2016 FORWARD LOOKING LOSS FACTOR METHODOLOGY REVIEW

DRAFT REPORT AND DETERMINATION

Published: **8 December 2016**

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

NOTICE OF SECOND STAGE CONSULTATION – FORWARD LOOKING LOSS FACTOR METHODOLOGY

National Electricity Rules – Rule 8.9

Date of Notice: 8 December 2016

This notice informs all Registered Participants and interested parties (Consulted Persons) that AEMO is commencing the second stage of its consultation on its review of the Forward Looking Loss Factor Methodology.

This consultation is being conducted under clauses 3.6.1, 3.6.2 and 3.6.2A of the National Electricity Rules (NER), in accordance with the Rules consultation requirements detailed in rule 8.9 of the NER.

Invitation to make Submissions

AEMO invites written submissions on this Draft Report and Determination (Draft Report).

Please identify any parts of your submission that you wish to remain confidential, and explain why. AEMO may still publish that information if it does not consider it to be confidential, but will consult with you before doing so.

Consulted Persons should note that material identified as confidential may be given less weight in the decision-making process than material that is published.

Closing Date and Time

Submissions in response to this Notice of Second Stage of Rules Consultation should be sent by email to mlf.process@aemo.com.au, to reach AEMO by 5.00pm (Melbourne time) on 23 December 2016.

All submissions must be forwarded in electronic format (both pdf and Word). Please send any queries about this consultation to the same email address.

Submissions received after the closing date and time will not be valid, and AEMO is not obliged to consider them. Any late submissions should explain the reason for lateness and the detriment to you if AEMO does not consider your submission.

Publication

All submissions will be published on AEMO's website, other than confidential content.

EXECUTIVE SUMMARY

The publication of this Draft Report and Determination (Draft Report) commences the second stage of the Rules consultation process conducted by AEMO to consider proposed changes to the Forward-Looking Loss Factor Methodology (Methodology) under the National Electricity Rules (NER).

AEMO's Issues Paper[1] identified what AEMO considered were the main issues with the Methodology and discussed corresponding amendments to:

- Increase transparency by consulting with industry on key inputs and assumptions used in the loss factor calculation.
- Conduct a backcast loss factor study at the end of each financial year.
- Apply a generation cap on forecast generation used in the loss factor calculation based on the five-year historical average.

Most submissions to the Issues Paper generally supported the proposed changes, but the following key issues were identified by Consulted Persons:

- Impact of applying a generation cap.
- Removing outliers in historical generation.
- Use of MT PASA to identify outages in generation forecasts.

After considering all submissions, AEMO proposes to amend the Forward Looking Loss Factor Methodology in the form published with this Draft Report.

Stakeholders are invited to submit written responses on the issues and questions identified in this paper by 5.00 pm (Melbourne time) on 23 December 2016, in accordance with the Notice of Second Stage Consultation published with this paper.

1 http://www.aemo.com.au/Stakeholder-Consultation/Consultations/Forward-Looking-Loss-Factor-Calculation-Methodology-Consultation-2016

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1. STAKEHOLDER CONSULTATION PROCESS

As required by the National Electricity Rules (NER), AEMO is consulting on possible revisions to the Methodology (combining the methodologies referred to in clauses 3.6.1, 3.6.2 and 3.6.2A of the NER) that AEMO uses to calculate inter-regional and intra-regional loss factors.

AEMO's indicative timeline for this review is outlined in Table 1. Dates may be adjusted depending on the number and complexity of issues raised in submissions and any meetings with stakeholders.

Table 1 Review timetable

Stage	Date
Issues Paper published	30 September 2016
Submissions due on Issues Paper	9 November 2016
Draft Report published	8 December 2016
Submissions due on Draft Report	23 December 2016
Final Report published	3 February 2017
Apply revised Methodology to 2017-18 MLFs	January – April 2017
Publish 2017-18 MLFs	1 April 2017

The publication of this Draft Report marks the commencement of the second stage of consultation.

2. BACKGROUND

2.1 NER requirements

The NER requires AEMO to calculate, each year, inter-regional loss factor equations and intra-regional loss factors, and to publish the results by 1 April. The NER[2] further requires AEMO to determine, publish and maintain in accordance with the NER consultation procedures:

- A methodology to determine the inter-regional (clause 3.6.1(c)) and intra-regional loss factors (clause 3.6.2(d)) to apply for a financial year for each transmission network connection point;
- A methodology for the calculation of average (intra-regional) transmission loss factors for proposed virtual transmission nodes (clause 3.6.2(g)).
- A methodology for forecasting, modelling and collecting forecast load and generation data for use in determining transmission loss factors (clause 3.6.2A(b)).

2.2 Role of marginal loss factors

Electrical energy losses occur due to the transfer of electricity through a network. The NER separates losses into two components[3]:

- Inter-regional losses, which are due to a notional transfer of electricity from the regional reference node (RRN) in one region to the RRN in an adjacent region.
- Intra-regional losses, which are due to the transfer of electricity between an RRN and transmission network connection points in the same region.

2 Clauses 3.6.1(c) and 3.6.2(d)
3 Clauses 3.6.1 and 3.6.2

Loss factors describe the marginal electrical energy losses associated with either inter-regional losses or intra-regional losses. They are both used in the central dispatch process to adjust the price of electricity at RRNs and connection points.

AEMO uses marginal costs as the basis for setting regional electricity prices in accordance with the NER. Marginal transmission electrical losses are the basis for referring these prices to electricity generation and consumption at different locations within regions.

Inter-regional loss factors are dynamic, determined by equations that calculate the losses between regions. Depending on region flows and demands, the inter-regional losses also adjust generating plant prices in determining the dispatch order of generation to meet demand.

2.3 Context of this consultation

The current Methodology was published following stakeholder consultation in 2002, and its underlying principles have remained largely unchanged since then. AEMO considers that while some improvements were made to the Methodology in 2014, the current Methodology may need further amendments to better reflect present conditions characterised by steadily increasing changes in generation mix, network usage and consumer demand patterns. This review will consider improvements to the Methodology that will better reflect the current circumstances.

Before commencing this review, in early 2016 AEMO facilitated a number of meetings to discuss stakeholder views on the current Methodology. Three initial meetings were held in Sydney, Brisbane and Melbourne to discuss the current Methodology and investigate issues identified by stakeholders. These issues were further developed in a stakeholder workshop held via a video conference to discuss issues and possible amendments. The minutes of these stakeholder meetings can be found on AEMO's website[4].

