REPORT: EFFECTIVENESS OF THE NEM PRUDENTIAL SETTINGS METHODOLOGY

CREDIT LIMIT PROCEDURES

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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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EXECUTIVE SUMMARY

In 2012, the New Prudential Standard and Framework was implemented in the National Electricity Market (NEM). The Australian Energy Market Operator (AEMO) has monitored and analysed its performance, and is currently satisfied it is performing as intended.

A key aspect of the Framework was establishment of a new Prudential Standard of 2%, and a revised maximum credit limit for market participants.

While AEMO does not suggest that authoritative conclusions about the Framework's effectiveness can be drawn from two years' observations, AEMO's review has found that the 2% Prudential Standard was met for 2015 for all regions except Tasmania (2.24%), and recommends no changes to the Credit Limit Procedures at this stage. AEMO will continue to closely monitor and review the effectiveness of the Framework and mitigate identified risks to ensure the Prudential Standard is met for the life of the NEM.

The Prudential Standard is the value of the prudential probability of exceedance (POE), expressed as a percentage. The prudential standard is 2%. The prudential POE represents the probability of a market participant's outstandings exceeding its maximum credit limit at the end of the reaction period (seven days) following an event wherein the market participant exceeds its outstandings limit on a given day, and subsequently fails to rectify the breach. The Credit Limit Procedures process is used by AEMO to determine the prudential settings for each Market Participant so that the Prudential Standard is met for the NEM over the long term. This is bearing in mind that actual market conditions can change from year to year. To determine each participant's prudential settings, AEMO applies the methodology outlined in the Credit Limit Procedures.

While there has never been a payment shortfall in the NEM, the 2% Prudential Standard target represents a significant improvement on the 4% POE previously carried under the former NEM prudential regime. Further, a comparative assessment against a previous year with similar levels of outstandings in the market suggests that this reduced POE has been achieved in conjunction with a reduction in market participants' maximum credit limit requirements, subject to variations in the quantity of electricity purchased in the market.

AEMO also assessed the effectiveness of participant risk adjustment factors (PRAFs) for 2015, and found that market participants appear to have benefited from the new PRAF methodology, in aggregate, with maximum credit limit requirements that better reflect the relative risk a participant poses to the market.

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 Credit Limit Procedures. Each year, AEMO will review the Framework, assess the merits of potential improvements, and publish its findings.

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1. BACKGROUND

1.1 The New Prudential Standard and Framework

The New Prudential Standard and Framework (the **Framework**) was implemented in 2012, and is located under Section 3.3 of the NER. Its key features are outlined in AEMO's Credit Limit Procedures.[1] The Framework replaced the previous NEM prudential regime, outlined in AEMO's Credit Limits Methodology based on a standard of reasonable worst case.

Under the Framework, the maximum credit limit for market participants is defined as:

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. (This would generally require the use of Retailer of Last Resort arrangements.)

A key aspect of the Framework is establishment of a Prudential Standard. The Prudential Standard is the prudential probability of exceedance (POE), expressed as a percentage. This is the probability of a market participant's maximum credit limit (MCL) being exceeded by its outstandings at the end of the reaction period (seven days), after the market participant exceeds its outstandings limit on a given day and has not rectified the breach. The new Prudential Standard is set at 2% (NER Clause 3.3.4A).

In practical terms, this means that the prudential arrangements establish a target that there will be no payment shortfall in the market in 98 out of 100 instances of a retailer defaulting on their market payments, i.e., the retailer exceeds their outstandings limit, subsequently defaults, and is removed from the market. In the remaining 2% of instances, AEMO's inability to collect sufficient funds following that participant's default, may result in a payment shortfall to remaining market participants who are net creditors in the market (considering both energy and reallocations).

1.1.1 How the Framework changed NEM prudentials

Table 1 summarises key differences between the previous NEM prudential regime (as outlined in the Credit Limits Methodology) and the Framework (as outlined in the Credit Limit Procedures).

Table 1 Key differences between the Credit Limits Methodology and the Credit Limit Procedures

	Credit Limits Methodology (previous)	Credit Limit Procedures (current)
Definition of standard	Reasonable Worst Case	Prudential Probability of Exceedance (POE)
Relevant time period for MCL	MCL = 42 days Reduced MCL[2] = 28 days	42 days

[1] http://aemo.com.au/Electricity/Settlements/Prudentials

[2] An option existed under the previous Rules for Participants to have their MCL calculated using a credit period of 28 days instead of 42 days. This was known as a "reduced MCL" or "RMCL". In such cases, the MCL was calculated using the same average price, load and volatility factors as are used in the standard MCL, but a shorter credit period was used in the calculation. This results in the Participant having a lower Trading Limit and lodging less initial collateral with AEMO, when compared to the standard MCL.

Measure of standard	4% POE (actual based on historical data)	2% POE target
MCL	Based on 42 or 28 (for RMCL) days	MCL = Outstandings Limit + Prudential Margin
Basis of OSL and PM	Price x load x volatility x days	Price x load x volatility OSL x days Price x load x volatility PM x days
Variance of MCL over the year	Approximately every 3 months	By season
Regional Reference price (RRP) used	Average price from previous year	Average price from NEM start for applicable season
Volatility Factor (VF)	Volatility factor from previous year	Volatility factor from NEM start for applicable season
Participant differentiation	Participants differentiated by daily load only	Participants differentiated by load factor and load profile

1.1.2 Credit Limit Procedures

The Credit Limit Procedures establish the process for determining the prudential settings, and calculating the required credit support for market participants to meet the Prudential Standard.

The key features of the methodology used are:

- MCL calculated over three seasons - summer, winter and shoulder[3].
- MCL accounting for seasonal differences in regional reference prices (RRP).
- MCL accounting for price and load volatility in each region through volatility factors (VFs).
- Use of Participant Risk Adjustment Factors (PRAFs) that express the relationship between regional load/generation and the market participant's marginal loss factor (MLF) adjusted load/generation. This is to adjust the OSL and PM to reflect the market participant's relative risk of their load/generation.
- Smoothing of changes in market participant MCL requirements over corresponding seasons. The approach considers seasonal data as a continuous series, over the lifespan of the NEM.
- For each region, only using load to calculate the level of volatility consistent with the 2% POE target, without adjusting for generation or reallocations.

1.1.3 Reviewing the Maximum Credit Limit under the Framework

AEMO performs MCL reviews for the summer, shoulder (1 and 2) and winter seasons every year. The 2014 Summer MCL review was the first conducted in accordance with the Framework, and was effective on 28 November 2013.

To date, a total of nine MCL reviews have been conducted. Those conducted following the previous annual report are listed below with the respective effective dates:

- 2015 Summer 2 December 2014
- 2015 Shoulder 1 1 April 2015

[3] The shoulder season is broken into two components Shoulder 1 and Shoulder 2 due to market participant preferences.

