CONSULTATION ON THE BASELINE ELIGIBILITY COMPLIANCE AND METRICS POLICY

ISSUES PAPER

Published: **18 December 2020**

EXECUTIVE SUMMARY

The publication of this Issues Paper commences the first stage of the Rules consultation process conducted by the Australian Energy Market Operator (AEMO) on the draft proposed Baseline Eligibility Compliance and Metrics Policy (Policy).

The Policy establishes the methodology by which AEMO will determine baseline eligibility and compliance under the wholesale demand response mechanism (Mechanism) and sets out the thresholds for baseline compliance metrics.

This Issues Paper aims to facilitate informed feedback on the Policy. AEMO invites stakeholders to suggest alternative options, where they do not agree that AEMO's proposals would achieve the relevant objectives. AEMO also asks stakeholders to identify any unintended adverse consequences of the proposed changes.

Stakeholders are invited to submit written responses on the issues and questions identified in this Issues Paper by 5.00 pm (Melbourne time) on 5 February 2021, in accordance with the Notice of First Stage of Consultation published with this Issues Paper.

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1. STAKEHOLDER CONSULTATION PROCESS

As required by the National Electricity Rules (NER), AEMO is consulting on the Baseline Eligibility Compliance and Metrics Policy (Policy) in accordance with the Rules consultation procedures set out in NER rule 8.9.

A glossary of terms used in this Issues Paper is at Appendix A.

AEMO's indicative timeline for this consultation is outlined below. Dates may be adjusted depending on the number and complexity of issues raised in submissions and any meetings with stakeholders.

Deliverable	Indicative date
Issues Paper published	18 December 2020
Submissions due on Issues Paper	5 February 2021
Draft Report published	5 March 2021
Submissions due on Draft Report	26 March 2021
Final Report published	30 April 2021

Prior to the Issues Paper submissions due date, stakeholders can request a meeting with AEMO, to discuss the issues raised in this Issues Paper.

NEM Registered Participants and other interested parties are invited to submit written responses on the questions identified in this Issues Paper and any other aspect of the draft Procedures. Stakeholders are requested to include reasons for their responses and (if applicable) details of any alternative options they consider may better achieve the relevant objectives. Submissions must be made in accordance with the Notice of First Stage of Consultation published with this Issues Paper.

2. BACKGROUND

2.1 NER requirements

The Policy covers the requirements that, under NER clause 3.10.2, AEMO must determine and publish:

- The baseline methodology metrics setting out the parameters for assessing the baseline produced by a baseline methodology when applied to a wholesale demand response unit (WDRU).
- The arrangements for regular and systematic testing, in relation to WDRUs, to determine whether baseline methodologies approved for application to WDRUs using applicable baseline settings produce baselines that satisfy the baseline methodology metrics (baseline compliance testing).
- The frequency with which baseline compliance testing will occur, which may be different for different WDRUs or classes of WDRU.

Once published, the Policy can be amended by AEMO without a formal consultation process.

2.2 Context for this consultation

In June 2020, the Australian Energy Market Commission (AEMC) released its final determination that sets out a series of changes to the NER to facilitate wholesale demand response (WDR) in the NEM, through a wholesale demand response mechanism (WDRM Rule). Under the WDRM Rule, from October 2021, consumers will be able to sell demand response in the wholesale market.

The WDRM Rule introduces a new market participant category, the Demand Response Service Provider (DRSP). A WDRU is a load used by a DRSP to provide WDR.

The Policy establishes the methodology by which the AEMO will determine baseline eligibility and compliance under the WDRM and sets out the thresholds for baseline eligibility and compliance metrics.

3. DISCUSSION

3.1 Baselines introduction

Baselines are an estimate of the consumption per trading interval during a day, based on a history of like days in the near past. Baselines are required for the two main purposes that they are the counterfactual energy amount for:

- Each single WDRU that is dispatched individually or as part of an aggregated WDRU for demand response. This baseline is required for demand response settlement.
- The WDRU that is dispatched for demand response. The single or aggregate WDRU baseline is required to assess performance against dispatch targets.