2.4 First stage consultation

AEMO issued a Notice of First Stage Consultation on 30 September 2016, together with an Issues Paper outlining a number of issues and proposed amendments to the Methodology, and invited submissions from Consulted Persons.

AEMO identified what it considered were the main issues with the Methodology and discussed corresponding amendments to:

1. Increase transparency by consulting with industry on key inputs and assumptions used in the loss factor calculation.
2. Conduct a backcast loss factor study at the end of each financial year.
3. Apply a generation cap on forecast generation used in the loss factor calculation based on the five-year historical average.

AEMO received four written submissions to the First Stage Consultation[5].

3. EVALUATION OF MATERIAL ISSUES

This section addresses each of the material issues raised in submissions, as indicated in Table 2. Appendix A contains a summary of all issues noted in submissions, together with AEMO's responses.

4 http://aemo.com.au/Stakeholder-Consultation/Consultations/Forward-Looking-Loss-Factor-Calculation-Methodology-Consultation-2016

5 Copies of all written submissions have been published on AEMO's website: http://aemo.com.au/Stakeholder-Consultation/Consultations/Forward-Looking-Loss-Factor-Calculation-Methodology-Consultation-2016

Table 2 Issues raised by Consulted Persons

No.	Issue	Raised by
1	Impact of applying a generation cap	Hydro Tasmania ERM Power Origin Energy Stanwell
2	Removing outliers in historical generation	Origin Energy
3	Use of MT PASA to identify outages in generation forecasts	ERM Power Origin Energy

3.1 Impact of applying a generation cap

3.1.1 Issue summary and submissions

In recent years, retirement of major baseload generation has resulted in remaining generation being extrapolated much higher than its historical average in the loss factor calculation. This may not be representative of a generator's capability and could result in marginal loss factors (MLF) that are not representative of actual loss factors. AEMO proposed that the current Methodology be amended to provide for a generation cap on forecast generation based on the five-year historical average energy.

ERM Power and Origin Energy supported the concept. However, Hydro Tasmania's view is that the existing Methodology is fit for purpose, provides sufficient flexibility and is robust and completely adequate in its current state. Citing the back casting results for Tasmania, Hydro Tasmania indicated consideration of any substantial changes to the current Methodology or the Rules is not warranted. Stanwell also expressed concerns that applying a generation cap may not be representative of future generation.

3.1.2 AEMO's assessment

The operator of the 1,600 MW Hazelwood Power Station (HWPS) recently announced that it will close at the end of March 2017[6]. This will have a significant impact on the calculation of MLFs for the 2017-18 year, and provides a useful case study for the impact of applying a generation cap, compared with the current Methodology.

Figure 1 shows the power stations that are likely to be dispatched at significantly higher levels [7] to make up for lost energy due to the HWPS closure. Figure 1 also shows the projected generation dispatch after applying a generation cap based on their five-year historical average. The results indicate that, without a generation cap, most of these power stations would be dispatched above their historical average, which may not be representative of their capability.

Figure 2 shows the power stations whose output would be increased to compensate for reduction of energy from capped power stations. Note that no generator is dispatched above its generation cap.

[6] Generation Information page update, 18 November 2016: http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information

[7] > 300 GWh compared to generation dispatch with Hazelwood PS in service

Figure 1 Change in generation extrapolation following HWPS closure and impact of generation cap

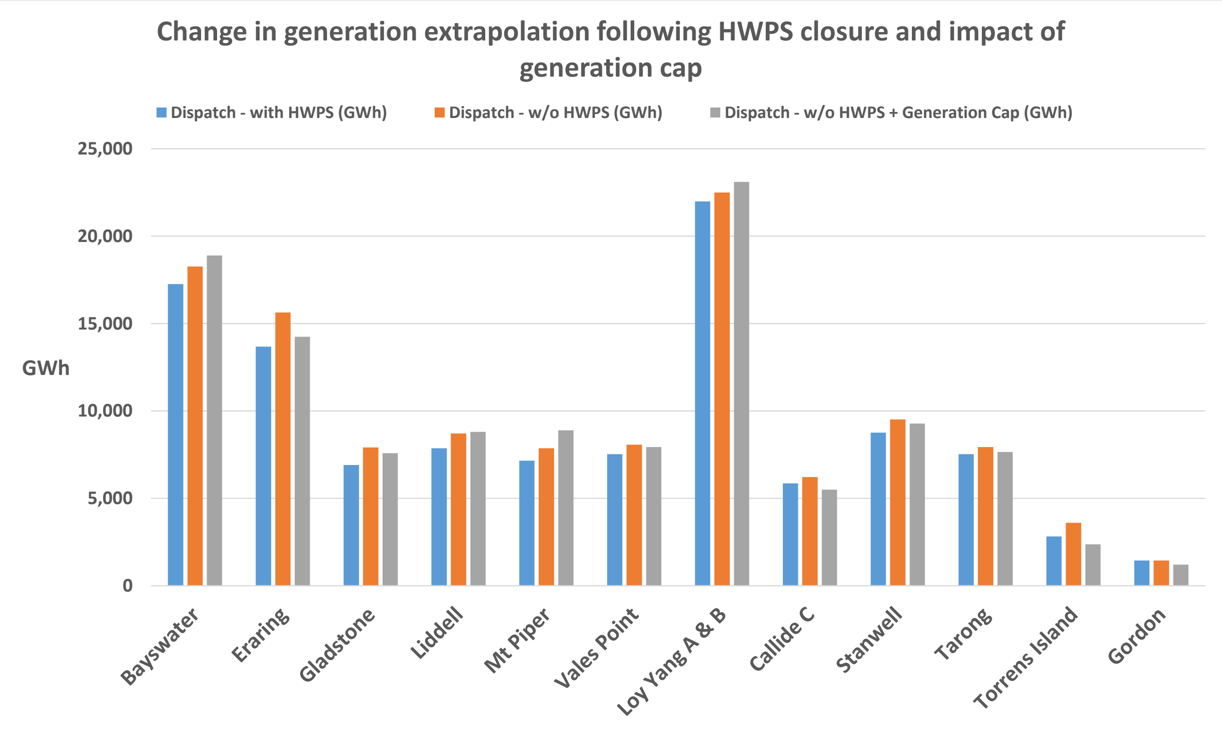


Figure 2 Increase in generation extrapolation following HWPS closure and applying generation cap