- 2015 Winter 5 May 2015
- 2015 Shoulder 2 1 September 2015
- 2016 Summer 1 December 2015

With the exception for 2016 summer, the data for all the MCL reviews conducted under CLP have been included in the analysis for this report. Data from the 2016 Summer MCL review are not included as the season is incomplete.

1.1.4 Carbon price repeal

Subsequent to the repeal of the *Clean Energy Act 2011* (CEA) that took effect on 1 July 2014, AEMO had amended the Credit Limit Procedures. These amendments were implemented in the 2014 Shoulder 2 MCL review, where we had:

- Adjusted the historical RRP.
- Recalculated the VF percentile for each region to meet the 2% prudential POE target over the life of the NEM.
- Recalculated the regional average prices and volatility factors for the 2014 Shoulder 2 season using the new VF percentiles and adjusted RRPs.
- Conducted the 2014 Shoulder 2 MCL review using new regional average prices and volatility factors.

The new VF percentiles have been used in all MCL reviews since the 2014 Shoulder 2 MCL review and will be used in all future MCL reviews until the calculation factors are reviewed according to the Credit Limit Procedures review process.

Information related to the Credit Limit Procedures on carbon price repeal can be found at:

http://aemo.com.au/Consultations/National-Electricity-Market/Credit-Limit-Procedures-Consultation-V2

2. ANALYSIS

2.1 Overview

To assess the Framework's performance, we analysed data for 2015, including data for 2015 Summer, 2015 Shoulder 1, 2015 Winter and 2015 Shoulder 2. The result of the analysis was then compared to the result tabled in the 2014 annual report. The data investigated comprises:

- MCL requirements set by AEMO.
- Guarantees and security deposits (cash) supplied to AEMO by market participants.
- Market participant outstandings compared to the outstandings limits.

From this available data, AEMO has assessed the level of prudential POE under the Framework, and the cost of achieving the 2% POE target.

The analysis indicates that the level of prudential POE under the Framework is consistent with the 2% POE target in all regions except Tasmania. Tasmania exceeded the 2% POE by 0.24%. This is a significant improvement on the prudential POE level in comparison to the previous NEM prudential regime. It effectively confirms a reduction in prudential POE in the market from about 4% to around 2%. Further, a comparative assessment against a previous year with similar levels of outstandings in the market suggests that this reduction in POE has been achieved along with a reduction in MCL requirements for market participants recognising that significant variations in electricity purchases between the compared periods may have a bearing on this assessment.

These two aspects of the analysis, while based on two years of data, indicate to AEMO that the Framework is performing as intended.

The effectiveness of the participant risk adjustment factors (PRAF) was also assessed for this report. Based on the information available from the nine MCL review periods completed to date, PRAF values for both load and generation are seen to generally fall within expected bounds. Also, MCL requirements appear to be appropriately moderated by the relative risk a participant poses to the market.

2.2 Framework performance

Two key aspects of analysing Framework performance are:

1. Level of prudential POE under the Framework.
2. Cost of achieving the 2% POE target.

2.2.1 Level of prudential probability of exceedance

To understand the level of prudential POE under the Framework since it was first applied in November 2013, AEMO analysed available prudential data for the latest year (2015) and the entire life of the NEM respectively, to verify the prudential risk management performance of the Framework in the context of the NEM's lifespan.

The level of prudential POE is indicated by two factors: the OSL exceedance, and MCL exceedance. The prudential POE is defined as the probability that (on a given day) a market participant's outstandings exceed their OSL; and that, following this exceedance at the end of the reaction period, the outstandings exceed their MCL.

AEMO analysed the instances that the OSL was exceeded, concurrently with the number of instances at the end of the reaction period that the outstandings exceeded the MCL for both 2015 and over the lifespan of the NEM. This analysis was conducted separately for each NEM region and is shown in Table 2 and 3.

Table 2 OSL and POE 2015 vs 2014

Region	OSL Exceedance		Prudential Probability of Exceedance	
	2014	2015	2014	2015
NSW	0.0%	1.10%	0.0%	0.27%
QLD	0.0%	8.77%	0.0%	2.19%
SA	0.5%	5.21%	0.5%	1.10%
TAS	0.0%	7.40%	0.0%	7.12%
VIC	4.1%	0.82%	0.3%	0.00%

Table 3 OSL and POE – Life of NEM

Region	OSL Exceedance		Prudential Probability of Exceedance	
	2014	2015	2014	2015
NSW	4.0%	3.78%	1.8%	1.73%
QLD	3.6%	3.94%	1.8%	1.85%
SA	4.2%	4.41%	1.8%	1.80%
TAS	2.5%	2.97%	1.7%	2.24%
VIC	3.7%	3.56%	1.8%	1.73%

Table 2 lists the achieved POE for the four 2015 completed MCL review periods under the Framework compared to 2014.

The data shows that during in 2015 the POE was within the 2% target for most regions except Queensland and Tasmania. Both OSL exceedance and the POE have increased in the short term for all regions compared to the previous year, with the exception of Victoria. This was due to a combination of regional price fluctuations and reduced MCLs for market participants. AEMO will continue to closely monitor and review the effectiveness of the Framework and mitigate identified risks to ensure the Prudential Standard is met for the life of the NEM.

When the Framework is applied to all market data available from the start of the NEM, the overall POE is within the 2% target for all regions except Tasmania, which has a POE of 2.24%. AEMO will continue monitoring the POE for the life of NEM in the next few years to ensure the 2% is met and align with the objective of the Framework.

Although the Framework was designed to exactly meet the 2% POE target, Table 3 shows that the effective probability has been slightly lower than the 2% target for NSW, QLD, SA and VIC. The following factors are likely to be responsible:

- Assessment period: at the time when the 2015 volatility factors and prices were published, data was only available up to 2014. The data used for analysis in this report includes the 2015 seasons.
- Volatility Factor Percentile revisions: AEMO reviews the Regional Volatility Factor Percentiles used in the MCL calculations about every three years. They were calculated for the first seasonal review and recalculated in the 2014 Shoulder 2 review after the carbon price repeal (August 2014). The next Volatility Factor Percentile revision is due by August 2017. The Volatility Factor Percentile will be reviewed and adjusted to ensure that the 2% POE is met in all regions.

The data also shows that regardless of whether we look at the four completed MCL review periods, or the life of the NEM data, the OSL is exceeded significantly more often than the MCL. This indicates that

while market participants exceeding their OSL is not an uncommon occurrence, this very rarely leads to them exceeding their MCL levels over the reaction period.

