

# Explanatory note – field trials for standby power controllers

21 December 2017



## An appropriate citation for this paper is:

Essential Services Commission 2017, *Explanatory note – field trials for standby power controllers*  
21 December

## Copyright notice

© Essential Services Commission 2017



This work, *Explanatory note – field trials for standby power controllers*, is licensed under a Creative Commons Attribution 4.0 licence [[creativecommons.org/licenses/by/4.0](https://creativecommons.org/licenses/by/4.0)]. You are free to re-use the work under that licence, on the condition that you credit the Essential Services Commission as author, indicate if changes were made and comply with the other licence terms.

The licence does not apply to any brand logo, images or photographs within the publication.

---



The Department of Environment, Land, Water and Planning develops policy for the [Victorian Energy Upgrades](#) program. The program provides incentives for Victorian households and organisations to make energy efficiency improvements that save money on their energy bills and reduce Victoria's greenhouse gas emissions

The Essential Services Commission administers the program as the 'Victorian Energy Efficiency Target scheme' under the *Victorian Energy Efficiency Target Act 2007*.

For more information, visit [veet.vic.gov.au](http://veet.vic.gov.au).

# Table of Contents

1. Introduction	1
2. VEET scheme application process for SPCs	3
3. Definitions	4
3.1. Basic definitions	4
3.2. AV operating mode definitions	4
3.3. IT operating mode definitions	4
4. Independent verification and safety requirements	5
4.1. Independent verification requirements	5
4.2. Safety requirements	5
5. Proposed field trial methodology	6
5.1. Approach	6
5.2. Sampling and setup	8
5.3. Initial measurement of appliance power	9
5.4. Data logging	9
5.5. Validation of device function (where applicable)	10
6. Alternative methods	11
7. Pre-trial data to be provided to the commission	12
7.1. Field trial data sheet	12
7.2. Details of the SPC	12
7.3. Proposed field trial methodology	12
7.4. Schematic layout	13
7.5. Any additional relevant data	13
8. Post –trial data to be provided to the commission	14
8.1. Individual household details	14
8.2. Details of appliances connected to the SPCs	14
8.3. Initial measurement of appliance power	15
8.4. Time series data and plots	15
8.5. Calculated power usage and savings data	15
– Figure 3: Required submission format for ‘calculated power usage and savings data’ for the AV field trials	16

8.6. Summary of data analysis methodology	21
8.7. Third week data	21
8.8. Any additional relevant data	22
Appendix A: Field trial data sheet	23
Appendix B: Pre-trial data to be provided to the commission	25
Appendix C: Post-trial data to be provided to the commission	26

# 1. Introduction

A standby power controller (SPC) is defined by the *Victorian Energy Efficiency Target Regulations 2008* (the Regulations) as a product that is intended to automatically reduce the standby energy consumption of equipment connected to it.

This document outlines a method for undertaking a field trial of an SPC, considered capable of achieving an abatement factor of 1.5 or more, as stipulated by the Principal Regulations. The purpose of the field trial is to evaluate, in the field, the functionality and energy savings attributable to such an SPC.

Before undertaking any field trial, the proponent should be familiar with the Regulations and its associated documents, and the application process as outlined in section 2.

**It is important to note that prior to being undertaken, the proposed field trial methodology must be discussed with the Essential Services Commission (the commission) to ensure that the field trial methodology is suitable for the SPC in question.**

There are certain minimum eligibility requirements which must be met before an SPC is eligible to undertake a field trial aimed at proving an increased abatement factor of 1.5 or more:

- SPCs for an IT environment must be capable of disconnecting mains power to controlled appliances when the master computer is in sleep mode. SPCs for an IT environment that do not possess this functionality will not be considered eligible for a field trial.
- For an IT SPC to be considered eligible for a field trial, it must be demonstrated that the SPC produces energy savings that are additional to those obtained from disconnecting mains power to controlled appliances when the master computer is in sleep or off mode. This data can be supplied in the pre-field trial data under the section Additional Relevant Data.
- For SPCs approved for an AV environment, products that solely operate in a master/slave arrangement will not be considered eligible for a field trial.

The final decision on abatement factors will be based on the commission's assessment of the field trial. The commission's assessment processes will include a normalisation process and application of discount factors where applicable. Please note that conducting a field trial will not guarantee that a product will be allocated more than one VEEC. It will be at the sole discretion of the commission, once the field trial has been assessed and the normalisation process undertaken.

