IPART

Independent Pricing and Regulatory Tribunal
New South Wales

Response to Submissions

Project Impact Assessment with Measurement and Verification Method Requirements consultation

Energy Savings Scheme

February 2020

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This document is published for the purpose of informing stakeholders about the consultation process for the PIAM&V Method Requirements. Use of this document for any other purpose is at the user's own risk, and is not endorsed by IPART.

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The Independent Pricing and Regulatory Tribunal (IPART)

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1 Introduction

The Project Impact Assessment with Measurement and Verification (**PIAM&V**) Method Requirements were developed in response to requests from Accredited Certificate Providers (**ACP**s) to provide additional guidance and clarity on the PIAM&V method. These requirements are also a response to recent changes to the *Energy Savings Scheme Rule of 2009* (**ESS Rule**) which allows the Scheme Administrator to publish PIAM&V Method Requirements and made changes to the measurement procedure requirements via clause 7A.5A.

1.1 Consultation process

We published draft PIAM&V Method Requirements on 18 October 2019, along with a request for feedback.

IPART conducted consultation on the draft PIAM&V Method Requirements between 18 October 2019 and 22 November 2019. This included seeking feedback from interested parties at the ESS Stakeholder Forum (**Forum**) on 11 November 2019 and a call for written submissions.

We received four written submissions from ACPs and Measurement and Verification Professionals.

1.2 Outcomes of consultation

We appreciate the time and effort that stakeholders put into responding to our consultation process.

This report forms our response to the stakeholder submissions. It supports the PIAM&V Method Requirements by providing a summary of the key issues raised by stakeholders, our response to those issues, and our reasons for either changing the requirements or maintaining the requirements as originally published (Section 2).

Stakeholders also raised a number of additional issues as part of the consultation process. These issues have been addressed in Section 3.

Appendix A presents the issues raised throughout the consultation process in greater detail. We have also published the written submissions on the Current Consultations page on our website.

1.3 Consultation questions

1. What types of supporting evidence and explanatory reasoning should be included in the Preliminary M&V Professional Report?

2. What types of evidence and justification can be provided to demonstrate that a proposed Measurement Period covers the full operating cycle for implementations where energy consumption is affected by weather?

3. What other factors should be considered when defining normal operating conditions?

4. What should be addressed by the explanatory reasoning in the Preliminary M&V Professional Report to demonstrate the appropriateness of factors related to the baseline Measurement Period?

5. What options (other than sub-metering), that can be supported by acceptable evidence, are available to ACPs to define the measurement boundary?

6. What other modelling criteria and corresponding thresholds should be considered?

7. Is there supporting evidence that can justify different thresholds than those provided in Table 1 and, if yes, what is that evidence?

8. What additional guidance or tools may provide support for the calculation of data uncertainty?

9. What other evidence can be provided to support the identification and selection of relevant Independent Variables?

2 Response to submissions

2.1 Required records – Preliminary M&V Professional Report

2.1.1 Outcome

We have made a decision to:

1 Leave Requirement 1.1 unchanged.

2.1.2 Submissions

Of the four submissions, one supported and two opposed the introduction of the Preliminary Measurement and Verification (**M&V**) Professional Report. A fourth submission was neutral. Key issues raised in the written submissions and at the Forum included that the Preliminary M&V Professional Report would not add value to projects that are straightforward and similar in nature, would add to the cost of undertaking a PIAM&V project and would be difficult to write and submit within the timeframe between the end of the Baseline Measurement Period and Implementation Date. In addition, the Preliminary M&V Professional Report could delay the implementation of projects and would require ACPs to have two parallel plans in place, one with the data included and a pre-project M&V Plan. One submission stated that the introduction of the Preliminary M&V Professional report should be the subject of transitional arrangements. All submissions provided suggestions for the type of information that should be included in the Preliminary M&V Professional report.

2.1.3 IPART Response

We consider the Preliminary M&V Professional Report is appropriate to meet the requirements of clause 7A.5A of the ESS Rule. We note that no submissions provided an alternative approach.

We acknowledge that completing the Preliminary M&V Professional Report will add some cost to the method. However, we consider that this cost could be offset by the early identification and correction of issues by the Independent M&V Professional.

We note that some stakeholders were concerned about the timing of the submission of the Preliminary M&V Professional Report. There is no requirement to submit the Preliminary M&V Professional Report to IPART prior to the Implementation Date, only that the report be completed prior to the Implementation Date. In addition, as the scope of the report is limited to the baseline Measurement Procedures only and not the baseline Measurement Period data, there is no impediment to ACPs completing the Preliminary M&V Professional Report prior to the Implementation Date. If there is a change to the Measurement Procedures after the Implementation Date, ACPs should document this in the final M&V Report and have the revised Measurement Procedures deemed appropriate for the Implementation by the M&V Professional.