It is important to note that there has never been a payment shortfall in the NEM. Meeting the 2% POE target does not mean that there will necessarily be a shortfall in any given year. It only provides a target within which we maintain the risk of loss in the event of market participant default.

2.2.2 Cost of achieving the 2% POE target

To understand the effectiveness of the Framework in improving the use of capital in the NEM, it is useful to examine how the level of MCL has changed over time. The MCL requirement for each participant outlines the amount of credit support (i.e., guarantees) each must provide to AEMO.

However, analysing the rise or fall of MCL amounts alone does not offer a full picture of the effects of the Framework. By default, this value changes with market changes, i.e., changes in demand and price. For a more accurate picture, consider the outstandings for the particular years being compared. The level of outstandings is a good proxy for the overall price and demand mix. Hence, periods of similar outstandings profiles form a good basis for MCL comparison.

For this analysis, we selected four different years (2011, 2012, 2013 and 2014) to compare with 2015. This approach compares 2015 with the years under the old regime (2011 to 2013) and the current (new) prudential Framework (2014) respectively.

Of the four earlier years, 2011 offers the most credible comparison of the previous NEM prudential regime with the 2015 Framework, as 2011 had the most similar year-long level of outstandings.

As shown in Figure 1, the levels of outstandings for 2011 and 2015 are similar (apart from the large spike in February 2011). It is also evident that the MCL level in 2015 is significantly lower than in 2011, by an average of more than $600 million[4] over the year. The difference is largest between January and February.

[4] This figure should be considered as indicative only. Due to the comparative nature of this assessment, the actual savings if the new regime had been in place for the 2011 period may have been significantly different to this.

Figure 1 MCL and Outstandings: 2011 vs 2015

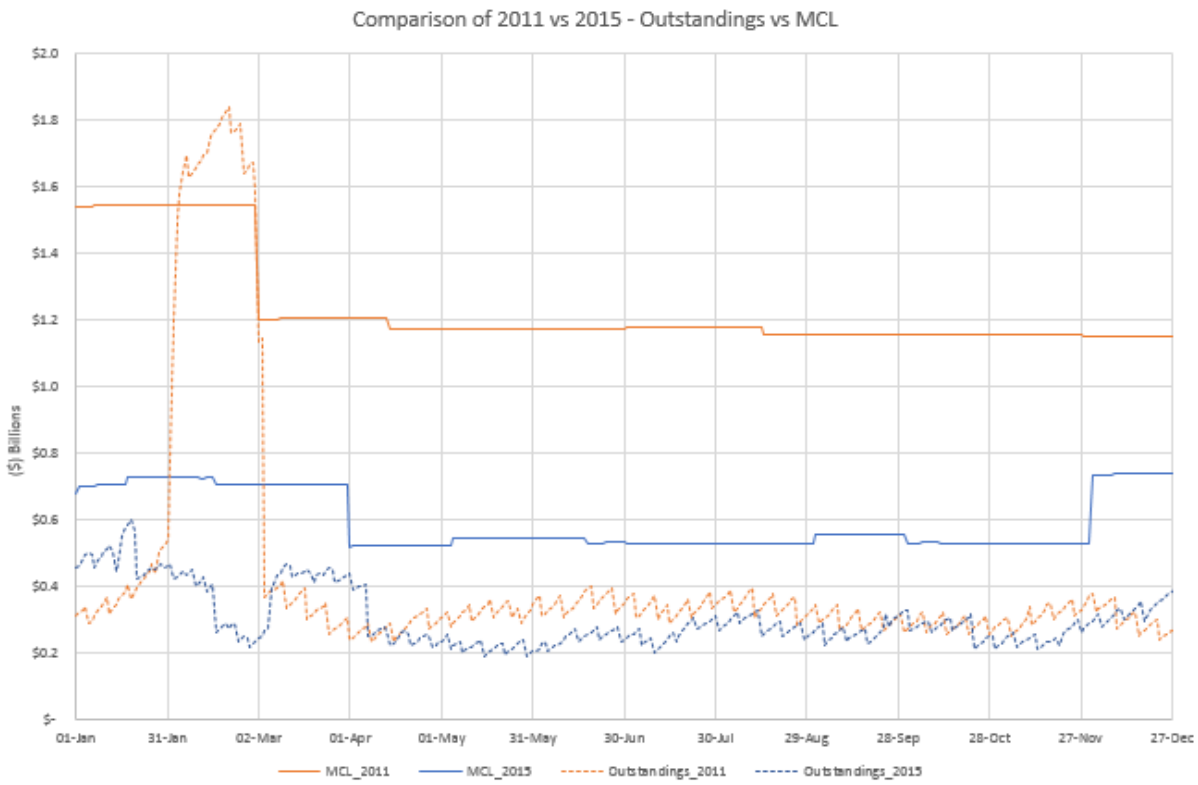


Figure 2 shows the comparison between the years 2012 and 2015. As the level of outstandings in the two years are quite different for significant timespans, it is difficult to draw any plausible conclusions regarding MCL levels. However, we can see that the 2015 MCL level is lower than in 2012 for all time periods except December, while outstandings are higher in 2015 compared to 2012 from January to early Febuary. The 2012 MCL level is much higher than the level of outstandings in the first half year and too low to cover the increased level of outstandings in the second half year. Compared to the 2012 MCL level, the 2015 MCL level outstandings more closely and efficiently. Overall, MCL clearly tracked the profile of outstandings more closely in 2015 than in 2012.

