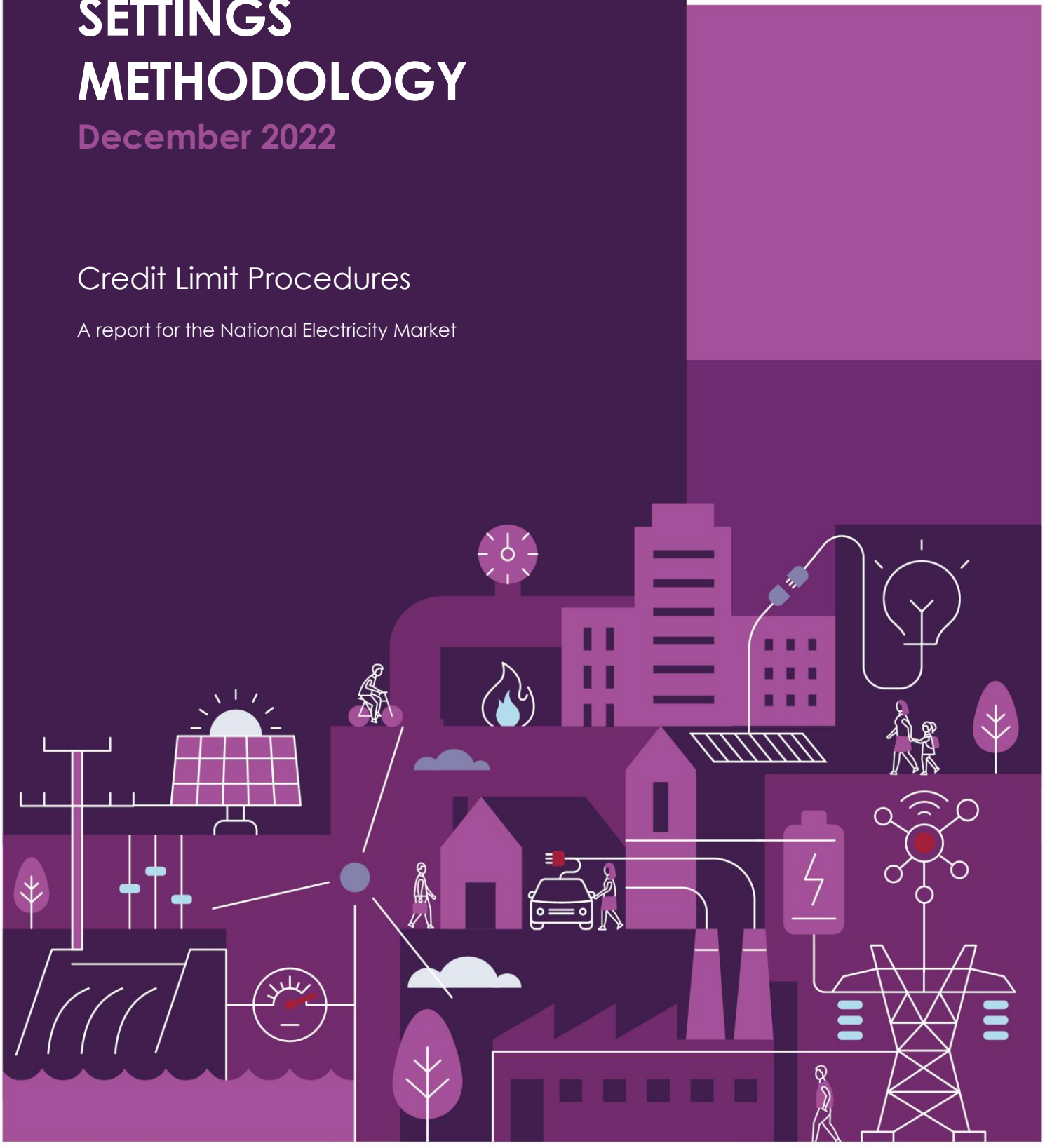
REPORT: EFFECTIVENESS OF THE NEM PRUDENTIAL SETTINGS METHODOLOGY

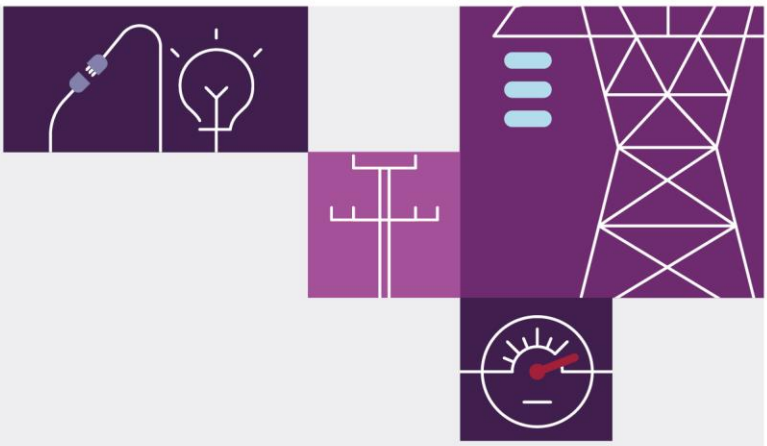
December 2022

Credit Limit Procedures

A report for the National Electricity Market

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR





Important notice

Purpose

AEMO has prepared this document to provide information about the effectiveness of the methodology used to determine the prudential settings for Market Participants, as at the date of publication.

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Version control

Version	Release date	Changes
1	16/12/2022	Final Report

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Executive summary

Under the National Electricity Rules (NER) clause 3.3.8(f), AEMO is required to annually review and publish its findings on the effectiveness of National Electricity Market (NEM) Prudential Settings Methodology. The 2022 review analysed prudentials data from 1 September 2021 to 31 August 2022, assessing whether:

- Maximum Credit Limits (MCL) were set appropriately.
- The prudential standard was met.

