fired water boiler or water heater (activity 38)

Table 7: Evidence requirements for replacement of a gas-fired water boiler or water heater

Requirements	Documentation	Description
Eligibility	VEEC assignment form	A declaration, signed by the AP or the installer, declaring that: • the building where the activity takes place is a Class 2 or 3 building (as per the Building Code of Australia) or a non-residential premises, and • the existing boiler or water heater is at least 10 years old
Baseline	Geo-tagged photographs of the baseline appliance nameplate	The photographs must clearly show: • the model number • the serial number • the year of manufacture • the nominal gas consumption of the boiler/heater.
	Geo-tagged photographs of the burner nameplate	The photographs must clearly show the year that the burner was installed on the baseline appliance.
	Manufacturer's specifications	The manufacturer's specifications must show all required baseline information that is not clearly visible on the nameplates.
Upgrade	Geo-tagged photographs of the upgrade appliance nameplate	The photographs must clearly show: • the model number • the serial number • the nominal gas consumption of the boiler/heater.
	Geo-tagged photographs of the burner nameplate	The photographs must clearly show the manufacturing date of the burner.
	Manufacturer's specifications	The manufacturer's specifications must show all required upgrade information that is not clearly visible on the nameplates, as well as either • for a boiler with a nominal gas consumption above 3,700 MJ/h but not above 7,500 MJ/h, that it has an electronic gas/air ratio control system • for a boiler with a nominal gas consumption above 7,500 MJ/h, that it has an electronic gas/air ratio control system which receives a signal from a flue gas sensor for combustion trim purposes.

Requirements	Documentation	Description
	Thermal efficiency test report	The report must be completed to BS 845 standard by a National Association of Testing Authorities accredited laboratory or equivalent, and clearly show: • the minimum gross thermal efficiency is at least 85 per cent when at a firing rate with an output that is at least 100 per cent but not more than 105 per cent of the manufacturer's rated heat output as determined in accordance with BS 7190 (pre-commissioning) or BS 845-1 (post-commissioning) • original measurements • conditions of the measurements (diagram for system being tested and protocol followed, and range of heat outputs tested) • any modelling or data extrapolation undertaken • all calculations and assumptions.
Decommissioning	Geo-tagged photographs	The photographs must clearly show: • the baseline appliance rendered permanently inoperable • the whole baseline appliance in its surrounding environment after being rendered permanently inoperable.
Installation	Geo-tagged photographs	The photographs must clearly show: • the baseline appliance in place at the premises before installation • the upgrade appliance after installation.
	Schematic diagram	Schematic showing all Type B appliances located at the premises highlighting those that have been upgraded as part of the claimed upgrade/installation.

5.3. Installation of an electronic gas/air ratio control (activity 39)

Table 8: Evidence requirements for installation of an electronic gas/air ratio control

Requirements	Documentation	Description
Eligibility	VEEC assignment form	A declaration, signed by the AP or the installer, declaring that: • the building where the activity takes place is a Class 2 or 3 building (as per the Building Code of Australia) or a non-residential premises • there was no electronic gas/air ratio control installed on the existing appliance (a Type B appliance that is a gas-fired steam boiler, gas-fired hot water boiler or gas-fired water heater) at the time of installation.
Existing appliance	Geo-tagged photographs of the existing appliance nameplate	The photographs must clearly show: • the model number • the serial number • the nominal gas consumption of the appliance.
	Manufacturer's specifications	The manufacturer's specifications must show all required existing appliance information that is not clearly visible on the nameplate.
Electronic gas/air ratio control	Geo-tagged photographs of the electronic gas/air ratio control	The photographs must clearly show: • the installed system's control panel • the installed gas/air ratio sensor.
	Manufacturer's specifications	The manufacturer's specifications must show the make and model of the electronic gas/air ratio control.
Installation	Geo-tagged photographs	The photographs must clearly show: • the existing appliance in its surrounding environment • the location where the electronic gas/air ratio control will be installed before installation.
	Schematic diagram	Schematic showing all Type B appliances located at the premises highlighting those that have been upgraded as part of the claimed upgrade/installation.