Transitional arrangements are set out in clause 11.12 of the revised ESS Rule. IPART has considered stakeholder suggestions when developing the Preliminary M&V Professional Report template.

2.2 Measurement Period where energy consumption is subject to seasonal variation

2.2.1 Outcome

We have made decisions to:

1 Modify Requirement 2.1 to oblige ACPs to include evidence that the baseline and operating Energy Models include one or more complete operating cycle of the End-User Equipment (**EUE**).

2 Make minor editorial changes to Requirement 2.3 and renumber to Requirement 2.2.

3 Move part of Requirement 2.6 relating to approaches to reducing statistical bias to explanatory text, and renumber to Requirement 2.3.

4 Convert Requirements 2.2, 2.4 and 2.5 to explanatory text.

2.2.2 Submissions

Three of the four submissions claimed that 12 months of data was not necessary to model energy consumption that is subject to seasonal variation. In addition, these submissions and stakeholders at the Forum stated that Effective Range and Accuracy Factor could be used to limit the creation of Energy Savings Certificates (**ESCs**) where Measurement Periods were inadequate. The same submissions contended that the baseline and operating Measurement Periods do not need to be the same length. One submission recommended that 12 months of data should be the minimum time required for an energy model where weather was a factor.

One submission stated that evidence that the Measurement Period covers a complete operating cycle is provided by the Effective Range, that it should be possible to use shorter Measurement Periods where a continuous program of roll outs has been implemented and further that modelling for one of the implementations needs to be conducted in periods between implementations.

2.2.3 IPART Response

The requirement that the Baseline and Operating Measurement Periods capture a complete operating cycle for the End-User Equipment (**EUE**) (Requirement 2.1) remains unchanged, however, ACPs must now include evidence of this in the M&V Report. We acknowledge that for some projects subject to seasonal variation it may be possible to capture a complete operating cycle with less than 12 months of data, provided that an ACP can provide evidence in the M&V Report that the shorter Measurement Period represents the complete operating cycle for the EUE.

We note that Effective Range can sometimes limit the number of ESCs generated by a project. However, the Effective Range does not define the operating cycle of a project, and therefore does not account for the uncertainty generated by an inadequate Measurement Period. For example, an ACP may determine the Effective Range of an HVAC project in a commercial building over a shoulder period in which maximum to minimum temperatures are recorded. However, this Measurement Period may not account for the additional energy required to cool or heat the thermal mass of the building after successive hot or cold days experienced over summer or winter respectively. On this basis, the Effective Range would not be evidence that the Measurement Period covers a complete operating cycle (Requirement 2.2).

We note that ACPs must reduce statistical bias in the underlying data and this remains a requirement (Requirement 2.3). However, based on the information provided in the submissions that there could be instances where baseline and operating Measurement Periods are different lengths, this part of the requirement has become explanatory text.

Requirements 2.2, 2.4 and 2.5 (original numbering) constitute guidance and related to the definition of an operating cycle, use of a full 12 months of data for EUE that is affected by weather and the treatment of changes to EUE within the measurement boundary after Implementation. These requirements have been changed to explanatory text.

Transitional arrangements for requirements relating to the Measurement Period are not necessary as the requirements are consistent with clause 7A of the ESS Rule.

2.3 Normal operating conditions

2.3.1 Outcome

We have made decisions to:

1 Leave Requirement 3.1 unchanged

2 Modify Requirement 3.2 to require that Non-Routine Events (as defined in clause 10 of the ESS Rule) be recorded in the M&V Report instead of the M&V Plan

3 Modify Requirement 3.3 to require that ACPs define the normal operating conditions of the EUE, and

4 Convert Requirements 3.3 (a–d) to explanatory text.

2.3.2 Submissions

Two submissions did not agree with the proposal to record Non-Routine Events in the M&V Plan as this can only be recorded after the data has been obtained and after development of the M&V Plan. The majority of written submissions and feedback from the Forum were against the inclusion of definitions of normal operating conditions in the requirements as they lacked flexibility, were too difficult for ACPs to meet due to lack of evidence and would not be relevant to some implementations. One stakeholder requested guidance on the choice of data to account for inconsistencies in weather patterns and climate change when developing a Normal Year, for example, the use of an average of the past three years, a particular year or another option.