The 2022 review found that MCLs were set sufficiently for the summer and shoulder seasons but were significantly exceeded by outstandings between May and August 2022. This was due to a large mismatch between the forecast prices used in the MCL calculations and actual prices. Analysis from the last two years indicates that increasingly winter is more likely to be the environment of higher prudential risks.

Over the review timeframe, guarantee levels were well above MCL requirements, indicating that participants were aware of the limitations of the MCL calculations, and continued to provide additional credit support above their MCL. Over the May to August period, there was a very large number of trading margin breaches, and consequently AEMO held a very large amount of security deposits (close to a billion dollars) used by participants to manage their prudential positions.

The prudential standard was not met in most regions over the analysis period, being exceeded in the NSW region at 2.83% and the QLD region at 2.66% in the VIC region at 3.14% and the TAS region at 5.17%. The high price events of winter 2022 were almost entirely responsible for the increase in exceedance.

While the prudential standard was significantly exceeded in most regions, there were only two shortfall events over the analysis timeframe, occurring as a result of the extreme market conditions of May to August 2022, and resulting in very small shortfall amounts. The potential impact of numerous default events and the shortfall events was significantly mitigated by AEMO's highly responsive operational processes that minimise, in close to real time, the risk of a payment shortfalls.

The prudential standard being exceeded in most regions and the mismatch between forecast prices used in MCL calculations and actual prices, indicates that AEMO has to implement some changes to the Credit Limit Procedures (CLP) and/or prudential processes to ensure MCLs are adequate, and the 2% prudential standard is met in the future. These changes will include amendments to the CLP to allow AEMO to reassess market participant credit support requirements during extreme market conditions, and updates to the volatility factor percentiles. AEMO will also explore additional ways the Rules, the CLP and the regional model used for price and volatility forecasts could be updated to ensure the prudential standard is met in the future.

For any further enquiries, please email Prudentials@aemo.com.au.

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1 Background

The New Prudential Standard and Framework sits under Clause 3.3 of the NER (National Electricity Rules). Its key features are outlined in AEMO's Credit Limit Procedures (CLP)[1]. The first MCL review conducted in accordance with the new Framework, was effective on 28 November 2013.

1.1 Credit Limit Procedures

The CLP[2] establish the methodology for determining the prudential settings and calculating the MCL, and hence credit support requirements for market participants, in a way that allows the 2% prudential standard to be met. The MCL for each participant for each season is calculated according to the formula:

Maximum Credit Limit = Outstandings Limit + Prudential Margin

Where:

- Outstandings Limit (OSL) reflects the level of credit support needed to cover liabilities for all trading periods that have occurred but not yet been paid for, assuming no market participant is failing.
- Prudential Margin (PM) reflects the credit support buffer intended to cover accruing liabilities in the NEM during the reaction period (seven days), which relates to the time it may take to curtail any further liabilities accruing from a failing market participant.

The key features of the MCL calculation include:

- MCL typically[3] calculated over three seasons - summer, winter, and shoulder[4].
- Seasonal differences in regional reference prices (RRP) and price and load volatility in each region are accounted for through volatility factors (VFs).
- The relative risk of a market participants energy profile is reflected using Participant Risk Adjustment Factors (PRAF) that express the relationship between regional load and a market participant's marginal loss factor (MLF) adjusted load.
- Changes in market participant MCL requirements are smoothed over corresponding seasons, with seasonal data considered as a continuous series, over the lifespan of the NEM.
- For each region, the level of volatility consistent with the prudential standard is calculated using historical regional load, RRP and relevant time period.

Further features of the CLP, together with the applicable prudential settings are summarised in Appendix 1.

[1] See https://www.aemo.com.au/-/media/files/electricity/nem/settlements_and_payments/prudentials/credit-limit-procedures.pdf?la=en

[2] See https://www.aemo.com.au/-/media/files/electricity/nem/settlements_and_payments/prudentials/credit-limit-procedures.pdf?la=en

[3] In 2022, AEMO did not run the scheduled 'shoulder' MCL review due to the challenging market conditions, with participant MCL for the shoulder season being the same as for the winter season.

[4] Summer (December to March), winter (April to September), shoulder (October to November)

1.2 Prudential standard

A key aspect of the CLP is the prudential standard. The prudential standard set at 2% under NER clause 3.3.4A. In practical terms, this means the prudential arrangements establish a target of no payment shortfall in the market in 98 out of 100 instances of a retailer defaulting on their market payments, that is, the retailer exceeds their outstandings limit, subsequently defaults, and is removed from the market. In the remaining two of 100 instances, AEMO would hold insufficient prudential collateral, resulting in a payment shortfall to the remaining market participants who are net creditors in the market (considering both energy and reallocations).

1.3 CLP Changes in 2022/2023

AEMO has commenced two consultations on the CLP in 2022:

- Proposed amendments for implementing prudential requirements for stand-alone power systems (SAPS) market participants (completed as of December 2022).
- Proposed amendments with respect to reassessing market participant prudential settings during extreme market conditions (ongoing as of December 2022).

In 2023, AEMO will also be consulting on proposed changes to the CLP in relation to the National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021. There may also be further consultations undertaken on other matters.

An update on all consultations, undertaken during the next year will be provided in the 2023 annual report.

2 Analysis

Under the NER, AEMO is required to annually review and publish its findings on the effectiveness of Credit Limit Procedures. The analysis period for this review encompassed data from 1 September 2021 to 31 August 2022, including the 2021 shoulder, 2022 summer and the 2022 winter seasons. The review assessed whether:

- MCL levels were set appropriately.
- The prudential standard was met.