5.4. Installation of a combustion trim system (activity 40)

Table 9: Evidence requirements for installation of a combustion trim system

Requirements	Documentation	Description
Eligibility	VEEC assignment form	A declaration, signed by the AP or the installer, declaring that: • the building where the activity takes place is a Class 2 or 3 building (as per the Building Code of Australia) or a non-residential premises • the existing appliance (a Type B appliance that is a gas-fired steam boiler, gas-fired hot water boiler or gas-fired water heater) has an electronic gas-air ratio control system capable of receiving a signal from a flue gas sensor for combustion trim purposes.
Existing appliance	Geo-tagged photographs of the existing appliance nameplate	The photographs must clearly show: • the model number • the serial number • the nominal gas consumption of the appliance.
	Manufacturer's specifications	The manufacturer's specifications must show all required existing appliance information that is not clearly visible on the nameplate.
Combustion trim	Geo-tagged photographs of the combustion trim	The photographs must clearly show: • the installed system's control panel • the flue gas sensor position on the flue after installation.
	Manufacturer's specifications	The manufacturer's specifications must show the make and model of the combustion trim.
Installation	Geo-tagged photographs	The photographs must clearly show: • the existing appliance in its surrounding environment • the existing appliance in place at the premises before installation • the location where the combustion trim will be installed before installation.
	Schematic diagram	Schematic showing all Type B appliances located at the premises highlighting those that have been upgraded as part of the claimed upgrade/installation.

5.5. Replacement of a gas-fired burner (activity 41)

Table 10: Evidence requirements for replacement of a gas-fired burner

Requirements	Documentation	Description
Eligibility	VEEC assignment form	A declaration, signed by the AP or the installer, declaring that: • the building where the activity takes place is a Class 2 or 3 building (as per the Building Code of Australia) or a non-residential premises • the existing burner is at least 10 years old.
Existing burner	Geo-tagged photographs of the existing appliance (a Type B appliance that is a gas-fired steam boiler, gas-fired hot water boiler or gas-fired water heater) nameplate	The photographs must clearly show: • the model number • the serial number • the nominal gas consumption of the appliance.
	Geo-tagged photographs of the existing burner nameplate	The photographs must clearly show the age of the burner.
	Manufacturer's specifications	The manufacturer's specifications must show all required existing burner information that is not clearly visible on the nameplates.
Upgraded burner	Geo-tagged photographs of the upgraded burner nameplate	The photographs must clearly show: • the model number • the nominal gas consumption of the burner.
	Manufacturer's specifications	The manufacturer's specifications must show: • all required upgraded burner information that is not clearly visible on the nameplate • if nominal gas consumption is above 3,700 MJ/h, the burner has an electronic gas/air ratio control system that is capable of receiving a signal from a flue gas sensor for combustion trim purposes.
Decommissioning	Geo-tagged photographs	The photographs must clearly show: • the existing burner rendered permanently inoperable • the existing burner shown adjacent to the existing appliance at the premises.

Requirements	Documentation	Description
Installation	Geo-tagged photographs	The photographs must clearly show: • the existing appliance in its surrounding environment • the upgraded burner before installation shown adjacent to the existing appliance at the premises • the existing burner in place at the premises before installation.
	Schematic diagram	Schematic showing all Type B appliances located at the premises highlighting those that have been upgraded as part of the claimed upgrade/installation.

5.6. Requirements for installation of an economizer (activity 42)

Table 11: Evidence requirements for installation of an economizer

Requirements	Documentation	Description
Eligibility	VEEC assignment form	A declaration, signed by the AP or the installer, declaring that: • the building where the activity takes place is a Class 2 or 3 building (as per the Building Code of Australia) or a non-residential premises • no more than one economizer is installed on the existing appliance (a Type B appliance that is a gas-fired steam boiler, gas-fired hot water boiler or gas-fired water heater).
Existing appliance	Geo-tagged photographs of the existing appliance nameplate	The photographs must clearly show: • the model number • the serial number • the nominal gas consumption of the appliance.
	Manufacturer's specifications	The manufacturer's specifications must show: • the type of existing equipment as a non-condensing one • what the flue-gas stack is constructed from (e.g. carbon steel or stainless steel) • all required existing appliance information that is not clearly visible on the nameplate.
Economizer	Geo-tagged photographs of the economizer	The photographs must clearly show: • the installed economizer • the boiler feedwater line entering the economizer.

