

## EXPLANATORY NOTE – PROJECT-BASED ACTIVITIES - MEASUREMENT AND VERIFICATION. PART 1: ACTIVITY GUIDANCE

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The Victorian Energy Efficiency Target (VEET) is a Victorian Government initiative promoted as the *Energy Saver Incentive*.

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## 1 INTRODUCTION

The VEET scheme is a Victorian Government initiative promoted as the Energy Saver Incentive. It commenced on 1 January 2009 and is administered by the Essential Services Commission (the ESC). The scheme was established under the *Victorian Energy Efficiency Target Act 2007* (the Act) and is administered in accordance with the *Victorian Energy Efficiency Target Regulations 2008* (the Principal Regulations) and the *Victorian Energy Efficiency Target (Project-Based Activities) Regulations 2017* (the PBA Regulations).

The VEET scheme is designed to make energy efficiency improvements more affordable, contribute to the reduction of greenhouse gases, and encourage investment, employment and innovation in industries that supply energy efficiency goods and services.

Under the scheme, accredited businesses can offer discounts and special offers on selected energy saving products, appliances and other energy efficiency improvements in homes, businesses or other non-residential premises. The greater the greenhouse gas reduction, the greater the potential saving.

There are many abatement methods or 'prescribed activities' in the VEET scheme. Undertaking a project-based activity (PBA) in measurement and verification (M&V) is an eligible prescribed activity under the PBA Regulations.

### 1.1 PURPOSE OF THIS DOCUMENT

The purpose of this document is to help participants understand PBA M&V activities and provide important information about their obligations when undertaking them.

This document explains how to participate in the PBA M&V activity under the VEET scheme. This activity is administratively and technically complex. Participants will need to spend time reviewing the activity's processes and requirements to understand how it works, even if they have years of experience in the energy efficiency industry.

### 1.2 HOW THIS DOCUMENT IS STRUCTURED

This explanatory note begins by explaining key concepts and issues – see Section 3 of this document. You will need to understand this section before reading the other sections of this document.

Sections 3 to 5 of this document explain the process for participating in M&V activities. Section 5 details the end-to-end process, starting with becoming accredited and finishing with the registration of Victorian energy efficiency certificates (VEECs). It is one example of how you might engage with the scheme. Every business is different, and the specifics of your arrangements may differ, but Section 5 should provide an easy way to find the information you need quickly.

## 1.3 LEGAL CONTEXT FOR THIS DOCUMENT

The ESC has prepared this explanatory note to assist with the interpretation of relevant parts of the:

- *Victorian Energy Efficiency Target Act 2007*
- *Victorian Energy Efficiency Target Regulations 2008*
- *Victorian Energy Efficiency Target (Project-Based Activities) Regulations 2017*
- *Measurement and Verification in the Victorian Energy Efficiency Target scheme: Methods and Variables 2017*
- *Victorian Energy Efficiency Target Scheme Guidelines*

This document 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 explanatory note and the above source documents, the content in the source documents takes precedence in the order shown.

## 2 BEFORE YOU BEGIN

This is not the only document you will need to understand how to participate in this activity. The following documents referred to in this document will be important throughout your involvement in the scheme in addition to the regulatory documents listed in the previous section. You should access these documents and keep them handy, especially if you are new to the VEET scheme. Each is available on the VEET website.

- Explanatory Note – Project-Based Activities – Measurement and Verification. Part 2: Compliance Requirements
- Explanatory Note – Lodging an Application for Accreditation
- Explanatory Note – Lodging a Product Application
- Explanatory Note – Approved Measurement and Verification Professionals

### 2.1 GLOSSARY

The following abbreviations and terms are used throughout this Explanatory Note.

ABN	Australian Business Number
AIP	Approval in Principle
AM&VP	Approved measurement and verification professional
AP	Accredited Person
ECM	Energy conservation measure
ESC	Essential Services Commission

ESV	Energy Safe Victoria
HVAC	Heating, ventilation and air conditioning
IPMVP	International Performance Measurement and Verification Protocol
IPPs	International privacy principles
OH&S	Occupational health and safety
M&MM	Measurement and monitoring manager
M&V	Measurement and verification
M&V in VEET	Measurement and Verification in the Victorian Energy Efficiency Target scheme: Methods and Variables 2017
M&V Plan	Measurement and verification plan
NAESCO	National Association of Energy Services Companies
PBA	Project-Based Activities
PBA Regulations	Victorian Energy Efficiency Target (Project-Based Activities) Regulations 2017
Prescribed greenhouse gas schemes	Commonwealth's Carbon Credits (Carbon Farming Initiative) Act 2011, and the Renewable Energy (Electricity) Act 2000
Principal Regulations	Victorian Energy Efficiency Target Regulations 2008
RECs	Renewable Energy Certificates (RECs)
RET	Commonwealth Renewable Energy Target
RFI	Request for information
RM	Risk manager
Schedule 34	VEET scheme lighting upgrade
STCs	Small-scale Technology Certificates
The Act	Victorian Energy Efficiency Target Act 2007
The Guidelines	Victorian Energy Efficiency Target Guidelines
UM	Upgrade manager
VBA	Victorian Building Authority
VEEC	Victorian energy efficiency certificate
VEET	Victorian Energy Efficiency Target

## 3 KEY CONCEPTS AND ISSUES

There are a range of concepts and terminologies specific to undertaking M&V projects in the VEET scheme. To successfully participate in the scheme you should spend time to familiarise yourself with the following key concepts and issues, even if you're an experienced energy efficiency practitioner.

### 3.1 PROJECT-BASED ACTIVITIES

The PBA Regulations provide for project-based activities in the VEET scheme.

Prior to the introduction of PBAs, prescribed activities under the VEET scheme used *deeming* methods. Deeming estimates an activity's abatement of electricity or gas based on average values for all activities across Victoria. PBA M&V projects use actual measurements and/or site specific modelling to quantify actual abatement.

M&V projects are technology neutral: they potentially allow multiple technologies, techniques, upgrades and abatement methods to be combined in one project. This was not possible under previous prescribed activities in the VEET scheme.

The reliance on actual measurements or site specific modelling allows abatement to be project specific, even if the project happens over different parts of a single site. Only projects at single sites are allowed at this time (e.g. the "site" must have the same street address or be geographically continuous over a defined location).

### 3.2 RELATIONSHIP TO OTHER PRESCRIBED ACTIVITIES

There are many types of prescribed activities which can generate VEECs in the VEET scheme.

A PBA is a stand-alone activity. The Accredited Person (AP) does not have to refer to existing schedules, except for lighting upgrades. All lighting upgrades under the VEET scheme require any lighting equipment installed to be on the ESC's approved product register, and the old lighting equipment and control gear must be de-commissioned in accordance with the Principal Regulations.

### 3.3 INELIGIBLE ACTIVITIES

The following activities are ineligible to create VEECs under project-based activities:

- activities that must be done to meet mandatory statutory or regulatory requirements.
- activities that have negative effects on production or service levels (including safety levels).
- activities that also create Renewable Energy Certificates (RECs) under the Commonwealth Renewable Energy Target (RET), except for some hot water systems that can create small-scale technology certificates (STCs) under the Small-scale Renewable Energy Scheme in addition to Victorian energy efficiency certificates (VEECs).

- activities that increase consumption of non-renewable energy.
- activities that will increase greenhouse gas emissions.

## 3.4 ELIGIBLE ACTIVITIES

There are six eligibility tests a project must satisfy to take part under project-based activities. They are:

- who is the project owner?
- what type of energy is saved?
- are the premises eligible?
- is the activity eligible?
- is the activity additional and does it result in genuine abatement?
- do you have the appropriate accreditations and approvals at the time of the project?

The eligibility conditions of each test are described in subsequent sections.

### 3.4.1 Project ownership

Project ownership focuses on who is responsible for the project, and the entity entitled to the certificates. To establish project ownership, the AP needs to substantiate their right to undertake the activity and identify affected stakeholders. Elements of project ownership are:

- owner
- legal right.

#### Owner

The AP must establish site ownership. This site-owning entity may be an individual or organisation which may, or may not be the AP themselves.

#### Legal right

The statement of legal right outlines the AP's right to undertake the project and their right to the abatement generated.

Section 16(1) of the Act states that the right to create certificates is held by the entity who consumes the electricity or gas. The AP must therefore establish the entity who consumes the electricity or gas and obtain permission from them.

The AP is also required to substantiate their right to undertake the project activities. This may include permission from the site owner, licences or planning and development approvals from local, state and/or federal regulatory bodies.



Once the APs rights have been established, the AP is then the project owner for the purposes of the VEET scheme.

### 3.4.2 Energy services affected

The energy services affected are the energy sources within the project boundary. These will generally be fixed electricity and mains gas utilities. Where other energy types are affected, or where the project involves fuel switching, the AP must provide details of each energy source, including:

- the type of renewable energy source
- average energy content of the new fuel
- difference in emissions factors between the original and new fuel.

VEECs can only be generated for saving grid electricity and fossil fuel gas: no other fuel savings are eligible. For clarity, projects that save coal, oil, petroleum based products, non-fossil fuel gas (such as biogas) and off-grid electricity are not eligible.

### 3.4.3 Eligible premises

To be an eligible premises, sites must fulfil two essential criteria:

- it must be in Victoria
- it must **not** be a new building

### 3.4.4 Eligible activities

For an M&V project to be eligible, it must meet the following conditions:

- the project must have been **completed after** the date you lodged your application for accreditation approval
- any lighting products installed as part of the activity must have been listed on the VEET product register before being installed (i.e. the 'Effective from' date listed in the product register must be before the date of installation)
- you must be able to source all documentation to verify the pre- and post-activity conditions.

### 3.4.5 Additionality and genuine abatement

To ensure that the VEET scheme is encouraging projects that would not have otherwise occurred, the ESC is required to assess the additionality of activities under the scheme. The AP is required to satisfy the ESC that their project is additional and will likely produce genuine abatement.

To satisfy the ESC that a project is additional, the AP must demonstrate that the project is:

- not required by law
- not registered under a prescribed greenhouse gas scheme.

### Not required by law

Projects that are required by law are those that have a qualitative or quantitative requirement for the AP, or other affected stakeholders, to undertake all or part of an activity. Certain activities may be considered not additional if external requirements compel the AP to undertake the activity. This includes complying with energy efficiency or greenhouse gas emissions requirements in any minimum standard or mandatory requirement under legislation.

The AP will need to provide a signed declaration that they are not required by law to undertake the project.

### Not registered under a prescribed greenhouse gas scheme

An AP cannot register the project under VEET as well as another prescribed greenhouse gas scheme, with the exception of some hot water systems. For clarity, prescribed greenhouse gas schemes are the Commonwealth's *Carbon Credits (Carbon Farming Initiative) Act 2011*, and the *Renewable Energy (Electricity) Act 2000*, excluding the hot water systems listed under Part 2, Division 4B of that Act.

To satisfy the ESC that the project is not registered under a prescribed greenhouse gas scheme, the AP is required to sign a declaration, and consent under s10 of the Act to allow the ESC to disclose the details of their participation to prescribed schemes to verify their statement.

## **3.4.6 Appropriate ESC accreditations and approvals**

To be eligible to participate in the VEET scheme and create VEECs, a project must have:

- an AP approved with the ESC to participate in PBA. This is in Section 3.5.
- a scoping plan, a project plan and impact report(s) lodged and approved with the ESC. These are described in Sections 3.24 and 3.27.

## **3.5 ROLE OF THE ACCREDITED PERSON (AP)**

Each project must have a nominated project owner to be responsible for the project. This organisation or natural person is required to apply to the ESC for accreditation as the AP. For clarity, the AP can be an organisation; it does not have to be a natural person.

The ESC may approve an organisation or natural person as an AP once all requested information has been lodged and assessed, and all necessary fees have been paid within a specified time frame.