Figure 2 MCL and Outstandings: 2012 vs 2015

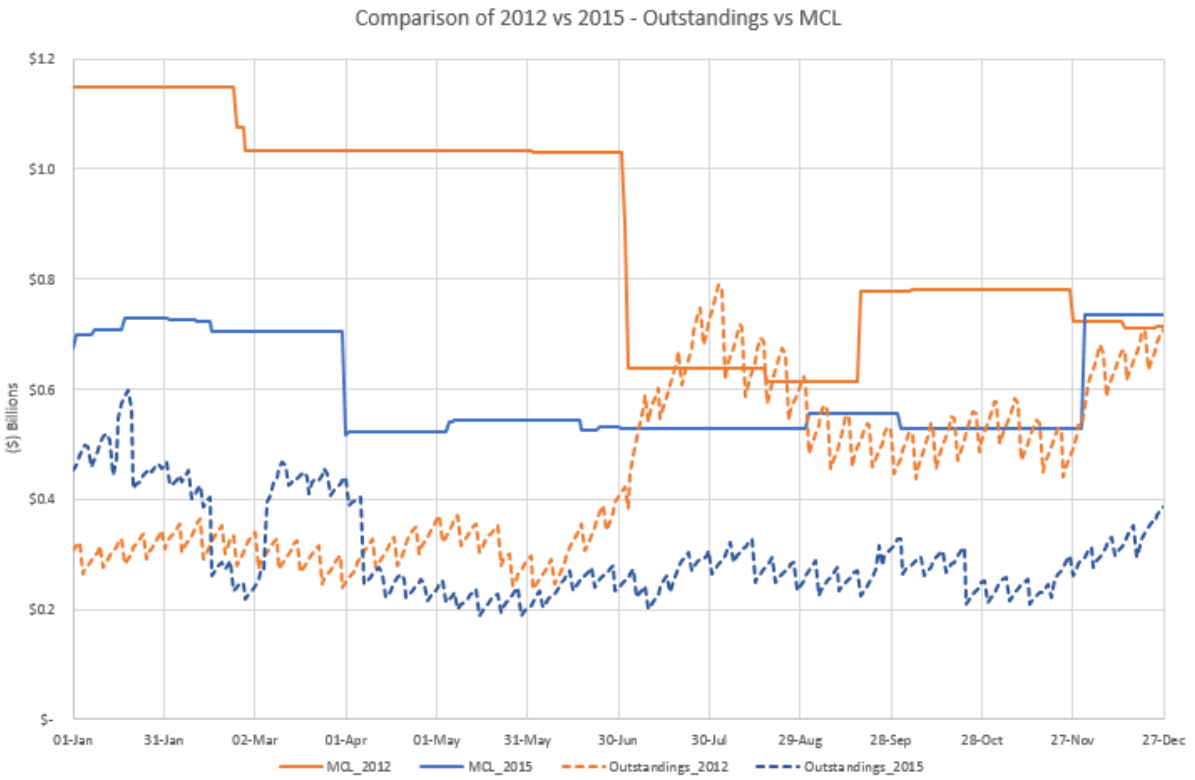
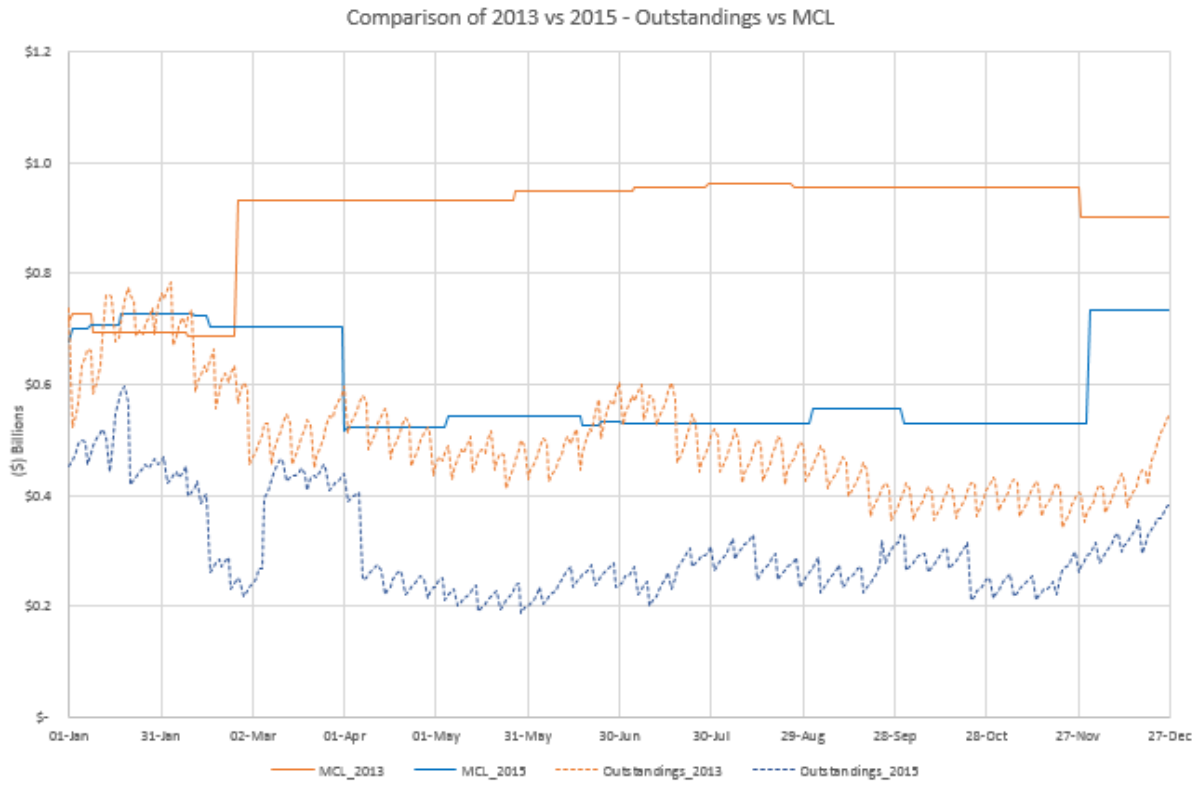