Please note that field trials will only be applicable to certain standby power controllers in accordance with the Victorian Energy Efficiency Target 2008 Regulations (the Regulations), and that field trials must not be undertaken before:

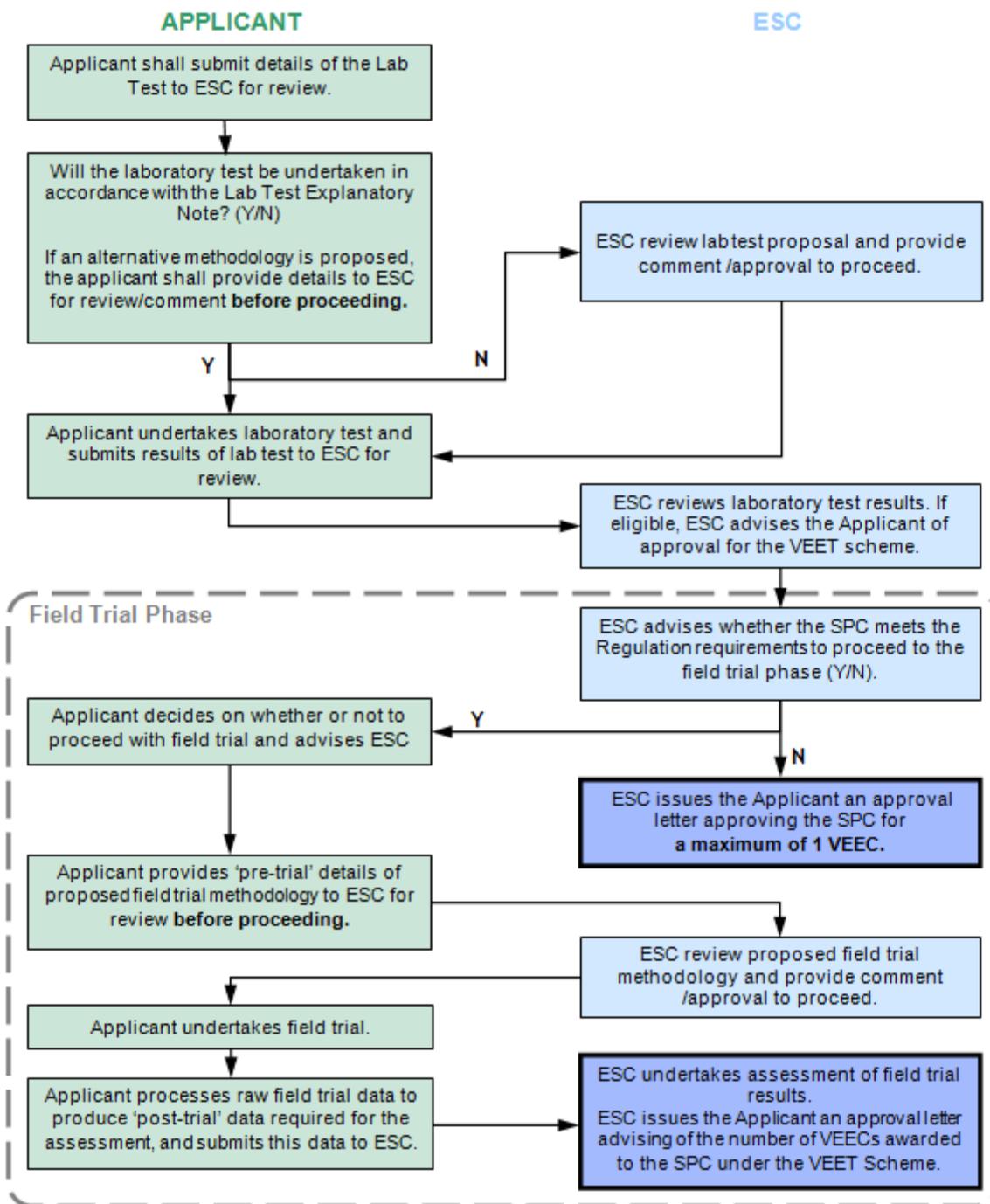
1. Essential Services Commission (the commission) has received and reviewed the SPC laboratory test results and confirmed that the SPC is eligible for the field trial phase; and
2. ESC has reviewed and approved the proposed field trial methodology and associated pre-trial documentation.

The full application procedure is set out in Section 2 of this explanatory note.

## 2. VEET scheme application process for SPCs

The Victorian Energy Efficiency Target (VEET) scheme application process for SPCs is presented as a flow-chart in Figure 1 below:

Figure 1: Flow Chart of VEET Scheme Application Process for SPCs:



## 3. Definitions

The definitions in the SPC Laboratory Test apply to this field trial.