Where the AP is a natural person, it is not necessary for them to be directly employed by the project owner, but they must have the authority to sign on the project owner's behalf. Where the AP is an organisation, the roles of the AP on VEET scheme documentation must be completed by one natural person.

All legal liability under the Act rests with the AP. If you feel unsure about the obligations and risks associated with being an AP, you should seek independent legal advice.

The AP is required to identify what the key roles in a project are, provide a suitable explanation of each of these roles, and record who is filling them.

APs are liable for the actions of project contractors. You may be required to provide information about the contractual arrangements for each contractor for each activity you undertake.

For an installation to be eligible under the VEET scheme, the AP must ensure it complies with all relevant laws and regulations, including those relating to Occupational Health & Safety (OH&S) and product safety, among others. This applies to all installations – including where you subcontract the installation work to a third party.

The AP must also keep all records relevant to all project activities in the manner and for the period specified in the Act. For clarity, this means for 6 years after lodging the final impact report.

### 3.6 ROLE OF THE UPGRADE MANAGER (UM)

For each upgrade, you must nominate a single natural person to legally represent the project owner to verify the upgrade documentation, including the assignment of rights. This person is referred to as the 'Upgrade Manager' (UM).

It is not necessary for the Upgrade Manager to be directly employed by the AP, but they must have the authority to sign on the AP's behalf. The roles of the Upgrade Manager on scheme documentation must also be completed by one person.

### 3.7 ROLE OF THE RISK MANAGER (RM)

For each upgrade, you must nominate a single person who is responsible for managing safety, risk and monitoring/anticipating issues that might arise during the course of the project. This person is referred to as the 'Risk Manager' (RM).

It is not necessary for the Risk Manager to be directly employed by the AP. The role of the Risk Manager on scheme documentation must also be completed by one person.

### 3.8 ROLE OF THE MONITORING & MEASUREMENT MANAGER (M&MM)

For each upgrade, you must nominate a single person responsible for monitoring independent variables, static factors and the like. This person is the 'Monitoring & Measurement Manager'.

It is not necessary for the M&MM to be directly employed by the AP. The roles of the M&MM on scheme documentation must be completed by one person. The M&MM can design the measurement and verification

Plan (M&V plan), and must oversee it. The M&M Manager cannot be the approved M&V professional for a project (See Section 3.10).

### 3.9 COMBINED ROLES

All of the roles of AP, UM, RM and M&MM can be done by the same person. The approved M&V professional cannot fulfil any other role.

The AP is required to identify what the key roles are, provide a suitable explanation of each of these roles, identify the qualifications and skillset of a person required to fill that role, and record who is filling them.

### 3.10 ROLE OF THE APPROVED M&V PROFESSIONAL (AM&VP)

For each upgrade, you must nominate a single person to validate the approach taken in, and content of the impact report and check that the M&V plan and impact report are consistent.

This person is referred to as the approved M&V professional (AM&VP). This person must be accredited by the ESC on its register of AM&VPs, published on the VEET website. An *Explanatory Note - Approved Measurement and Verification Professionals* and an *Application for Approved Measurement and Verification Professionals* form is available on the VEET website.

It is not appropriate for the AM&VP to be directly employed by the AP or the site owner. They must have the qualifications and experience to provide competent M&V advice, sufficient independence to provide frank advice, and authority to sign off their assessments of the AP's impact reports.

The role of the AM&VP must be completed by one person. The AM&VP cannot carry out any other role in the M&V project.

### 3.11 USING SUBCONTRACTORS

An AP can use subcontractors to undertake installations on their behalf. However all liability rests with the AP. Non-compliant projects will not be tolerated and may be subject to enforcement action.

As the use of subcontractors is a compliance risk, you may be required to provide information about the contractual arrangements for each upgrade you undertake.

### 3.12 INSURANCE

PBAs will generally be large projects with high costs and large risks. APs are encouraged to seek guidance on the appropriate type and level of insurance for their project.

APs are required to have Public Liability cover of at least \$5 million, Product Liability cover of at least \$5 million and Professional Indemnity cover of at least \$5 million to undertake PBAs. This must include cover for rectification.

However, APs can apply for a waiver of these requirements if they are undertaking projects on their own sites. The *Insurance waiver declaration – Project-Based Activities* form is available on the VEET website. APs undertaking projects on their own sites are advised to seek guidance and apply their own judgement on the appropriate type and level of insurance for their project. For clarity, the ESC is not mandating the level of insurance needed for APs running projects on their own sites; the ESC expects these APs to determine their own insurance needs.

Given their key role in the M&V process, the AM&VP must have a minimum professional indemnity coverage of \$5 million.

Other expert advisors to any project are also encouraged to have professional Indemnity insurance, and APs are encouraged to consider this when contracting expert advisors. M&V projects will generally have large budgets, and any consequences of acting on inaccurate advice may also be large.

The ESC encourages APs and experts to consider increasing the value of all types of insurance coverage in line with the value of the project, the risks involved and the consequences of any flow-on effects.

### 3.13 PRODUCT SAFETY AND OH&S

The AP is responsible for the safety of products and activities undertaken as part of M&V projects. The ESC has no occupational health and safety (OH&S) jurisdiction in Victoria. However, the ESC still requires all product installers participating in the VEET scheme to be fully licensed and have completed appropriate safety training.

Further, for an installation to be eligible under VEET, it must comply with all relevant laws and regulations, including those relating to OH&S and product safety. This applies to all project activities, including where you subcontract the installation (or modification) work to a third party.

Under 10(c) of the Principal Regulations, VEECs cannot be created if the AP knew, or ought to have known, that the prescribed activity was not undertaken in accordance with the provisions of the *Electricity Safety Act 1998*, the *Gas Safety Act 1997*, the *Occupational Health and Safety Act 2004*, the *Building Act 1993* or their respective regulations.

If the ESC becomes aware that an M&V project does not meet these provisions, the ESC may not register VEECs for the project, and may refer the matter to the relevant regulator to investigate.

### 3.13.1 Installing or modifying equipment – important information

If you are planning on installing new equipment or modifying/adjusting existing ones as part of a PBA, you should ensure that you thoroughly understand the OH&S, compliance and warranty implications. You should also satisfy yourself that the equipment you plan to install or modify do not pose any unreasonable risks to your staff, sub-contractors or to your client and the public, either during the activities or after them.

Importantly, you should understand that ‘modifying’ existing equipment may effectively create a ‘new’ product from a legal viewpoint. This means that you could become responsible for that equipment’s compliance with relevant safety and compatibility laws and standards. Further, the modification may void the warranty provided by the original manufacturer, meaning you may be considered liable should the equipment malfunction after the activity date.

The *Electricity Safety Act 1998* and *Electricity Safety (Installations) Regulations 2009* requires a *Certificate of Electrical Safety* (or an agreed exemption) for all electrical installation work. In Victoria, this is overseen by Energy Safe Victoria (ESV). This document, where required, must be retained on file by the AP should the ESC require an audit. This document must detail the modification work performed on each equipment type modified. ESV also oversees gas installation regulations, while plumbing standards are overseen by the Victorian Building Authority (VBA).

If you feel unsure about the obligations and risks associated with your planned activities, you should seek independent legal and/or other expert advice.

## 3.14 APPROVALS & PERMITS

You should ensure that you clearly understand the approvals and permits required for any project activity you engage in. Failure to apply for and comply with all relevant approvals and permits may lead to enforcement action being taken against you by the relevant body.

If you feel unsure about the approvals and permits required for an upgrade project, you should seek independent legal and expert advice.

## 3.15 MEASUREMENT BOUNDARY

The measurement boundary is the limit of a project. It defines what activities are inside and outside of a project. It includes all energy consuming products installed, removed, adjusted or otherwise affected in implementing the project, and every device co-metered with an energy consuming device in the project.

Energy consuming equipment or components may be excluded from the measurement boundary if it is impractical or disproportionately costly to measure changes in the electricity or gas use resulting from the project. The ESC must be advised and assured with appropriate evidence that the change in the electricity or

gas consumed is minor; or the changes in electricity or gas consumption are accounted for in the interactive energy savings.

### 3.16 MEASURED ENERGY CONSUMPTION

Measured energy consumption is the energy consumed by all equipment within the measurement boundary. Where a project has many similar activities at the same premises, measured energy consumption can be determined from measurements of a sample of the activities, if the ESC is advised and satisfied that:

- the measured energy consumption of each activity can be reasonably described by the same energy model
- the sampling methods produce a random sample
- calculation of the relative precision used to determine the accuracy factor includes quantification of the impact of the sampling.

### 3.17 SITE CONSTANTS & STANDARD VALUES

A site constant is a parameter of the project site that affects the energy consumed within the measurement boundary but does not vary under normal operating conditions. Site constants include parameters like floor area for a building, or the number of shifts in a day. Each project must have one or more site constants recorded.

A standard value is the value the site constant is expected to have under normal operating conditions. An M&V professional can advise on the appropriate identification of site constants.

### 3.18 INTERACTIVE ENERGY SAVINGS

Interactive energy savings are energy savings due to the project that are outside the notional measurement boundary. An example is savings in heating, ventilation and cooling (HVAC) due to lighting upgrades; more efficient lighting products produce less heat, meaning that air conditioning does not need to work as hard. This saves additional energy in the HVAC system in summer, and costs more heating energy in winter.

Interactive energy savings must be measured, or estimated with a repeatable method that uses site- and project- specific data. The method must be a generally accepted estimation approach for the energy type involved, and must be used to estimate interactive energy savings in all calculations for the project.

An M&V professional can advise on the appropriate identification of interactive energy savings.

### 3.19 M&V VEEC CALCULATION METHODS

There are three methods for calculating and creating VEECs for M&V projects:

- forward creation method using normal year energy savings
- annual creation method using measured annual energy savings
- forward creation with 'top up' method, which uses forward creation, followed by the annual creation method.

The M&V VEEC calculation methods are defined in *Measurement and Verification in the Victorian Energy Efficiency Target scheme: Methods and Variables (M&V in VEET)*.

The forward creation method uses Equations 1, 2 and 4, while the annual creation method uses Equations 1, 3 and 5. A brief explanation is provided in sections 3.19.1 and 3.19.2. You should ensure you fully understand these methods and equations.

The choice between the three methods will depend on:

- the risk factors of the upgrade
- project cash-flow requirements
- the administration required
- the AP's business preference.

Forward creation creates the VEECs earlier in the project. This may have cash flow benefits. A single impact report must be prepared and lodged following measurement of the "operating period". The operating period in this case can be anything up to 24 months long: it can be a short spot measurement, or it can be a 24 month long metered measurement. The period chosen should reflect the full operating cycle of the equipment measured, and evidence should be provided to the ESC justifying the use of this timeframe. The ESC may not accept short periods for some project types, in which case a longer period must be selected.

This option has the ability for projects to quickly generate VEECs relatively soon after project completion. Forward creation has less administration, as it only requires one impact report. A persistence model must be used to discount the expected amount of abatement in order to account for degradation of abatement over the lifetime of the project. This decline in the persistence model means that forward creation may not create as many VEECs as annual creation over the project lifetime.

As forward creation uses a persistence model, there is therefore a related reduction in the accuracy of abatement. For this reason this method has the following restrictions:

- Forward creation cannot be used when projects are easily reversible (for example: changes related to behaviour, set-point changes, or equipment that is easily switched off). Where there is any doubt over this, the ESC will decide that annual creation is the only viable method.
- Forward creation is limited to 50,000 VEECs.
- Forward creation cannot be used if the project has previously used annual creation.

You will need to consider these and other factors when deciding between the creation methods. You should seek independent technical and financial advice if you are unsure.



### 3.19.1 Forward creation method using normal year energy savings

The forward creation method allows VEECs to be created for energy savings up to 10 years in the future. The method depends on setting a baseline, and then estimating savings for future years using measured values over an “operating period” and a persistence model. Persistence models estimate the decline in abatement over time, and are described in Section 3.28. An impact report must be approved before VEECs can be created.