2.1 Setting of MCL levels

This analysis reviews key prudential indicators in aggregate for the market, including the minimum credit support requirements as calculated by AEMO (total MCL), the total outstandings in addition to the amount of bank guarantees, and cash provided to AEMO by market participants. The analysis examines trends over both the short and long term and the relationship between these indicators and what can be deduced about the effectiveness of prudential settings overall.

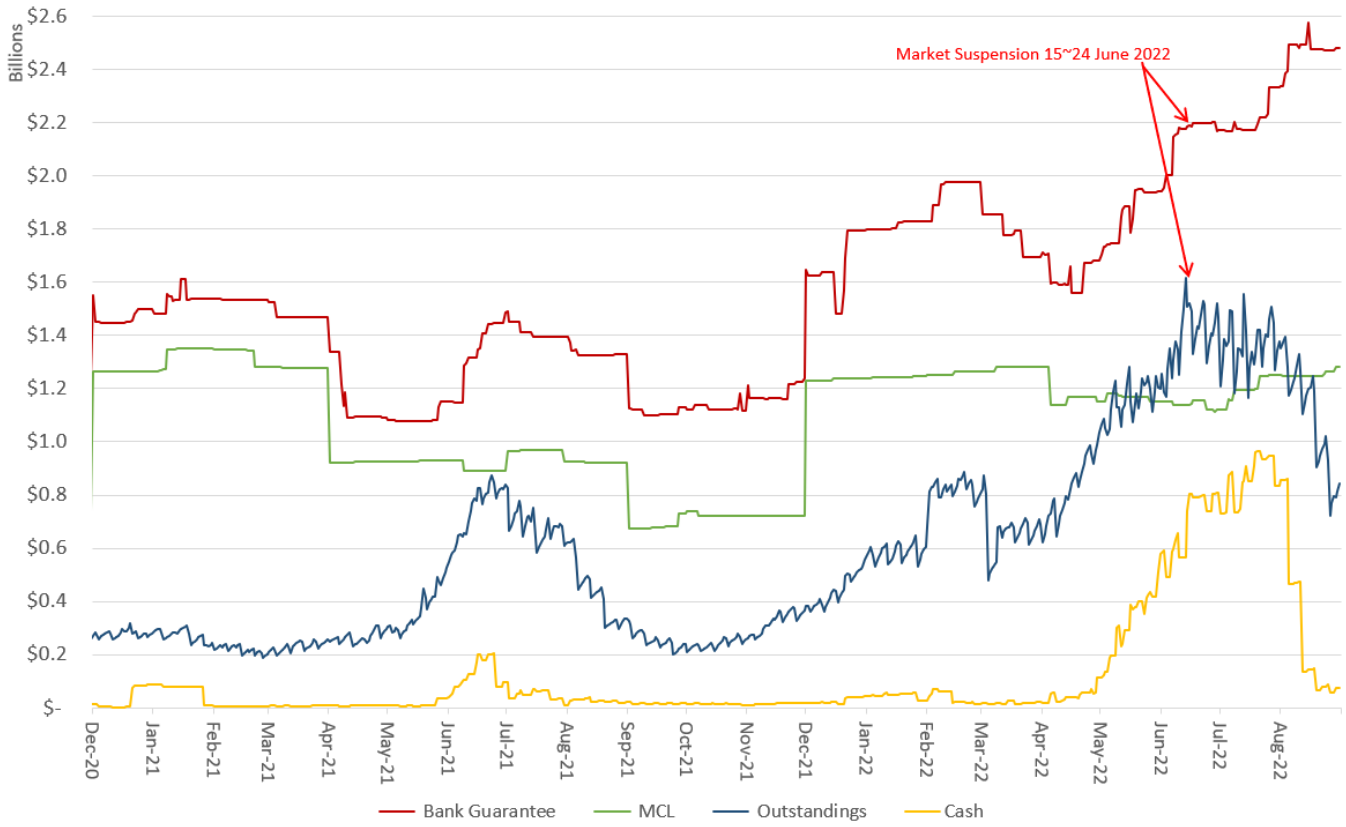
2.1.1 Short term prudential trends

Figure 1 shows the total MCL[5] and total outstandings[6] as well as total guarantees and cash (security deposits) provided by market participants over a 21-month time period.

[5] Sum of calculated MCLs for all market participants.

[6] Sum of outstandings for all market participants.

Figure 1 Key prudential indicators (1 December 2020 – 31 August 2022)



Key observations:

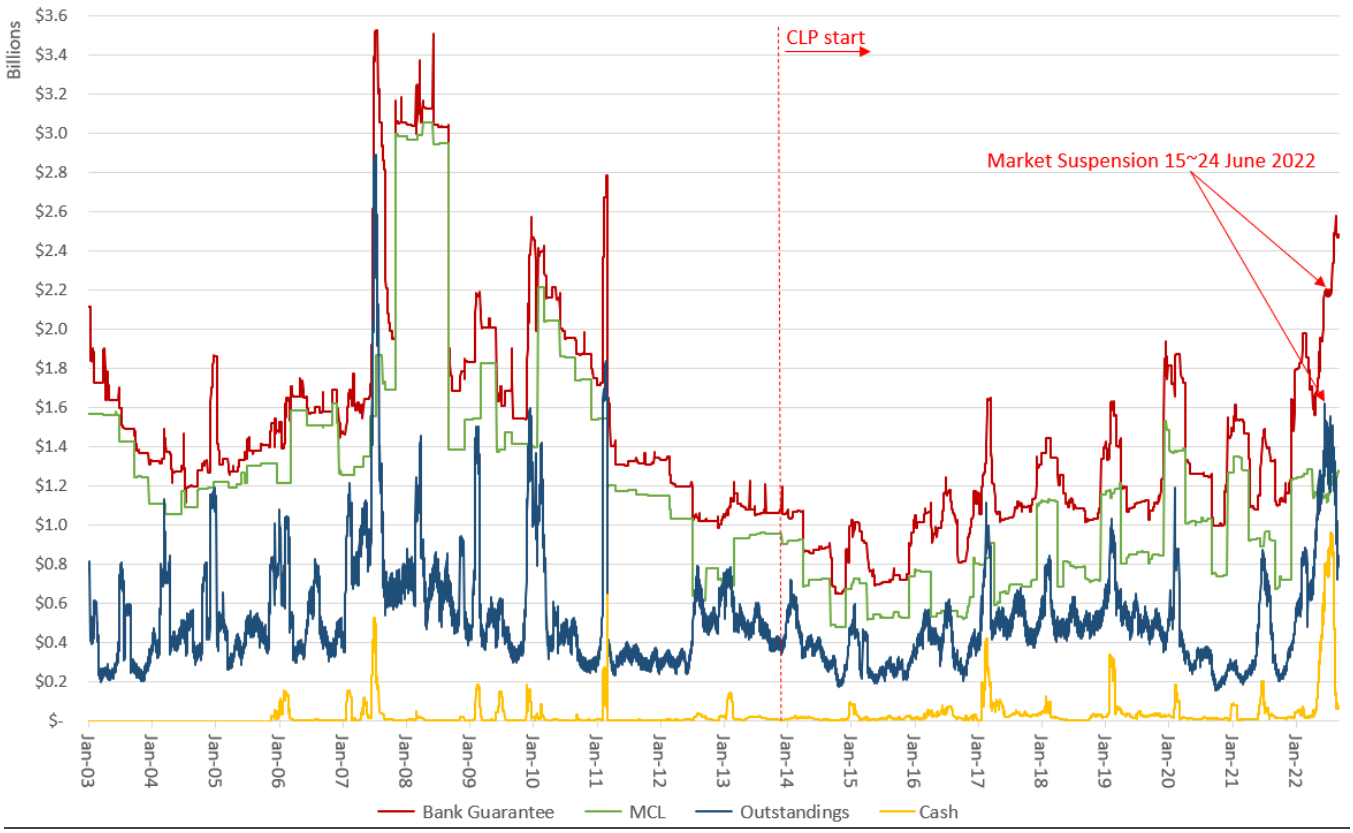
- Guarantees levels, as has been the case for many years, were well above the MCL requirements, with a particular big gap opening up between the two over the May to August period in 2022. This shows that participants are aware of the limitations of the MCL calculations and continue to provide additional credit support above their MCL levels and adjust their credit support coverage to suit the conditions in each season.
- Total MCL levels for the 2022 summer season were very similar to the previous summer. Market participants provided additional guarantees well above their MCL requirements, indicating that they believed there was a need for additional prudential support for the 2022 summer period. As usual for the time of year, participants provided extra security deposits during the Christmas and New Year holiday season.
- While from a prudential standpoint, summer 2022 was relatively uneventful, with MCLs adequately covering outstandings and minimal use of security deposits, it is clear from Figure 1 that outstandings started their upward trajectory around November 2021, increasing over summer and then increasing dramatically from May 2022 onwards.
- The outstandings levels in the winter seasons were significantly higher than summer seasons in 2021 and 2022. This suggests that increasingly winter is more likely to be the environment of higher prudential risks.

- Outstandings levels exceeded the MCL levels significantly between early-May and mid-August in 2022, peaking on 13 June 2022. This was due to very high prices together with the limitations of the CLP which is uses regional prices from the previous seasons (instead of the recent prices) in the MCL calculations.
- The biggest increase in outstandings occurred in the 2nd week in June 2022, with the market suspended after this week. The market suspension event started the downward trend in outstandings, with outstandings eventually returning to the normal range in late August 2022.
- Bank guarantee levels trended upwards along with outstandings and continued increasing after the outstandings passed their peak. This indicates that market participants anticipated that the high price period would continue and were mitigating the potential risks by providing additional credit support. Under such challenging conditions, this demonstrates market participants' financial resilience and their confidence in the market, despite the ongoing events at that time.
- The very high outstandings together with low MCLs meant that there were a large number of trading margin breaches in 2022. There were in fact more trading margin breaches in May/June of 2022, than in the combined years of 2018, 2019 and 2020.
- To manage trading limit breaches over the May to August period, market participants increasingly provided AEMO with a large amount of security deposits (reaching nearly one billion dollars), which AEMO had to hold for extended periods.
- A large amount of cash was returned to market participants after the July billing weeks had been settled, with a clear downward trend in outstandings. From August onwards, security deposit levels reduced significantly even though outstandings were still higher than usual and this was due to an increase in long-term credit support provided to adequately cover outstandings.
- There was a significant decrease in the total value of MWh reallocations from 1 July 2022 and consequently, the overall value of MCL levels increased at this time.
- There were no significant impacts was observed in the prudentials space, from the implementation of 5-minutes settlement, global settlement and the wholesale demand response mechanism.

2.1.2 Long term prudential trends

Figure 2 looks at the levels of total MCL, guarantees, cash and outstandings over the entire life of the NEM.