2.3.3 IPART Response

Stakeholders raised concerns about timing issues raised by the recording of Non-Routine Events in the M&V Plan. Therefore we have changed the requirement to, at a minimum, recording any Non-Routine Events in the M&V Report. The M&V Plan should provide information on the procedures the ACP will use to identify and account for Non-Routine Events when conducting the modelling.

Several submissions were against restricting the definitions of normal operating conditions in Requirement 3.3. We acknowledge that there are many options to define normal operating conditions. To address the concerns and maintain flexibility in the PIAM&V method, the proposed normal operating conditions have now been included in the explanatory text. The requirement to define the normal operating conditions for the EUE in the M&V Plan remains in place.

The request for IPART to provide guidance and rules on what data should be used for a "Normal Year" is noted and will be considered for inclusion in subsequent PIAM&V guidance documents.

2.4 Engaging an M&V Professional

2.4.1 Outcome

We have made decisions to:

1 Modify Requirement 4.1 to provide additional clarification of roles of the M&V Professional.

2 Modify Requirement 4.2(a) to include "prior to the Implementation Date", and Requirement 4.2(b) has been changed to reference items listed in clauses 7A.5(a) – (g) instead of listing individual items.

3 Leave Requirement 4.3 unchanged

4 Add Requirement 4.4 to clarify that should Measurement Procedures change after the Preliminary M&V Professional report has been completed, an M&V Professional must deem appropriate the amended Measurement Procedures and provide their written explanatory reasoning in the M&V Professional report.

5 Provide additional guidance in the explanatory text relating to the submission of the report and the process to document changes to the Measurement Procedures after the Preliminary M&V Professional Report.

2.4.2 Submissions

Feedback from the written submissions and the Forum reiterated concerns regarding the need for a Preliminary M&V Professional Report. Submissions also suggested a range of information that should be included in the Preliminary M&V Professional Report including using relevant sections of the existing M&V Professional Report and measures to record and exclude Non-Routine Events. Two submissions suggested that the Preliminary M&V Professional Report should review and comment on baseline and operating measurement

period data and include a discussion of any irregularities, outliers and selection of the baseline period.

2.4.3 IPART Response

Our response to stakeholder concerns regarding the requirement for a M&V Professional Report is provided in Section 2.1.3. Requirement 4.4 has been added to provide additional clarity to ACPs and M&V Professionals should there be a change in the Measurement Procedures after the Preliminary M&V Professional report is completed.

We will consider using the suggested sections of the M&V Professional Reports as a basis for developing the Preliminary M&V Professional Report. However, as the scope of the Preliminary M&V Professional Report is restricted to the baseline Measurement Procedures we do not consider it appropriate to require that ACPs provide a discussion of baseline or operating period data. To assist ACPs and M&V Professionals meet the requirements in clause 7A.5A, we will publish a Preliminary M&V Professional Report template before commencement of the provision.

2.5 Measurement boundary

2.5.1 Outcome

We have made decisions to:

1 Modify Requirement 5.1 to clarify which items of EUE need to be documented as part of defining the measurement boundary

2 Modify Requirement 5.2 to reflect that Energy Savings calculated using utility meter data must occur as a result of the Implementation, and

3 Remove Requirement 5.3 and incorporate into the explanatory text for the measurement boundary.

2.5.2 Submissions

Feedback from the written submissions and the Forum showed that stakeholders generally disagreed with the proposal to document all items of equipment that are included in the Implementation within the measurement boundary. Documenting all items of equipment that are included in the Implementation was considered to be "unnecessary red-tape" and prohibitive for a whole of site measurement boundary. In addition, one submission preferred that minor changes to energy use patterns on-site (ie, less than 10%) be accepted within a threshold otherwise the Energy Saver /contractor would be discouraged from making minor changes to achieve additional savings. A submission also noted that an inability to manually adjust a boundary was unnecessarily prohibitive. The submissions provided a number of options to define the Measurement Boundary.

2.5.3 IPART Response

We note the concerns raised in the submissions regarding the documentation of all equipment. We acknowledge that if a whole of site approach is being used to measure the performance of an entire facility it is not feasible, or necessary, to list all items of equipment in the building. We do not intend to require all equipment to be listed as that would not be practical and would place an unnecessary burden upon ACPs. On this basis, we have clarified Requirement 5.1 to clearly define that only EUE that is modified/installed/replaced as part of the Implementation must be documented as part of defining the measurement boundary.