Requirements	Documentation	Description
	Manufacturer's specifications	The manufacturer's specifications must show: • the make and model of the equipment • whether it is a condensing or non-condensing type • that the economizer is capable of controlling minimum flow rates or that it is designed to run dry.
Installation	Geo-tagged photographs	The photographs must clearly show: • the existing appliance in its surrounding environment • the existing appliance and flue arrangements in place at the site before installation • the location where the economizer will be installed on the boiler's flue-gas stack before installation.
	Schematic diagram	Schematic showing all Type B appliances located at the premises highlighting those that have been upgraded as part of the claimed upgrade/installation.

6. Gas efficiency activity process

This section provides you with the process for undertaking a gas efficiency activity under the program.

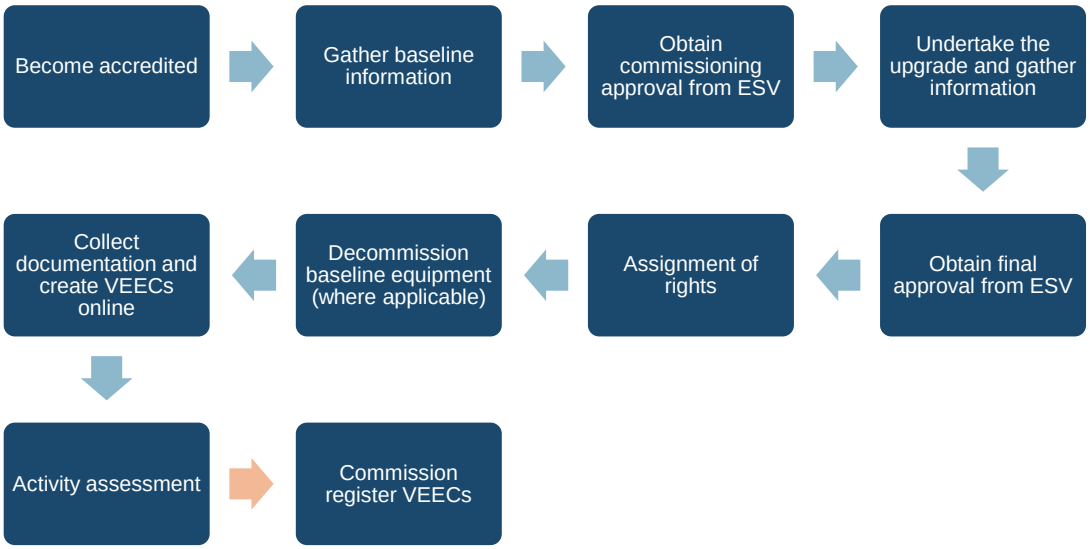

Figure 1: Process for undertaking gas efficiency upgrade

6.1. Become accredited

You must be accredited/approved to undertake this activity to create VEECs for this activity. Visit www.esc.vic.gov.au/become-veu-accredited for information on how to become accredited.

6.2. Gather baseline information

Verify the baseline environment by collecting any necessary information you need for certificate creation prior to performing the upgrade. Evidence requirements are outlined in sections 4 and 5.

6.3. Obtain commissioning approval from Energy Safe Victoria

Under the Gas Safety Act 1997 and Gas Safety (Gas Installation) Regulations 2008, the installation and/or modification of a Type B appliance must be approved by Energy Save Victoria.

You most provide Energy Save Victoria with a completed application form, including the information specified in Schedule 9 of the Gas Safety (Gas Installation) Regulations 2008 at least 28 days before the planned appliance commissioning date. The appliance can only be installed once ESV has provided written notification of its decision to accept or conditionally accept the gas appliance installation.