Figure 2 Key prudential indicators (Life of NEM)



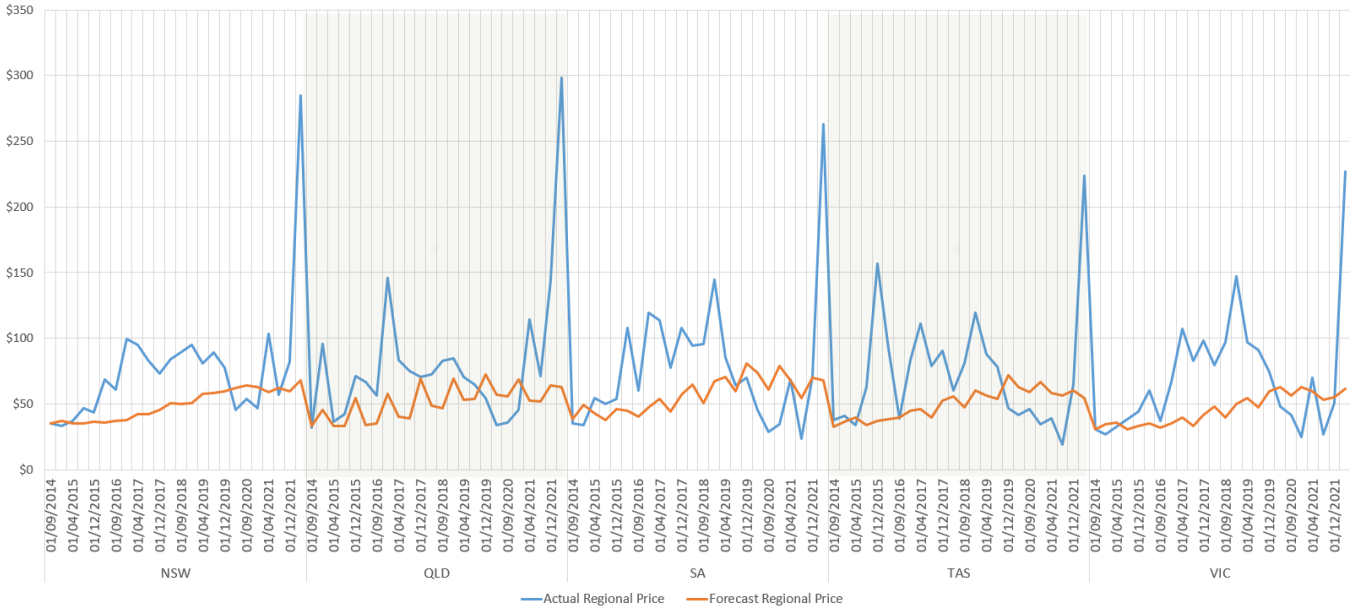
Key observations:

- The general behaviour of market participants, in managing their prudentials, has been fairly consistent over the years since the introduction of the CLP. The key behaviours are:
    - Providing guarantees significantly above MCL levels for all seasons.
    - Using cash to manage periods of high outstandings.
- Outstandings had a step increase from late 2016, due to price and volatility increases in all regions until 2020. This was followed by a reduction in outstandings, with outstandings hitting a record low in October.
- After a 20-month stable period, the May 2021 QLD power outage event triggered a rapid up-trend in outstandings. There were no further events impacting outstandings until a sustained high price period from May 2022 until the market suspension in June 2022.
- Outstandings reached their highest level under the CLP between May and Aug 2022, with a peak of approximately $1.6 billion on 13 June 2022. This is, however, still below all-time peaks in outstandings in 2007 and 2011 (prior to the CLP starting and under a different prudentials methodology).

- MCL levels have been changing at a slower rate than outstandings have been changing and this is due to the design of the CLP which aims to smooth changes in MCLs resulting from one-off changes to prices and volatility, while responding to longer-term trend changes.
- There were no periods where the MCL was below outstandings from January 2017 until the May to August period in 2022.
- As was typical in the past years and currently, Market participants continue to use security deposits during periods of high outstandings (usually due to transient high prices, such as the high price events between May and August 2022).

Figure 3 shows regional forecast prices (used in MCL calculations) in comparison to actual prices over MCL seasons, during the past 8 years. As shown, forecast prices are steady and slowly changing over time (as is the intention under the CLP), while actual prices have very large up and down swings over various MCL seasons.

Figure 3 Regional forecast prices compare to actual prices (2014-2022)



Key observations:

- In all regions, actual prices were at a low point in 2014 and early 2015, started to trend up from mid-2015 and continued to climb until 2019. After 2019, actual prices remained moderate, except for the price spikes in NSW and QLD between May and July 2021 (2021 winter season). Actual prices increased dramatically in all regions in 2022, beyond all previously seen price spikes.
- Since 2016, the actual prices have been constantly higher than the forecast prices except in 2020. This was especially acute over winter 2022, when actual prices were 2 to 3 times higher than the forecast prices in all regions.
- Forecast prices movements lag behind actual prices changes in all regions under the current CLP price forecasting methodology. The methodology in the CLP has been designed to smooth changes in market participants required MCLs from one season to the corresponding season in the following year resulting from one-off changes to average regional prices and volatility, while responding to longer-term trend

changes. This, in practical terms, has meant that the regional mode[7] is slow to respond to price rises and it takes significant time for forecast prices to "catch-up" with step changes in prices. This limitation in the CLP resulted a mismatch between the forecast prices and actual prices, specifically over the 2022 winter season.

- Additionally, while the CLP allows AEMO to revise market participant MCLs for load and reallocation changes, the MCL cannot be revised to reflect actual market prices significantly different from the forecast prices. This together with the very high prices of 2022, resulted in a significant mismatch between market participant MCLs and subsequent outstandings. This limitation in the CLP is being addressed through proposed changes to allow AEMO to revise market participant MCL under extreme market conditions and is out for consultation as of December 2022. Refer to section 2.4 for further details.

2.2 Meeting the prudential standard

2.2.1 Prudential probability of exceedance

The prudential standard is the value of the prudential probability of exceedance (POE), expressed as a percentage and is set at 2% (NER clause 3.3.4A). It is a theoretical calculation and does not consider AEMO's responsive prudentials processes or the significant level of the additional credit support provided by participants above their MCL requirements.