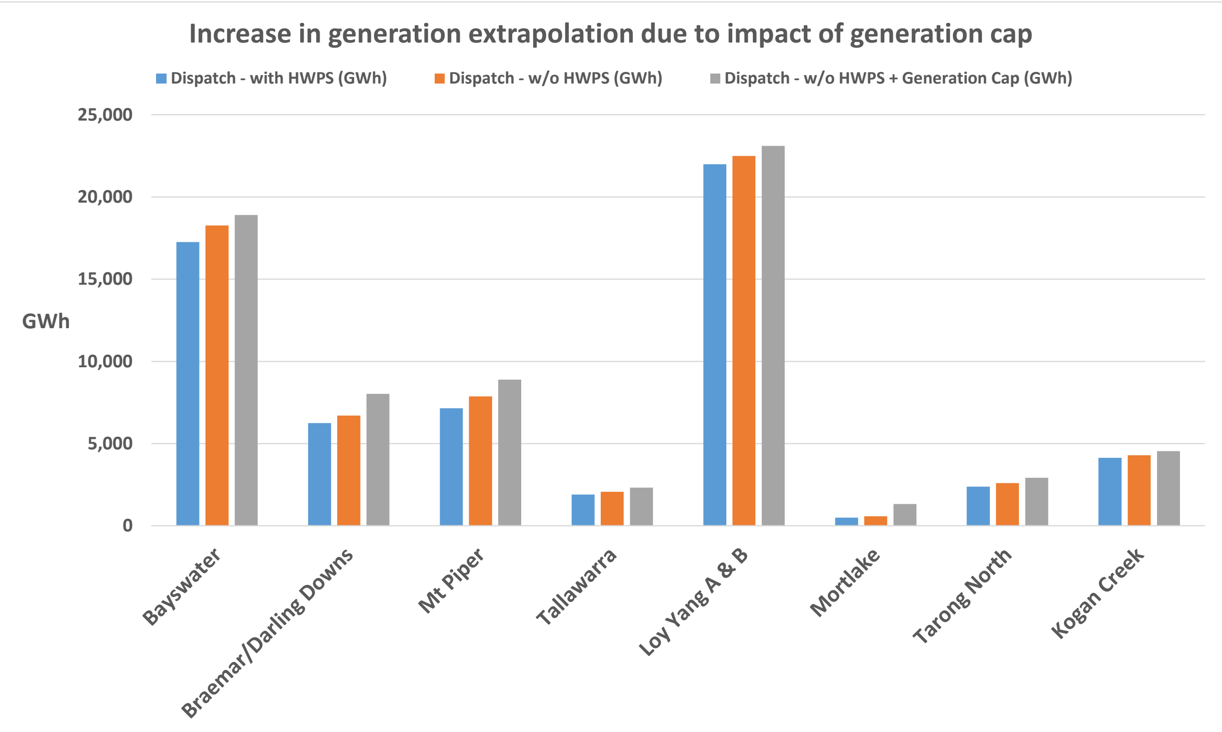
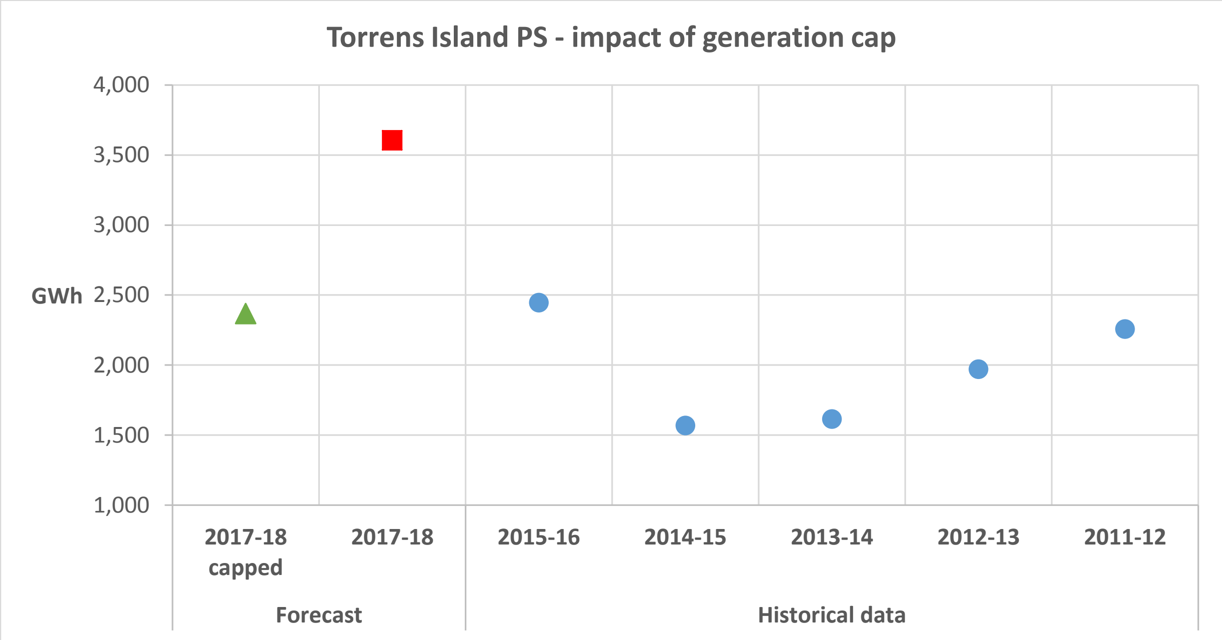
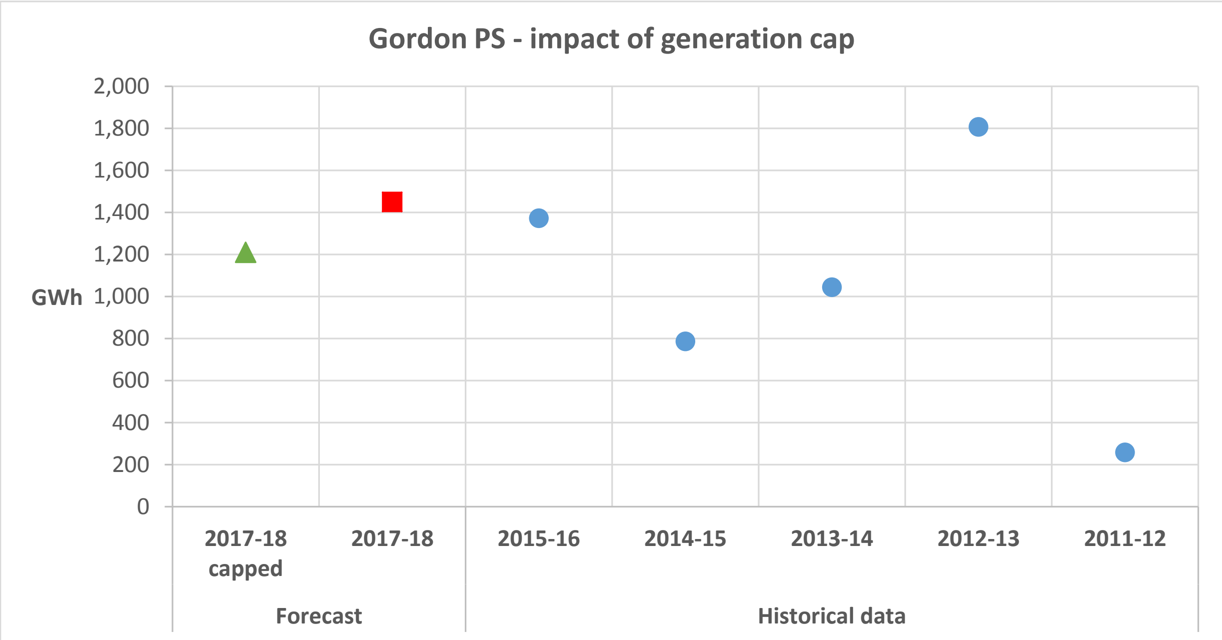