### 3.1. Basic definitions

- Principal appliance – The principal appliance will either be the television (TV) in the audio-visual field trial environment, or the computer in the information technology field trial environment.
- AV – The audio-visual or AV SPC field trials will focus on the TV and associated peripheral devices that may be controlled by an AV SPC. These could include items such as amplifiers, receivers, DVD players, set-top boxes etc.
- IT - The information technology or IT SPC field trials will focus on the computer and associated peripheral devices that may be controlled by an IT SPC. These could include items such as printers, modems, scanners, etc.
- SPC – The standby power controller device that forms the basis of the field trial.
- Computer – The computer is the principal appliance in the IT SPC field trial. This can take the form of a desktop computer or a laptop.

### 3.2. AV operating mode definitions

Definitions of AV operating modes are as follows:

- In use - Device switched ON and undertaking its primary function, e.g. DVD player playing a DVD, stereo playing music, TV projecting moving images, etc.
- Idle (active standby) mode - Device switched ON but (where applicable) not undertaking its primary function, e.g. DVD player "ON" but not playing a DVD, stereo on but not playing music, etc.
- Passive standby mode – Device ready to be switched ON by a remote control.
- Pairing - Setup such that the SPC simply switches the connected appliances ON and OFF based on the operation of a single existing remote control button, which the SPC is required to be paired with during the initial commissioning.

### 3.3. IT operating mode definitions

Definitions of IT operating modes are as per the US Energy Star Program Requirements for Computers, Version 5.2.

## 4. Independent verification and safety requirements

### 4.1. Independent verification requirements

The field trial must be undertaken by a third party, independent to the SPC manufacturer, supplier and VEET proponent. The third party must be:

- a NATA approved test laboratory with ISO 17025 certification,  
or
- an independent verifier certified to ISO 9001 requirements for all related inspection, verification, testing and certification activities  
or
- a commission approved body with necessary skills and resources to perform such field trial.

### 4.2. Safety requirements

The field trial shall be conducted in a manner that is safe for the occupants of the dwellings involved.

## 5. Proposed field trial methodology

### 5.1. Approach

Typically, in order to evaluate real-world savings attributable to a consumer energy-saving device, energy consumption is measured using a trial, during a pre-installation period followed by a post-installation period and the results are compared. However, this approach introduces considerable uncertainty due to unavoidable differences in operator behaviour between these periods. To partially account for this uncertainty, large sample sizes (numbers of dwellings) are required. This results in significant logistical issues and cost, while not wholly addressing the uncertainty.

To avoid this problem, the following field trial approach has been proposed:

1. The field trial monitoring is carried out in a minimum of 20 Australian households, and only one trial of each SPC type (AV or IT) should be carried out per house.
2. The power consumption of all appliances to be attached to the SPC are measured, in various modes of operation. This is a short test performed within a matter of minutes.
3. Data logging of the power consumption of the principal and controlled appliances (separately) is undertaken over 14 consecutive days.
4. The principal and controlled appliances must remain connected to mains power at all times (i.e. the SPC shall not interrupt the power supply), in order to allow for accurate calculation of energy consumption of appliances (analogous to the pre-installation period).
5. The theoretical ON and OFF events of the SPC are logged. This allows for accurate calculation of the energy that would have been saved if the SPC had been functioning as intended.
6. In order to independently confirm that the SPC is functioning as intended, the parameters used by the SPC to undertake switching events are also logged (i.e. in the case of an AV-IR SPC, IR signals must be logged).
7. Third week – In order to verify user behaviour is not affected by the SPC over a longer period, the field trial will include a further 7 consecutive days during which the SPC will operate as intended. Log data related to “in use” and “standby” events in accordance with the above procedure. This verification will be reviewed as part of the commission’s assessment of the field trial. The aim of the third week is to collect information on the SPC control strategy and its effect on user behaviour.
8. Trial participants should also be interviewed at the conclusion of the third week to gauge their reaction to the SPC as they found it in actual operation.
9. Please note that if an SPC has a particularly aggressive control strategy (e.g. short shut-off times), then the information provided by the third week may be the only way to verify that this

strategy is acceptable to the end user, and would not be overridden by the user in a real world situation.

10. Data collected is analysed in order to confirm device functionality. All data and results are submitted to the commission (in accordance with the requirements of section 7 of this explanatory note) where they will be normalised<sup>1</sup> against baseline power and energy consumption data held by the commission, in order to determine the abatement factor of the SPC. Details of all devices connected to each SPC involved in the trial (e.g. type, brand, model, description, initial power measurements) should be provided to the commission to allow the normalization to be undertaken.