Note that APs have three opportunities to refine their savings figures based on measured data, so they can submit up to three reports (See Section 4(c) of the ‘M&V in VEET’ document).

#### Equation 1

$$VEECs = \text{electricity savings} \times \text{electricity emissions factor} \times \text{regional factor} + \text{gas savings} \times \text{gas emissions factor} + \text{renewable energy savings} \times \text{renewable emissions factor} - \text{counted savings}$$

where:

savings = baseline energy consumption – upgrade energy consumption for each fuel type calculated for the chosen creation method using the relevant Equation 2 or 3.

The regional factors for metropolitan and regional Victoria, and the emissions factors for electricity, gas and liquefied petroleum gas are listed in the ‘M&V in VEET’ document, available on the VEET website.

*Renewable emissions factor* is the relevant emissions factor for the renewable energy listed in Section 2.1 of the National Greenhouse Accounts Factors (2016). This is shown in Table 1.

**Table 1: Fuel combustion emission factors - solid fuels and certain coal based products<sup>1</sup>**

Fuel combusted	Energy content factor GJ/t	Emission factor kg CO <sub>2</sub> -e/GJ (relevant oxidation factors incorporated)		
		CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
Bituminous coal	27.0	90	0.03	0.2
Sub-bituminous coal	21.0	90	0.03	0.2
Anthracite	29.0	90	0.03	0.2
Brown coal	10.2	93.5	0.02	0.4
Coking coal	30.0	91.8	0.02	0.2
Coal briquettes	22.1	95	0.07	0.3
Coal coke	27.0	107	0.04	0.2
Coal tar	37.5	81.8	0.03	0.2
Solid fossil fuels other than those mentioned in the items above	22.1	95	0.07	0.3

<sup>1</sup> from Section 2.1 of *National Greenhouse Accounts Factors, Commonwealth Department of Environment, August 2016*

Fuel combusted	Energy content factor GJ/t	Emission factor kg CO <sub>2</sub> -e/GJ (relevant oxidation factors incorporated)		
		CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
Industrial materials and tyres that are derived from fossil fuels, if recycled and combusted to produce heat or electricity	26.3	81.6	0.02	0.2
Non-biomass municipal materials, if recycled and combusted to produce heat or electricity	10.5	87.1	0.7	1.1
Dry wood	16.2	0	0.1	1.2
Green and air dried wood	10.4	0	0.1	1.2
Sulphite lyes	12.4	0	0.07	0.6
Bagasse	9.6	0	0.2	1.2
Biomass municipal and industrial materials, if recycled and combusted to produce heat or electricity	12.2	0	0.7	1.1
Charcoal	31.1	0	4.8	1.1
Primary solid biomass fuels other than those mentioned in the items above	12.2	0	0.7	1.1

## Equation 2 - Energy savings using forward creation method

$$energy\ savings = \sum_i (normal\ year\ savings \times AF \times DF_i)$$

where:

- $i$  is a year of the maximum time period for forward creation for the project.
- *normal year savings* is calculated using Equation 4.
- $AF$  is the accuracy factor determined using Table 2 where the “relative precision” means the relative precision of the normal year savings at 90% confidence level.
- $DF_i$  is the decay factor for year  $i$  set out in Table 3, or determined by applying a persistence model approved by the ESC under regulation 6 AC of the PBA Regulations to all products installed as part of the activity that were not previously installed at the premises where the project is undertaken.

The forward creation method measures savings in the first ‘normal year’, and uses this value to assume certain levels of savings in each year. Levels are reduced according to the accuracy of the measurements and the decay in the project’s efficiency over time assumed in a persistence model. This method is administratively easier, and creates large amounts of VEECs earlier in a project, but the assumed decay over time generally results in fewer VEECs over the life of the project.

## Equation 4 - Normal year energy savings

$$\text{normal year savings} = \sum_t (E_{BM,t} - E_{OM,t}) + E_{int}$$

where:

- $t$  is an eligible time interval in the normal year.
- $E_{BM,t}$  is the energy consumption for  $t$  from the baseline model.
- $E_{OM,t}$  is the energy consumption for  $t$  from the operating model.
- $E_{int}$  is the total interactive energy savings for the project in the normal year, up to a maximum of  $0.1 \times \sum_t (E_{BM,t} - E_{OM,t})$ .

The forward creation method's maximum period is 10 years from the implementation start time of the project.

### 3.19.2 Annual creation method using measured annual energy savings

The annual creation method allows VEECs to be created for measured energy savings for the immediately preceding year. The method depends on setting a baseline model for a prior year and then measuring and modelling savings for the impact year – the difference between these two models are the “annual” savings which can be created. The following year, a new impact is measured, modelled and compared with the same baseline model, and so on for subsequent years.

There is more administration required in preparing and lodging an annual impact report every year for ten years compared to forward creation, but more VEECs could be created overall as the actual abatement is measured, rather than using an estimate of the decline in abatement over time.

The method depends entirely on measured values, and so is only limited by the project lifetime. The annual creation method uses Equations 1, 3 and 5. Equation 1 was described in Section 3.19.1.

#### Equation 3 - Energy savings using annual creation or top up method

$$\text{energy savings} = \text{measured annual savings} \times AF \mp \text{previous energy savings}$$

where:

- *measured annual savings* is calculated using Equation 5.
- $AF$  is the accuracy factor determined using Table 2 where the “relative precision” means the relative precision of the measured savings at 90% confidence level.
- *previous energy savings* is the total amount of energy savings calculated using this equation for the previous reporting period (if any), including negative energy savings (if any).

#### Equation 5 - Measured annual energy savings

$$\text{measured annual savings} = \sum_t (E_{BM,t} - E_{meas,t}) + E_{int}$$

where:

- $t$  is an eligible time interval in the reporting period.
- $E_{BM,t}$  is the energy consumption for  $t$  from the baseline model.
- $E_{meas,t}$  is the measured energy consumption for  $t$ .
- $E_{int}$  is the total interactive energy savings for the project in the reporting period, up to a maximum of  $0.1 \times \sum_t (E_{BM,t} - E_{meas,t})$ .

### 3.19.3 Forward creation with ‘top up’

The ‘forward creation with top up’ method combines features of the previous two methods. This gives the benefit of creating large numbers of VEECs earlier in a project, while maximising the total number by refining estimates with more accurate measured data rather than accepting the decay in the persistence model. It is administratively more complex than forward creation or annual creation.

To use this method, APs need to have an operating period AND a reporting period for the first year. These may be the same time period, or they may be different. For the first ‘normal year’ (i.e. the forward creation part), APs should use Equations 1, 2 and 4.

Each ‘top up’ year - **including** the first year - needs a reporting period (i.e. the annual creation part), where APs measure and model every 12 month period from the project implementation date. For this, APs should use equations 1, 3 and 5. APs only need submit an impact report to the ESC once the number of VEECs created through the ‘top up’ method exceeds those already registered through forward creation. This impact report should contain all of the modelling for each 12 month period from the project implementation start date until that 12 month period. Following the submission of this first impact report using equations 1, 3 and 5, APs must submit an impact report to the ESC every 12 months, until the project ends.

## 3.20 BASELINE CALCULATION (‘BEFORE’)

A baseline energy model is a model that quantifies energy use before the project is undertaken. A baseline energy model can be established by regression analysis or an estimate of the mean.

If regression analysis is used, the baseline must:

- be based on the value of the measured energy consumption and independent variables during the baseline period where site constants are at their normal values
- be based on at least 80% of the total number of time intervals in the baseline period

- have at least six times as many independent observations of the independent variables as the number of independent variables in the energy model.

If an estimate of the mean is used, the baseline must:

- be based on the value of the measured energy consumption during the baseline, where site constants are at their normal values and where the coefficient of variation of the measured energy consumption over the period is less than 15%
- be based on at least 80% of the total number of time intervals in the baseline.

For both cases the baseline period must end before the implementation start time<sup>2</sup>, and at least one data point must be within two years before commencement.

A baseline energy model must not be used to calculate energy savings if the ESC is not satisfied, having regard to advice from an approved M&V professional, that the model provides a reasonably accurate and reliable estimate of measured energy consumption. For more information, refer to the *International Performance Measurement and Verification Protocol 2012 (IPMVP)*.

### 3.20.1 Normal year

A normal year comprises a set of values for a continuous 12 month period for each independent variable used in the energy models. The normal year is used where the period under consideration includes events outside the ordinary i.e. unusual heatwaves, floods etc. The “normal” year can either be the baseline year, the operating period year, or some other determined “normal” year. Both the baseline AND operating model must be “normalised”. For further guidance see Chapter 4.6.2 from IPMVP.

A normal year must not be used to calculate energy savings if the ESC is not satisfied, having regard to advice from an approved M&V professional, that the normal year reasonably represents the expected mean, range and variation of the independent variables used in the energy models in an average year of the maximum time period for forward creation.

### 3.21 IMPACT CALCULATION ('AFTER')

An operating energy model is a model that quantifies energy use after the project is undertaken. An operating energy model can be established by regression analysis or an estimate of the mean. If regression analysis is used, the results must:

- be based on the value of the measured energy consumption and independent variables during the operating period where site constants are at their normal values
- be based on at least 80% of the total number of time intervals in the operating period

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<sup>2</sup> except for easily reversible PBA M&V projects, where baseline data can be measured after works are undertaken, provided the site can be returned to a pre-project state during measurement.

- have at least six times as many independent observations of the independent variables as the number of independent variables in the energy model.

If an estimate of the mean is used, the results must:

- be based on the value of the measured energy consumption during the baseline, where site constants are at their normal values and where the coefficient of variation of the measured energy consumption over the period is less than 15%
- be based on at least 80% of the total number of time intervals in the baseline.

For both cases the operating period must not start before the implementation start time, and must end no later than two years after the implementation start time.

An operating energy model must not be used to calculate energy savings if the ESC is not satisfied, having regard to advice from an approved M&V professional, that the model provides a reasonably accurate and reliable estimate of measured energy consumption. For more information, refer to the IPMVP.

### 3.22 MEASUREMENT & VERIFICATION

Measurement and verification (M&V) is the process of measurement to reliably determine actual *savings* created by an energy management program. Savings cannot be directly measured, since they represent the absence of energy use. Instead, savings are determined by comparing measured use before and after project implementation, with appropriate adjustments for changes in conditions.

The IPMVP provides methods, with different levels of cost and accuracy, for determining savings, either for the whole facility or for individual energy conservation measures (ECM).

The IPMVP specifies the contents of a Measurement and Verification Plan (M&V plan). This M&V plan adheres to fundamental principles of M&V and if followed, will produce verifiable savings reports (impact reports). For PBA measurement and verification projects, a risk plan must be developed for each project. The elements of the M&V plan sit within the risk plan component of the project plan. The M&V plan and approach taken must be validated by a qualified professional. For clarity, the approved M&V Professional does not write the plan, but it must be validated by them before lodgement of the impact report with the ESC.

M&MMs operating an M&V project are required to complete an M&V plan in line with the IPMVP. The Measurement & Verification plan should be consistent with IPMVP terminology and include:

- the chosen energy conservation measure
- M&V option
- basis of adjustment
- analysis procedure

- meter specifications
- expected accuracy.

The M&V plan should also adequately describe quality assurance procedures for:

- data collection and storage
- data loss and gaps
- calculation accuracy
- review approach
- equipment and system testing
- calibration process
- other relevant quality assurance controls.

The M&MM is required to develop the plan using savings options B or C from the IPMVP. Options A and D are not eligible in PBAs at this time. The approach and results must be validated by the approved M&V professional.

### **3.22.1 Option B: Retrofit Isolation, All Parameter Measurement**

Option B requires all relevant field parameters to be measured. Measurement frequency ranges from short-term to continuous, depending on the expected variations in the savings and the length of the operating period.