However, we note that in some cases, a whole of site approach is being applied to estimate Energy Savings at the equipment level. In relation to selection of the measurement boundary, Section 2.1 of the International Performance Measurement and Verification Protocol's (**IPMVP**) *Generally Accepted M&V Principles*[1] provides the following guidance:

> Savings may be determined for an entire facility or a portion, depending upon the ECM characteristics and the purpose of the reporting.
>
> - If the purpose of reporting is to verify the savings from equipment affected by the savings program, a measurement boundary should be drawn around that equipment and measurement requirements for the equipment within the boundary can then be determined. …
> - If the purpose of reporting is to verify and/or help manage total facility energy performance, the meters measuring the supply of energy to the total facility can be used to assess performance and savings. …

The submissions suggest that ACPs support a whole of site measurement boundary so that energy savings from all activities on site can be captured. This approach can lead to energy savings from excluded equipment or ineligible activities being incorrectly attributed to an Implementation and these savings would not be eligible for ESC creation. To address this misunderstanding, we have modified Requirement 5.2 to clarify that energy savings estimated using utility meter data (whole of site approach) must be the result of the Implementation. We note that this is consistent with existing guidance, see Table A1 of the *Project Impact Assessment with Measurement & Verification Method Guide* (**PIAM&V Method Guide**) which states:

> The measurement boundary must include all EUE whose energy consumption will be affected by the RESA. Where feasible, consider setting the measurement boundary to:
>
> – minimise the proportion of measured energy consumption that is unrelated to the project (savings should typically exceed 10% of the baseline energy)
> – Exclude the impact on energy savings of any activities not related to the RESA, or that must be excluded from the energy models.

We have noted stakeholder feedback that Requirement 5.3 represents alternative approaches to setting the measurement boundary and as a result have moved the clause to the explanatory text.

1 Efficiency Valuation Organization, October 2018

2.6 Independent variables – Independent Variable definition

2.6.1 Outcome

We have made decisions to:

1 Make a new Requirement 6.1 that clarifies that ACPs must have regard to and document all relevant Independent Variables and Site Constants in the M&V Plan and M&V Report.

2 Leave Requirement 6.1 (original) unchanged and renumber to Requirement 6.2, and

3 Replace the original Requirement 6.2 with a new Requirement 6.3 that states that ACPs should ensure that the thresholds of statistical good fit in Table 1 are met. Where they cannot be met, an M&V Professional must provide written explanatory reasoning to justify that the selected Independent Variables are appropriate for the Implementation.

2.6.2 Submissions

Two out of four submissions and views expressed at the Forum objected to the advice that temperature was not an appropriate Independent Variable for a lighting upgrade. In addition, the submissions stated that the definition of Independent Variable had been incorrectly interpreted and that it should relate to the measurement boundary rather than the "simplistic notion that they should purely relate to the upgraded equipment". One stakeholder stated that it is "the saving that is being verified, not the correlation of selected variables to the EUE."

All of the written submissions and feedback from the Forum showed that stakeholders objected to the introduction of statistical thresholds with some submissions stating that the use of modelling criteria and corresponding thresholds would limit the number of projects that could use the PIAM&V method to create ESCs. In addition, submissions stated that there is no need for modelling criteria and thresholds as reduced accuracy from poor correlation with modelled Independent Variables can be accounted for by the Accuracy Factor.

2.6.3 IPART Response

We note the objections to Requirement 6.1 (now 6.2) that the ACP must ensure that the selected Independent Variables affect the energy consumption of the EUE that is upgraded.

Definition of an Independent Variable

Clause 10 of the ESS Rule defines an Independent Variable as: "a parameter that varies over time, can be measured and affects the EUE's energy consumption for the purpose of clause 7A of this Rule." This definition is different from IPMVP which more loosely defines an Independent Variable as "a parameter that is expected to change routinely and have a measureable impact on Energy Consumption and/or Demand of a system or facility." The definition of an Independent Variable as it relates to EUE in the ESS Rule is clear.

Independent Variables for Lighting

Lighting is an EUE category for the purpose of the PIAM&V method. As such, the use of an Independent Variable that does not affect the EUE's energy consumption such as temperature

is not appropriate. On this basis, the Requirement, that selected Independent Variables and Site Constants affect the energy consumption of the EUE, remains unchanged. As a consequence, the guidance advising that temperature is not an appropriate Independent Variable for a lighting upgrade also remains.