However, please note that if the methodology proposed above is not appropriate for the SPC in question, then an alternative method may be proposed to the commission. Any alternative method proposed must comply with the requirements of section 6 of this explanatory note, and should be discussed and agreed with the commission before proceeding with the field trial.

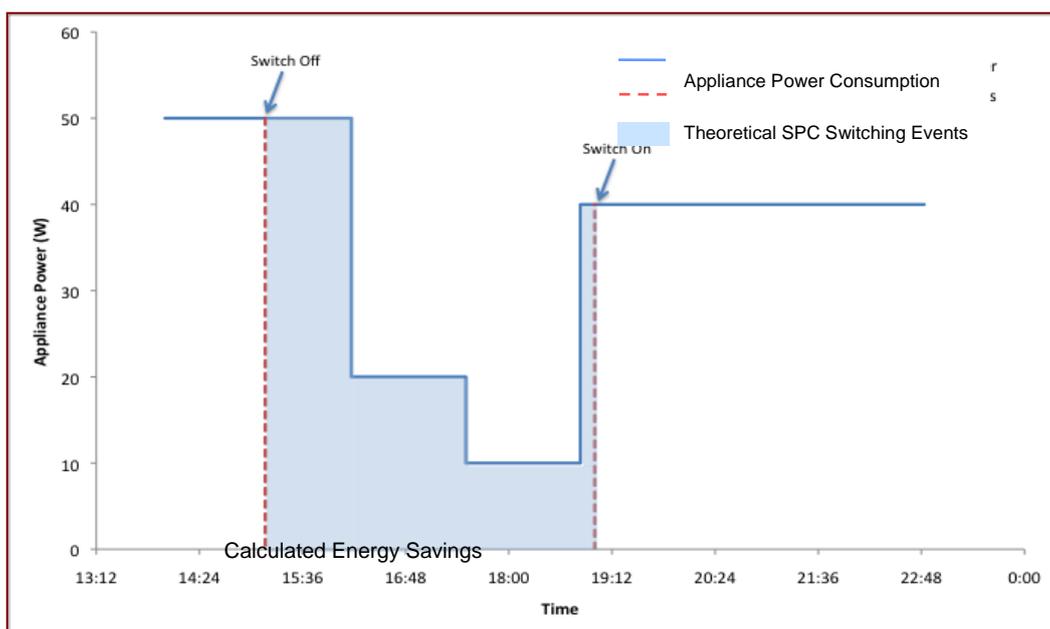
Please refer to Figure 2 for an example of data logging and a calculation of the potential energy savings.

Note that the area above the blue shaded area in Figure 2 is often incorrectly claimed as energy savings in a pre and post installation trial.

---

<sup>1</sup> Normalisation will be used to adjust the energy savings calculated from the field trial so that they are representative of the savings which could be achieved in the average Victorian household with the SPC device installed over a 10 year period. It will take into account the average ownership and energy performance of appliances, as well as any regulatory changes which are likely to impact on household standby power loads.

**Figure 2: Example data logging and energy saving calculation**



Note: The parasitic power consumption of meters is to be subtracted from the power consumption data.

## 5.2. Sampling and setup

Samples of each SPC model, selected at random by an independent party, shall be trialled. IT and AV SPCs must be trialled separately. For SPCs intended for use in either IT or AV environments, both environments must be trialled.

Households shall be selected to be broadly representative of typical Australian households, with typical appliance ownership, appliance usage and occupancy levels.

For each SPC type (IT or AV) at least 20<sup>2</sup> field trials must be undertaken in at least 20 dwellings (i.e. one dwelling per IT/AV field trial). Dwellings must be located in Australia, occupied in a conventional fashion by their inhabitants and operating normally.

Each SPC shall be setup according to manufacturer instructions, with default factory settings enabled.

---

<sup>2</sup> Up to 5 trial failures are permitted (e.g. data logger failure, interference by householder, etc.) resulting in minimum of 15 field trials.

Each SPC should be connected to all electronic appliances used in the IT or AV environment, ensuring that appliances, which the householder would not normally want disconnected from mains power (e.g. video recorder with timer) are identified and not connected to the SPC.

### **5.3. Initial measurement of appliance power**

Using a calibrated power meter, measure the average total power consumption (for each SPC installation) over 60 seconds of:

1. The principal appliance (TV or computer) when in the following modes:

- average “In Use” mode (AV) / average “In Use” mode (IT).
- average “Idle” mode” (AV) / average “Idle” mode (IT).
- average “Passive” mode (AV) / average “Sleep” mode (IT).