Savings are determined from short-term or continuous measurements of baseline and reporting period energy, and/or engineering calculations based upon measured values. Refer to IPMVP Section 4.7.2 for more information on option B. Note that non-routine adjustments are not eligible for PBAs in the VEET scheme.

### **3.22.2 Option C: Whole Facility**

In Option C, energy use is continuously measured at the whole facility throughout the reporting period. Analysis of the baselines allows calculation of savings. These are commonly used for multifaceted energy management programs that affect many systems in a facility. In order to use this option, the expected energy savings must be 10% or more of the baseline energy consumption. The ESC will require APs to submit evidence of this when selecting this option. Refer to IPMVP Section 4.8 for more information on option C. Note that non-routine adjustments are not eligible for PBAs in the VEET scheme.

### 3.22.3 Choosing between options

The choice between options B and C depends on the size of the project to the size of the facility it occurs in, as well as the financial cost and project complexity compared to the amount of VEECs expected as a return. One report suggests that each IPMVP option will cost the client the following percentages of total project costs:

- Option B = 3-10%
- Option C = 1-3% (if meters are already installed)<sup>3</sup>

Option C can be used where savings exceed 10% of the baseline energy use. That way the change can be confidently identified in facility wide metering, even when the reporting period is shorter than two years. Where savings cannot be confidently identified on facility wide meters or where expected savings are less than 10% of baseline energy consumption, option B should be used with specific metering installed on a smaller project area.

IPMVP's Section 4.11 offers more guidance on selecting between option B and C for any specific project, and IPMVP's Appendix A contains examples of each option. If you are unsure about the choice between options, you should seek advice from an M&V professional.

### 3.22.4 Measurement frequency, time intervals and eligible time intervals in a period

Measurement frequency is the number of measurements taken during a given period. A time interval is the segment of time between regular measurements. An eligible time interval is the segment of time between regular measurements that give representative data.

Requirements for measurement frequency, time intervals and eligible time intervals are:

- The length of a time interval is determined by the required measurement frequency.
- The time intervals must be continuous.
- The length of a time interval used to calculate electricity, gas or renewable energy savings may differ; however, time intervals used to calculate the same type of energy savings must be the same length.
- For each fuel type, the measured energy consumption, independent variables and site constants must be measured over the same time interval in a reporting period.
- The period is eligible if all site constants are at standard values and each independent variable is:
  - no less than the minimum value of the effective range minus 5% of the difference between the maximum and minimum values of the effective range

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<sup>3</sup> Birr, D & Donahue, P, "Meeting the Challenge – How Energy Performance contracting Can Help Schools Provide Comfortable, Healthy, and Productive Learning Environments", The National Association of Energy Services Companies (NAESCO) and the US Environmental Protection Agency, 2001, pp. 32-33



- no more than the maximum value of the effective range plus 5% of the difference between the maximum and minimum values of the effective range.
- The effective range is:
  - the range of values of the variable used to develop the baseline energy model if the time interval is in the reporting period or
  - if the time interval is in the normal year: the range of values that are in both:
    - the range of values of the variable used to develop the baseline energy model
    - the range of values of the variable used to develop the operating energy model.

If you are unsure about measurement frequency, time intervals and eligible time intervals, you should seek advice from an M&V professional.

### 3.23 ESC POWERS

The PBA Regulations give the ESC powers to administer the new PBA activity that APs should be aware of. They include:

- ESC may grant or refuse a scoping approval.
- ESC may grant or refuse a project plan.
- The ESC may publish approved project plans on a public register, naming the project, the AP, the project's location, the method intended to calculate energy savings and any other non-commercially-sensitive information as the ESC requires.
- The ESC must not approve a project plan if the ESC is not satisfied that the project is likely to reduce greenhouse gas emissions.
- The ESC may cancel a project plan approval after 28 days written notice if the ESC is satisfied that the project is unreasonably delayed or unable to satisfy the requirements of the PBA Regulations.
- ESC may grant or refuse a variation to a scoping approval or project plan.
- ESC may approve or refuse an application to be registered as an approved Measurement and Verification Professional (AM&VP).
- ESC may publish a register of AM&VP, and may remove people from the register after 28 days written notice.
- ESC may approve or refuse an impact report.
- The ESC can refuse to register VEECs after 28 days written notice if the ESC is satisfied that the impact report is unable to satisfy the requirements of the PBA Regulations.

## 3.24 SCOPING AND PROJECT PLANS

The AP must have their proposed project conditionally approved in principle and have an application for their project plan lodged with the ESC before they can begin their project activities. Overall project approval is broken into two parts, being:

- scoping plan – including project intent
- project plan – including risk plan.

The scoping plan is the first part of the application for approval in principle (AIP). A conditional AIP can be granted where all aspects of the scoping plan have been met (excepting some aspects of where legal right has yet to be satisfied). Where a conditional AIP has been granted, the AP can measure and determine a baseline; however, they may only commence project activities once the ESC has acknowledged receipt of their project plan.

The requirements for the scoping plan are described in greater detail in Section 4.3 of this explanatory note. An *Application for scoping plan approval – Project-Based Activities – Measurement and Verification* is available on the VEET website.

The project plan is the second part to the ESC's assessment of a project's eligibility to create and register VEECs. The project plan allows the AP to define their activity so that the ESC may determine its eligibility.

The project plan covers six elements of a project. All must be satisfied before the project plan can be fully approved in principle. These include:

- project ownership
- project purpose
- additionality
- project governance
- project specifics
- operational health and safety.

Although APs can commence project works once the scoping plan has been conditionally approved in principle and the ESC has acknowledged receipt of the project plan, it is strongly recommended for APs to await the approval in principle of their project plan before beginning these project activities. APs should weigh the costs of delaying the commencement of project works against that of the project plan potentially being rejected by the ESC.

Project plans are described in greater detail in Section 4.4.

## 3.25 BASELINE DATA COLLECTION/MODELLING

Baseline data measures the condition at a project site prior to a project being undertaken. The baseline is the electricity or gas used inside a project boundary before an M&V project is carried out.

Baseline data must be collected within 24 months of an M&V project beginning (i.e. the start of project works). Measurements, modelling and the design of the baseline data collection/modelling regime can be carried out by a competent M&V practitioner, however the approved M&V professional (AM&VP) who is selected to validate this work during the impact report stage cannot be involved in this.

The AM&VPs report must be included with the impact report and approved by the ESC before VEECs can be created.

## 3.26 IMPACT ASSESSMENT/MODELLING

The impact is the difference in electricity, gas or renewable energy used within a project boundary after an M&V project has been carried out. Impact assessment data measures the condition at a project site after a project has been undertaken.

Impact assessment must be measured within 24 months of an M&V project commencement date (i.e. the date the project is brought back into service). Measurements, modelling and the design of the impact assessment/modelling regime can be carried out by a competent M&V practitioner, however the AM&VP who is selected to validate this work during the impact report stage cannot be involved in this.

The AM&VPs report must be included with the impact report and approved by the ESC before VEECs can be created.

## 3.27 IMPACT REPORT

The impact is the difference between the baseline and the operating energy use after a given project. The impact report quantifies and reports this difference. The impact report includes the M&V data and baseline information.

*An Application for Impact Report Approval – Project-Based Activities – Measurement and Verification* form will be available on the VEET website once this becomes available.

While the report can be written by a competent person (most probably the M&MM), the approach, final result and report must be validated by the AM&VP before submission to the ESC.

### 3.28 PERSISTENCE MODEL

The persistence model provides an estimate of the expected lifetime of an energy consuming product (in whole years). It applies a decay factor representing the annual decline in performance due to the type of product, how it is used and the environment it is used in.

The persistence model is only relevant if a forward creation model is used. It is not relevant for annual creation.

APs can propose a persistence model if they have significant experience and/or significant data on a product. The ESC must approve a persistence model before it can be used as part of the project plan. Any persistence model approved by the ESC will be published on the VEET website. APs should consider the intellectual property implications before submitting new persistence models.

When choosing between equally valid persistence models, the most conservative persistence model should be used. The ESC will require valid justification to use the model which is not the most conservative. The ESC may reject the use of a particular persistence model if it is not assured that the model provides the most conservative set of yearly decay factors when applied to more than one product. Refer to Table 2 in M&V in VEET for more detail on what the ESC consider acceptable. The default persistence model is shown in Table 2.

**Table 2: Default persistence model with decay factor over time**

<i>Year (t)</i>	<b>Decay factor</b>
<b>1</b>	1.00
<b>2</b>	0.80
<b>3</b>	0.64
<b>4</b>	0.51
<b>5</b>	0.41
<b>6</b>	0.33
<b>7</b>	0.26
<b>8</b>	0.21
<b>9</b>	0.17
<b>10</b>	0.13

### 3.29 UNCERTAINTY AND ACCURACY CALCULATIONS

Measuring any physical quantity includes errors. In this case errors are the differences between observed and true energy use.

The accuracy of any measured value is properly expressed as the range the true value is expected to fall in, with the level of confidence. For example, a meter may measure consumption as 5,000 units with a precision of  $\pm 100$  units, and a confidence of 95%. This means that 95% of the readings of the same true value are expected to be between 4,900 and 5,100 units.

Two key drivers in dealing with uncertainty and accuracy in M&V projects are:

- establishing the energy consumers' acceptable savings accuracy during the M&V planning process
- reporting the savings with no more significant digits than the least number of significant digits in metered quantities, estimates or constants used in quantification.

These are described in more detail in subsequent sections.

### 3.29.1 Acceptable accuracy

The acceptable accuracy is the level of uncertainty that the AP is prepared to accept. Businesses and APs are encouraged to check the accuracy of existing and installed meters, and check if they are correctly installed in suitable locations. APs need to weigh up the extra cost of more precise metering versus the reduction in VEECs that may be created as a result of less precise metering or estimation. APs should seek independent M&V and financial advice if unsure.

When determining savings, it is feasible to quantify many uncertainty factors, but usually not all of them. Therefore when planning an M&V process, you report both quantifiable uncertainty factors and also qualitative elements of uncertainty. The objective is to recognize and report all uncertainty factors, either qualitatively or quantitatively.

To ensure acceptable levels of uncertainty, errors must be managed when developing and implementing the M&V plan. Process characteristics which should be carefully reviewed to manage accuracy are:

- Instrumentation – measurement equipment errors are due to calibration, inexact measurement, or improper meter selection installation or operation.
- Modelling – the inability to find mathematical forms that fully account for all variations in energy use. Modelling errors can be due to inappropriate functional form, inclusion of irrelevant variables, or exclusion of relevant variables.
- Sampling – use of a sample of the full population of items or events to represent the entire population introduces error as a result of the variation in values within the population, or biased sampling. Sampling may be done in either a physical sense (i.e., only 2% of the lighting fixtures are measured) or a temporal sense (instantaneous measurement only once per hour).
- Interactive effects (beyond the measurement boundary) that are not fully included in the savings computation methodology.
- Estimation of parameters rather than measurement. You can minimize the variation between the parameter's estimated value and its true value through careful review of the ECM design, careful estimating of the parameter, and careful ECM inspection after installation.

Methods of quantifying, evaluating and reducing some of these uncertainties are discussed in Appendix B of the IPMVP. Chapter 8.5 discusses some issues in establishing the correct level of uncertainty for any project. Appendix B - 1.2 defines how large savings must be, relative to statistical variations in baseline data, for

results to be valid. The model for relating accuracy factors to the relative precision of data is found in Table 1 in M&V in VEET. It is also shown in Table 3.

**Table 3: Accuracy factors for mean estimate and regression analysis methods based on relative precision**

Relative precision	Accuracy factor if an energy model for the project is developed using an estimate of the mean	Accuracy factor if all energy models for the project are developed using regression analysis
< 25%	0.9	1
25% to < 50%	0.8	0.9
50% to < 75%	0.7	0.8
75% to < 100%	0.5	0.6
100% to < 150%	0.3	0.4
150% to < 200%	0.1	0.2
>200%	0	0

### 3.29.2 Significant digits

Significant digits are covered in more detail in Section 8.12 of the IPMVP. The key takeaway is that the accuracy of project metering must be designed with the acceptable project accuracy in mind.