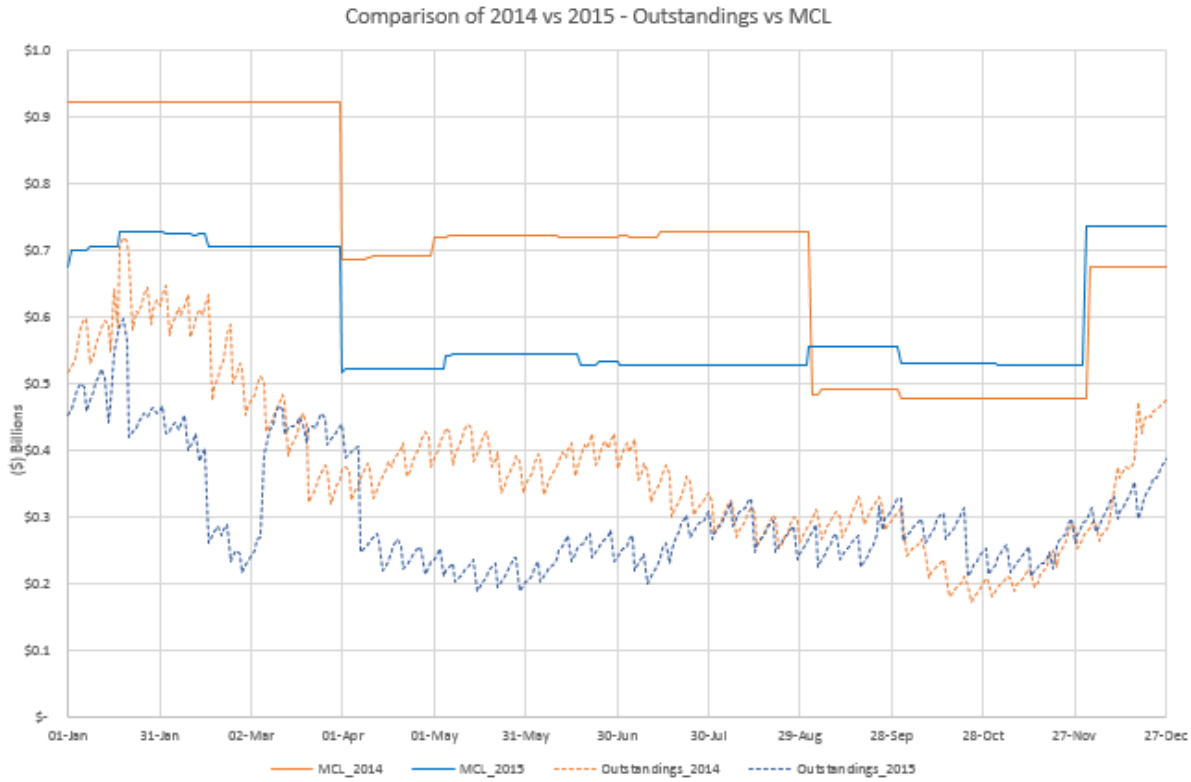
Figure 3 compares the MCL and outstandings in 2013 (the year before the new prudential Framework was introduced) and 2015. In this comparison, the MCL levels are lower for the 2015 year in all, but not from January to February. As the level of outstandings in 2015 is also lower than in 2013 over the entire year, it is difficult to draw any plausible conclusion about whether the lower MCL levels are a direct consequence of the new prudential Framework. However, it is clear that in 2015 the MCL level tracked the profile of outstandings closer than in 2013. For example, comparing the MCL and outstandings levels from January to February in 2015 and 2013, the 2015 MCL level is sufficient to cover the increase in the outstandings level in that period of the year, while the 2013 MCL level was not sufficient to cover the increase in the outstanding level in that period of the year.

Figure 3 MCL and Outstandings: 2013 vs 2015



In Figure 4, we compare the MCL and outstandings in 2014 (first year after the new prudential Framework was introduced) with 2015's. Overall, the levels of outstandings were covered by the corresponding MCL levels consistently for these two years. The sudden drop in outstandings level between February and March 2015 was not captured by the movement of the MCL level. This is because the MCL calculation is seasonal and the new prudential Framework is designed to smooth the MCL level over the life of the NEM instead of capturing sudden market change.

Figure 4 MCL and Outstandings: 2014 vs 2015



The Framework has only been in applied for two years. Accordingly, it is difficult to draw any credible conclusions regarding the MCL level prescribed under the Framework. However, from data gathered to date, we have seen that:

- MCL requirements under the Framework are lower than MCL requirements determined under the previous prudential regime for similar levels of outstandings.
- MCL amounts prescribed by the Framework appear to follow the profile of outstandings better than the previous NEM prudential regime.
- The level of outstandings did not exceed MCL in 2014 and 2015, while in other years (2011, 2012 and 2013) under the previous prudential regime, the level of outstandings did exceed the corresponding MCL over a number of periods
- The gap between MCL levels and corresponding outstandings levels is consistently smaller under the Framework.

All of the above observations may be due to the particular nature of trading, prices and demand levels in the NEM for 2015. AEMO will continue to monitor Framework performance over the next few years to support any conclusion on the overall effectiveness of the new prudential Framework.

Initial assessment completed over 2014 and 2015 suggests that the Framework is working as intended, and has not led to an increase in MCL levels (on aggregate) for market participants. In fact, MCLs calculated under the Framework are less than the MCLs imposed on market participants during comparable time periods under the previous MCL methodology, and better match the actual level of outstandings in the NEM.

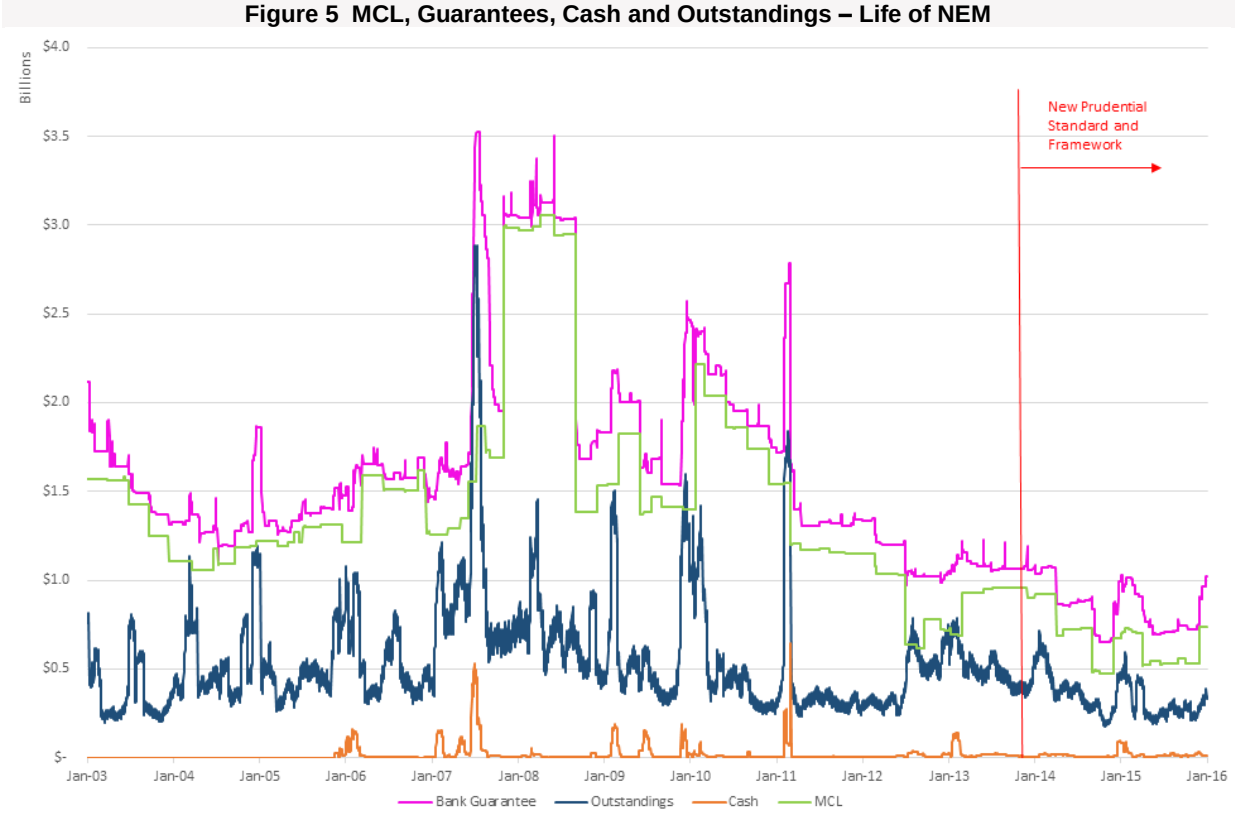
2.2.3 Other Considerations

Figure below looks at the levels of MCL, guarantees, cash (in the form of security deposits) and outstandings from 2003 to 2015, and offers the following observations:

1. The level of bank guarantees is consistently above the MCL level. This is due to market participants using bank guarantees not only to meet their MCL requirements, but also to increase their trading limits.
2. The trading limit for market participants is determined by the difference between the total value of their credit support and the prudential margin.[5] Where the prudential margin exceeds their total credit support, the trading limit will be negative. Market participants cannot trade above their trading limits.