Exceeding the prudential standard does not mean that there is a payment shortfall in any given year. The purpose of the prudential standard is to provide a target within which AEMO seeks to maintain the risk of loss in the event of market participant default. The POE over the past 6 years, for each NEM region is shown Table 1. The changes in POE since the start of the CLP are shown in Figure 4. As shown, at the end of the current analysis period (31 August 2022), the prudential standard was exceeded in all regions except SA. The prudential standard was exceeded in the NSW region at 2.83% and the QLD region at 2.66% in the VIC region at 3.14% and the TAS region at 5.17%.

Table 1 POE for the past 6 years

	Prudential data to 30 November 2017	Prudential data to 31 March 2018	Prudential data to 31 March 2019	Prudential data to 31 August 2020	Prudential data to 31 August 2021	Prudential data to 31 August 2022
NSW	3.8%	3.7%	2.0%	2.0%	2.3%	2.83%
QLD	3.6%	3.6%	2.3%	1.5%	1.8%	2.66%
SA	3.2%	3.2%	2.0%	1.3%	1.3%	1.90%
TAS	7.8%	8.3%	5.3%	4.7%	4.4%	5.17%
VIC	3.9%	4.0%	3.0%	2.6%	2.6%	3.14%

Between 2019 and 2021, the POE in the NSW and QLD regions was close to 2%. While the POE in the VIC region was above 2% for the past 6 years, it stabilised at 2.6% in 2020/2021. The POE for the TAS region has

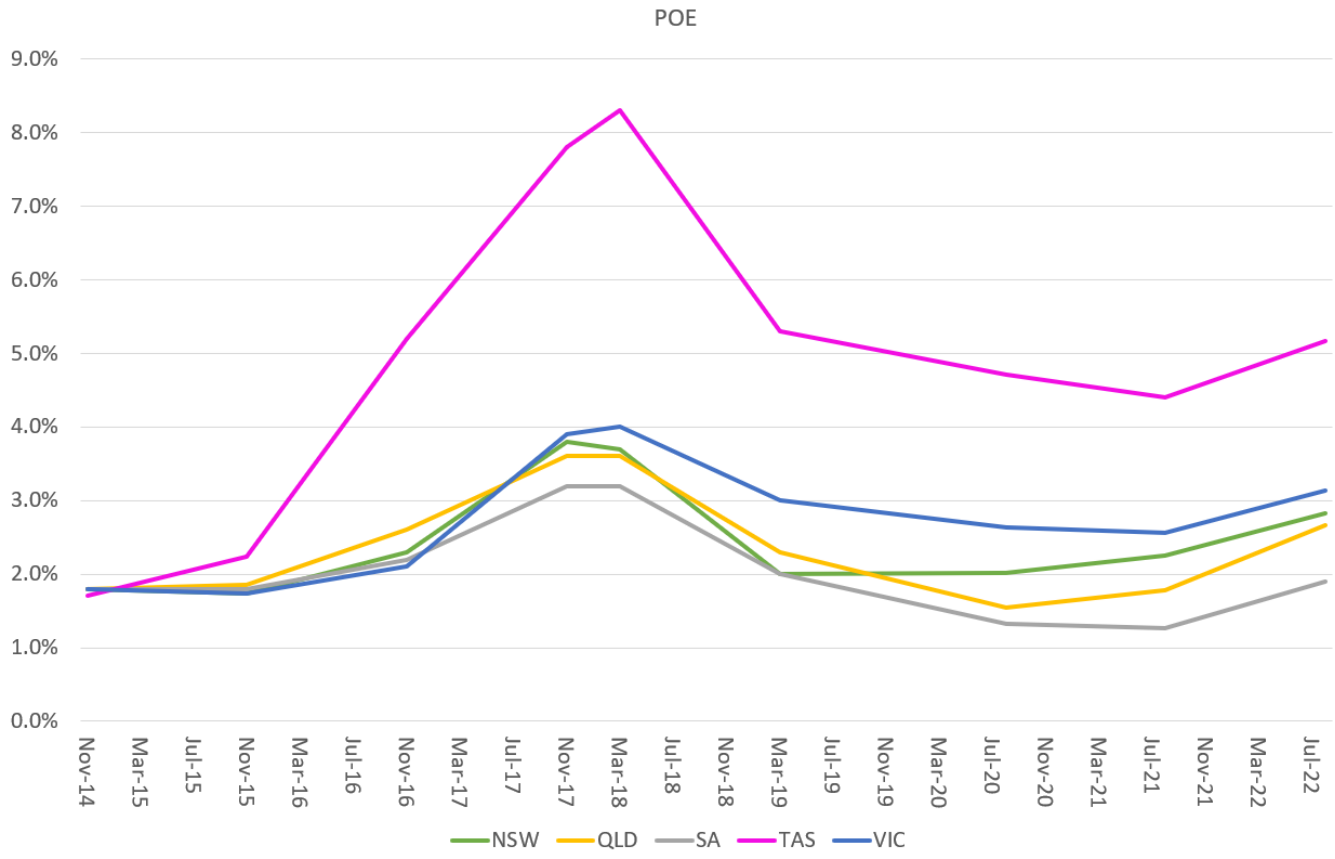
[7] The regional model is used by AEMO to forecast average regional prices and volatilities based on past NEM data.

always been higher than other regions, due to an artefact of the modelling[8], but has also been on a downward trend since 2019. Over the analysis period, these four regions all had a significant uplift in POE, with the high price events of 2022 being almost entirely responsible for the increase.

The POE for SA has been lower than the 2% prudential standard for the last few years and is still below 2% after the events of 2022. This indicates that the volatility factor for the SA region may need to be recalibrated. The recalibration of the VF percentiles to align with the 2% prudential standard is scheduled in mid-2023 (after 2023 summer season finishes). The VF percentiles for the other regions will likely increase to 100% if they are not yet at 100%.