The significant digits of a number are the digits that carry meaning. This includes all digits *except*:

- leading zeros
- trailing zeros when they are merely placeholders
- spurious digits.

Spurious digits appear when calculations are carried out to greater precision than the original data, or measurements are reported to a greater precision than the equipment supports. These create false precision. Numbers are often rounded to avoid reporting insignificant figures for simplicity rather than to indicate measurement precision.

The key rule is to report the savings with no more significant digits than the least number of significant digits in metered quantities, estimates or constants used to calculate them. For instance, if the least accurate meter measures four significant figures, then all results calculated from that value must be reported in no more than four significant figures.

## 3.30 ASSIGNMENT OF RIGHTS TO VEECS

A consumer needs to complete and sign a *VEEC assignment form: Project-Based Activities – Measurement and Verification* when assigning their right to create VEECs to a third-party AP. This form needs to collect the information necessary for APs to create certificates and demonstrate compliance with the legislation. A *VEEC assignment form: Project-Based Activities – Measurement and Verification* template will be available on the VEET website in due course.

You may customise the front page of your own *VEEC assignment form: Project-Based Activities – Measurement and Verification* to incorporate additional explanatory text, company logos and other features. You will need to provide a copy of your *VEEC assignment form: Project-Based Activities – Measurement and Verification* for review by the ESC as part of your impact report. The ESC will not allow changes to standard parts of the *VEEC assignment form: Project-Based Activities – Measurement and Verification*.

You must give a copy of the *VEEC assignment form: Project-Based Activities – Measurement and Verification*, or another document containing the same information, to consumers at the time of signing. Additionally, you must ensure that all personal information collected in the *VEEC assignment form: Project-Based Activities – Measurement and Verification* is held in accordance with the Information Privacy Principles (IPPs) under the *Privacy and Data Protection Act 2014* (Vic). Details of how to comply can be found at [www.privacy.vic.gov.au](http://www.privacy.vic.gov.au).

### 3.31 VARIATIONS

A variation is any change to an approved, or conditionally approved M&V project and the project team running it. Changes are expected in any large project, especially in the early stages. Some variations, such as the forward creation of more VEECs based on improved measurements, can be proposed right up until final VEEC creation.

Once a scoping or project plan has been submitted, the ESC must approve any proposed change(s) before the change is made in practice. Unapproved changes (especially from the project plan) that affect the result of impact reports could result in VEECs not being created for the project. In addition, a project cannot create VEECs while a variation request is being processed.

Some project details can be changed readily after approval. These include changes to site ownership, project scope and timing, project boundaries and most key project roles. Other conditions cannot be changed readily, and may warrant a new project application. These include a change of AP, a change of location or change of purpose.

Changes in project team personnel are handled differently. In this case the need for change must be communicated as soon as possible, and the AP needs to recruit replacements with the same or higher skills and experience as those set out in the project plan, so that the AP still has the capacity to carry out the agreed project.

A simple process has been put in place to enable variation applications. An *Application for variations – Project-Based Activities – Measurement and Verification* is available on the VEET website. This is a relatively short form which allows APs to communicate the proposed variation quickly. It enables the ESC to quickly assess if they will consider the variation. Larger variations are likely to be bespoke and in this case, the ESC will issue a request for further information following receipt of the short variation application. Table 4 list the variations that can and can't be made.

**Table 4: Acceptable and unacceptable variations for M&V projects**

ESC will consider variations for	ESC will not consider variations for
Site ownership	Requests not made on the standard <i>Application for variations – Project-Based Activities – Measurement and Verification</i> form
Project timing	The AP, except in exceptional circumstances
Project measurement boundaries	Changes to the project's physical location
Scope of the project, if purpose hasn't changed	Changes to the Energy Conservation Measure
Reduction in the scope of the project	Changes to the project's purpose
Modelling approach	Adding significant services to the project plan
Changes to key roles responsible for the delivery of the project	Any change to multi-site projects
Project conditions outside of the AP's control	Any change that makes genuine abatement unlikely
Fix mismatch in boundaries between the project plan and the impact report	Any change that introduces unacceptable risk to the project
Correct different baseline energy models in the impact report	Any change that removes additionality
Impact reports that significantly over-create VEECs	Projects that are still processing another variation i.e. one variation is allowed at a time
Other factors, if compelling reasons exist	Unreasonably frequent changes
	Multiple revisions of previously made changes
	Any change that fails requirements set out in the Act, Regulations, Guidelines and explanatory note

Should an AP want to vary their project, they should discuss it with the ESC as soon as possible. If the variation will be considered, the AP can lodge more details and seek approval. If it won't be considered, the AP can either proceed with the original plan, or lodge a new project.



For clarity, a decision to not consider a variation is a rejection of the variation. Note also that a decision to consider a variation is not an approval: any such approval requires a full assessment of a larger application. The ESC can approve small variations on the basis of the initial brief application if warranted.

### 3.32 TERMINATION

Termination is an early end to a project. Termination is an option if circumstances change and it is clear that the project won't succeed as planned. Both APs and the ESC have the option to terminate projects at any stage. The PBA regulations term these terminations as 'relinquishment' or 'cancellation' respectively.

APs can relinquish projects by applying to the ESC in writing, and receiving confirmation from the ESC. If an AP is considering relinquishing a project, they should discuss it with the ESC as soon as possible.

The ESC may move to cancel projects if the ESC is concerned that:-

- projects are not meeting the PBA Regulations requirements
- APs are not responding to requests for information
- projects are not progressing in a timely manner.

Should the ESC have grounds to believe that a project should be cancelled, it will investigate the project. If the investigation confirms those grounds, a cancellation report will be compiled and a notice of intent to cancel will be sent to the AP.

The AP then has 28 days to respond. If the AP wants their project to continue, they can work with the ESC to answer the concerns and plan a way forward.

If an adequate response is not received, the ESC will send a notice of cancellation, and remove the project from the register of approved project plans so that VEECs cannot be created or traded.

### 3.33 SUMMARY OF KEY CONCEPTS AND ISSUES

While some key concepts have been used in previous schedules in the VEET scheme, there are many new concepts in this document specific to undertaking PBA projects.

To participate in the scheme you should familiarise yourself with all the key concepts and issues, even if you're an experienced energy efficiency practitioner. The use of these concepts to design, carry out, measure and verify M&V projects are described in greater detail in Section 4.

If you are unsure about any of these concepts, please contact VEET support on (03) 9032 1310 or [veet@esc.vic.gov.au](mailto:veet@esc.vic.gov.au).

## 4 KEY ADMINISTRATIVE PROCESSES

### 4.1 INTRODUCTION

The key steps for creating VEECs for measurement and verification activities are:

- apply to be an AP for PBA
- submit scoping plan
- submit project plan
- undertake baseline data collection/modelling
- undertake the project
- assess/model the impact
- submit impact report to ESC
- create VEECs.

A process map is shown in Figure 1. Each step is described in the following sections.

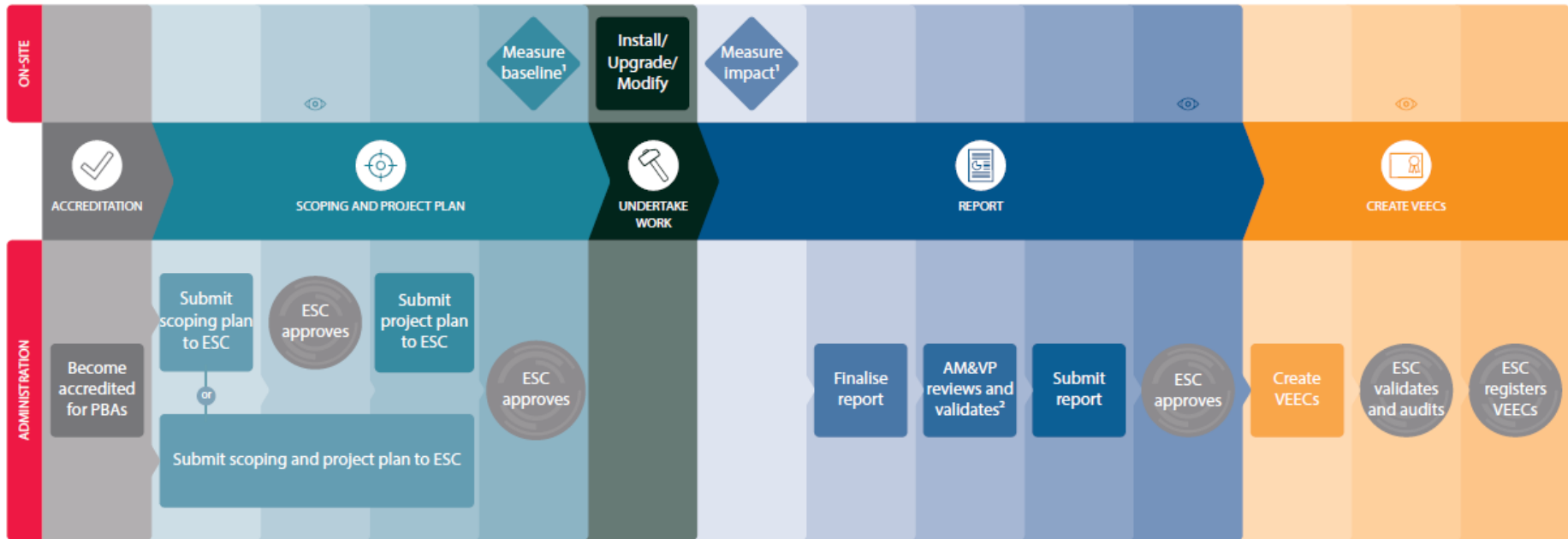
### 4.2 APPLY TO BE AN ACCREDITED PERSON

A project proponent must be accredited for PBA before they can create VEECs from these types of projects.

If you are not yet accredited, the process is described in *Explanatory Note – Lodging an Application for Accreditation*.

If you are already an AP and want to apply to participate in PBAs, the application process is different from previous schedules and uses a different form. The process is described in *Explanatory Note – Lodging an Application for Accreditation* and the *Application for Approval - Project-Based Activities - Measurement and Verification* is available on the VEET website.

The AP approval process for PBAs is simpler than the AP accreditation process for other schedules.



**Figure 1: Process map - Project-Based Activities - Measurement and Verification**

This process map shows the steps businesses must follow in order to create Victorian energy efficiency certificates (VEECs) from measurement and verification projects.

The map is divided into two process streams: on-site and administration. If you are doing all of the work related to VEECs, follow both streams. If you are contracting out administrative duties, follow the 'on-site' stream but ensure you are fully aware of all responsibilities within the 'administration' stream.

0 May include a site inspection.

1 The baseline and impact measurements must be completed before the end of the stage indicated. These measurements can take up to 24 months. In some special cases, the baseline can be measured after the work is completed.

## 4.3 SUBMIT SCOPING PLAN

### 4.3.1 Scoping plan – project intention

The scoping plan covers a range of elements of the M&V project. The purpose of the scoping plan is to provide the ESC with an understanding of what you plan to do, without requiring details that may not be able to be provided at this early stage of the project's development.

Having the approval in principle in two parts means that you can gain conditional approval in principle from the ESC for the scoping plan, before proceeding to collect the information required for the project plan. This allows you to gain confidence that the project is likely to be eligible, before spending the money and time that it may take to gather the more detailed information required for the project plan.

*An Application for scoping plan approval – Project-Based Activities – Measurement and Verification* is available on the VEET website. Scoping plans can be submitted at the same time as project plans. Once a scoping plan has been assessed and approved by the ESC, the ESC will contact the AP to inform them of their progress and check if there needs to be any changes to the project plan. APs would then have the opportunity to update and re-submit. If no changes are needed, the ESC will assess the submitted project plan.

