IPART Independent Pricing and Regulatory Tribunal | NSW

# Energy Savings Scheme Notice 02/2021

# PIAM&V Method Requirements (No 2)

December 2021

ESS »

## Enquiries

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## Acknowledgment of Country

IPART acknowledges the Traditional Custodians of the lands where we work and live. We pay respect to Elders, past, present and emerging.

We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples.




**ISBN** 978-1-76049-548-0

# Contents

# PIAM&V Method Requirements (No 2) for Other Implementations

## Background

The PIAM&V Method Requirements (No 2) for Other Implementations are published under the *Energy Savings Scheme Rule of 2009* (**ESS Rule**). Accredited Certificate Providers (**ACPs**) must comply with the PIAM&V Method Requirements (No 2) for Other Implementations when calculating Energy Savings using the PIAM&V Method, to account for Energy Savings for which Energy Savings Certificates (**ESCs**) have already been created using any of the Deemed Energy Savings Method, Metered Baseline Method or PIAM&V Method.

The PIAM&V Method Requirements (No 2) for Other Implementations apply only to projects with an Implementation Date on or before 31 December 2021.

Under clause 7A.16 of the ESS Rule, ACPs must comply with PIAM&V Method Requirements when using the PIAM&V Method. The PIAM&V Method Requirements (No 2) for Other Implementations apply in addition to the PIAM&V Method Requirements published on 21 February 2020. In the event of any inconsistency between two Method Requirements, the PIAM&V Method Requirements (No 2) for Other Implementations take precedence over the PIAM&V Method Requirements.

## How to use this document

The PIAM&V Method Requirements (No 2) for Other Implementations is structured in two parts:

1. **The Method Requirements**: The Method Requirements part contains the PIAM&V Method Requirements that ACPs must comply with under clause 7A.16 of the ESS Rule.
2. **Explanatory text**: The explanatory text provides further guidance, including examples and additional information, to assist ACPs, M&V Professionals and auditors to better understand the scope and operation of the requirements. To the extent an ACP deviates from the approach outlined in the explanatory text, the Scheme Administrator expects that an ACP will provide further explanation in order to demonstrate how the approach it has taken complies with the Act, the ESS Rule and the PIAM&V Method Requirements.

## How this document relates to the PIAM&V Method Guide

The PIAM&V Method Requirements (No 2) for Other Implementations should be read in conjunction with other guidance materials, including the PIAM&V Method Guide. However, for the avoidance of doubt, while the PIAM&V Method Guide offers guidance regarding the PIAM&V Method, clause 7A.16(c) of the ESS Rule provides that ACPs must comply with the PIAM&V Method Requirements. A contravention of a PIAM&V Method Requirement by an ACP is a contravention of the ESS Rule.

# Method Requirements

## 1 Application and definitions

### 1.1 Application

(1) These Method Requirements apply to the determination of Energy Savings using the Project Impact Assessment with Measurement and Verification Method (**PIAM&V Method**) under clause 7A of the ESS Rule for an Implementation where:

(a) the Measurement Boundary for the Implementation includes at least one item of End-User Equipment that has been the subject of one or more Deemed Method Implementations, MBM Implementations or other PIAM&V Implementations (**Other Implementations**); and

(b) the Implementation Date for the Implementation and each of the Other Implementations is on or before 31 December 2021.

(2) For the avoidance of doubt, Requirement 1(b) applies to Implementations and Other Implementations which have Implementation Dates prior to the commencement of these Method Requirements.

(3) In the event of any conflict or inconsistency between these Method Requirements and the PIAM&V Method Requirements dated 21 February 2020 and published in Energy Savings Scheme Notice 04/2020, these Method Requirements will prevail to the extent of the conflict or inconsistency.

(4) These Method Requirements commence on and from the date of publication.

(5) Accredited Certificate Providers must comply with these Method Requirements from the date of commencement until they are revoked or replaced.

### 1.2 Definitions

In this document, unless the contrary intention appears, terms used have the same meaning as they have for the purposes of Schedule 4A of the *Electricity Supply Act 1995* (**ES Act**) and the *Energy Savings Scheme Rule of 2009* (**ESS Rule**), and:

(a) **Deemed Method Implementation** means an Implementation of a Recognised Energy Saving Activity (**RESA**) for which Energy Savings Certificates (**ESCs**) have already been created based on Energy Savings calculated using the Deemed Energy Savings Method.