Statistical Thresholds

We do not agree that modelling criteria and corresponding thresholds are not required for the reason that the effect of poor correlation with modelled Independent Variables is not accounted for by the Accuracy Factor. Modelling provided to IPART using the PIAM&V method has demonstrated that the relative precision of the models presented is always less than 25%. This results in an Accuracy Factor of 1 for Regression Analysis and 0.9 for Estimate of the Mean respectively. This is despite some models having R-squared (**R^2**) values significantly lower than 0.75, a t-statistic of less than two and measurement periods that do not cover a complete operating cycle. The absence of a high relative precision in these instances is not an indicator of the accuracy of the model, so much as a failure of the relative precision calculation to capture the material errors associated with data, measurement, use of estimates and assumptions, and the modelling.

While we acknowledge the limitation of using R^2 alone to reject or accept a model, as a guide, a combination of an R^2 value > 0.75, t-statistic > 2 and Coefficient of Variation (Root Mean Square Error (**CV(RMSE)** < 25% is recommended. It is noted that this approach is consistent with other measurement and verification methods including the IPMVP and is less stringent than the Carbon Credits (Carbon Farming Initiative – Industrial Electricity and Fuel Efficiency) Methodology Determination 2015 (**IEFE Method**). On this basis, the CV(RMSE) test has been added to the statistical thresholds in Table 1.

Having taken the submissions into account and noting the above we have changed the requirement to meet the statistical thresholds to guidance in the explanatory text. However, where the statistical thresholds are not met, we expect that ACPs will document in the M&V Plan and M&V Report the process used to identify and test whether other relevant Independent Variables improve the fit of the model.

We have also introduced a new requirement (Requirement 6.3) for M&V Professionals to provide explanatory reasoning to justify that the selected Independent Variables are appropriate for the Implementation in instances where the statistical thresholds are not met. This requirement builds on the existing requirement in the ESS Rule, clause 7A.6(d), which requires Independent Variables be deemed appropriate for the Implementation by an M&V Professional with their written explanatory reasoning provided.

2.7 Accuracy Factor

2.7.1 Outcome

We have made decisions to:

1 Modify Requirement 7.1(c) to include “estimates and assumptions”, and

2 Include additional explanatory text on potential sources of error that should be considered.

2.7.2 Submissions

Two submissions addressed the Accuracy Factor. One submission stated that statistical uncertainty analysis is a highly complex topic and the other stated that data uncertainty was already covered by the Effective Range and accuracy/precision discount. Additional detailed and specific guidance on how uncertainty should be calculated was requested. Feedback received at the Forum noted that the inclusion of "material sources of error" in Requirement 7.1 was important for creating balance.

2.7.3 IPART Response

We agree that statistical uncertainty analysis is a highly complex topic. Care should be taken by ACPs to ensure that measurement uncertainty is carefully considered in all projects to ensure that it is appropriately accounted for in the calculation of relative precision. In addition, we note that additional clarification is required to ensure that ACPs consider the uncertainty associated with any estimates or assumptions made in developing the Baseline or Operating Energy Models.

In terms of guidance, we would encourage ACPs to first consult the IPMVP Core Concepts Application Guide *Uncertainty Assessment for IPMVP*.[2]

2.8 Estimate of the Mean model

2.8.1 Outcome

We have made decisions to:

1 Modify Requirement 8.1 to improve clarity.

2 Leave Requirement 8.2 unchanged

3 Remove Requirement 8.3

4 Leave Requirements 8.4(a) and (b) unchanged and renumber to 8.3(a) and (b)

5 Add Requirement 8.3(c) to clarify that the selected measurement periods must include one or more complete operating cycles

6 Convert Requirement 8.5 to explanatory text, and

7 Provide additional explanatory text on when an Estimate of the Mean model can be used and an example of the correct presentation of Site Constant data.

2.8.2 Submissions

Two submissions provided comment on the Estimate of the Mean requirements. Both submissions and stakeholders at the Forum expressed concern that ACPs would be unable to demonstrate that all relevant Independent Variables had been considered and this would impact on the viability of the model type. The submissions suggested limiting the

2 Efficiency Valuation Organization (EVO), July 2019

requirement to projects that are temperature dependent, focusing compliance on the eligibility of selected variables rather than testing that other variables could be used or using IEFE method guidance on the selection of Independent Variables. Additional guidance on how IPART defines the significance of Independent Variables and how to determine whether an Independent Variable is relevant for consideration was requested.