Figure 3 further shows the impact of a generation cap on the forecast generation in the loss factor calculation. The examples show that the 2017-18 generation cap for Torrens Island and Gordon power stations (green marker) are better aligned with their five-year historical average than they would be without a cap (red marker).

Figure 3 Example of impact of generation cap on Torrens Island PS and Gordon PS

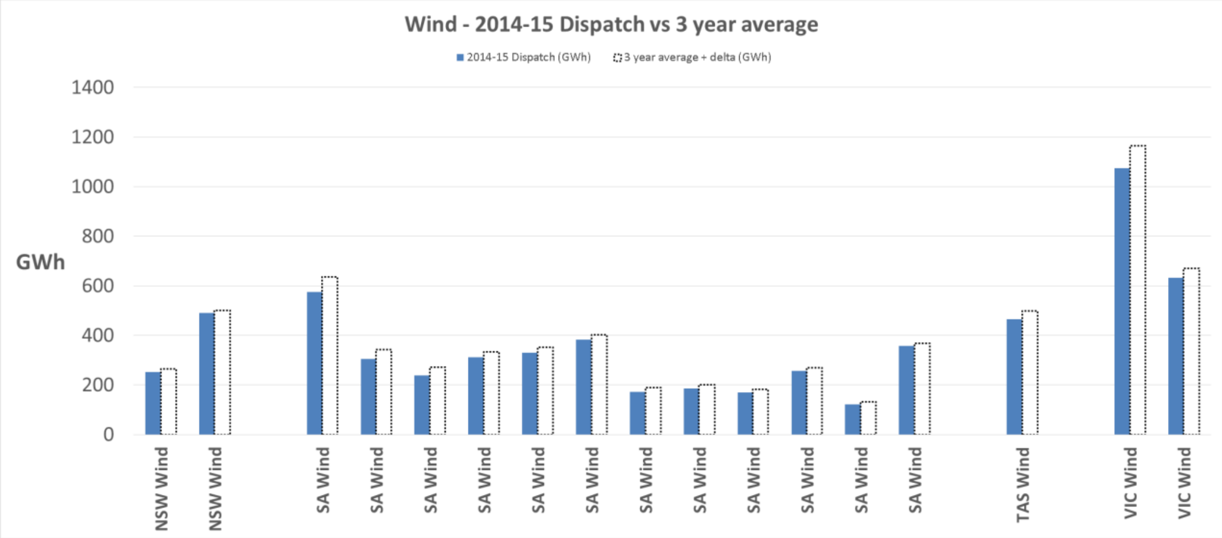




ERM Power questioned if the wind and solar PV generation profile will be based on one single reference year or an average of a three to five year period to account for the normal variations in output. AEMO does not propose to apply a generation cap to semi-scheduled generation such as wind farms or solar farms as the difference between forecast and historical average is minimal (see Figure 4).

If the historical wind or solar PV generation profile is not representative of future generation due to major outages or abnormal conditions, generators are invited to submit an adjusted generation profile providing it meets the conditions of clause 5.5.6 of the Methodology.

Figure 4 Actual wind generation in 2014-15 compared to three-year average



AEMO intends to continue using the most recent completed year as the reference year for wind and solar farms.

3.1.3 AEMO's conclusion

The graphs in section 3.1.2 illustrate that the current Methodology can produce abnormal results when accounting for large changes in the supply/demand balance, such as the retirement of baseload power stations. This is particularly relevant for the 2017-18 year given the retirement of large baseload generation such as HWPS in Victoria and Northern Power Station in South Australia earlier in 2016. Applying a generation cap results in forecast generation that is more representative of a generator's capability and, in turn, produces MLFs that are more likely to represent actual marginal losses in the power system.

AEMO has republished indicative extrapolation results under clause 5.5.6 of the Methodology on AEMO's website[8] due to changes following the announced closure of Hazelwood PS.

AEMO's draft determination is to revise clause 5.5.2 of the Methodology to reflect the generation capping process in the generation forecast.

3.2 Removing outliers in historical generation

3.2.1 Issue summary and submissions

AEMO proposed that the current Methodology be amended to incorporate a generation cap on forecast generation based on a five-year historical average.

Origin Energy suggested that analysis be undertaken to remove outliers from the five-year historical average as this can distort the generation cap applied to a power station.

3.2.2 AEMO's assessment

AEMO has assessed the impact of removing historical outliers when determining the generation cap that applies to forecast generation. Analysis shows that an historical outlier can be identified if the annual energy generated in a particular year is outside the range $\pm 1.645\sigma$ (where σ is one standard deviation from the five-year historical average). This equates to being outside 90% of the area under the normal distribution curve.