2. All controlled appliances when in the following modes:

- average “In Use” mode (AV) /average “In Use” mode (IT).
- average “Idle” mode” (AV) / average “Idle” mode (IT).
- average “Passive” mode (AV) / average “Sleep” mode(IT)

Refer to section 7 for definition of operating modes.

### **5.4. Data logging**

The data logger should log the following at 1- minute intervals for the duration of the field trial (time synchronised):

The total power consumption of the principal appliance (TV or computer)

1. The total power consumption of all controlled appliances.
2. The ON and OFF events of the switching device (whilst not allowing the SPC to interrupt the power supply to the control / principal appliances).
3. Other information that the SPC uses to make switching decisions, for example infra-red signals from remote controls, etc.
4. The total power consumption of the SPC.

Please note that the parasitic power consumption of meters (if any) is to be subtracted from power measurements.

The applicant shall also provide the commission with details of the accuracy of the data logging equipment to be used in the study before proceeding with the field trial. Please refer to section 7 for further details.

## **5.5. Validation of device function (where applicable)**

Review the power reading data of the SPC device (where applicable) to ensure data integrity of power measurements from SPC device to within +/- 5% of the power meters used in the field trial.

From the data collected, ensure the SPC device is isolating and supplying power to the connected controlled devices at the appropriate time in line with its stated functionality.

## 6. Alternative methods

If the objectives of the “Proposed Field Trial Methodology” presented in section 5 cannot be met for the SPC in question, then an alternative field trial methodology may be developed provided that:

- the reason(s) why the SPC is not able to comply with the “Proposed Field Trial Methodology” are discussed and agreed in advance with the commission, and
- all necessary pre- and post-trial information and data will still be delivered to the commission (as detailed in section 7 and section 8), and
- the same level of validation around device functionality and energy saving performance as the “Proposed Field Trial Methodology” are delivered, and
- the applicant advises the commission of any benefit / consequence as a result of the changes to the proposed method, and
- the alternative method is approved in advance by the commission.

## 7. Pre-trial data to be provided to the commission

The following section details the information that shall be provided to the commission for review, comment and approval *before the field trial is undertaken*. The information that shall be provided at this stage can be summarised as follows:

- field trial data sheet
- details of the SPC
- proposed field trial methodology
- schematic layout
- any additional relevant data

Each of these items is described in detail below, and a summary checklist of items required for the 'pre-trial' submission is provided in Appendix B.

### 7.1. Field trial data sheet

Please refer to Appendix A of this Explanatory Note for a "Field Trial Data Sheet" pro forma.

### 7.2. Details of the SPC

Please provide the following information:

- a description of the SPC and its functionality (e.g. a description of the control strategy that the SPC employs – duration to shutoff etc.)
- state if there have been any changes to the functionality of the SPC device from the default factory settings
- state if the functionality of the SPC device has been modified in any way since the laboratory test.

### 7.3. Proposed field trial methodology

Please provide details of the proposed field trial methodology, including details of any proposed modifications from the methodology presented in section 5 of this Explanatory Note. Please also detail any potential benefits or consequences of these proposed modifications.

The applicant shall also provide the commission with details of the accuracy of the data logging equipment to be used in the study before proceeding with the field trial.

## **7.4. Schematic layout**

The applicant must supply the commission with a schematic layout of the proposed field trial setup, with the following items clearly labelled:

- the SPC
- the principal appliance
- the controlled appliances
- IR sensor (if any)
- power/data loggers
- event loggers (recording IR signals, SPC switching events etc.)

## **7.5. Any additional relevant data**

Applicants must declare any known incompatibilities with IT or AV equipment that could be encountered in residential or business installations. It is the responsibility of the applicant to ensure installations of SPCs will not occur in situations of incompatibility.

For an IT SPC, please provide preliminary data to demonstrate that the SPC can provide additional energy savings beyond that obtained from disconnecting mains power to controlled appliances when the master computer is in sleep or off mode. This data can be discussed with the commission, but might include:

- time and power logs (at one minute intervals) of desktop and laptop computers and connected devices showing how the SPC disconnects the mains power to controlled appliances in various modes
- functional descriptions of the energy savings strategy(s)
- other data that might substantiate the energy savings of the SPC.

Please provide details of any additional observations that may affect field trial results.

## 8. Post –trial data to be provided to the commission

The following section details the key data that shall be provided to the commission from each individual field trial installation (including those where failures have occurred). This data will be used to undertake assessment process, including normalisation of the field trial data. This post-trial data can be summarised as follows:

- individual household details
- details of appliances connected to the SPCs
- initial measurement of appliance power
- time series data and plots
- calculated power usage and savings data
- summary of data analysis methodology
- third week data
- any additional relevant data

Each of these items is described in detail below, and a summary checklist of items required for the ‘post-trial’ submission is provided in Appendix C.