2.8.3 IPART's response

We have modified Requirements 8.1 (a) and (b) to improve readability. Requirement 8.3 has been deleted as it is addressed by Requirement 6.2. We have added Requirement 8.3(c) to ensure that ACPs select measurement periods that include a complete operating cycle of the EUE. This is because we have observed instances where an Estimate of the Mean model has been based on a Measurement Period that represents less than a complete operating cycle. Had the entire operating cycle been considered, the data would not have met the requirements to use an Estimate of the Mean as the coefficient of variation (CV) would have been greater than 15%. On this basis, the requirement that ACPs select a Measurement Period that includes one or more complete operating cycles has been included to ensure that ACPs are able to identify if relevant Independent Variables that significantly affect energy consumption exist.

We disagree that the PIAM&V Method Requirements impact on the viability of the Estimate of the Mean model as it is possible for ACPs to demonstrate that they have tested likely Independent Variables to determine that they do not have a significant effect on the energy consumption. Testing for likely Independent Variables to determine if they are relevant is a fundamental step in the M&V process and should be done by ACPs as a matter of course.

Where an ACP identifies relevant Independent Variables, but there is little variation in the data such that the CV is less than 15%, it is open to the ACP to choose to use an Estimate of the Mean model type. The approach taken to establish the model and assess the relevance of Independent Variables should be documented in the M&V Report.

We note that one submission expressed concern that the use of an Estimate of the Mean method precluded the use of forward creation. This is not the case, as forward creation is available for use with all model types.

3 Other issues raised

The submissions raised a number of issues outside of the scope of the consultation process. These issues are addressed below.

3.1.1 Batch approach to M&V Professional reports

One submission noted that M&V Professional reports are required for each project, even when the projects are almost identical and requested that a batch approach be adopted.

We acknowledge that ACPs may have a number of projects that are similar in nature. However, as the PIAM&V method provides significant flexibility in the way energy savings projects are modelled, the ESS Rule requires that all projects under the method are deemed appropriate by an M&V Professional on an individual basis.

3.1.2 Acceptance of M&V Professional reports

One submission noted that IPART has not accepted some M&V Professional reports and that this has consequences for project timing and ESC creation. In addition, IPART needs to provide M&V Professionals with up to date information on the PIAM&V method and access to IPART's PIAM&V experts.

IPART does not approve or accept M&V Professional reports. We have identified a number of issues with the approach taken by M&V Professionals as part of the first M&V Professional review completed in 2019. As part of the review, we provided feedback to the M&V Professionals with the aim of improving the quality of the reports provided to ACPs and reducing the potential for improper ESC creation by ACPs.

We issue information and clarifications of the PIAM&V method to stakeholders when necessary and M&V Professionals are welcome to seek advice from IPART when necessary.

3.1.3 The role of M&V Professionals

One stakeholder questioned whether M&V Professionals should be involved in the PIAM&V Method, or could the same approach used in other jurisdictions such as Victoria be used instead.

The ESS Rule currently requires an M&V Professional to deem appropriate a number of components of the PIAM&V method. Removing the role of M&V Professionals in the PIAM&V method would be the subject of a rule change.

3.1.4 Unacceptable Independent Variables

One stakeholder stated that IPART does not accept regression based on operating hours as the Independent Variable even for extremely granular data.

ACPs are able to use any relevant measured Independent Variable provided that it can demonstrate that the Independent Variable is appropriate and meets the requirements of clause 7A of the ESS Rule. We note that using the dependent variable data (energy consumption) to calculate values for the Independent Variable (operating hours) is not an acceptable approach, as operating hours cannot simultaneously be an independent and dependent variable.