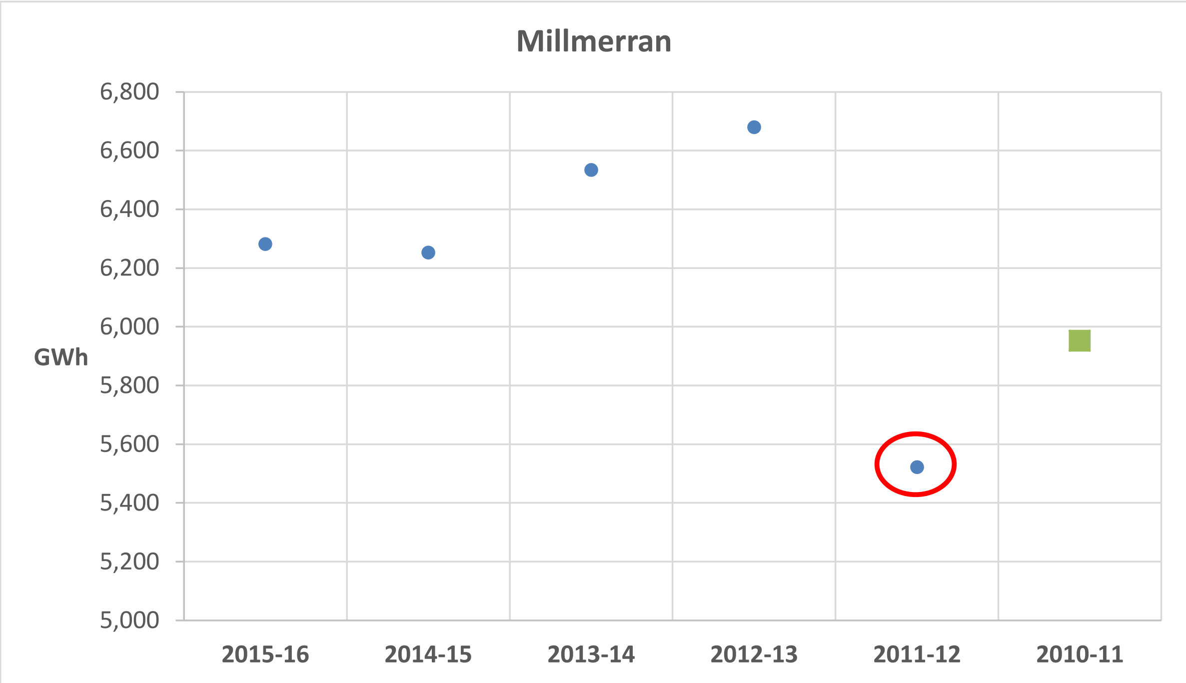
8 http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Loss-factor-and-regional-boundaries

AEMO will not consider a data point in year t-1 (e.g. 2015-16 for the 2017-18 calculation) to be an outlier. The most recent complete year has more weighting on the projected trend of generation and shouldn't be considered an outlier. NER clause 3.6.2A(d) requires AEMO to use historical generation data from the most recent 12 month period and, as such, will not be excluded from the generation cap calculation.

Figure 5 shows examples of values AEMO determined to be an outliers. Where an outlier exists, AEMO did not consider this year in determining the generation cap. Instead, AEMO used the previous year (in this case 2010-11) to ensure a five-year average is still applied.

By removing an outlier from the historical data, the generation cap may either increase or decrease.

Figure 5 Historical generation and outliers for Millmerran and Callide C



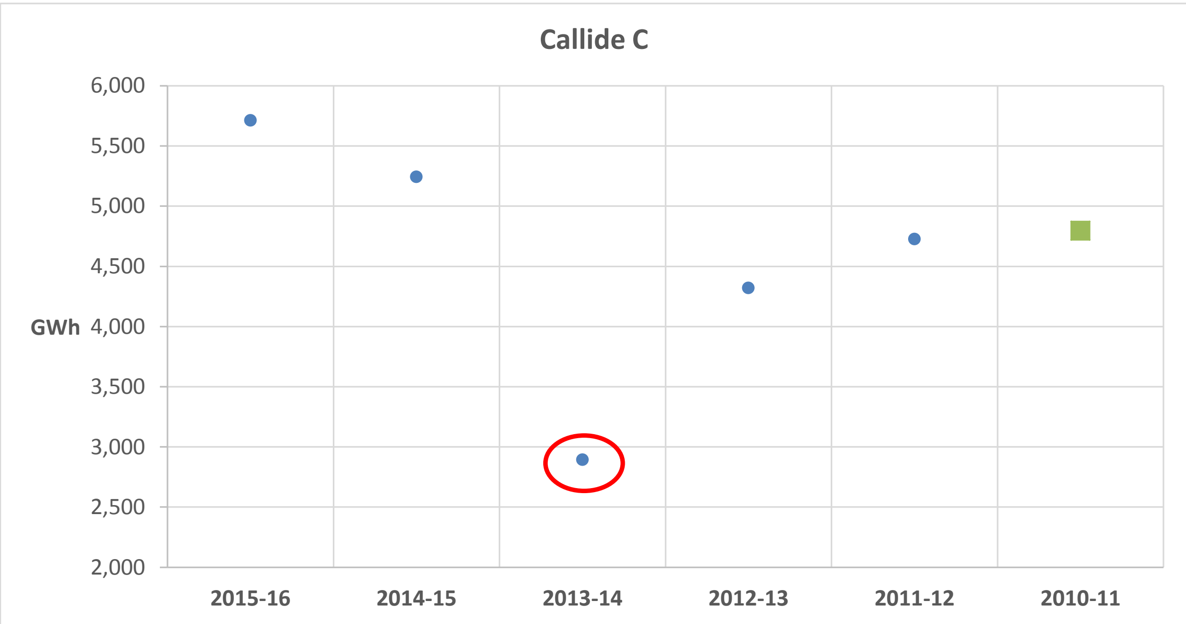
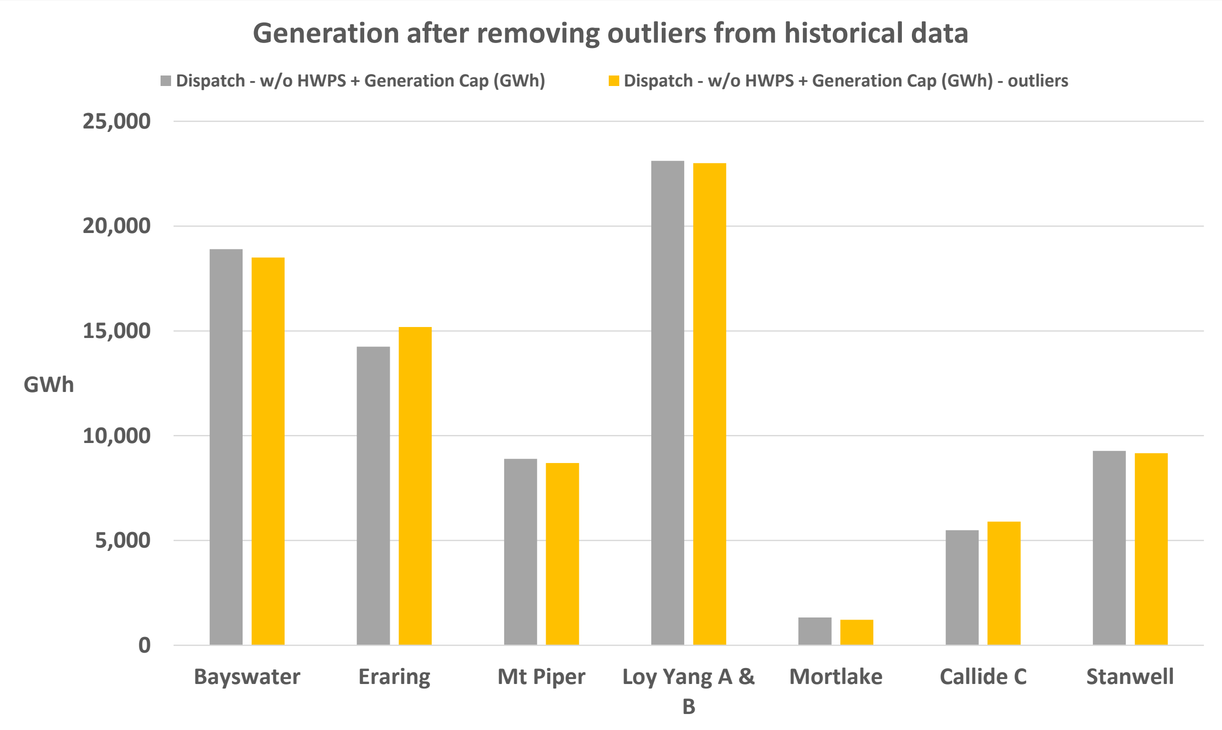