(b) **MBM Implementation** means an Implementation of a RESA for which ESCs have already been created based on Energy Savings calculated using the Metered Baseline Method.

(c) **Measurement Boundary** means the items of End-User Equipment which will have their electricity consumption, Gas consumption, or both, measured in accordance with clause 7A.5(d) of the ESS Rule.

(d) **PIAM&V Implementation** means an Implementation of a RESA for which ESCs have already been created based on Energy Savings calculated using the PIAM&V Method.

(e) **RNF**, Regional Network Factor, is the value from Table A24 of Schedule A to the ESS Rule corresponding to the postcode of the Address of the Site or Sites where the Implementation(s) took place.

# 2 Exclusion of Other Implementations as Non-Routine Events

Subject to Requirement 3 below, where one or more Other Implementations:

(1) occur during the chosen Measurement Period; and

(2) are not modelled by any Independent Variables or Site Constants,

the Accredited Certificate Provider must record and exclude each of the Other Implementations as Non-Routine Events in accordance with clause 7A.5(g) of the ESS Rule.

# 3 Exclusion of Other Implementations as Interactive Energy Savings

## 3.1 Application of this Requirement

(1) This Requirement 3 applies where one or more Other Implementations is unable to be excluded as a Non-Routine Event under clause 7A.5(g) of the ESS Rule because:

(a) the percentage of time to be excluded is 20% or more of the Measurement Period, or

(b) the Implementation Date for the Other Implementation is after the end of the Measurement Period for the Baseline Energy Model determined in accordance with clause 7A.5(b)(i) of the ESS Rule and before the start of the Measurement Period for the Operating Energy Model determined in accordance with clause 7A.5(b)(ii) of the ESS Rule.

## 3.2 Calculation of Interactive Energy Savings for Deemed Method Implementations

(1) The Interactive Energy Savings estimated in accordance with clause 7A.9 of the ESS Rule must include an estimate of the changes to energy consumption attributable to the Deemed Method Implementations using the following formulae:

(a) where the Deemed Method Implementation was calculated using the Sale of New Appliances sub-method under clause 9.3 of the ESS Rule:

$$-(Equation\ 5 \div Lifetime \div RNF)$$

(b) where the Deemed Method Implementation was calculated using the Commercial Lighting Energy Savings Formula sub-method under clause 9.4 of the ESS Rule:

$$-(Equation\ 6 \div Asset\ Lifetime \div RNF)$$

(c) where the Deemed Method Implementation was calculated using the Public Lighting Energy Savings Formula sub-method under clause 9.4A of the ESS Rule:

$$-(Equation\ 6A \div Asset\ Lifetime \div RNF)$$

(d) where the Deemed Method Implementation was calculated using the High Efficiency Motor Energy Savings Formula sub-method under clause 9.5 of the ESS Rule:

$$-(Equation\ 12 \div Asset\ Life \div RNF)$$

(e) where the Deemed Method Implementation was calculated using the Power Factor Correction Energy Savings Formula sub-method under clause 9.6 of the ESS Rule:

$$-(Equation\ 13 \div Site\ Life \div RNF)$$

(f) where the Deemed Method Implementation was calculated using the Removal of Old Appliances sub-method under clause 9.7 of the ESS Rule:

$$-(Equation\ 15 \div Lifetime \div RNF)$$

(g) where the Deemed Method Implementation was calculated using the Home Energy Efficiency Retrofits sub-method under clause 9.8 of the ESS Rule:

$$-(Equation\ 16 \div Lifetime \div RNF)$$

(h) where the Deemed Method Implementation was calculated using the Installation of High Efficiency Appliances for Businesses sub-method under clause 9.9 of the ESS Rule:

$$-(Equation\ 17 \div Lifetime \div RNF)$$

(2) For the purposes of this Requirement 3.2:

(a) **Asset Life**, **Asset Lifetime**, **Lifetime** and **Site Life** have the meanings given in Equation 5, Equation 6, Equation 6A, Equation 12, Equation 13, Equation 15, Equation 16 and Equation 17, as the case requires.

(b) a reference to an 'Equation' in Requirement 3.1(3) means the Energy Savings calculated for the Deemed Method Implementation using that Equation.