A Summary of Submissions

Topic	Views expressed	How addressed
Required records	– Preliminary M&V Professional report does not add value for projects that are straightforward or similar in nature, and would add to the cost of undertaking a PIAM&V project. – A Preliminary M&V Professional report and pre-project M&V Plan would be difficult to write and submit within the timeframe between end of the baseline period and implementation period. – The Preliminary M&V Professional Report should be completed before the implementation date and submitted within a month of the implementation date. – That ACP's would need two parallel plans in place, a pre-project M&V Plan and one with the data included. – A batch approach could be used where similar sites are receiving the same upgrade with one Preliminary M&V Report being provided. – Appropriate transitional arrangements are required in the event that proposed changes are implemented.	– Requirement 1.1 remains unchanged. – IPART acknowledges that the requirement to submit a Preliminary M&V Professional report will entail costs to ACP's, however these costs should be considered against the material benefits that will arise for ACP's through obtaining early feedback from the M&V Professional on their proposed Measurement Procedures. – Additional explanatory text has been provided to define the scope of the Preliminary M&V Professional report to limit it to the Measurement Procedures in relation to the Baseline Energy Model only. This clarification addresses the concerns that the baseline measurement period must be complete before the Preliminary M&V Professional report can be completed. – The requirement to complete a Preliminary M&V Professional report will be subject to the transitional arrangements stated in clause 11.12 of the ESS Rule. – Issues raised in submissions have been addressed in Section 2.1.3
Measurement period subject to seasonal variation	– 12 months should be the minimum time required for energy models where the thermal mass of buildings is a relevant consideration. – The collection of 12 months of data may not represent a full operating cycle as temperatures could increase year on year. This would mean that clause 7A5.(f1) would not be met by the proposed time period. – Regression models with appropriate Independent Variables would be good evidence and justification of duration of Measurement Periods. – The definition of 'summer' being December to February is arbitrary and should instead be defined based on observed weather conditions at the site. – One stakeholder stated "effective range should change to not apply to ambient weather variables when a full winter and	– Modify Requirement 2.1 to oblige ACPs to provide evidence in the M&V Report to support that the baseline and operating energy models include one or more complete operating cycle. – Minor editorial changes to Requirement 2.3 and renumbered to Requirement 2.2 – Examples on reducing statistical bias provided in Requirement 2.6 moved to explanatory text and the requirement was renumbered to Requirement 2.3 – Requirements 2.2, 2.4 and 2.5 have been incorporated into the explanatory text. – Issues raised in submissions have been addressed in Section 2.2.3

Topic	Views expressed	How addressed
	summer period has been captured both during the baseline and operating periods." – It could be possible to capture the full operating cycle with less than 12 months of data where seasonal variation occurs, stating that "weather during shoulder periods (between March – May and September – November) is very similar therefore it may be acceptable to only capture one of those periods. Capture of the majority (ie 2 out of 3 months of the season) of summer for cooling projects, and winter for heating projects should be acceptable and reduce certificate creation times for Energy Savers." – It should be possible to use measurement periods that are shorter than a full operating cycle where a continuous program of roll outs has been implemented and modelling for one of the implementations needs to be conducted in periods between implementations – More than one stakeholder stated that effective range provided a reasonable basis for setting restrictions on the number of ESCs which could be created. – Baseline and operating periods do not need to be the same length. – Appropriate transitional arrangements should be put in place should the requirements be introduced.	
Normal operating conditions	– Submissions noted that non-routine events cannot be recorded in the M&V Plan as they have not occurred yet. – Disagreed with the proposed requirement to define normal operating conditions based on the prescriptive list. – Stakeholders identified that more flexibility is required to define normal operating conditions.	– Requirement 3.1 remain unchanged – Requirement 3.2 has been modified to require non-routine events be recorded in the M&V Report instead of the M&V Plan. – Requirement 3.3 has been amended to require that ACPs define the normal operating conditions of the EUE – Requirements 3.3 (a-d) have been converted to examples of normal operating conditions and moved to explanatory text. – Issues raised in submissions have been addressed in Section 2.3.3

Topic	Views expressed	How addressed

Engaging an M&V Professional	– There is uncertainty around IPART's acceptance of M&V Professional reports. This uncertainty adds time and expense to M&V projects.
	– M&V Professionals require up to date information concerning IPART's requirements and rules, and will need access to IPART M&V experts to clarify issues if in doubt.
	– There is a lack of independent M&V Professionals for ACPs to use.
	– Requiring that an M&V Professional is independent to the project forces many ACPs to forego their best resource when they most need it. This risks the confidence in the whole scheme because the result is that the project is set up to fail and energy savers, equipment suppliers and ACPs will opt out of the scheme.
	– Clarification was sought on whether the same M&V Professional must write both the Preliminary and final M&V Professional reports.
	– The involvement of M&V Professionals in the process was questioned and the potential to use the same process as used in other jurisdictions such as Victoria being identified as an alternative approach.
		– Requirement 4.1 has been changed to clarify the role of M&V Professional.
		– Requirement 4.2(a) has been updated to include "prior to Implementation Date" and Requirement 4.2(b) has been changed to reference items listed in clause 7A.5(a) – (g) instead of listing individual items.
		– Explanatory text was provided for the following:
		  – timing for the preparation of the report and that the report does not need to be submitted to the Scheme Administration before the Implementation Date.
		  – as stated on page 5 of the Consultation Paper the Preliminary and Final M&V Professional Reports do not need to be completed by the same M&V Professional.
		  – to assist ACPs and M&V Professionals meet requirements a Preliminary M&V Professional Report template will be published prior to commencement of the provision.
		– Requirement 4.3 remains unchanged
		– Requirement 4.4 added "If the Measurement Procedures change, these changes must be assessed by an M&V Professional who must deem the amended Measurement Procedures appropriate and provide their written explanatory reasoning in the M&V Professional Report."
		– Issues raised in submissions have been addressed in Section 2.4.3