The scoping plan covers the following:

- project ownership
- project purpose
- additionality.

#### **Project ownership**

Project ownership focuses on who is responsible for the project and the entity that is entitled to the certificates. To establish a project owner, the AP needs to substantiate their right to undertake the activity and identify other stakeholders affected.

The elements of project ownership are:

- owner
- legal right.

#### Owner

The AP must establish site ownership. This site-owning entity may be an individual or organisation which may, or may not be the AP themselves.

If the AP is using an agent's services for some or all of their project, the agent's details should be provided (see project governance in section 4.4.1). This includes full service agents, who operate the entire project, through to agents supporting just the administrative side of the AP's participation in the VEET scheme.

### Legal right

The statement of legal right covers the AP's right to undertake the activity and their right to the abatement generated.

The right to the abatement is set out under section 16 (1) of the Act. The Act states that the holder of the right to create certificates is the entity who consumes the electricity or gas. The AP must therefore establish the entity who consumes the electricity or gas and obtain permission from them.

M&V projects are generally longer than those in other schedules. To provide APs, energy consumers and the ESC with some certainty in the initial stages, a *Project consent form – Project-Based Activities* must be completed as part of the scoping plan. This form shows the intent of the energy consumer to assign VEECs to the AP. This form is available on the VEET website.

Actual VEEC assignment does not happen until VEECs are created after an impact report is approved by the ESC. A *VEEC assignment form: Project-Based Activities – Measurement and Verification* must accompany the impact report. This form will be available on the VEET website in due course.

The AP is also required to substantiate their right to undertake the project activities. This may include permission from the site owner, licences or planning and development approvals from local, state and/or federal regulatory bodies.

### **Project purpose**

The project purpose is your opportunity to explain what the project involves and how this aligns with the activity's eligibility requirements. The project purpose should establish:

- project name
- activity
- location
- start date
- description
- energy services affected.

Each is described in more detail in subsequent sections.

## Project name

The project name is the public reference and identifier for the project, and will be shown in the register of approved project plans. You should nominate your preferred name for the project. That name:

- must be unique
- must not mislead about the project's ownership or purpose
- must not contain language inappropriate for a publicly listed project.

The name should use the following convention: [company name]\_[site]\_[project purpose]\_[start date] e.g. PackagingCompany\_Moorabbin\_Boiler Upgrade\_Dec 2017.

Project names that do not give the correct owner, site, purpose and start date will be rejected.

## Activity (PBA method)

You must specify the activity, or the PBA method of the PBA Regulations being used. You will also need to provide evidence that you are able to satisfy the relevant eligibility requirements set out in that activity, guidelines and explanatory notes for that activity. This includes detailing previous experience and/or qualifications in similar projects.

Note that only M&V activities are acceptable at this point in time.

## Location

The location should be an address, where available. A lot number or equivalent or GIS coordinate can be used where no other location identifying reference is available.

The project's location is required in the project plan. It must be one geographically continuous site. The ESC is not accepting multi-site projects at this time.

## Start date

The project start date sets the date the project works are expected to be completed and the project is brought back into service (after any commissioning). This is also known as the implementation date in the PBA Regulations.

## Description

The description is the APs explanation of the project. Use this section to describe the activities being undertaken, including how the project plan addresses the eligibility criteria set out in the regulations, guidelines and explanatory notes.

This is a high level description, and should provide the ESC with a basic understanding of everything that is being proposed, and whether this falls within the general scope of the relevant M&V project.

## Energy services affected

The energy services affected are the electricity and gas sources within the project boundary. These will generally be fixed utilities in the form of grid electricity or piped natural gas. Where other energy types are affected, or where the project involves fuel switching, provide details of each energy source including:

- the type of renewable energy source
- average energy content of the new fuel
- difference in emissions factors between the original and new fuel.

## **Additionality**

The ESC assesses the additionality of activities to ensure that VEET encourages projects that would not have otherwise occurred. Section 15 of the Act outlines various requirements of other abatement schemes or regulatory frameworks that may mean a project is required by law, or already accounted for and therefore not additional.

You must satisfy the ESC that your project is additional and will likely produce genuine abatement by demonstrating that the project is:

- not required by law
- not registered under a prescribed greenhouse gas scheme.

## Not required by law

Certain activities may not be considered additional if laws or other external requirements compel you or other affected stakeholders to undertake all or part of the activity. You will need to provide a statement and any relevant evidence that you are not required by law to undertake the project.

## Not registered under a prescribed greenhouse gas scheme

You cannot register the project under VEET as well as another prescribed greenhouse gas scheme<sup>4</sup>.

To satisfy the ESC, you must provide a statement that the project is not registered under a prescribed greenhouse gas scheme, and give consent under section 10 of the Act for the ESC to disclose details of your participation to prescribed greenhouse gas schemes to verify your statement.

## **4.4 SUBMIT PROJECT PLAN**

### **4.4.1 Project plan – risk plan**

The project plan includes the specific details of the project. The purpose is to provide the ESC with a detailed picture of exactly what you plan to do under the project.

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<sup>4</sup> The only exceptions are certain types of hot water systems. See Section 13 of the Principal Regulations.

The project plan can be provided at the same time as the scoping plan; however it is not required at that stage. The project plan must however be provided to the ESC and approved prior to the project activity commencing.

Specific requirements will vary by M&V project; however, they will all cover the following:

- project governance
- project specifics
- occupational health & safety (OH&S).

These are described in more detail in subsequent sections.

### Project governance

Project governance covers the people and delivery schedule required for successful delivery of the project. These will include the following:

- key roles
- expert advisors
- agents
- delivery schedule.

You will be required to identify the key roles during the operation and administration of the project. You must identify the responsibilities each of the key roles will have for specific elements of the project. These may include planning, design, delivery or administrative tasks.

You must also engage expert advisors to support the successful delivery of your activity or to provide independent advice to satisfy the ESC's validation requirements. In addition to key personnel and expert advisors, you may nominate an agent to act on your behalf. Agents may be responsible for the scheme administration for the project, or could play large roles, up to and including a full service agent who undertakes the project on behalf of the AP.

You are also required to develop a project schedule.

### Key roles

The key roles are responsible for delivery of specific critical elements of the project. All projects should have, as a minimum, an upgrade manager (UM), a risk manager (RM) and a metering and monitoring manager (M&MM). For smaller projects, this may all be you (the AP) alone; however, larger and more complex projects are likely to have several key roles responsible for a range of functions.



You will be required to provide a description of the responsibilities and functions for each of these key roles. In addition to this, you will need to identify any relevant skills, qualifications and/or experience for the roles to be safely undertaken.

Some examples of key roles may include lead engineer, operations manager, safety manager, etc. You are not required to nominate a specific individual to fill the key roles identified; however, you may provide this if someone has been appointed.

For M&V projects, where you are using an internal M&V expert to oversee your project planning and baseline, they will need to note this as a key role in addition to the impartial expert advisor described below.

### Expert advisors

An expert advisor is an impartial, third party advisor engaged by you to validate and verify elements of the project as required by the ESC. The expert advisor is an individual with relevant expertise in the methodology being used and generally will have industry experience and/or relevant tertiary qualifications. The requirements for an expert are defined for each M&V project.

Expert advisors may not always be required, depending on the activity, the method being used and the risk-rating of the AP.

For M&V projects, an approved M&V Professional (AM&VP) is always required to validate the impact report provided by the AP. You can engage an expert advisor to review your project plan, baseline and impact report before they are reviewed. For clarity, to avoid any potential for a conflict of interest, the expert advisor must be a different person to the AM&VP.

The AP will also need to provide the ESC with confidence that the expert does not have a conflict of interest that might prevent them from providing impartial advice.

### Agent

An agent is someone nominated by the AP to engage with the ESC, on their behalf. An agent may be engaged to perform a variety of tasks, from administrative and scheme participation tasks, to operating elements of the project.

If you nominate an agent, the agent is not responsible for delivery of the project. You as the AP continue to be responsible for any action undertaken during participation in the VEET.

The specific responsibility and function of the agent will govern what evidence needs to be provided to satisfy the ESC that the agent can perform their function safely and effectively.

If you decide to use an agent, you need to provide the agent written authority to act on your behalf. You will also need to let the ESC know if and when they can expect to deal with the agent on your behalf.

## Project delivery schedule

The project delivery schedule will outline the timing for implementation of the project. This will identify key dates and any relevant tolerances. These timings form the approved implementation approach, with all key timings included. This may include, but is not limited to:

- baseline start and end dates
- activity start date
- operational date (which forms the start date for the first reporting period for annual creation methods)
- proposed start and end dates for the operational period (for forward creation methods).

## **Project specifics**

The project specifics section gives you an opportunity to explain how your project will be delivered in detail. Specific requirements are set out in the PBA Regulations, guidelines, explanatory notes, and any relevant standards. The primary focus of the project description is to:

- establish geographical and/or system bounds for the activity
- identify which type of activity is being undertaken
- explain how the activity will result in measurable abatement
- provide the ESC with confidence that the AP understands how to implement a successful project of the type described.

The PBA M&V method gives APs options on how to develop models, calculate their impact, report on that impact and register certificates. To support the ESC's ability to forecast workload and effectively assess an application to register certificates, you will need to clarify how you intend to undertake these steps. Project specifics can be broken up as follows:

- detailed description
- project boundary
- modelling approach
- calculation approach
- activity frequency.

## Detailed description

The detailed description builds on the description provided in the scoping plan. The detailed description should provide information on the specific equipment being used, how the upgrade will take place and other relevant details related to the project.

APs operating a M&V project are required to complete a M&V plan in line with the *International Performance Measurement and Verification Protocol (IPMVP)*. You are required to develop the plan using option B or C from the IPMVP. Options A and D are not eligible under M&Vs at this time.

### Project boundary

The project boundary is the system that is monitored and affected by the activity. It defines the systems and equipment that are included in the project.

The boundary may also include pieces of equipment or other elements of the system or affected systems that are specifically excluded from the project. In these cases, you will need to provide justification why these elements are excluded and how any interactive affects are accounted for.

The project boundary needs to be defined including affected equipment, metering and energy sources. The system is defined in further detail within the M&V Plan.

### Modelling approach

The modelling approach covers a variety of options available to the APs on how they baseline their activity and then determine its impact.

The M&V method requires APs to establish a baseline energy model for each gas and electricity source within the project boundary and to then compare that to an operating model using the same parameters. You are able to use either a regression model, or an average energy model.

### Calculation approach

The AP must nominate the calculation approach, which is the type and frequency of reporting you intend to undertake. This may be a single forward creation based on the activity undertaken, or APs can report on the impact of the activity on an ongoing annual basis. This type of reporting will be retrospective and based on observed savings.

APs undertaking an M&V project may also wish to combine forward and annual creation.

Note that:

- For annual creation, the impact report period is known as the 'reporting period' where a reporting period is a 12 month period which begins on the date the project is brought into service after the project works (this is known as the 'implementation date' in the PBA Regulations).
- For forward creation, the impact report period is known as the 'operating period' where an operating period is any length of period (up to a maximum of 24 months after the implementation date).
- For forward creation with top-up, there will be an operating period AND a reporting period.

## Activity frequency

The activity frequency refers to the number and frequency of activities you intend to undertake throughout the project. The project may consist of a single activity or upgrade; however, the M&V method allows for the AP to undertake multiple, or ongoing activities under the PBA Regulations. These may include rolling upgrades or the staged implementation of an activity.

You are required to explain how you intend to roll out activities under your project.

APs should note that the implementation date is the date that the first activity finishes (e.g. the date that equipment is deemed to have come back into service after being upgraded). This date sets the timeframe for the entire project, so if for example, your second activity does not complete until year 3, then savings for this activity can only be accounted for the remaining seven years of the project.