### 8.1. Individual household details

Please provide the following details for each of the field trial households:

- the address of the household
- the demographics of the household, including any changes to the demographics throughout the field trial period.

### 8.2. Details of appliances connected to the SPCs

Please provide details of all appliances to be connected to the SPC in each household, including:

- brand
- model
- description of relevant features (e.g. TV / monitor screen size, screen type – CRT, Plasma, LCD, LED etc.)

### **8.3. Initial measurement of appliance power**

Please measure and report the power consumption of all appliances to be attached to the SPC in various modes of operation as follows:

1. The principal appliance (TV or computer) when in the following modes:

- average “In Use” mode (AV) / average “In Use” mode (IT).
- average “Idle” mode (AV) / average “Idle” mode (IT).
- Average “Passive” mode (AV) / average “Sleep” mode (IT).

2. All controlled appliances when in the following modes:

- average “In Use” mode (AV) / average “In Use” mode (IT).
- average “Idle” mode (AV) / average “Idle” mode (IT).
- average “Passive” mode (AV) / average “Sleep” mode (IT)

### **8.4. Time series data and plots**

For each individual household please submit one time series data set AND one time series plot displaying the following:

- the 1-minute time history of the power consumption of the principal appliance,
- the 1-minute time history of the total power consumption of all controlled appliances,
- the time history of the ON and OFF events of the SPC switching device, and
- the 1-minute time history power consumption of the SPC.

This information shall be supplied in MS Excel data files with clearly labelled column headings stating parameter recorded and measurement units. The time series plots shall also have all series clearly labelled.

### **8.5. Calculated power usage and savings data**

The following section describes a set of data that needs to be supplied to the commission to enable the assessment to be completed, including normalisation of the field trial data. Generally this data can be taken directly from the field trial results; however some items will need to be calculated through post-trial analysis of the data outputs.

It is envisaged that the principal appliance (TV or computer) will be monitored by a single data logger, and that the controlled appliances will be monitored by an additional data logger. If this is undertaken the data requested below can be easily determined.

**Figure 3: Required submission format for ‘calculated power usage and savings data’ for the AV field trials**

	All Controlled Devices								Principal Appliance (TV)							Controlled Devices	
	Average In Use Power (Watts)	Average Max Power Savings (Watts)	Average Min Power Savings (Watts)	No Savings Mode Power (Watts)	In Use Time (%)	Max Power Savings Mode Time (%)	Min Power Savings Mode Time (%)	No Savings Mode Time (%)	Average In Use Power (Watts)	Average Idle Power (Watts)	Average Passive Standby Power (Watts)	In Use Time (%)	Idle Mode Time (%)	Passive Standby Mode Time (%)	No Savings Mode Time (%)	Total baseline energy usage (kWh/pa)	Average total SPC energy saving (kWh/pa)
Site 1																	
Site 2																	
Site 3																	
Site 4																	
Site 5																	
Site 6																	
Site 7																	
Site 8																	
Site 9																	
Site 10																	
Site 11																	
Site 12																	
Site 13																	
Site 14																	
Site 15																	
Site 16																	
Site 17																	
Site 18																	
Site 19																	
Site 20																	

**Table 1: Definitions of ‘calculated power usage and savings data’ for the AV field trials**

<b>AV Calculated Data (Data Column Headings)</b>	<b>AV Definitions</b>
<b>Controlled Devices</b>	
Average in use power	The average power consumed by controlled appliances when they are switched on and undertaking their primary functions.
Average maximum power savings	The savings that are achieved when the SPC switches off the connected appliances when they are in a high power consumption mode, such as ‘in use’ or ‘idle’ mode. When connected appliances are turned off in their high power consumption mode, the maximum savings are achieved. These savings are averaged out per installation.
Average minimum power savings	The savings that are achieved when the SPC switches off the connected appliances when they are in a low power consumption mode, such as ‘passive standby’ mode. When the connected appliances are turned off in their low power consumption mode, less savings are achieved. These savings are averaged out per installation.
No savings mode power	No savings mode occurs when the controlled appliances are not turned off by the SPC when they are not in use. The power consumed by connected appliances during the field trial when they are not turned off by the SPC and they are not ‘in use’.
In use time	The percentage of time that the controlled appliances spent ‘in use’ during the field trial.
Maximum power savings mode time	The percentage of time the controlled appliances spent in the ‘maximum power savings mode’ during the field trial.
Minimum power savings mode time	The percentage of time the controlled appliances spent in the ‘minimum power savings mode’ during the field trial.
No savings mode time	No savings mode occurs when the controlled appliances are not turned off by the SPC when they are not in use. The percentage of time the controlled appliances spent in ‘no savings mode’ during the field trial.
<b>Principal Appliance (TV)</b>	
Average in use power	The average power consumed by the television when it is switched on and being used.
Average idle power	The average power consumed by the television when it is switched on but not being used.
Average passive standby power	The average power consumed by the television when it is in a state that is ready to be switched on by a remote control.