Unless changes are made to the way MCLs are calculated and or the regional model, AEMO does not anticipate the POEs will return to 2% in the NSW, QLD, VIC and TAS regions in the near future.

Figure 4 Changes in POE over time



Key observations:

- There was an uplift in POE for all regions from 2016, plateauing out over 2017/2018 and then falling from 2018 to 2021. There was an uplift in the POE for all regions in 2022 due to the high price events in 2022 winter.

[8] The TAS region joined the NEM in 2006 (1999 for all other regions), resulting in a smaller data set being available to use in the regional model, and making it harder for the prudential standard to be met. This, together with the Basslink outage in 2016, is why the prudential standard has not been met in the region over the past 5 years, even with the VF percentile set at 100%. AEMO's previous analysis (2017 CLP Effectiveness Review) indicates that if the effect of the 2016 Basslink outage is excluded, the 2% prudential standard could be reached.

- The 2% prudential standard represents a target of no payment shortfall in the market in 98 out of 100 instances of market participant default and subsequently removed from the market. There were no payment shortfalls in 2017/2018 when the prudential standard was also significantly exceeded. However, there were two shortfall events over the 2022 winter period at similar POE levels.
- The POE is calculated over the life of NEM. Thus, exceeding the 2% prudential standard indicates a higher risk of payment shortfall overall, but it does not indicate a payment shortfall in any given year. Over the 2017/2018 period, although the number of prudential exceedances[9] were high (resulting in a high POE), the dollar amounts of the outstandings exceedances were relatively small, and the exceedance occurrences were spread out over a longer timeframe. However, in 2022 winter, the dollar amounts of the outstandings exceedances were large and the exceedances occurred in the same time period, concentrating the prudential risks.
- When the same number of exceedances are spread out over a longer period of time, the likelihood of payment shortfall is lower as it allows some 'breathing time' for the market participant and AEMO to react, e.g. market participants have more time provide additional credit support and AEMO has more time and data to revise the MCL levels.
- When actual prices are significantly higher than the forecast prices used in MCL calculations, the dollar value of the exceedances is larger. This was the case for winter 2022, when very high prices lasted for many weeks.

2.2.2 Implications of not meeting the prudential standard

While the prudential standard was not met in most of the regions, and in some cases was significantly exceeded, there were only two settlement payment shortfall events during the analysis timeframe. Both settlement shortfall events occurred in 2022 due to the extreme market conditions from May to August and the amounts were insignificant overall.

The potential impact of numerous default events and the two shortfall events were significantly mitigated by AEMO's highly responsive operational processes that minimise, in close to real time, the risk of market settlement payment shortfalls. AEMO continues to improve its prudential processes and the way it manages new and existing challenges in the market.

Between 2018 and 2019, AEMO identified that forecast prices were lagging significantly behind actual prices, resulting in low MCL levels, and contributing to POE levels being above the 2% prudential standard. To address this, AEMO implemented some changes to the CLP and the regional model. These changes resulted in prudential requirements being better aligned with actual market conditions and are reflected in the lower POE values in 2019, 2022 and 2021.

The extreme market events of 2022 have indicated that further changes need to be made to prudential process and the CLP so that the 2% prudential standard can be met in the future. Please see Section 2.4 for details.

2.2.3 Regional model recalibration

The regional model was recalibrated in 2019 through the adjustment of the Volatility Factor (VF) percentiles to reflect market conditions more accurately.

[9] A prudential exceedance is a day when a market participant's MCL is exceeded by its outstandings at the end of the reaction period following the Market Participant exceeding its OSL on any day and failing to rectify this breach.

The VF percentiles are adjustable variables that can be used to recalibrate the regional model, with the aim of meeting the 2% prudential standard. The recalibrated VF percentiles adjusted to meet the 2% prudential standard, and currently used in the regional model are shown in Table 2.

The next scheduled recalibration of AEMO's regional model will be in mid-2023 (after the completion of the 2023 summer season). AEMO anticipates that the VF percentiles will be set at 100% (the maximum) for all regions except SA and will exceed the 2% prudential standard in most regions.

Table 2 Volatility factor percentiles

Region	VF percentiles
NSW	99.8%
QLD	100.0%
SA	99.0%
TAS	100.0%
VIC	100.0%

2.3 Conclusions

MCL levels

- MCLs were set at a sufficient level for the summer and shoulder seasons in the analysis period. MCL levels were significantly exceeded by participant outstandings between May and August 2022. This was due to a significant mismatch between forecast prices used in the MCL calculations and the actual prices.
- The outstandings levels in the winter seasons were significantly higher than summer seasons in both 2021 and 2022. This suggests that increasingly winter is more likely to be the season with higher prudential risks.
- Guarantees levels were well above the MCL requirements, with a particular big gap opening up between the two over the May to August period in 2022. This shows that participants are aware of the limitations of the MCL calculations and continue to provide additional credit support above their MCL levels and adjust their credit support coverage to suit the conditions of each season.
- To manage trading limit breaches during the May to August period, market participants increasingly provided AEMO with a large amount of security deposits (reaching nearly one billion dollars), which AEMO held for extended periods.
- While generally higher market prices will be wound into the forecast prices used in MCL calculations over time, this is a slow process under the current methodology, meaning that actual prices may outstrip forecast prices for years to come, resulting in insufficient MCL coverage going forward. To address this, AEMO is proposing some changes to the CLP, as outlined in Section 2.4.
- No significant impact to prudentials was observed after the implementation of 5-minutes settlement, global settlement and the wholesale demand response mechanism or global settlements.

Meeting the prudential standard

- The prudential standard was exceeded in the NSW region at 2.83%, the QLD region at 2.66%, in the VIC region at 3.14% and the TAS region at 5.17%.