[**Note**: For the purposes of clause 7A.9(c) of the ESS Rule, Interactive Electricity Savings and Interactive Gas Savings estimated in accordance with this Requirement 3.2 may exceed 10% of total Electricity Savings and Gas Savings, respectively.]

## 3.3 Calculation of Interactive Energy Savings for MBM Implementations

(1) The Interactive Energy Savings estimated in accordance with clause 7A.9 of the ESS Rule must include an estimate of the changes to energy consumption attributable to the MBM Implementations using the following formulae:

(a) for Interactive Electricity Savings:

$$-(\sum Electricity\ Savings\ \div \mathrm{RNF})$$

(b) for Interactive Gas Savings:

$$-(\sum Gas\ Savings)$$

(2) For the purposes of this Requirement 3.3:

(a) **Electricity Savings** and **Gas Savings** are calculated in accordance with Methods 1, 2, 3 or 4 (as the case may be) under clause 8 of the ESS Rule

(b) the summation is to be calculated over 1 year.

[**Note**: For the purposes of clause 7A.9(c) of the ESS Rule, Interactive Electricity Savings and Interactive Gas Savings estimated in accordance with this Requirement 3.3 may exceed 10% of total Electricity Savings and Gas Savings, respectively.]

## 3.4 Calculation of Interactive Energy Savings for PIAM&V Implementations

(1) The Interactive Energy Savings estimated in accordance with clause 7A.9 of the ESS Rule must include an estimate of the changes to energy consumption attributable to the other PIAM&V Implementations using the following formulae:

(a) for Interactive Electricity Savings:

$$-(Normal\ Year\ Electricity\ Savings \div RNF)$$

(b) for Interactive Gas Savings:

$$-(Normal\ Year\ Gas\ Savings)$$

(2) For the purposes of this Requirement 3.4, **Normal Year Electricity Savings** and **Normal Year Gas Savings** are calculated in accordance with Equation 7A.2 or 7A.5 (as the case may be) of the ESS Rule

[**Note**: For the purposes of clause 7A.9(c) of the ESS Rule, Interactive Electricity Savings and Interactive Gas Savings estimated in accordance with this Requirement 3.4 may exceed 10% of total Electricity Savings and Gas Savings, respectively.]

## 3.5 Accuracy Factor

(1) This Requirement 3.5 sets out the process, for the purposes of clause 7A.10(a)(ii) of the ESS Rule, to be used to determine the Accuracy Factor where this Requirement 3 applies.

(2) Where this Requirement 3 applies, the Accuracy Factor, in relation to Equations 7A.1 and 7A.3, is a number between 1 and 0; and is calculated by applying the following formula:

$$Value\ Table\ A23 \times IES\ Factor$$

where:

(a) **Value Table A23** is the value listed in Table A23 of Schedule A to the ESS Rule corresponding to the energy model type and relative precision of the Electricity Savings or Gas Savings estimate at 90% confidence level for the Implementation;

(b) **IES Factor** is the value listed in Table 1 corresponding to the Interactive Energy Savings calculated in accordance with Requirement 3.2, 3.3 or 3.4 (as the case may be) as a percentage Total Savings, where:

(i) **Total Savings** is calculated by applying the following formula:

$$\left(E_{Baseline} - E_{Operating}\right)$$

where:

(A) $\mathbf{E_{Baseline}}$ is:

(I) the annual electricity consumption predicted by a Baseline Energy Model established in accordance with clauses 7A.2 and 7A.3 of the ESS Rule using measurements of electricity consumption; or

(II) the annual Gas consumption predicted by a Baseline Energy Model established in accordance with clauses 7A.2 and 7A.3 of the ESS Rule using measurements of Gas consumption.

(B) $\mathbf{E}_{\mathbf{Operating}}$ is:

(I) the annual electricity consumption predicted by an Operating Energy Model established in accordance with clauses 7A.2 and 7A.4 of the ESS Rule using measurements of electricity consumption; or

(II) the annual Gas consumption predicted by an Operating Energy Model established in accordance with clauses 7A.2 and 7A.4 of the ESS Rule using measurements of Gas consumption.