## **Occupational Health and Safety (OH&S)**

The ESC has no OH&S jurisdiction in Victoria. However, the Act requires all APs to ensure their activities are undertaken in accordance with the *Electricity Safety Act*, the *Gas Safety Act*, the *Occupational Health & Safety Act*, the *Building Act* and their respective regulations before the ESC can create VEECs.

You as the AP will be required to explain how you will monitor compliance with your risk approach throughout the project, including record keeping, monitoring approach and governance.

In addition, you will be required to nominate an officer responsible for safety on the project. This person will be responsible for ensuring the OH&S approach is followed, and should be listed as key role for the project in section 4.4.1 on "Project governance" above.

The OH&S section is designed to ensure that you have planned to operate your project in a safe manner. It requires you to consider the safety implications of your project, which includes development of an OH&S approach and monitoring regime prior to undertaking the project. This section can be broken into the following:

- Relevant regulations and standards;
- Relevant safety issues and risks; and
- OH&S approach.

## Relevant regulations and standards

This section requires you to identify the relevant safety standards that apply to activities being undertaken as part of the project. These standards will include relevant acts and regulations, OH&S standards, industry best practices, equipment safety guidelines and other relevant standards.

## Relevant safety issues and risks

You are also required to identify specific areas of risk that apply to the project. These may include issues such as working at heights, with heavy machinery, etc. As part of identifying these risks you will be required to explain how they relate to the project and when they will be relevant throughout the project.

## OH&S approach

The OH&S approach is the AP's plan to address and manage health and safety risks throughout the operation of the project. The OH&S approach should address each of the areas of risk identified in the previous section, including how the risks will be controlled and what procedures, and training and qualification requirements you will put in place to ensure these risks aren't realised. These should be detailed in line with relevant work place health and safety compliance codes, published by WorkSafe Victoria, based on the type of environments the project will be undertaken.

In summary, the OH&S plan should identify safety issues in line with WorkSafe Victoria's Risk and Control Plan requirements to:-

- identify hazards
- assess risks
- develop controls
- monitor control effectiveness
- assign responsibility to a project team member.

## **4.5 UNDERTAKE BASELINE DATA COLLECTION/MODELLING**

The baseline is the main piece of evidence that you will need to collect in order to show site conditions before any project activity is undertaken. This is achieved with a baseline energy model. Specific requirements are set out in the PBA Regulations, methods and variables document, guidelines, explanatory notes, and any relevant standards.

A baseline energy model is a model that quantifies energy use before the project is undertaken. Getting the right baseline data is absolutely essential to the PBA methodology measuring genuine abatement. Getting the baseline wrong means it is likely that VEECs will not be able to be created for a project, as it may be impossible to redo the baseline.

A baseline energy model can be established by regression analysis or an estimate of the mean.

If regression analysis is used, the baseline must:

- be based on the value of the measured energy consumption and independent variables during the baseline period where site constants are at their normal values; and

- be based on at least 80% of the total number of time intervals in the baseline period; and
- have at least six times as many independent observations of the independent variables as the number of independent variables in the energy model.

For clarity, where site constants are not at their normal values, the data collected for energy consumption for any independent variables is not valid.

The baseline model must match the actual baseline at least 80% of the time. For example, if you have 365 data measurements over a year, at least 292 points must fit the baseline model.

You need six times the number of measurements of an independent variable for each independent variable within the model. For example, if you have only one independent variable (e.g. production volume), then you need at least six measurements of production volume within the model. If you have two independent variables (e.g. production volume and ambient temperature), then you need at least twelve measurements of each.

If an estimate of the mean is used, the baseline must:

- be based on the value of the measured energy consumption during the baseline, where site constants are at their normal values and where the coefficient of variation of the measured energy consumption over the period is less than 15%; and
- be based on at least 80% of the total number of time intervals in the baseline

For clarity, where site constants are not at their normal values, the data collected for energy consumption for any independent variables is not valid.

The co-efficient of variation or relative standard deviation is the ratio of the standard deviation to the mean. It shows the extent of variability in relation to the average. A co-efficient greater than 15% suggests the site is not operating normally.

The baseline model must use measured energy consumption at least 80% of the time. For example, if you have 365 data intervals over a year, at least 292 intervals must be used to estimate the mean.

For both cases the reporting or operating period must not start before the implementation start time, and must end no later than two years after the implementation start time. The reporting period (used only in annual creation methods) is a twelve month period which commences on the date the first activity is implemented (e.g. brought into service after an upgrade). The operating period (used only in forward creation methods) is a period of anything up to 24 months after the implementation date.

A baseline energy model must not be used to calculate energy savings until the ESC is satisfied that the model provides a reasonably accurate and reliable estimate of measured energy consumption. The ESC may take advice from an approved M&V professional, and the ESC can withhold approval unless it is assured that the model is accurate.

For more information, refer to section 8.2 in the IPMVP.

## 4.6 UNDERTAKE PROJECT ACTIVITIES

“Project activities” is the carrying out of projects and control measures that generate grid electricity and/or fossil fuel gas savings (abatement). For an installation to be eligible under VEET, it must comply with all relevant laws and regulations, including those relating to OH&S and product safety. This applies to all projects – including where you subcontract any work to a third party.

An AP can use subcontractors to undertake project work on their behalf. However all VEET legal liability rests with the AP. This means that if a subcontractor is found to have disregarded a relevant law or failed to properly record information about the project works, the AP may be subject to compliance or legal action.

As the use of subcontractors is a compliance risk, you may be required to provide information about the contractual arrangements for each project you undertake. This information is recorded on the PBA assignment form and may be requested when you create the VEECs associated with each project.

## 4.7 UNDERTAKE IMPACT ASSESSMENT/MODELLING

The impact assessment allows the AP an opportunity to show how energy intensive the site is after their project is delivered. This is achieved with an operating energy model. Specific requirements are set out in the PBA Regulations, 'M&V in VEET' document, guidelines, explanatory notes, and any relevant standards.

An operating energy model is a model that quantifies energy use after the project is undertaken. Getting the right operating model data is essential to the M&V methodology measuring genuine abatement. Getting the operating model wrong means it is likely that VEECs will not be able to be created until a proper operating model is put in place.

An operating energy model can be established by regression analysis or an estimate of the mean (this is also noted with baselines in Section 4.5). The impact reporting period can be either an operating period (for forward creation methods) or a reporting period (for annual creation methods).

If regression analysis is used, the operating energy model must:

- be based on the value of the measured energy consumption and independent variables during the impact reporting period where site constants are at their normal values
- be based on at least 80% of the total number of time intervals in the impact reporting period
- have at least six times as many independent observations of the independent variables as the number of independent variables in the energy model.

If an estimate of the mean is used, the operating energy model must:

- be based on the value of the measured energy consumption during the impact reporting period, where site constants are at their normal values and where the coefficient of variation of the measured energy consumption over the period is less than 15%
- be based on at least 80% of the total number of time intervals in the impact reporting period.

For both cases the impact reporting period must not start before the implementation start time, and must end no later than two years after the implementation start time.

As with baseline models, an operating energy model must not be used to calculate energy savings if the ESC is not satisfied that the model provides a reasonably accurate and reliable estimate of measured energy consumption.

## 4.8 SUPPLY IMPACT REPORT TO ESC

The impact report quantifies and reports the difference in energy use between the correct baseline and the operating energy use after a project. The impact report must include:

- baseline model and supporting data,
- operating model and supporting data,
- reported savings, and
- the details of the savings calculation for each energy type in the project.

Savings should be reported to the correct number of significant digits (see Section 3.29.2) with a statement of possible errors. Any deviations from the project plan and its M&V plan should also be reported with reasons for the deviation, and an estimate of the effects on the final savings reported.

Those using annual creation need to lodge impact reports each year. Those creating VEECs using forward creation only have to lodge impact reports at the beginning of the project. Those using a mix of forward creation with annual top-up will need to submit an impact report for the forward creation and then further annual impact reports for the top ups. Further VEECs (other than those created in advance through forward creation) cannot be created until the amount forward created has been exceeded.

For example, the maximum amount of VEECs able to be created using the forward creation method is 50,000. If your project is expected to create 60,000 VEECs, then you might wish to forward create 50,000 and then 'top-up' for the additional VEECs. The 50,000 VEECs could be created with the first impact report. Further VEECs could only be created once the project generates more than 50,000 VEECs. The other 10,000 VEECs would come from annual creation.

The impact report should also be accompanied by a report from an AM&VP which validates the impact report.



For clarity, the AM&VP cannot write the impact report: the M&MM can do this. However the process, content and approach taken must be validated by the AM&VP before the impact report is submitted to the ESC. The ESC will not accept impact reports that have not been validated by the AM&VP.

The submitted impact report must be submitted to the ESC using the *Application for impact report approval – Project-Based Activities – Measurement and Verification* form. This form will be available on the VEET website.

## 4.9 ASSIGNMENT OF VEEC CREATION RIGHTS

The energy consumer holds the right to any abatement. That right can be assigned to APs in writing in accordance with Section 8 of the *Victorian Energy Efficiency Target Guidelines*.

Where the AP is also the energy consumer, VEECs are not assigned and no benefits are transferred. However, even in this case a *VEEC assignment form: Project-Based Activities*<sup>5</sup> is still required to be filled out by the AP.

Where APs carry out projects on other people's sites, keep in mind that there can be a substantial length of time from project initiation to VEEC creation. An AP needs to complete and sign a *Project consent form – Project-Based Activities* as part of their scoping plan in order to demonstrate an energy consumer's intent to assign VEEC creation rights early in an M&V project.

Once the project has been carried out, a consumer needs to complete and sign a *VEEC assignment form: Project-Based Activities*<sup>5</sup> when assigning their right to create VEECs to a third-party AP. A *VEEC assignment form: Project-Based Activities*<sup>5</sup> needs to collect the information necessary for APs to create certificates and demonstrate compliance with the legislation. *VEEC assignment form: Project-Based Activities*<sup>5</sup> templates are available on the VEET website.

You may customise the coversheet for your own VEEC assignment form to incorporate additional explanatory text, company logos and other features. When applying for accreditation, you will need to provide a copy of your *VEEC assignment form: Project-Based Activities*<sup>5</sup> for review by the ESC as part of your accreditation application process. The ESC will not allow any other changes to the VEEC PBA assignment forms.

You must give a copy of the *VEEC assignment form: Project-Based Activities*<sup>5</sup> to consumers at the time of signing. Additionally, you must ensure that all personal information collected in the VEEC assignment form is held in accordance with the Information Privacy Principles (IPPs) under the *Privacy and Data Protection Act 2014 (Vic)*. Details of how to comply can be found at [www.privacy.vic.gov.au](http://www.privacy.vic.gov.au).

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<sup>5</sup> This document has yet to be released by the ESC

## 4.10 RECORD KEEPING

In addition to the requirements set out in section 72 of the Act, you must keep records and documents which provide evidence of the following, to the extent applicable:

- the records referred to in clause 7.9 of this explanatory note in relation to assignments of rights to create certificates;
- sales, purchase and/or service records of each product or service which constitutes a prescribed activity for which certificates have been created, including make and model number, if applicable the street address and postcode of the *consumer* (if in a residential premises) or the ABN, business name, address and postcode (if in a business or non-residential premises);
- all raw baseline data, baseline model and other supporting information, raw operating data, operating model and all supporting information, metering accuracy and calibration information and equipment specifications.
- any additional record keeping requirement set out by the ESC.

Records should be kept in case of audit by the ESC, for a period of six years after the final impact report is lodged.

## 4.11 CREATE VEECS

To create VEECs, an AP must submit certain information to the ESC. VEEC creation requests can be made by making a single entry through the VEET website ([www.veet.vic.gov.au](http://www.veet.vic.gov.au)). APs that are approved to undertake M&V projects are able to access upload forms via their online account on the VEET website.