AV Calculated Data (Data Column Headings)	AV Definitions
In use time	The percentage of time that the television spent 'in use' during the field trial.
Idle mode time	The percentage of time that the television spent in 'idle' mode during the field trial when the SPC was recorded as having switched off the power to the controlled appliances.
Passive standby mode time	The percentage of time that the television spent in 'passive standby' mode during the field trial when the SPC was recorded as having switched off the power to the controlled appliances.
No savings mode time	No savings mode occurs when the controlled appliances are not turned off by the SPC when they are not in use. The percentage of time that the television spent in 'passive standby' or 'idle' mode and the SPC had not switched off the power to the controlled appliances.
<b>Controlled Appliances</b>	
Total baseline energy usage	The total power consumption of the controlled appliances, expressed in kilowatt hours per annum, that would normally be consumed if no SPC was in place, as extrapolated from the field trial results.
Average total SPC energy savings	The energy savings that would have resulted from the SPC operating normally, taking the energy use of the SPC into account.

Figure 4: Required submission format for ‘calculated power usage and savings data’ for the IT field trials

	All Controlled Devices								Principal Appliance (Computer)							Controlled Devices	
	Average In Use Power (Watts)	Average Max Power (Watts)	Average Min Power (Watts)	No Savings Mode Power (Watts)	In Use Time (%)	Max Power Savings Mode Time (%)	Min Power Savings Mode Time (%)	No Savings Mode Time (%)	Average In Use Power (Watts)	Average Idle Mode Power (Watts)	Average Sleep Mode Power (Watts)	In Use Time (%)	Idle Mode Time (%)	Sleep Mode Time (%)	No Savings Mode Time (%)	Total baseline energy usage (kWh/pa)	Average total SPC energy saving (kWh/pa)
Site 1																	
Site 2																	
Site 3																	
Site 4																	
Site 5																	
Site 6																	
Site 7																	
Site 8																	
Site 9																	
Site 10																	
Site 11																	
Site 12																	
Site 13																	
Site 14																	
Site 15																	
Site 16																	
Site 17																	
Site 18																	
Site 19																	
Site 20																	

**Table 2: Definitions of ‘calculated power usage and savings data’ for the IT field trials**

IT Calculated Data (Data Column Headings)	IT Definitions
<b>Controlled Devices</b>	
Average in use power	The average power consumed by controlled appliances when they are switched on and undertaking their primary functions.
Average maximum power savings	The savings that are achieved when the SPC switches off the connected appliances when they are in a high power consumption mode, such as ‘in use’ or ‘idle’ mode. When connected appliances are turned off in their high power consumption mode, the maximum savings are achieved. These savings are averaged out per installation.
Average minimum power savings	The savings that are achieved when the SPC switches off the connected appliances when they are in a low power consumption mode, such as ‘sleep’ mode. When the connected appliances are turned off in their low power consumption mode, less savings are achieved. These savings are averaged out per installation.
No savings mode power	No savings mode occurs when the controlled appliances are not turned off by the SPC when they are not in use. No savings mode power is the power consumed by connected appliances while in no savings mode.
In use time	The percentage of time that the controlled appliances spent ‘in use’ during the field trial.
Maximum power savings mode time	The percentage of time the controlled appliances spent in the ‘maximum power savings mode’ during the field trial.
Minimum power savings mode time	The percentage of time the controlled appliances spent in the ‘minimum power savings mode’ during the field trial.
No savings mode time	No savings mode occurs when the controlled appliances are not turned off by the SPC when they are not in use. The no savings mode time is the percentage of time the controlled appliances spent in ‘no savings mode’ during the field trial.
<b>Principal Appliance (computer)</b>	
Average in use power	The average power consumed by the computer when it is switched on and being used.
Average idle mode power	The average power consumed by the computer in idle mode when the SPC switched off the controlled appliances.
Average sleep mode power	The average power consumed by the computer in sleep mode when the SPC switched of the controlled appliances.