Market participants could therefore provide bank guarantees with values higher than needed for meeting their MCLs. This allows participants more freedom to determine their trading limits, and allow them to better manage anticipated trading activities. It is also evident that, as intended, market participants readily use cash (security deposits) during periods of high outstandings (usually due to transient high prices).

Figure 5 MCL, Guarantees, Cash and Outstandings – Life of NEM



As can be seen from Figure 6, (aside from the lower outstandings and lower MCL levels discussed in the previous section) the general behaviour of market participants in managing their prudentials has stayed consistent in transition to the Framework. From November 2013 to early 2016, market participants continued to provide guarantees in excess of the MCL to similar extents as previous years.

Security deposit value has also remained consistent with that seen before introduction of the Framework, with a spike during periods of high outstandings (and most likely prices). This suggests that the Framework has not materially affected market participants in their general approach to prudential management in the NEM.

However, it is worth noting that AEMO believes market participants are using security deposits less often since the Framework was introduced. This is likely because the concept of the Reduced MCL has been eliminated.

[5] The prudential margin ensures that the NEM is not exposed to a prudential risk inconsistent with the Prudential Standard during the period (seven days) of suspending a defaulting market participant from the NEM.

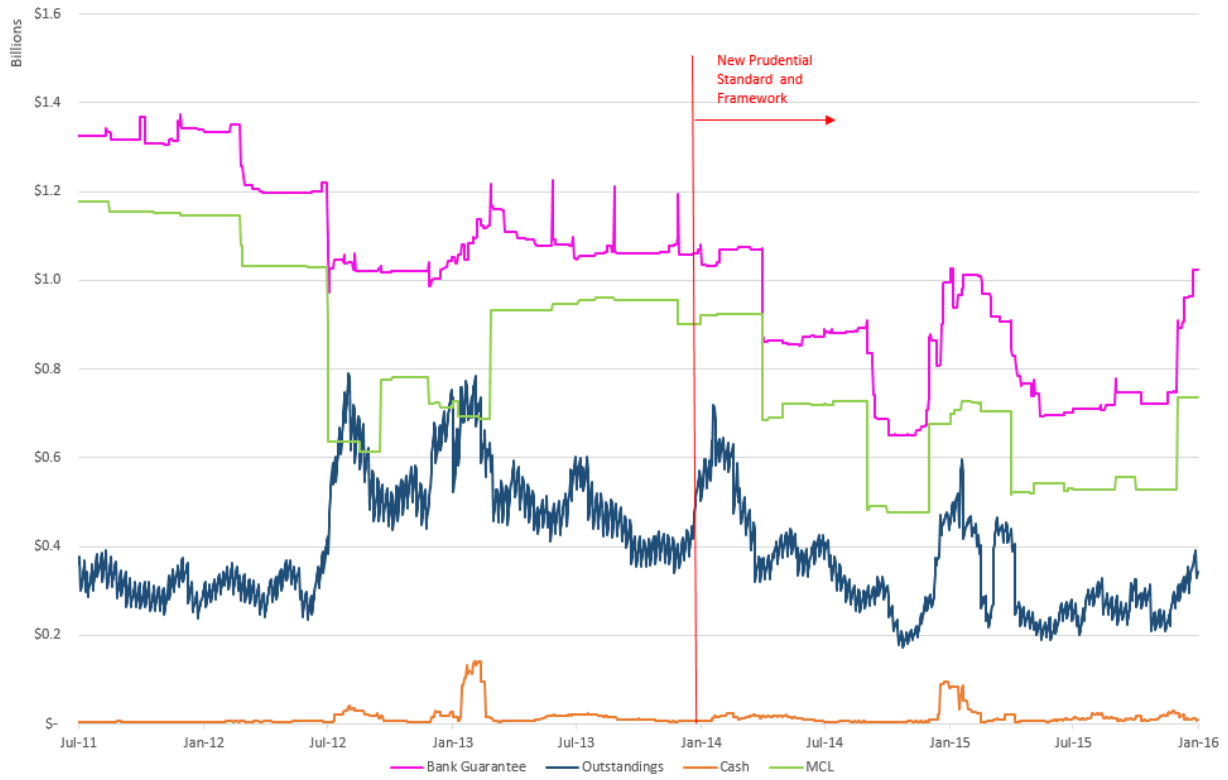
Under the previous NEM prudential regime, market participants had the option of a Reduced MCL (RMCL) which allowed the trading limit to be calculated on the basis of a 28 day credit period.

AEMO's 2011 Energy Market Prudential Readiness Review, found that the use of RMCL had the following consequences:

- Increased dependency on security deposits as the trading limit is reduced, in turn requiring market participants to more closely manage their outstandings, than with the standard MCL.
- Widespread adoption of the reduced MCL option was possibly adding further uncertainty regarding the level of prudential cover applied in the NEM.
- Independent studies showed that application of the reduced MCL mechanism reduced NEM prudential quality.

The concept of RMCL does not exist in the Framework. However, this has not resulted in an increase in the overall MCL level, as shown in Section 2.2.2. Also, the POE has decreased significantly from 4% to 2% and the number of security deposit applications has also decreased, reducing the administrative workload for AEMO and market participants.

Figure 6 MCL, Guarantees, Cash and Outstandings – 2011 to 2015



2.3 Participant Risk Adjustment Factors

The Participant Risk Adjustment Factors ($PRAF_L$ or $PRAF_G$ or $PRAF_R$) are factors derived by AEMO using historical data. They are used to reflect the relative risk of market participants' estimated load, generation and energy and reallocations respectively. These PRAFs are based on an analysis of the relationship between half-hourly regional load/generation/energy and dollar reallocation profiles, half-hourly regional prices and historic POE.

Based on submissions received regarding the methodology for calculating PRAFs, AEMO's *2012 Credit Limit Procedures Draft Determination and Report* proposed to review the PRAFs as part of the annual review of the Credit Limit Procedures.