Figure 6 shows the impact of removing outliers from the five-year historical average. This would result in an increase in the generation cap for Eraring and Callide C power stations, and a reduction in the generation cap for Bayswater, Mt Piper, Loy Yang, Mortlake and Stanwell power stations.

Figure 6 Change in generation cap after removing outliers from historical data



3.2.3 AEMO's conclusion

While the impact of removing outliers from the five-year historical average was minimal for the study in section 3.2.2, AEMO accepts that determining the generation cap in this way will produce a generation forecast that better represents a generator's capability.

AEMO's draft determination is to revise clause 5.5.2 of the Methodology to remove outliers in the generation capping process.

3.3 Use of MT PASA to identify outages in generation forecasts

3.3.1 Issue summary and submissions

Under the current Methodology, as indicated by the NER, AEMO uses generation data from the most recent financial year as an input to the loss factor calculation. A generating unit is considered unavailable in a period if it was unavailable in the equivalent historic period. This has the effect of lowering the generator in the priority order[9] for dispatch during the outage period. However, the current Methodology does consider forecast outages in the target year as reported in the Generation Information Page of AEMO's website[10]. For generators coming out of an extended outage (e.g. cold storage), clause 5.4.6 of the Methodology requires the historical profile to be backfilled in consultation with the registered owner.

[9] See section 5.5.2 of the Methodology

[10] https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information

ERM Power and Origin Energy proposed that outages advised through the Medium Term Projected Assessment of System Adequacy (MT PASA) process should be applied in forecast generation for loss factor calculations.

3.3.2 AEMO's assessment

MT PASA is primarily an outage coordination tool to assess medium-term reliability. A snapshot of machine availability in MT PASA does not necessarily reflect future outages, rather it represents an iteration of the medium-term reliability problem and may not converge until the seven-day short-term timeframe.

AEMO considered a 'what-if' analysis on the use of MT PASA data for planned outages. For the 2014-15 financial year, the most recent MT PASA information that would likely have been used (had such a process been in place) for the 2014-15 calculation would have been the data submitted on 14 January 2014. This was compared with historical generation data from 2014-15 to compare the number of days where each unit was actually out of service.

Table 3 Outage days in 2014-15 compared to MT PASA forecast

DUID	Number of outage days reported in MT PASA on 14/01/2014	Number of outage days that actually occurred from 2014-15 historical data	Difference[11]
TARONG#4	365	22	343
NPS2	265	38	227
YARWUN_1	35	7	28
CALL_B_2	35	9	26
GORDON	42	28	14
MOR2	365	351	14
MEADOWBK	299	288	11

Table 3 shows that the number of outage days reported in MT PASA can be materially different to what occurred historically, and can result in a favourable MLF for generators.

Conversely, filling in outages in the historical data profile, based on future availability reported in MT PASA can be problematic because it would be difficult to identify what constitutes an outage in the historical data, and the need to make assumptions on a generator's capacity factor.

The current method of relying on historical data has the advantage of providing an appropriate number of planned and forced outages in the long term.

3.3.3 AEMO's conclusion

AEMO's draft determination is not to use MT PASA in the MLF calculation process, due to the shortcomings of its use for that purpose outlined above.

[11] Units shown are limited to differences of more than 10 days

4. OTHER MATTERS

4.1 Method for calculating average transmission loss factors for Virtual Transmission Nodes

AEMO currently maintains the “Methodology for the Averaging of Transmission Loss Factors”[12], in accordance with NER clause 3.6.2(g), to document the method for calculating transmission loss factors for each Virtual Transmission Node (VTN). AEMO considers this procedure to be part of the Forward Looking Loss Factor Methodology.

As part of this Rules consultation, AEMO has included a proposal to amend the Methodology to include the procedure for calculating average transmission loss factors for VTNs. The associated commentary that currently appears in the “Methodology for the Averaging of Transmission Loss Factors” has been removed from the text that appears in the draft Methodology at clauses 5.6.2 and Appendix E.

4.2 Dual MLFs – Net Energy Balance

Clause 5.6.1 of the current Methodology describes AEMO’s criteria for calculating the Net Energy Balance (NEB) at a transmission network connection point to determine if a dual MLF is required.

AEMO has amended clause 5.6.1 to further clarify the NEB calculation, and has provided a worked example in Appendix D of the draft Methodology. There is no change to the application of the NEB.

4.3 Presentation and minor drafting

Since the last major review of the Methodology, AEMO has developed a revised standard format for external procedures. AEMO has therefore taken this opportunity to align the Methodology with its standard format to the extent practicable. This includes some re-ordering of content – for example the glossary is moved to an interpretation section at the front of the document, removal of unnecessary provisions, differences in the introductory provisions and reformatting. In addition, AEMO has identified some minor drafting changes that are proposed to increase clarity and certainty of meaning in some parts of the Methodology.

AEMO is also reviewing the document title, Forward Looking Loss Factor Methodology, to ensure consistency with terminology in the rules, and will make any necessary adjustments prior to final publication.