## Table 1 IES Factor based on percentage of Interactive Energy Savings due to Other Implementations

| **Interactive Energy Savings (% of Total Savings)** | **IES Factor** |
|---|---|
| 0 to < 20% | 1.0 |
| 20 to < 30% | 0.95 |
| 30 to < 40% | 0.9 |
| 40 to < 50% | 0.8 |
| 50 to < 60% | 0.6 |
| 60 to < 70% | 0.5 |
| 70 to < 80% | 0.3 |
| 80 to < 90% | 0.1 |
| ≥ 90% | 0 |

# Explanatory text

## Application

In June 2021, IPART updated its *Project Impact Assessment with Measurement & Verification Method Guide* (**PIAM&V Method Guide**)[a] to ensure that guidance on 'Counted Energy Savings' is consistent with the ESS Rule. The PIAM&V Method Guide had previously stated that Energy Savings calculated under a different Recognised Energy Saving Activity could be excluded from PIAM&V Method calculations as Counted Energy Savings, which was not consistent with the ESS Rule. Counted Energy Savings can only be used to account for Energy Savings Certificates (**ESCs**) created for the same Implementation, not for ESCs created under another Recognised Energy Saving Activity (e.g. Deemed Method, MBM or PIAM&V Implementations). The guidance has therefore been updated to align with the ESS Rule.

Due to the long timeframes for some PIAM&V projects, projects may have commenced based on the earlier guidance in version 4.2 of the PIAM&V Method Guide. This means that an Accredited Certificate Provider (**ACP**) may have commenced projects on the assumption that it could exclude Energy Savings calculated for Other Implementations as Counted Energy Savings. These Method Requirements have been developed to address this situation and to enable ACPs to exclude, from the calculation of Energy Savings for affected projects, energy savings from other Implementations for which ESCs have already been created using the Deemed Energy Savings Method, Metered Baseline Method or PIAM&V Method. In practice this is most likely to occur where the Measurement Boundary for the PIAM&V project is the same as the Site boundary.

The Method Requirements apply only to Implementations with an Implementation Date on or before 31 December 2021.

## Exclusion of Other Implementations as Non-Routine Events

Non-Routine Events are defined in the ESS Rule as events which affect energy use, within the chosen Measurement Period, that are not modelled by any Independent Variables or Site Constants. Non-Routine Events are required to be removed from the Measurement Period to enable like-for-like comparison of before and after energy savings scenarios. They are typically due to static factors that may include fixed, environmental, operational and maintenance characteristics.

Requirement 1.2 defines Other Implementations for the purposes of these Method Requirements. Requirement 2 provides that Other Implementations are to be considered Non-Routine Events if they affect energy use within the chosen Measurement Period for the PIAM&V project and they are not modelled by any Independent Variables or Site Constants.

[a] *Project Impact Assessment with Measurement & Verification Method Guide*, Energy Savings Scheme, June 2021, Version 4.3.

Consistent with the requirements of clause 7A.5(g) of the ESS Rule, Requirement 2 requires ACPs to record and exclude Other Implementations that are Non-Routine Events where the percentage of time excluded is less than 20% of the Measurement Period.

## Interactive Energy Savings

Where the percentage of time that would be excluded for Other Implementations is 20% or more of the Measurement Period, or where the Implementation Date for the Other Implementation is after the end of the Measurement Period for the Baseline Energy Model and before the start of the Measurement Period for the Operating Energy Model, ACPs must instead exclude the Energy Savings from Other Implementations as Interactive Energy Savings.

Requirement 3 sets out the formulae that must be used to estimate Interactive Energy Savings, depending on whether the Other Implementation is a Deemed Method Implementation, MBM Implementation or PIAM&V Implementation. The formulae provide an estimate for the annual energy savings attributable to those Other Implementations.

Application of these formulae will result in a negative value for Interactive Energy Savings, enabling the Energy Savings from the Other Implementation to be subtracted from the calculation of Energy Savings once inputted into Equations 7A.2, 7A.4 and 7A.5.

## Accuracy Factor

To account for the potential increase of inaccuracy in the calculation of Energy Savings as a result of including Other Implementations in the Measurement Boundary, Requirement 3.4 sets out the process for determining the Accuracy Factor. This process is published under clause 7A.10(a)(ii) of the ESS Rule.

The Accuracy Factor is calculated by multiplying the value corresponding to the energy model type and relative precision of the Electricity Savings or Gas Savings estimate at 90% confidence level listed in Table A23 of Schedule A to the ESS Rule by an Interactive Energy Savings Factor (**IES Factor**).