To determine a market participant's PRAFs, their margin loss factor-adjusted load and generation amounts are used to account for the impact of this variable on each market participant's prudential settings.

The PRAFs for each MCL review are based on available data from the previous like season, and are determined as representative of the market participant's current trading behaviour.

Where insufficient historical data is available, or the market participant's trading behaviour has changed significantly since the previous like season, then a more representative range of historical data may be used. Where no data is available, a default PRAF value of 1.05 for load and 0.95 for generation is applied.

The previous NEM prudential regime did not include the concept of PRAFs. Instead, a standard factor of 1.05 was applied to load and generation to account for the impact of marginal loss factors on the MCL.

The analysis below examines the actual PRAF values for 2015, for load, generation and reallocations, and the distribution of these PRAF values.

The average PRAF values under the Framework, for both load and generation, are lower than the average loss factor of 1.05 applied under the previous NEM prudential regime. Further, the distribution of PRAF values for both load and generation are as expected:

- Approximately 89 per cent of the $PRAF_L$ values range between 0.9 and 1.1.
- Approximately 86 per cent of the $PRAF_G$ values range between 0.9 and 1.

This tentatively suggests that calculation of PRAFs for both load and generation are working as intended. In general most market participants do not appear to be disadvantaged by the new methodology while a significant portion of market participants benefit from introduction of the new methodology. This is due to the application of a more accurate method of assigning participant specific risks related to load and generation.

2.3.1 PRAF Values

Table 4 shows the highest, lowest and average PRAF values for load, generation and reallocations for all regions for 2015. As shown, the average PRAF values under the Framework, for both load and generation, are lower than the average loss factor of 1.05 applied under the previous NEM prudential regime.

Table 4 PRAF values in 2015 seasons (all regions)

	$PRAF_L$	$PRAF_G$	$PRAF_R$*
Highest	8.47	2.96	1.3
Lowest	0.44	0.78	0.93
Average**	1.03	0.99	1.02

* Zero $PRAF_R$ are excluded.
** Average of PRAFs in all regions in 2015 seasons. For load/generation weighted PRAFs per region per season, refer to table 5 and 6.

Table 5 and Table 6 show load-weighted and generation-weighted PRAFs for all regions for the four 2015 seasons. The average $PRAF_L$ falls between 0.98 and 1.04, while the average for $PRAF_G$ falls between 0.94 and 1.01 for all regions and seasons. Again, these are lower than the average loss factor of 1.05 applied under the previous NEM prudential regime.

Table 5 Load weighted $PRAF_L$

Region	2015 Summer	2015 Shoulder 1	2015 Winter	2015 Shoulder 2
NSW	1.01	1.01	1.00	1.01
QLD	1.04	1.04	1.04	1.03
SA	1.00	1.02	1.01	1.01
TAS	1.01	0.99	0.98	1.00
VIC	1.01	1.02	1.02	1.02

Table 6 Generation weighted $PRAF_G$

Region	2015 Summer	2015 Shoulder 1	2015 Winter	2015 Shoulder 2
NSW	1.01	0.98	0.99	0.99
QLD	0.95	0.96	0.95	0.96
SA	0.99	0.98	0.97	0.98
TAS	0.94	0.94	0.96	0.95
VIC	0.98	0.97	0.97	0.97

AEMO also analysed individual participants with a comparatively high or low PRAF to get a better understanding of PRAFs overall. The observations from these outliers are:

- In-house load consumption for generators: the usual analysis period for in-house load uses the default period (from the first date of the previous 'like' season to the calculation up to date), which may lead to a higher $PRAF_L$. However, as the load volume is small (under 10 MWh), a higher $PRAF_L$ does not result in a materially higher MCL.
- Low load consumption for customers: when a participant's load consumption is low, e.g., lower than 10MWh, the typical $PRAF_L$ analysis period for the load is a default period (previous 'like' season). This may lead to a higher $PRAF_L$. However, as the load volume is small, a higher $PRAF_L$ does not result in a materially higher MCL.
- Lower consumption in peak half-hourly periods: participants with lower consumption levels in peak periods than off-peak periods, generally have a low $PRAF_L$.

2.3.2 Distribution of PRAF Values

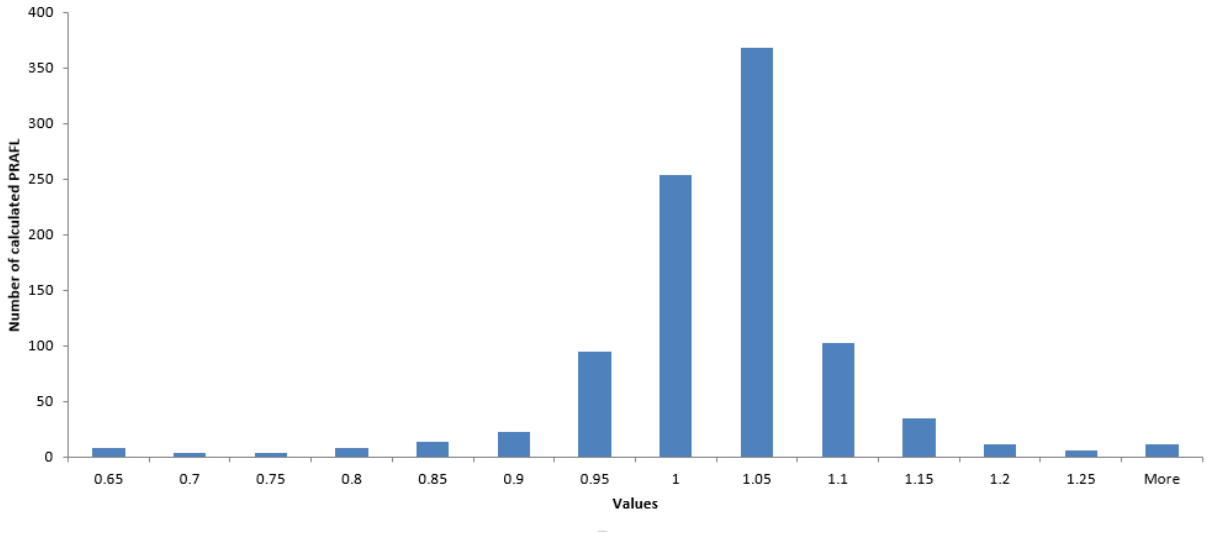
Under the previous NEM prudential regime, AEMO applied a fixed loss factor of 1.05 for load and generation when calculating the MCL. The Credit Limit Procedures introduced individual PRAFs for load, generation and reallocation in the MCL calculation to reflect a participant's individual relative risk due to trading behaviour. The PRAFs take loss factors into account. The individual PRAFs that vary significantly from the average loss factor of 1.05 would affect the MCL.