To have a baseline and to participate in the WDRM, the load at the NMI must demonstrate a level of predictability, so the baseline can be established, against which demand response settlement and dispatch performance will occur.

The predictability of each load needs to be tested to ensure it meets the eligibility criteria for participating in the WDRM. The baseline is set at the single WDRU level for demand response settlement purposes. Predictability of the WDRU's load can be tested by applying the baseline methodology to a history of days for which a demand response did not occur and using statistical techniques to demonstrate that they meet the baseline methodology metrics.

3.2 Baseline methodology metrics

Baseline methodology metrics are used to test the efficacy of baseline methodologies in predicting a load's consumption patterns. Using these metrics, eligibility is assessed:

- Prior to classification of a WDRU (baseline eligibility assessment).
- At regular intervals during normal operations (baseline compliance testing).

The baseline eligibility assessment ensures that only sufficiently predictable NMIs are able to participate, whereas the baseline compliance testing ensures that a NMI's baseline remains sufficiently predictable thereafter.

Under NER clause 3.10.2(b), the baseline methodology metrics used for baseline eligibility assessment and baseline compliance testing are in respect of accuracy and freedom from bias.

The statistic used to measure:

- Accuracy is a baseline's relative root mean squared error (RRMSE). The RRMSE quantifies the absolute error in the baseline. The RRMSE is normalised by the average load over the assessment period.
- Bias is the baseline's average relative error (ARE). This statistic, for a given customer, is the average baseline per TI less the average actual load per TI, expressed as a fraction of the average load over the assessment period.

A load must be predictable for the purposes both of baseline eligibility assessment and baseline compliance testing. This predictability of load is determined by whether the accuracy and bias metrics, calculated for the specified baseline methodology using historical data for the load according to the baseline eligibility assessment or baseline compliance testing rules for that baseline methodology, meet the proposed thresholds outlined in Table 1.

Table 1 – Baseline methodology metrics – proposed accuracy and bias thresholds

	Threshold	Baseline Eligibility Assessment	Baseline Compliance Testing
Accuracy	20%	RRMSE value calculated for the load, over all of the minimum required eligibility days for all the TIs in the eligibility TIs widow for that baseline methodology, has to be equal to or lower than the accuracy threshold specified.	RRMSE value calculated for the WDRU, over all of the minimum required compliance days for all the TIs in the compliance TIs window for that baseline methodology, has to be equal to or lower than the accuracy threshold specified.
Bias	2% to 5% (to be finalised)	ARE value calculated for the load, over all of the minimum required eligibility days for all the TIs in the eligibility TIs widow for that baseline methodology, has to be equal to or lower than the bias threshold specified.	ARE value calculated for the WDRU, over all of the minimum required compliance days for all the TIs in the compliance TIs widow for that baseline methodology, has to be equal to or lower than the bias threshold specified.

In determining the baseline methodology metrics AEMO must have regard to:

- First, the need to not distort the market.
- Second, the need to maximise the effectiveness of the WDR scheme at least cost to consumers.
- Third the level of accuracy achieved by the demand forecasts used by AEMO.

In relation to the first and second requirements:

- A very strict accuracy threshold would exclude many participants who may be able to participate, which reduces the effectiveness of the WDRM.
- An overly-generous (high) accuracy threshold would likely lead to inefficient dispatch and increased uncertainty as to the amount of demand response available.
- The larger the bias threshold, the more likely the market will be distorted. Participants with positive bias will be over-paid relative to the actual demand reduction provided and vice versa participants with negative bias. This situation may result in selective participation by participants with positive bias, leading to a consistent mis-direction of value in the market.

Accordingly, AEMO's view is that:

- The accuracy threshold should be as generous as possible, without leading to operational difficulties.
- The bias threshold should be as low as possible to minimise market distortion, without excluding too many potential participants.

In this regard, the assessment[1] by consultants Oakley Greenwood of a variety of RERT-like baseline methodologies indicates that:

- An accuracy threshold of 10% would result in an estimated:
    - 3.7% to 4% of NMIs with annual consumption of 160 MWh to 750 MWh being eligible for WDRM.