Further information related to gas technical information, licensing and regulation, applying for a gas installation and AS/NZ standards are available at https://www.esv.vic.gov.au.

6.4. Undertake the upgrade and gather information

Ensure you comply with other relevant legislations, such as Occupational Health and Safety, whilst performing the upgrade, and that you collect all evidence requirements. Evidence requirements are outlined in sections 4 and 5.

6.5. Obtain final approval from Energy Save Victoria

Following an inspection of the commissioned appliance, Energy Save Victoria will allocate the appliance a compliance plate and issue a final acceptance letter. The appliance can only be handed over to the energy consumer once Energy Save Victoria has issued those mentioned documents.

6.6. Assignment of rights

An important part of the certificate creation process is the valid assignment of the right to create VEECs from the consumer to you. Ensure the signatory has the legal authority to sign on behalf of the consumer entity.

6.7. Decommission baseline appliance

For activities 37, 38 and 41, baseline appliance that is replaced or removed must be decommissioned in accordance with the VEET Regulations (see section 3.2). See Section 5 for evidence requirements.

6.8. Collect documentation and create VEECs online

Prior to creating VEECs for an activity, ensure you have collected the required documents for the upgrade as specified in sections 4 and 5. You may be asked to submit further information in addition to all those required documents as part of our assessment process.

To create VEECs, you can upload the activity using either an upload form or the online user interface on the VEU Registry. Different activity types have different data input requirements, so it is important that you input the correct data in the relevant field.

6.9. Activity assessment

Given the complex nature of these upgrades and the potential VEEC volumes involved for a single installation, we intend to conduct a detailed assessment of each activity submitted for VEEC creation. All installations will be assessed as first creations prior to the registration of certificates.

After you press the ‘create’ button for your validated activities, the VEECs associated with your upgrade are created and assigned a unique identifier. We then assess your created VEECs and decide whether to register them.

You must always retain complete and accurate documentation for each upgrade you have undertaken.

6.10. Commission registers VEECs

Once your VEEC creation claims have been validated by us, we will provide you with an invoice for the certificate registration fee of $1 per certificate. Once payment is received, we will register your VEECs and notify you that they are available to be traded and/or surrendered to us.

Glossary

Term	Definition
Approved laboratory	Approved laboratory means a laboratory that is: • accredited by the National Association of Testing Authorities, or • registered by an authority recognised by the National Association of Testing Authorities under a mutual recognition agreement.
Building Code	Building Code means the Building Code of Australia within the meaning of Section 3(1) of the Building Act 1993.
Decommission	Decommission means disable and render permanently unusable.
Economizer	Economizer has the same meaning as in AS 1228.
Energy consumer	Energy consumer, in relation to a prescribed activity, means the person who is the consumer of electricity or gas in respect of whom a prescribed activity is undertaken within the meaning of Section 16 of the Victorian Energy Efficiency Target Act 2007.
Gas/air ratio control	Gas/air ratio control has the same meaning as in AS 3814.
Gas-fired burner	Gas-fired burner means a burner within the meaning of AS 3814 but does not include a burner that uses a fuel other than a gas within the meaning of section 3(1) of the Gas Safety Act 1997
Gas-fired hot water boiler	Gas-fired hot water boiler means a hot water boiler within the meaning of AS 3814 but does not include: • a boiler with burners (as defined in AS 3814) that use a fuel other than a gas within the meaning of section 3(1) of the Gas Safety Act 1997; or • a steam boiler as defined in AS 3814.
Gas-fired steam boiler	Gas-fired steam boiler means a steam boiler within the meaning of AS 3814 but does not include: • a boiler with burners (as defined in AS 3814) that use a fuel other than a gas within the meaning of section 3(1) of the Gas Safety Act 1997; or • a hot water boiler or a water heater as defined in AS 3814.
Gas-fired water heater	Gas-fired water heater means a water heater within the meaning of AS 3814 but does not include: • a storage water heater or an instantaneous water heater as defined in AS 4552–2005 Gas fired water heaters for hot water supply and/or central heating published by Standards Australia on 8 December 2005 (superseded); or • a storage water heater or an instantaneous water heater as defined in AS/NZS 5263.1.2.