IT Calculated Data (Data Column Headings)	IT Definitions
In use time	The percentage of time the computer spent 'in use' during the field trial.
Idle mode time	The percentage of time that the computer spent in 'idle' mode when the SPC switched of the controlled appliances during the field trial.
Sleep mode time	The percentage of time that the computer spent in 'sleep' mode when the SPC switched of the controlled appliances during the field trial.
No savings mode time	No savings mode occurs when the controlled appliances are not turned off by the SPC when they are not in use. No savings mode time is the percentage of time that the computer spent in 'sleep' or 'idle' mode and the SPC did not switch off the controlled appliances.
Controlled Appliances	
Total baseline energy usage	The total power consumption of the controlled appliances, expressed in kilowatt hours per annum, that would normally be consumed if no SPC was in place, as extrapolated from the field trial results.
Average total SPC energy savings	The energy savings that would have resulted from the SPC operating normally, taking the energy use of the SPC into account.

## 8.6. Summary of data analysis methodology

Please provide a description of how the field trial data has been be analysed to provide the 'calculated power usage and savings data' as requested above. This description will assist the commission to understand spreadsheet data provided and the approach that has been used to develop the final results.

## 8.7. Third week data

Time series plots (and raw data) of 'ON and OFF' and 'Standby' events for this week should be submitted in accordance with the requirements outlined above.

In addition, the following shall be supplied to assist in the SPC assessment:

- A description of any changes to the controlled devices by the end users (e.g. devices have been removed from the SPC as the user found they required them to be on continuously, switching on devices regularly to override the SPC cutting off power, etc.).

- Interviews with the end users should be undertaken to estimate how many times they have overridden the SPC and in what circumstances this occurred (e.g. if they stopped the SPC from automatically turning off of appliances while watching TV or using the computer).

## **8.8. Any additional relevant data**

- Please provide details of any additional observations that may affect field trial results, such as:
- Unusual appliances attached to the SPC
- Incompatible appliances attached to the SPC whether known in advance or arising through the trial
- Changes in number of appliances connected to an SPC
- Unusual appliance usage patterns
- Changes in household occupancy levels, etc.

## Appendix A: Field trial data sheet

### Victorian Energy Efficiency Target (VEET) Standby Power Controller (SPC) Approval

#### Field trial data sheet

**SPC type:**     IT/     AV/     AV-IR

If the SPC is for both AV and IT environments, please check both IT and AV.

#### SPC details

Brand:

Model:

Serial no:

Date of manufacture:

Voltage:

Type of field trial:

AV only     IT only     IT and AV

#### Trial conductor details

Name of laboratory/business/approved body:

Accreditation:

Testing officer:

Date of test/s:

Name and address of Applicant:

### Minimum eligibility criteria for field trial

IT - Is the SPC capable of disconnecting mains power to controlled appliances when the master computer is in sleep mode?

Yes /  No

AV - Does the SPC operate solely on the basis of a master/slave arrangement?

Yes /  No

**Describe how the product was tested for minimum eligibility criteria**

### Summary

Has the appliance passed all requirements as laid out in the commission's Explanatory note -laboratory test for standby power controllers:

IT  Yes/  No/  Not applicable

AV  Yes/  No/  Not applicable

AV- IR  Yes/  No/  Not applicable

Signature:

## Appendix B: Pre-trial data to be provided to the commission

The pre-trial data requirements have been detailed in section 7 of this Explanatory Note, this Appendix merely summarises the data that shall be supplied to the commission before the field trial is undertaken to allow the commission to review and approve the proposed field trial methodology prior to proceeding. This Appendix should be read in conjunction with Section 7.

Please use the below checklist as the cover sheet for the 'pre-trial data' submission to the commission.

Pre-Trial Data to be provided to commission	Data Supplied (Y/N)
1. Field trial data sheet	
2. Details of the SPC	
3. Proposed field trial methodology	
4. Schematic layout	
5. Any additional relevant data	

## Appendix C: Post-trial data to be provided to the commission

The post-trial Data requirements have been detailed in section 8 of this explanatory note. This appendix merely summarises the data that shall be supplied to the commission following completion of the field trial to facilitate the assessment of the SPC. This appendix should be read in conjunction with section 8.

Please use the below checklist as the cover sheet for the 'post-trial data' submission to the commission.

Post-trial data to be provided to the commission	Data supplied (Y/N)
1. Individual household details	
2. Details of appliances connected to the SPCs	
3. Initial measurement of appliance power	
4. Time series data and plots	
5. Calculated power usage and savings data	
6. Summary of data analysis methodology	
7. Third week data	
8. Any additional relevant data	

## Document version control

The RM reference for this document is: C/11/11597

Version	Amendments made	Date published
1.4	Formatting changes	7 June 2017
2.0	Updated to new Victorian Energy Upgrades template	21 December 2017