None of these changes are substantive.

4.4 Market design issues

AEMO raised numerous market design issues during the first stage of consultation following stakeholder feedback during the round table discussions. Stakeholder submissions in response to the Issues Paper did not provide any substantive rationale that the market design issues warranted further attention at this stage.

AEMO does not intend to pursue these issues in this consultation because insufficient net benefits have been demonstrated at this stage to justify a change. AEMO will continue to monitor the performance of the Methodology and make changes when appropriate.

AEMO notes that it is open to any participant to initiate a rule change proposal if they consider it appropriate.

[12] Published http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Loss-factor-and-regional-boundaries

5. DRAFT DETERMINATION

Having considered the matters raised in submissions and at forums, AEMO proposes to determine an amended Methodology for Calculating Forward Looking Transmission Loss Factors (incorporating the methodologies required under clauses 3.6.1(c), 3.6.2(d), 3.6.2(g) and 3.6.2A(b) of the NER) in the form of Attachment 1.

Attachment 1 – Draft Forward Looking Loss Factor Methodology.

Published as a separate document on AEMO's website with this report. Two versions of this document have been provided - a change marked version of the existing published Methodology and a clean draft.

APPENDIX A. SUMMARY OF SUBMISSIONS AND AEMO RESPONSES

No.	Consulted Person	Category	Issue	AEMO Response
1	Hydro Tasmania ERM Power Origin Stanwell	Transparency of process	Support for initiative to increase transparency	AEMO has revised clause 5.5.6 of the Methodology to publish key inputs and modelling assumptions along with indicative extrapolation results.
2	ERM Power		When publishing monthly expected generation output, it would be helpful if AEMO included the generator outage data included in the assumptions (on a number of days in any month basis) as forecast generator outages can have a large impact on the MLF outcomes.	AEMO believes there are shortcomings in the MT PASA process and as such will not use forecast outages in the loss factor calculation. Therefore, AEMO will not publish forecast generator outage data with indicative generation data. See section 3.3 of this draft report for further details.
3	ERM Power		We would recommend that for ease of access, links to the relevant regional and connection point forecast data be included in the AEMO assumptions report	AEMO will provide links to the relevant regional and connection point forecast data in the MLF assumptions report.
4	Stanwell		An appropriate balance must be maintained between a simple, transparent calculation Methodology which cannot be manipulated by participants and one which provides the most accurate forecast of loss factors.	AEMO considers the current and past consultation process on the Methodology is a suitable mechanism to ensure the balance between simplicity, transparency and accuracy is appropriate.
5	Stanwell		As well as the ability for participants to provide AEMO with a revised generation profile, consideration could be given as to whether AEMO should have the power to request a revised generation profile from a participant.	AEMO has revised clause 5.5.6 of the Methodology to give AEMO the authority to request a revised generation profile from a participant should AEMO consider the historical profile unrepresentative of future generation.
6	Stanwell		Regarding generation scaling, Stanwell is concerned that in some cases the scaling process may not accurately reflect the reduced generation profiles of generators which are located near a generator which is expected to return from cold storage.	This is currently addressed in 5.4.6 of the Methodology. If the capacity of a generator has been restored from a reduced capacity (e.g. cold storage of a unit), then AEMO in consultation with the registered owner will backfill the historical profile of the generating unit to represent the restored capacity.
7	Hydro Tasmania ERM Power Origin Stanwell	Backcast loss factors	Support publication of backcast results	AEMO will publish backcast results on a sub-regional basis within 6 months following the end of each financial year. The Methodology has not been updated to reflect this as it is a performance measure rather than an intrinsic part of the calculation. However, AEMO internal processes will be updates to reflect this requirement.

No.	Consulted Person	Category	Issue	AEMO Response
8	ERM Power		Given that the backcasting study uses historical demand and generation output, we are uncertain as to why any generation scaling would be required to meet the actual demand profile. AEMO should explain the requirement for these small amounts of generation scaling in greater detail	Small amount of generation scaling can occur due to the following reasons: • Active and reactive powers used as inputs in the power system studies are derived from revenue metered half-hourly energy. Therefore the active and reactive power values reflect the average power every half-hour, not the power measured at an instant in time. • Differences in losses due to the network model not being exactly equal to the historical network topology. • The historical generation may slightly exceed the backcasted generation because of simplifying assumptions as made on the size of generator auxiliaries in the backcast study. • The load flow algorithm requires the slack bus to pick up all losses. While this is a valid solution, the historical dispatch may be slightly different. However, certain modifications to the backcasting process can be made to minimise errors due to the issues above, and will be implemented in future backcasting exercises
9	ERM Power		ERM Power is also disappointed that AEMO has chosen only to publish the backcasting study outcomes on an electrical sub-region basis rather than on a connection point basis. We believe the backcasting study outcomes need to be published on a connection point rather than electrical sub-region basis if AEMO intends to meet participant's requirements for improved transparency in this area.	AEMO views the primary reason for backcasting MLFs is to evaluate if the Methodology is fit for purpose. AEMO believes that backcasting and reporting results on a sub-regional basis rather than a connection point basis is sufficient for this purpose. The backcasting process has significantly less rigor applied to the calculation and review. It also includes simplifying assumptions in order to minimise the resources required to calculate backcasted MLFs, and is only fit for the purpose of evaluating sub-regional MLFs. AEMO believes that backcasted MLFs on a connection point is not sufficiently accurate to compare with the published connection point MLFs.
10	Origin Energy		It would be helpful for AEMO to outline what parts or inputs to the Methodology would need to be adjusted to ensure more accurate MLFs in electrically weak parts of the power system, usually located adjacent to interconnectors.	AEMO will provide a detailed report explaining the differences between forecast MLFs and backcast MLFs, along with potential issues with the MLF Methodology, in the annual MLF backcast report.
11	Stanwell		In addition to publishing the (backcasting) results, Stanwell requests AEMO to provide some commentary explaining the difference.	AEMO will provide a detailed report explaining the differences between forecast MLFs and backcast MLFs, along with potential issues with the MLF Methodology, in the annual MLF backcast report.
12	Stanwell		Stanwell is concerned that the results are not more symmetrical for a given sub-region over the years. A non-biased methodology would produce an even distribution of over and under forecast loss factors for a given sub-region	Variations in sub-regional MLFs are strongly influenced by Interconnector flows particularly electrically close to Interconnectors. These flows are driven by the load and generation forecast which vary due to externalities.