Term	Definition
Nominal gas consumption	Nominal gas consumption has the same meaning as in AS3814.
Type B appliance	Type B appliance has the same meaning as in the Gas Safety Act 1997.
VEEC	A Victorian energy efficiency certificate created under Section 17 of the Victorian Energy Efficiency Target Act 2007.

Appendix A: VEEC calculation for gas efficiency activities

VEECs for these activities are calculated using the following equation:

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

- GHG Eq.: Greenhouse gas equivalent
- Consumption: The nominal gas consumption
- DEI: The default efficiency improvement
- LUF: The load utilisation factor
- Lifetime: The asset lifetime

Activity 37 - Replacement of a gas-fired steam boiler with a high efficiency gas-fired steam boiler

- In every instance, the consumption value is the lower of the net nominal gas consumption (MJ/h) of the upgrade appliance or of the baseline appliance
- LUF is 0.206
- Lifetime is 20
- The value for DEI is detailed below:

Table 12: Default energy improvement value for activity 37

Condition		Input value
Year of manufacture if 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 per cent to less than 85 per cent	2.71×10^{-6}
	New steam boiler has a gross thermal efficiency of 85 per cent 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 per cent to less than 85 per cent	2.22×10^{-6}
	New steam boiler has a gross thermal efficiency of 85 per cent 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 per cent to less than 85 per cent	2.49×10^{-6}
	New steam boiler has a gross thermal efficiency of 85 per cent or greater	5.25×10^{-6}
Year of manufacture of the	New steam boiler has a gross thermal	2.00×10^{-6}

incumbent boiler marked as 1990 or later, and the burner was installed up to and including 10 years ago	efficiency of 80 per cent to less than 85 per cent	
	New steam boiler has a gross thermal efficiency of 85 per cent or greater	4.76×10^{-6}

Activity 38 - Replacement of a gas-fired water boiler or heater

- In every instance, the consumption value is the lower of the net nominal gas consumption (MJ/h) of the upgrade appliance or of the baseline appliance
- LUF is 0.206
- Lifetime is 20
- The value for DEI is detailed below:

Table 13: Default energy improvement value for activity 38

Condition		Input value
Year of manufacture if 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 per cent to less than 90 per cent	2.58×10^{-6}
	New hot water boiler or water heater has a gross thermal efficiency of 90 per cent 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 per cent to less than 90 per cent	2.06×10^{-6}
	New hot water boiler or water heater has a gross thermal efficiency of 90 per cent 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 per cent to less than 90 per cent	2.29×10^{-6}
	New hot water boiler or water heater has a gross thermal efficiency of 90 per cent 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 per cent to less than 90 per cent	1.78×10^{-6}
	New hot water boiler or water heater has a gross thermal efficiency of 90 per cent 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	New hot water boiler or water heater has a gross thermal efficiency of 85 per cent to less than 90 per cent	1.10×10^{-6}
	New hot water boiler or water heater has a gross thermal efficiency of 90 per cent or greater	3.87×10^{-6}

Condition	Input value
the Building Code as amended from time to time	

Activity 39 - Installation of an electronic gas/air ratio control

- Consumption
  - If the nominal gas consumption of the existing appliance on which the electronic gas/air ratio control is installed is less than 11,400 MJ/h, then the consumption value is the nominal gas consumption (MJ/h) of that existing appliance
  - If the nominal gas consumption of the existing appliance on which the electronic gas/air ratio control is installed is at least 11,400 MJ/h, then the consumption value is 11,400
- LUF is 0.206
- Lifetime is 20
- DEI is 0.65×10^{-6}

Activity 40 - Installation of a combustion trim system

- Consumption
  - If the nominal gas consumption of the existing appliance on which the combustion trim system is installed is less than 11,400 MJ/h, then the consumption value is the nominal gas consumption (MJ/h) of that existing appliance
  - If the nominal gas consumption of the existing appliance on which the combustion trim system is installed is at least 11,400 MJ/h, then the consumption value is 11,400
- LUF is 0.206
- Lifetime is 10
- The value for DEI is detailed below:

Table 15: Default energy improvement value for activity 40

Condition	Input value
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}

Activity 41 - Replacement of a gas-fired burner

- Consumption

  - If the nominal gas consumption of the existing appliance on which the upgraded burner is installed is less than 11,400 MJ/h, then the consumption value is the nominal gas consumption (MJ/h) of that existing appliance
  - If the nominal gas consumption of the existing appliance on which the upgraded burner is installed is at least 11,400 MJ/h, then the consumption value is 11,400

- LUF is 0.206
- Lifetime is 20
- DEI is 1.07×10^{-6}

Activity 42 - Requirements for installation of an economizer

- In every instance, the consumption value is the nominal gas consumption (MJ/h) of the existing appliance on which the economizer is installed
- LUF is 0.206
- Lifetime is 10
- The value for DEI is detailed below:

Table 17: Default energy improvement value for activity 42

Condition	Input value
If the product is installed on a steam boiler	1.81×10^{-6}
If the product is installed on a hot water boiler or water heater	1.41×10^{-6}

Appendix B: Worked Examples for creating VEECs

Example 1

You would like to undertake the below upgrade

Baseline	Upgrade
A hot water boiler: • manufactured in 1986 • with original burners of that same year • having a nominal gas consumption of 900 MJ/h.	A gas-fired hot water boiler: • with a gross thermal efficiency of 87 per cent (as tested using BS 7190) • which has a nominal gas consumption of 1,125 MJ/h • which has a new digital gas/air ratio control installed on the burner.

As the new boiler has a nominal gas consumption ≤ 3,700 MJ/h, VEECs can be created for the replacement of the boiler **and** for the installation of the gas/air ratio control.

The VEECs for this upgrade must be created as separate VEEC creation claims (one for activity 38 and one for activity 39).

Replacement of a gas-fired water boiler or water heater (activity 38)

You must select the following entries in your VEEC creation form for below form fields:

- Purpose of upgrade: Select “Other”
- Upgrade product consumption: 1,125 MJ/h
- Thermal efficiency upgrade: Select “85% to less than 90%”
- Decommissioned product age: Select “Boiler manufactured 1989 or earlier and burner installed more than 10 years ago”
- Decommissioned product consumption: 900 (this value will be used to calculate GHG reduction as this is the lowest of the two consumption figures)

You will be able to create 84 VEECs for this VEEC creation claim.

Installation of the gas/air ratio control (activity 39)

You must select the below entry in your VEEC creation form for this activity’s form fields:

- Type B appliance consumption: 1,125

You will be able to create 26 VEECs for the installation of an electronic gas/air ratio control.

You will be able to create 84 VEECs for the boiler replacement (activity 38) and 26 VEECs for the installation of an electronic gas/air ratio control (activity 39). In total, you will be able to create 110 VEECs for this upgrade activity.

Example 2

You would like to undertake the below upgrade

Baseline	Upgrade
A steam boiler: • manufactured in 1991 • which has had its burner replaced in 2009 (10 years ago) • which has a nominal gas consumption of 10,900 MJ/h.	A gas-fired steam boiler • with a gross thermal efficiency of 83 per cent (as tested using BS 845) • which has a nominal gas consumption of 8,750 MJ/h • which includes a new digital gas/air ratio control and new combustion trim.

As the new boiler has a nominal gas consumption >7,500 MJ/h, VEECs can only be created for boiler replacement and not for the installation of the combustion trim and gas/air ratio control.

Replacement of a gas-fired steam boiler (activity 37)

You must select the following entries in your VEEC creation form for below form fields:

- Upgrade product consumption: 8,750 MJ/h
- Thermal efficiency upgrade: Select “80% to less than 85%”
- Decommissioned product age: select “Boiler manufactured 1990 or later and burner installed up to 10 years ago”
- Decommissioned product consumption: 10,900 MJ/h

You will be able to create 632 VEECs for the steam boiler replacement (activity 37). This VEEC value includes savings associated with the installation of the gas/air ratio control and combustion trim control.

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