[1] Analysis undertaken by Oakley Greenwood was performed on a per day basis (for TIs 32-40) per quarter. The eligibility rate represented in the analysis is the % of NMIs that would achieve the accuracy threshold on all days of a quarter. For WDRM, eligibility/compliance would be assessed over the total eligibility/compliance days for the baseline methodology, likely resulting in a higher level of eligibility than indicated by the Oakley Greenwood analysis.

    - 11.7% to 11.9% of NMIs with annual consumption of 750 MWh to 100 GWh being eligible.
- An accuracy threshold of 20% would result in an estimated:
    - 17% to 20% of NMIs with annual consumption of 160 MWh to 750 MWh being eligible.
    - 34% to 37% of NMIs with annual consumption of 750 MWh to 100 GWh being eligible.

In its WDRM final determination, the AEMC stated that the metrics determined by AEMO should require baselines to exceed the level of accuracy considered 'good' in the RERT scheme. Specifically, this means an accuracy threshold of no more than 10%[2]. However, the RERT scheme currently has an accuracy threshold of 20%. Further, it measures accuracy on an aggregate basis, while under the WDRM, accuracy will be calculated for each NMI.

In AEMO's view, at the commencement of the WDRM, an accuracy threshold of 20% is justified to account for the fact that accuracy is measured at the NMI level and to allow levels of participation which ensure the effectiveness of the WDRM.

The assessment by consultants Oakley Greenwood indicated that the median ARE scores, used to measure bias, were under 1% for a variety of RERT-like baseline methodologies tested. Accordingly, a bias threshold of between 2%-5% is likely to allow a reasonable proportion of NMIs to be eligible for WDR, while ensuring that calculated baselines are not overly biased in either direction. The final bias threshold will take into consideration any additional analysis received from Oakley Greenwood and feedback received during the consultation.

If the thresholds set for accuracy and bias are deemed too low or too high, AEMO can amend the baseline methodology metrics under NER clause 3.10.2(a). AEMO will review the metrics after the first summer of WDRM operations and will consult market participants on any changes if needed.

Questions

- Is there any additional clarifying information required in the Policy regarding the proposed statistical methods for baseline eligibility assessment and baseline compliance testing?
- Is there any participant feedback on the proposed accuracy threshold?
- Is there any participant feedback on the proposed bias threshold?

3.3 Draft eligibility and compliance settings

The draft eligibility and compliance settings for the three baseline methodologies most likely to be implemented for the start of the WDRM are shown in

[2] Oakley Greenwood, Baselining the ARENA-AEMO Demand Response RERT Trial, prepared for ARENA, September 2019

Table 2.

These settings are:

- Detailed in the Baseline Methodology Register, which is yet to be finalised.
- Preliminarily provided in this Policy for information, to give a sense as to the likely application of the eligibility and compliance processes to a particular baseline methodology.

Table 2 - Baseline methodology – draft eligibility and compliance settings

	Minimum no. of eligibility days	Eligibility TIs window	Minimum no. of compliance days	Compliance TIs window
Weekdays	50 calendar days	10am to 8pm	50 calendar days	10am to 8pm
All days	50 calendar days	10am to 8pm	50 calendar days	10am to 8pm
Weekends and public holidays	20 calendar days	10am to 8pm	20 calendar days	10am to 8pm

3.3.1 Minimum number of eligibility/compliance days

Each baseline methodology has a minimum number of eligibility/compliance days required for the baseline eligibility assessment or baseline compliance testing to be performed. Eligibility/compliance days are days immediately preceding the day of the baseline eligibility assessment or baseline compliance testing, up to the minimum number of eligibility/compliance days specified.

If a load does not have a minimum number of eligibility days (i.e. a new load), then the baseline eligibility assessment cannot be performed for the load.

For each baseline methodology, the number of eligibility/compliance days proposed is equivalent to 7-10 weeks of days relevant to that baseline methodology (see Table 1). This approach allows a sufficiently long timeframe to assess a load's predictability against the baseline compliance metrics, but not so long as to span changing seasons.

3.3.2 Eligibility/compliance TIs window

The eligibility/compliance TIs window refers to the trading intervals from which meter data is taken for the load, for the purpose of conducting baseline eligibility assessment or baseline compliance testing.