## 4.12 ESC VALIDATES VEECS

To successfully create VEECs, the data uploaded for a particular activity must pass the website's validation and address verification checks. After you press the 'Create' button for validated activities, the VEECs associated with that activity are created and are assigned a unique ID number. The ESC then assesses those certificates and will decide whether to register them or not. All documentation must always be submitted with every M&V project. Since PBAs are technology neutral, M&V projects will vary greatly, and so will the documentation needed for VEEC creation.

## 4.13 ESC REGISTERS VEECS

The ESC has powers to decide whether it registers or does not register VEECs based on the results of the validation and audit of the impact report. APs should expect every large PBA project to be audited before VEECs are registered. The audit and risk assessment parts of the validation process are described in Section 4.14.

Once validated, the ESC will raise and forward an invoice in due course for the accepted number of VEECs in order to complete the registration process. Once payment is received, the ESC registers the certificates and notifies the AP that the certificates are now valid and therefore available to be traded and/or surrendered to the ESC.

#### 4.14 AUDIT/RISK ASSESSMENT

The ESC is responsible for monitoring compliance with the Act, the Principal Regulations and the PBA Regulations. This includes undertaking periodic audits of the VEET-related operations of scheme participants.

Under Section 7(2)(d) of the Act, the ESC may audit the creation of certificates by APs. The Commission may appoint one or more members of staff of the ESC or another appropriately qualified or experienced person or firm to investigate compliance with the Act, Principal Regulations and PBA Regulations. Please refer to Section 15 of the *Victorian Energy Efficiency Target Guidelines* (the Guidelines).

If required, the ESC must issue an audit report under ASAE 3000 “Assurance Engagements Other than Audits or Reviews of Historical Information” which provides for reasonable assurance. The report requirements are described in Section 15.2 of the Guidelines.

The ESC has developed a number of explanatory notes to help APs understand and fulfil their audit and compliance obligations. These explanatory notes can be accessed through the Publications section of the VEET website.

#### 4.15 COMPLIANCE INVESTIGATION

The ESC or an expert appointed by it may conduct investigations of specific issues when audits or other information received by the ESC indicates possible breaches of the Act, the Principal Regulations, the PBA Regulations or the Guidelines. Areas of possible non-compliance and compliance investigation are described in Section 15.3 of the Guidelines.

The findings of a compliance investigation may lead to enforcement actions against an AP.

Should investigations indicate possible breaches of other Victorian or Commonwealth laws, the ESC will refer the matter to the police or relevant authority.

#### 4.16 ENFORCEMENT

Where investigation has shown unintentional non-compliance with the Act, Regulations, Guidelines and other ESC documents and requirements, the ESC may

- warn the AP;

- reprimand the AP; and/or
- impose a condition or restriction on the accreditation of the AP.

Where an AP without reasonable excuse does not comply with a direction to produce documents, or provides false or misleading information, the penalty is 60 penalty units for an individual, and 240 penalty units for a body corporate. The value of a penalty unit is set annually by the Department of Treasury and Finance, and is updated on 1 July each year.

If the ESC considers that an AP has breached undertakings given under the VEET scheme or improperly created VEECs, the ESC may suspend or revoke their accreditation and issue a certificate surrender notice to that person.

The penalty for failing to comply is 600 penalty units and an additional 1 penalty unit for each certificate that the person fails to surrender in accordance with the order.

## 5 PROCESS OVERVIEW

This section steps through a notional PBA M&V process to place the explanatory material in context. A high level overview was provided in Figure 1. Actual business processes vary considerably and this notional process may bear little resemblance to your own systems. The structure is not prescriptive, but is designed for ease of reference.

### 5.1 UNDERSTAND YOUR COMPLIANCE OBLIGATIONS

Participating in VEET can be challenging, especially at the start. Make sure you understand how the scheme works before engaging in any projects, including all relevant scheme guidance documentation and the end-to-end process described in this section.

### 5.2 BECOME ACCREDITED

To create VEECs, you must be approved by the ESC to undertake PBA activities under the PBA Regulations.

You (regardless of whether you are already an AP in the VEET scheme) must apply for approval to undertake PBA activities by completing the *Application for Approval – Project-Based Activities – Measurement and Verification* form available from the VEET website.

### 5.3 VEET PRODUCTS

Products under a M&V project, except for lighting equipment, do not need to be approved by the ESC prior to being installed. There is no VEET product register associated with M&V projects, except for lighting.

To create VEECs from any M&V project that involves a lighting upgrade, all lighting products installed must be approved on the VEET product register.

APs and VEET account holders (including manufacturers) seeking to add a new lighting product to the product register must submit an application under another schedule (e.g. Schedule 34) to the ESC using the online product application tool via your VEET account. The ESC can then verify that the product is capable of meeting the minimum criteria required by the Principal Regulations for that schedule.

For more information about the product application and assessment process, please refer to the *Explanatory Note – Lodging a Product Application*, which contains a detailed step-by-step guide to getting a product listed for each prescribed activity category on the VEET register of products.

## 5.4 PRE-CALCULATE VEECS

You may need to do a forward estimate of the number of VEECs a project will generate in order to quote for a job, develop a business case, complete the project consent form, or for other scenarios.

As M&V projects allow many different types of abatement technologies, techniques and controls, the ESC does not provide a VEEC calculator for this purpose. It is expected that project proponents wishing to participate in M&V projects should be capable of undertaking the engineering calculations necessary to pre-calculate VEECs for these activities. Proponents who are unable to calculate these figures are likely to need professional assistance in order to participate in these activities.

## 5.5 SUBMIT SCOPING PLAN

You will need to compile and submit a scoping plan that meets the requirements of the PBA Regulations. These are summarised in Section 4.3 of this document and the *Explanatory Note: Project-Based Activities – Measurement and Verification. Part 2: Compliance Requirements*.

An *Application for Scoping Plan Approval – Project-Based Activities – Measurement and Verification* form must be filled in and the necessary supporting material must be collected and attached. Your application must include a completed *Project consent form – Project-Based Activities*. Both documents are available on the VEET website.

APs must create and submit an *Application for Scoping Plan Approval – Project-Based Activities – Measurement and Verification* by uploading the form and the supporting materials via your VEET account on the VEET website.

Applications for scoping and project plan approval can be made at the same time or separately. The scoping plan will be assessed first and must be approved before the project plan is assessed.

## 5.6 SUBMIT PROJECT PLAN

The project plan defines the project in detail, and is the major part of the ESC's assessment of a project's eligibility to create and register VEECs.

The content of the project plan is described in the PBA Regulations and in the 'M&V in VEET' document. An *Application for Project Plan Approval – Project-Based Activities – Measurement and Verification* form can be downloaded from the VEET website. The form must be filled in and the necessary supporting material must be collected and attached. Major parts of the project plan are described in detail in Section 4.4.

APs must create and submit a project plan approval by uploading the completed form and supporting materials via your VEET account on the VEET website.

The scoping plan must be conditionally approved in principle and the project plan must be acknowledged as having been received by the ESC before APs can commence physical work on the M&V project. All work must take place in accordance with the approved project plan. It is strongly recommended that APs await full approval in principle for the project plan from the ESC before beginning work on the project; M&V projects can have significant cost implications for both APs, site owners and/or energy consumers. The benefits of starting work on the project early should be weighed against the potential consequences of the ESC not approving the project plan.

## 5.7 GATHER BASELINE INFORMATION AND MODELLING

When measuring the baseline energy, you must follow the process which was approved in the M&V plan that was submitted as part of the project plan. If there are any differences in the process, you must have a variation for the project plan approved by the ESC before submitting your impact report.

To create VEECs, you must have collected all the relevant baseline information specified in Section 4.5 of this document, and stored it according to the requirements of the Act. You need to produce a baseline model using either regression analysis or an estimate of the mean energy model described in Section 4.5 of this document.

In the event you require more specific guidance about the data requirements for a given project, refer to the upload form, the IPMVP report or to the PBA Regulations themselves.

There are a number of other types of information you will need to gather for your records, beyond the data you need to create VEECs using the online system. Ensure you consult the relevant section of the *Explanatory Note – Project Based Activities – Measurement and Verification. Part 2: Compliance Requirements*. Contact the VEET support team if you are still unsure of your obligations.

The approved project plan requires APs to collect baseline data on energy consumption and relevant factors that influence the energy consumption for the duration of the baseline period.

Once data collection is complete, APs must undertake statistical data analysis and establish a baseline model. This must be done correctly: failure to adequately capture the baseline conditions could render the entire project incapable of creating VEECs.

APs submit their baseline data and model as part of the impact report, after actual project works are in place.

## 5.8 UNDERTAKE WORKS

Undertake works according to Section 4.6 of this document. The highest priority during the project works is that all relevant OH&S laws, standards and precautions are observed. You will also need to ensure that your staff and/or subcontractors collect any relevant compliance information about the project processes.

'Implementation start time', in relation to a project, means the date, and optionally the time, normal operations are capable of commencing after all changes to be implemented by the project, including any testing and commissioning, are completed. Measurement of the impact cannot happen before this date.

## 5.9 GATHER POST-ACTIVITY INFORMATION AND MODELLING

To create VEECs for a project, you must collect all relevant post-activity information in accordance with Section 4.7 of this document. You need to produce a model for the new system's energy use using either regression analysis or an estimate of the mean energy model. These are described in Section 4.7 of this document.

## 5.10 OBTAIN ASSIGNMENT OF RIGHTS

Before VEECs can be created, there must be an assignment of rights between the energy consumer and the AP if they are different people. You must ensure that the person signing on behalf of the client, the 'authorised signatory', does indeed bear legal authority to sign on the behalf of that entity. M&V projects by their nature have long periods between project start to quantifying, creating and assigning VEECs. This *VEEC assignment form: Project-Based Activities – Measurement and Verification* completes the process that started with the *Project consent form – Project-Based Activities*.

The *VEEC assignment form: Project-Based Activities – Measurement and Verification* template must be used, and copies must be retained by the AP and the energy consumer. The *VEEC assignment form: Project-Based Activities – Measurement and Verification* is available on the VEET website. A completed PBA assignment form must accompany the impact report.

## 5.11 SUPPLY IMPACT REPORT TO ESC

After implementation, savings are measured so that an impact report can be lodged with the ESC.

The impact report's content is described in Section 12.11 of the PBA Regulations and also the 'M&V in VEET' document issued under section 18 of the PBA Regulations. These requirements are summarised in Section 4.8 of this document. The baseline and operating energy reports are major components of the impact report. The impact report must be accompanied with a report from an AM&VP validating the approach. These are available from the VEET website.

## 5.12 CREATE VEECS

VEEC creation requests can be made with a single entry of an impact report through the VEET website. That entry basically states the date, place and number of VEECs identified in the impact report. APs approved for M&V activities can access VEEC upload forms via their online account on the VEET website.

## 5.13 ESC ASSESSES VEEC CREATION APPLICATION

To successfully create VEECs, the data uploaded for a particular activity must pass the website's validation and address verification checks. After you press the 'Create' button for validated activities, the VEECs associated with that activity are created and are assigned unique ID numbers.

The ESC then assesses those certificates and will decide whether to register them. Audits, including site visits may be part of the assessment process.

## 5.14 ESC REGISTERS VEECS

The ESC will raise and forward an invoice in due course for VEECs accepted in order to complete the registration process. Once payment is received, the ESC registers the certificates and notifies the AP that the certificates are now valid and therefore available to be traded and/or surrendered to the ESC.

## 6 WHERE TO GET HELP

If you encounter difficulties when participating in this activity, you should in the first instance consult the explanatory material listed in Section 3 of this document.

If you are unable to resolve your issue using the publicly available material, please contact the VEET support team on (03) 9032 1310 or [veet@esc.vic.gov.au](mailto:veet@esc.vic.gov.au).



## Document version history

Version	Amendments	Effective date
V1.0	Creation of new 'Explanatory Note – Project-Based Activities – Measurement and Verification. Part 1: Activity Guidance	1 August 2017
V1.1	Removal of Option A of the IPVMP	17 November 2017