No.	Consulted Person	Category	Issue	AEMO Response
13	ERM Power	Generation cap for forecast generation	The Methodology should also consider an "Energy Floor" based on a 5 year historical average to cater for years when demand is forecast to decrease or when generator output has been significantly impacted by a major outage.	The process of excluding historical outliers from the generation cap calculation will prevent the need to apply an "Energy Floor". Removing historically low generation years (potentially impacted by a major outage) will prevent generation being dispatched abnormally low. The "Percent_Demand_Increase" factor in the generation cap calculation also considers years when demand decreases.
14	ERM Power		We do not believe there is a need to include a specific term for retired generation in the energy limit equation. Simply because a generating unit retires does not result in a uniform increase across the output of all remaining generators and this should be left for the normal supply/demand balancing.	It is true that an energy deficit caused by a retiring generator may not result in a uniform increase across the output of all remaining generators. However, by not accounting for the possibility, the ensuing generation cap results in the unit in question **not** picking up any deficit energy, which is incorrect. By accounting for the deficit in the generation cap, the extrapolation algorithm has the flexibility to scale generation to cover the deficit as per the priority order. Therefore AEMO believes that an allowance is required to account for retiring generation in the generation cap.
15	ERM Power		It remains uncertain from the Issues Paper if the wind and solar PV profile will be based on one single reference year or an average of a 3 to 5 year period to account for the normal variations in output. A single reference year to represent outputs from solar PV and wind generators could possibly result in errors in the MLF calculation.	AEMO intends to use a single reference year for solar PV and wind generators. See section 3.1 of this draft report for further details.
16	Origin		Origin would like to see analysis undertaken that removes outliers from the 5 year historical generation pattern; AEMO should develop a methodology, in consultation with participants, which details how they would account for outliers.	AEMO agrees that outliers should not be included in the determination of a generation cap. See section 3.2 of this draft report for further details.
17	Stanwell		AEMO has referred to this method as "applying an energy limit", however, it is not clear how this relates to the term "non-energy limited" used in section 5.5.2 of the procedure. It appears that the term "output limit" or "generation cap" may be a better term to prevent confusion.	AEMO accepts this suggestion and proposes to use the term "generation cap" in the revised Methodology.
18	Stanwell		While Stanwell supports the feasibility of the scaled generation forecast, the method proposed (generation cap) may not be representative of the level of future generation.	AEMO believes applying a generation cap will result in forecast generation that is more representative of a generator's capability and, in turn, produce MLFs that are more likely to represent actual marginal losses in the power system. See section 3.1 of this draft report for further details.
19	Stanwell		The application of an energy limit is unlikely to be representative of the future, especially if demand is growing.	The intent of the "Percent_Demand_Increase" factors is to account for an increase or decrease in demand.

No.	Consulted Person	Category	Issue	AEMO Response
20	Stanwell		Stanwell considers using a capping factor of the greater of the five year historical maximum or the 95th percentile of the generator's nameplate capacity would produce a more accurate loss factor.	AEMO believes enforcing a 95th percentile of nameplate capacity would be counter intuitive as it would result in little or no capping, which is substantially similar to the current Methodology. Refer to section 3.1 regarding AEMO's views on the benefits of applying a generation cap.
21	Stanwell		Stanwell notes that a "buffer" is used in the formula for the generation forecast. Stanwell requests greater transparency of this factor including how it is determined	The generation cap is the five-year historical average energy. The buffer is used to account for unforeseen circumstances. The buffer value will be published along with the indicative extrapolation results.
22	Origin		In developing AEMO's third generation forecasting method using historical pre-dispatch values against load forecasts, Origin would seek clarification on the assumptions that would be used. Specifically would a time series or snapshot methodology be employed?	The use of the National Electricity Market Dispatch Engine to provide a generation forecast is one of the suggested concepts, and is still in its infancy. Since feedback constraints are not suitable (since they rely on SCADA), and results are needed at only a half hourly resolution, the ideal form of the dispatch engine is Pre-dispatch in offline mode. It is a sensitivity on the reference year – if the demand forecast in the reference year was replaced by the demand forecast of the target year, what would the dispatch have been? In addition to the demand forecasts, the offline pre-dispatch engine cases would also contain new units with representative bids, retirements, and adjustments to a selected set of important constraints to approximate the transmission network of the target year. The offline pre-dispatch engine would need to be modified to run only for a single trading interval, rather than covering the full pre-dispatch timeframe of up to 2 days. Taking the reference year Pre-dispatch cases as an input, this process will be repeated for all half-hours of the reference year. Advantages are: • Security constrained dispatch forecast • Transparent, and does not require subjective decision making • Not resource intensive once the system has been developed • Price reflective Disadvantages are: • Price reflective of the reference year, and not the target year
23	ERM Power	Other	The use of planned outages as advised in the MTPASA process, in place of historical outages from the reference year. AEMO should adjust a power station's nominal energy output to reflect the inclusion or non-inclusion of a planned outage for the calculation year.	AEMO believes there are shortcomings in the MT PASA process and as such will not use forecast outages in the loss factor calculation. See section 3.3 of this draft report for further details.
24	Stanwell		It would be a worthwhile addition would be to 'sense check' the historical 5 year generation forecast, with MT PASA data for plant closures or extended outages	AEMO believes there are shortcomings in the MT PASA process and as such will not use forecast outages in the loss factor calculation. See section 3.3 of this draft report for further details.

No.	Consulted Person	Category	Issue	AEMO Response
25	Hydro Tasmania		Hydro Tasmania strongly believes that any substantial changes to the current Methodology or the Rules should only be considered if a material problem is evident and currently this is not the case.	AEMO believes applying a generation cap will result in forecast generation that is more representative of a generator's capability and, in turn, produce MLFs that are more likely to represent actual marginal losses in the power system. See section 3.1 of this draft report for further details.
26	Hydro Tasmania		Hydro Tasmania believes, the existing Methodology is fit for purpose, provides sufficient flexibility and is robust and completely adequate in its current state.	AEMO believes applying a generation cap will result in forecast generation that is more representative of a generator's capability and, in turn, produce MLFs that are more likely to represent actual marginal losses in the power system. See section 3.1 of this draft report for further details.
27	ERM Power	Market Design issues	Appendix B of the Issues Paper contains other issues raised by participants during the successive roundtables and workshop and we believe that AEMO should continue to process and report on these concepts for future consideration.	AEMO does not intend to pursue these issues because insufficient net benefits have been demonstrated at this stage to justify a change. AEMO will continue to monitor the performance of the Methodology and make changes when appropriate. AEMO notes that it is open to any participant to initiate a rule change proposal if they consider it appropriate.