AEMO considered two factors when choosing the proposed window:

- When WDR is likely to happen.
- How opportunities for gaming could be reduced.

AEMO assumes that activation for the purposes of the WDRM will be primarily based on wholesale price levels. Oakley Greenwood analysed the top 100 price intervals in each of the NEM regions in each of the years 2017, 2018 and 2019. The analysis revealed that:

- Most price events occur in summer and winter, with a large number in January.
- Events tend to occur during consecutive intervals over a couple of days during trading intervals 30 to 40, with a high tendency to occur in intervals 36 through 38 (analysis of 30 minute trading intervals).

AEMO believes that if the eligibility/compliance window is too narrow, then gaming would be more likely. This is because, while baseline methodology eligibility/compliance is measured across the proposed TIs window, nonetheless the WDRU may be bid in and dispatched any time during the day. Accordingly, if the eligibility/compliance window is too narrow, a WDRU could be bid in at times when its baseline is not sufficiently predictable to meet the relevant accuracy/bias thresholds.

In conclusion, the trading intervals from 10am through to 8pm are proposed as the eligibility TIs window and compliance TIs window.

Questions

- Is there any participant feedback on the proposed minimum number of eligibility/compliance days?
- Is there any participant feedback on the proposed eligibility/compliance TIs window?

3.4 Baseline eligibility assessment

Under NER clause 2.3.6(e)(5), for the purposes of WDRU classification, a DRSP must demonstrate that the baseline methodology, when applied to the load and using the proposed baseline settings and historical metering data for the load, produces a baseline that satisfies the baseline methodology metrics and any other criteria in the WDR guidelines.

Questions

- Is there any additional clarifying information required in the Policy regarding baseline eligibility assessment?
- Are there any unintended/adverse consequences of the baseline eligibility assessment framework as described in the Policy?

3.5 Baseline compliance testing

To participate in the WDRM, a NMI which is part of a WDRU must maintain a predictable load for which baseline energy can accurately be estimated (i.e. satisfy the baseline compliance standard). This predictability of load is determined through the baseline compliance testing, using the baseline compliance metrics.

Under NER clause 3.10.4(a), the baseline compliance standard is satisfied by a WDRU if the approved baseline methodology, when applied to the WDRU using the approved baseline settings, produces a baseline that satisfies the baseline methodology metrics. Such a WDRU is said to be baseline compliant. Otherwise, the WDRU is said to be baseline non-compliant.

3.5.1 Frequency of testing

AEMO proposes that baseline compliance testing be undertaken at least twice per calendar year, indicatively during:

- Winter in June.
- Summer in late November/early December.

AEMO believes that this is a reasonable frequency, which does not place excessive administrative burdens on either DRSPs or AEMO. AEMO may also undertake baseline compliance testing at any other time of the year at its discretion, for all WDRUs, or any particular WDRU.

At this stage, AEMO does not foresee the need for different frequency of testing for different WDRUs or classes of WDRU.

Questions

- Is there any additional clarifying information required in the Policy regarding baseline compliance testing?
- Are there any unintended/adverse consequences of the baseline compliance testing framework as described in the Policy?
- Is there any participant feedback on the proposed frequency of baseline compliance testing?

4. DRAFTING OF PROCEDURES

To help stakeholders and other interested parties to respond to this Issues Paper, AEMO has published the draft Policy with this report.

5. SUMMARY OF MATTERS FOR CONSULTATION

In summary, AEMO seeks comment and feedback on the draft Policy.

Submissions on these and any other matter relating to the proposal discussed in this Issues Paper must be made in accordance with the Notice of First Stage of Consultation published with this Issues Paper, by 5.00 pm (Melbourne time) on 5 February 2021.

APPENDIX A - GLOSSARY

Term or acronym	Meaning
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator Limited
ARE	Average Relative Error
DRSP	Demand Response Service Provider
NEM	National Electricity Market
NER	National Electricity Rules
Procedures	Baseline Eligibility Compliance and Metrics Policy
RRMSE	Relative Root Mean Squared Error
TI	Trading Interval
WDRM	Wholesale Demand Response Mechanism
WDRU	Wholesale Demand Response Unit