Measurement Boundary	– Documenting all items of EUE on the site was considered to be unnecessary and increased red tape. – Submissions stated that minor changes to the energy use patterns from other actions of site (not included in the implementation) should be able to be included in the model as savings. – More than one stakeholder preferred that minor changes to energy use patterns on-site (ie less than 10%) be accepted within a threshold, or only document EUE with significant energy consumption, otherwise the Energy Saver /Contractor	– Requirement 5.1 has been revised to make it clear that only the EUE that is modified, replaced, installed or removed as part of the Implementation needed to be documented. – Requirement 5.2 has been modified to clarify that energy savings estimated using utility meter data (whole of site approach) must be the result of the Implementation. – Requirement 5.3 has been incorporated into the explanatory text section of the document.

Topic	Views expressed	How addressed
	would be discouraged from making minor changes to achieve additional savings. – Metering is the preferred way to define the measurement boundary. – A submission stated that inability to manually adjust the boundary was unnecessarily prohibitive. – A number of options for defining the Measurement Boundary were suggested.	– Issues raised in submissions have been addressed in Section 2.5.3
Independent Variables and Site Constants	– Two submissions disagreed with the interpretation of the definition of Independent Variable and considered that lighting upgrade projects could be modelled using temperature as an independent variable where energy savings exceeded 10% of the baseline energy. – All submissions disagreed with the reintroduction of statistical thresholds. – The use of statistical thresholds would limit the number of viable regression models and is not aligned with international guidance. – The thresholds would result in many projects being ineligible to create certificates, even though significant savings have been determined. – The accuracy of the model is reflected in the savings accuracy and the accuracy factor. – The suggested thresholds are suitable as recommendations, but not as requirements.	– A new requirement, Requirement 6.1 has been added to clarify that ACPs must have regard to and document all relevant Independent Variables and Site Constants in the M&V Plan and M&V Report. – Requirement 6.1 (originally 6.2) was unchanged and renumbered to Requirement 6.2 – A new requirement, Requirement 6.3 has been added that states that ACPs should ensure that the thresholds of good fit in Table 1 are met and where the thresholds are not met, an M&V professional must provide explanatory reasoning to justify that the selected Independent Variables are appropriate for the Implementation. – The Coefficient of Variation (Root Mean Square Error) of less than 25% has been added as a statistical test. – Issues raised in submissions have been addressed in Section 2.6.3
Accuracy Factor	– Statistical uncertainty is a highly complex topic. – Measurement uncertainty is to a large degree cancelled as it is the savings that are verified, not the absolute energy consumption. – Data uncertainty is also already covered by the effective period [sic] and the accuracy/precision discount. – Additional detailed and specific guidance on how uncertainty should be calculated was requested.	– Minor modifications to Requirement 7.1 and inclusion of estimates and assumptions in Requirement 7.1(c). – Additional explanatory text on potential sources of error was provided. – Issues raised in submissions have been addressed in Section 2.7.3

Topic	Views expressed	How addressed
Estimate of the Mean model	– Concern was raised that it would not be possible to assess all possible Independent Variables and Site Constants when determining if an Estimate of the Mean model was appropriate. – Additional guidance was sought on how IPART defines the significance of Independent Variables and how to determine whether an Independent Variable is relevant for consideration. – Concerned that Estimate of the Mean will be eliminated as ACPs will not be able to demonstrate that all relevant Independent Variables have been considered. – The compliance should be changed to solely focus on whether the selected variable are eligible, not whether some other variables also could have been used. – Suggested that the requirement be limited to upgrades that are temperature dependent. – One stakeholder stated that the Estimate of the Mean method precluded the use of forward creation. – IEFE method could be used for guidance on the selection of Independent Variables.	– Requirement 8.1 has been modified to provide clarity – Requirements 8.2 – 8.4 (b) remain unchanged. – Requirement 8.4(c) has been modified to include “one or more complete operating cycles” – Requirement 8.5 has been moved to the explanatory text section. – The explanatory text section has been modified to include examples of the data requirements for site constants when using an Estimate of the Mean model. – Issues raised in submissions have been addressed in Section 2.8.3