The IES Factor is determined by the Interactive Energy Savings as a proportion of Total Savings (being the difference between the energy consumption predicted using the Baseline Energy Model and the energy consumption predicted using the Operating Energy Model).

The Accuracy Factor effectively discounts the number of certificates that may be created where the calculation of Energy Savings using the PIAM&V Method accounts for Other Implementations to address the reduced reliability of this approach for determining project level Energy Savings.

# Worked Example 1: A lighting upgrade within the Measurement Boundary for a HVAC upgrade

Consider a lighting upgrade under the Commercial Lighting Energy Savings Formula sub-method (**CLF**) within the measurement boundary for a heating, ventilation and air conditioning (**HVAC**) upgrade under the PIAM&V Method. The Baseline and Operating Energy Models are established using Regression Analysis and the duration of the lighting upgrade as a percentage of the Measurement Period exceeds 20%.

### For the lighting upgrade:

- Baseline Consumption calculated in accordance with Equation 7 of the ESS Rule equals 20,000 MWh
- Upgrade Consumption calculated in accordance with Equation 8 of the ESS Rule equals 12,000 MWh
- Asset Lifetime equals 10 years (from Table A10.6 of Schedule A of the ESS Rule)
- Regional Network Factor equals 1.0

### For the HVAC upgrade:

- Normal Year electricity consumption predicted by the Baseline Energy Model equals 5,000 MWh
- Normal Year electricity consumption predicted by the Operating Energy Model equals 3,000 MWh
- Relevant value in Table A23 of Schedule A of the ESS Rule equals 1.0

### Step 1 – Calculate the lighting upgrade savings using Equation 6 of the ESS Rule

*Electricity Savings* = *[Baseline Consumption – Upgrade Consumption]* × *Regional Network Factor*

Electricity Savings$_{CLF}$ = (20,000 – 12,000) x 1.0 = 8,000 MWh

### Step 2 – Estimate the Interactive Energy Savings due to the lighting upgrade

Interactive Energy Savings ($S_{DMI\ CLF}$) are calculated in accordance with Requirement 3.1(2)(b):

$S_{DMI\ CLF}$ = -(Equation 6 ÷ Asset Lifetime ÷ RNF)

= -(8,000 ÷ 10 ÷ 1)

$S_{DMI\ CLF}$ = -800 MWh

### Step 3 – Calculate the Normal Year Savings for the HVAC upgrade

Using Equation 7A.2 of the ESS Rule:

$$\textit{Normal Year Electricity Savings} = \sum_t \left( E_{Baseline}(\tilde{x}_1(t), \tilde{x}_2(t), \ldots \tilde{x}_p(t)) - E_{Operating}(\tilde{x}_1(t), \tilde{x}_2(t), \ldots \tilde{x}_p(t)) \right) + \textit{Interactive Energy Savings}$$

Normal Year Electricity Savings = (5,000 – 3,000) + (-800) = 1,200 MWh

### Step 4 – Calculate the IES Factor

Calculate the Interactive Energy Savings as a percentage of the Total Savings.

Total Savings = ($E_{Baseline}$ – $E_{Operating}$) = (5,000 – 3,000) = 2,000 MWh

Interactive Energy Savings % = | Interactive Energy Savings | ÷ Total Savings

= |-800| ÷ 2,000

= 40%

From Table 1:

For Interactive Energy Savings of 40% of Total Savings, IES Factor = 0.8

### Step 5 – Calculate the Accuracy Factor

Accuracy Factor = Value in Table A23 of Schedule A of the ESS Rule x IES Factor

= 1.0 x 0.8

Accuracy Factor = 0.8

### Step 6 – Calculate the Energy Savings for the HVAC upgrade

Using Equation 7A.1 of the ESS Rule:

$$Electricity\ Savings = \sum_{1\ to\ 10} ((Normal\ Year\ Electricity\ Savings \times Accuracy\ Factor \times Decay\ Factor_{1\ to\ 10}) \times Regional\ Network\ Factor - Counted\ Energy\ Savings_{1\ to\ 10})$$

= ((1,200 x 0.8 x (1.0+0.99+0.99+0.98+0.98+0.97+0.96+0.96+0.95+0.95)) x 1.0 – 0)

Electricity Savings = 9,341 MWh

= 9,901 ESCs