- All regions had a significant uplift in POE over the analysis period, with the high price events of 2022 being almost entirely responsible for the increase.
- AEMO does not anticipate the POEs will return to 2% in anytime soon under the current CLP methodology, for all regions bar the SA region which is already below the 2% prudential standard.
- While the prudential standard was not met in most of the regions, and in some cases was significantly exceeded, there were only two participants to cause shortfall over the analysis timeframe. The settlement payment shortfall amounts were insignificant, and both occurred as a result of the extreme market conditions of May to August 2022.
- The potential impact of numerous market participant default events and the two market participants that caused shortfall events was significantly mitigated by AEMO's highly responsive operational processes that minimise, in close to real time, the risk of settlement payment shortfall.

2.4 Intended actions

The prudential standard being exceeded in most regions and the mismatch between forecast prices used in MCL calculations and actual prices, indicates that AEMO has to implement some changes to the CLP and/or prudential processes to ensure MCLs are adequate, and the 2% prudential standard is met in the future. These changes will include:

- Amendments to the CLP to allow AEMO to reassess a market participant's credit support requirements to better align with accrued liabilities during extreme market conditions, with the aim of re-establishing the prudential standard. Under the proposal, AEMO would be able to re-assess market participants' credit support requirements to align with accrued liabilities when the participant's average current accrued liabilities over the prior 21 days exceeds the amount of credit support held by AEMO for the participant. AEMO started the consultation on these proposed changes on 18 November 2022, which should be implemented in 2023.[10]
- Updates of volatility factor percentiles to ensure they are set to be aligned with the 2% prudential standard. To be done post the 2023 summer season.

AEMO will also explore additional ways the Rules, regional model and/or the CLP could be updated to ensure the prudential standard is met in the future.

For any further enquiries, please email prudentials@aemo.com.au.

[10] See consultation documents at: https://aemo.com.au/consultations/current-and-closed-consultations/credit-limit-procedures-reassessing-mcl-in-extreme-market-conditions

A1. Key CLP features and relevant data

Table 3 CLP key features

Feature	Description/value
Definition of standard	Prudential Probability of Exceedance (POE)
Relevant time period for MCL	42 days (35 days outstanding period plus 7 days reaction period)
Measure of standard	2% POE target
MCL	MCL = Outstandings Limit + Prudential Margin
Basis of OSL and PM	Price x load x volatility OSL x 35 days Price x load x volatility PM x 7 days
Variance of MCL over the year	By season
Regions	MCL calculations are regionally based (NSW, QLD, SA, TAS & VIC)
Regional Reference price (RRP) used	Average price from NEM start for applicable season in each region
Volatility Factors (VF)	Volatility factor from NEM start for applicable season in each region
Volatility Factor percentiles	Calculated to meet the 2% prudential standard
Participant differentiation	Participants differentiated by load factor and load profile
PRAF	Express the relationship between regional load/generation/reallocations and the market participant's marginal loss factor (MLF) adjusted load/generation/reallocations.
Weighting factor – average regional load	70%
Weighting factor – average regional price	20%
Weighting factor – volatility factors	20%

The current prudential settings are described in Table 4 to Table 6. They specify the forecast volatility factors and average prices calculated for input to the prudential settings calculations for the 2022 winter, 2022 shoulder and the 2023 summer seasons.

AEMO did not conduct a scheduled MCL review for the 2022 shoulder season, thus, the prudential settings used in 2022 shoulder season are the same as 2022 winter. With the ongoing high energy price conditions in 2022 winter and the subsequent settlement shortfalls, the outcomes of a scheduled shoulder MCL review would have reduced the MCL requirements and were inconsistent with the objective of meeting the prudential standard.

Under the NER, AEMO is only required to review Market Participant MCLs at yearly intervals. Although AEMO's normal practice had been to conduct a scheduled review for all market participants on a seasonal basis, AEMO concluded that conducting a scheduled review for 2022 shoulder season would have exposed the market to a higher risk of further and larger shortfalls.

Table 4 Outstandings Limit Volatility Factor (VFOSLR)

Region	2022 Winter	2022 Shoulder	2023 Summer
NSW	1.52	1.52	1.56
QLD	1.53	1.53	1.51

Region	2022 Winter	2022 Shoulder	2023 Summer
SA	1.54	1.54	1.79
TAS	1.62	1.62	1.49
VIC	1.54	1.54	1.71

Table 5 Prudential Margin Volatility Factor (VFPMR)

Region	2022 Winter	2022 Shoulder	2023 Summer
NSW	2.28	2.28	3.04
QLD	2.12	2.12	2.98
SA	2.32	2.32	4.43
TAS	2.17	2.17	1.71
VIC	2.21	2.21	4.04

Table 6 Average Price (PR)

Region	2022 Winter	2022 Shoulder	2023 Summer
NSW	$67.70	$67.70	$64.23
QLD	$62.61	$62.61	$77.03
SA	$68.08	$68.08	$69.90
TAS	$54.47	$54.47	$61.23
VIC	$61.73	$61.73	$54.20

Table 7 specifies the regional Volatility Factor Percentiles consistent with the prudential standard as calculated for input to the prudential settings calculations.

Table 7 Volatility Factor Percentiles

Region	Volatility Factor Percentile
NSW	99.8%
QLD	100%
SA	99.0%
TAS	100%
VIC	100%

Glossary

This document uses many terms that have meanings defined in the National Electricity Rules (NER). The NER meanings are adopted unless otherwise specified.

Term	Definition
CLP	credit limit procedures
MCL	maximum credit limit
NER	National Electricity Rules
OSL	outstandings limit
PM	prudential margin
POE	prudential probability of exceedance
VF	volatility factor
WDR	wholesale demand response