A default PRAF value of 1.05 for load and 0.95 for generation is applied when no historic data is available.

An analysis of the distribution of all market participant PRAF values is a useful way of judging how the Framework is effecting MCL calculations.

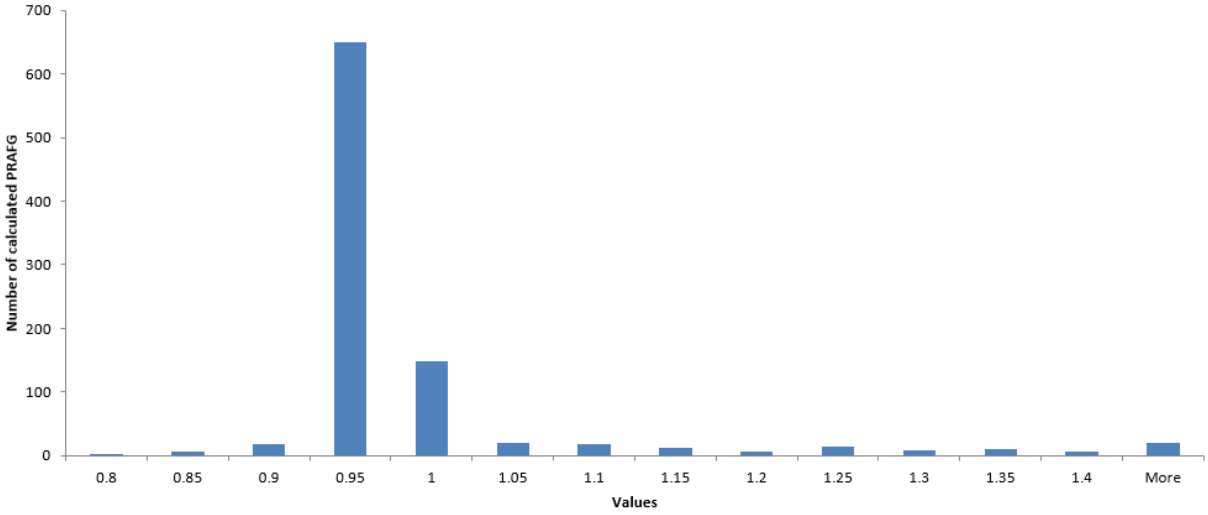
As shown in Figure 7, the most (approximately 89 per cent) of the $PRAF_L$ values range between 0.9 and 1.1.

Figure 7 - $PRAF_L$ Distribution for 2015 (all regions)



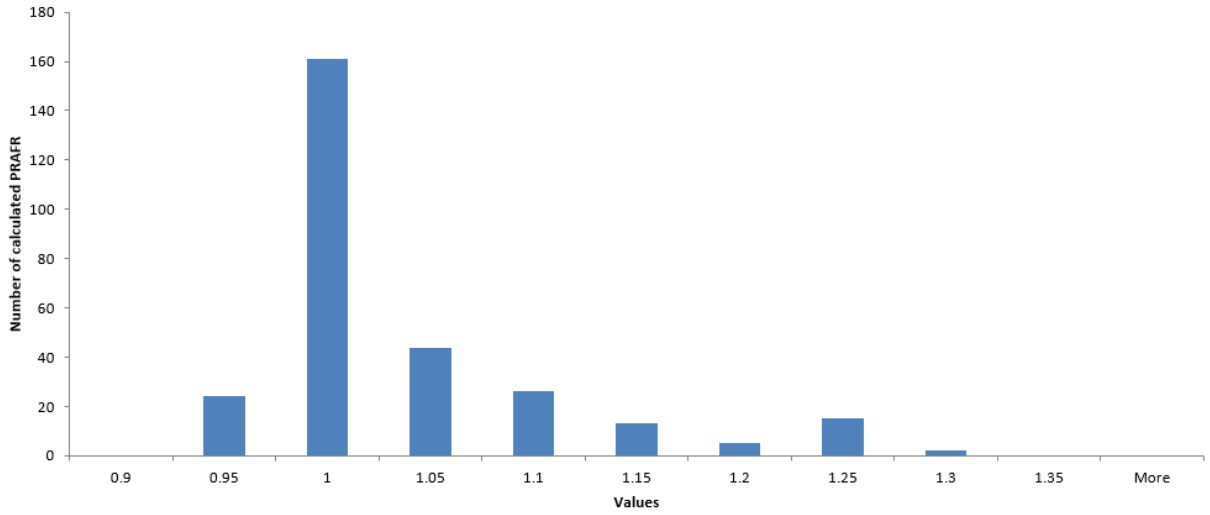
As shown in Figure 8, the most (approximately 85 per cent) of the $PRAF_G$ values range between 0.9 and 1.

Figure 8 $PRAF_G$ Distribution for 2015 (all regions)



As shown in Figure 9, the most (approximately 88 per cent) of the non-zero $PRAF_R$ values range between 0.95 and 1.1.

Figure 9 - $PRAF_R$ Distribution for 2014 (all regions)



The results from analysing distribution of PRAF values for both load and generation are as expected. This indicates that calculation of PRAFs for both load and generation are generally working as intended.

3. CONCLUSIONS AND RECOMENDATIONS

The 2015 analysis of the new Prudential Standard and Framework indicates that the level of prudential POE under the Framework meets the 2% POE target in most regions. Only Tasmania had exceeded the 2% POE by 0.24%. This still represents a significant improvement on the level of prudential POE compared to the previous NEM prudential regime (4%). Further, based on a comparative assessment of 2015 data against similar periods under the previous MCL regime, our analysis suggests that this reduction in prudential POE has been achieved along with a reduction in market participants' MCL requirements.

An assessment of PRAFs for 2015 indicates that average PRAF values for both load and generation fall below the 1.05 average loss factor applied under the previous NEM prudential regime. In aggregate, market participants appear to have benefited from the new PRAF methodology, with MCL requirements likely to better reflect the relative risk a participant poses to the market compared to the previous regime. The result of this PRAF assessment is consistent with the 2014 result.

The results of this second review suggest that the Framework is performing as intended. AEMO does not suggest that authoritative conclusions about the Framework's effectiveness can be drawn from two years' observations. However, AEMO recommends no change to the Credit Limit Procedures at this stage. We expect to be able to provide more conclusive confirmation of this as more data becomes available for analysis over the next few years.

While these observations are a product of extensive modelling and assessment of market data available since the inception of the Framework, we note that additional analysis over the next few years will be required for AEMO be able to make definitive conclusions about its overall effectiveness.

Annual reviews of the Framework will continue, with the findings used to make any changes and/or improvements as deemed necessary.

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