30 November 2019

Level 45
152 St Georges Terrace
Central Park
Perth WA 6000

Postal Address:
PO Box 7096
Cloisters Square
Perth WA 6850

T 08 9469 9800

Rajat Sarawat
Executive Director, Energy Markets
Economic Regulation Authority
Level 4, Albert Facey House
Perth WA 6000

Sent by email to: rajat.sarawat@erawa.com.au

Dear Rajat

MARGIN VALUES AND COST_LR PROPOSALS FOR THE 2020/21 FINANCIAL YEAR

SUBMISSION OF PROPOSALS FOR THE 2020/21 FINANCIAL YEAR

In accordance with the Wholesale Electricity Market Rules (**WEM Rules**), the Australian Energy Market Operator (**AEMO**) is pleased to provide the Economic Regulation Authority (**ERA**) with its proposals for:

- the Margin_Peak and Margin_Off-Peak values (**margin values**) to apply during the 2020/21 Financial Year [clause 3.13.3A(a)]; and
- the updated Cost_LR value to apply during the 2020/21 Financial Year [clause 3.13.3C(a)].

BACKGROUND

The margin values are used to calculate the amount paid to Synergy as the default provider of the Spinning Reserve Service. In accordance with clause 3.13.3A of the WEM Rules, the margin values are reviewed annually.

The Cost_LR value must cover the costs for providing the Load Rejection Reserve Service, the System Restart Service and any Dispatch Support Service[1]. On 30 November 2018, AEMO submitted its proposal for the Cost_LR value for the period from 1 July 2019 to 30 June 2022 (**Review Period**) under clause 3.13.3B(a) of the WEM Rules. In accordance with clause 3.13.3C, and as recommended by the ERA in its Determination – Ancillary service parameters: spinning reserve margin (for 2019/20) and load rejection reserve and system restart costs (for 2019/20 to 2021/22) (**Determination**)[2], AEMO has determined the Cost_LR value for the following Financial Year to be materially different from the costs provided under clause 3.13.3B. AEMO is therefore required to submit an updated proposal for the Cost_LR value to the ERA under clause 3.13.3C(a).

AEMO engaged Ernst & Young as a consultant to provide an independent assessment of the margin values and the L component of the Cost_LR value for the 2020/21 Financial Year. The consultant has produced a confidential report (Ancillary services parameter review 2019 final report (confidential version)) (**Report**) and will produce a public version of the report shortly. A copy of the Report is provided as **Attachment 1** to this letter. The Report covers (among other things) the key market-related

[1] As at the date of this letter, AEMO does not anticipate that it will incur Dispatch Support Service costs during the Review Period, for the purposes of clause 3.13.3B(a) of the WEM Rules.
[2] Available at: https://www.erawa.com.au/electricity/wholesale-electricity-market/ancillary-services-parameters/load-rejection-cost_lr.

assumptions applied in the Wholesale Electricity Market modelling, the calculation of costs and the modelling methodology applied, and the results of the modelling simulations.

Pursuant to clause 3.11.8A of the WEM Rules, AEMO has entered into Ancillary Service Contracts with Market Participants for the System Restart Service. AEMO has proposed the R component of the Cost_LR value for the 2020/21 Financial Year based on these contracts. AEMO has outlined its approach for determining the R component of the Cost_LR value in **Appendix 1** of this letter.

PROPOSED MARGIN VALUES FOR THE 2020/21 FINANCIAL YEAR

In accordance with the recommendations of the Report, AEMO proposes the following margin values to apply during the 2020/21 Financial Year:

Reporting metric	Unit	Approved / Proposed (2019/20)	Proposed (2020/21)
Margin_Peak	%	17.32	39.65
Margin_Off-Peak	%	12.92	23.24
SR_Capacity_Peak	MW	235.40	251.66
SR_Capacity_Off-Peak	MW	236.40	240.24
Arithmetic average balancing price, peak trading intervals	$/MWh	56.48	35.15
Arithmetic average balancing price, off-peak trading intervals	$/MWh	46.08	31.16
Average annualised availability cost, peak trading intervals	$m	6.91	5.063
Average annualised availability cost, off-peak trading intervals	$m	3.43	2.419

The expected total average annualised availability cost for SRAS payments to Synergy has decreased from $10.34M in 2019/20 to $7.48M in 2020/21. A discussion of the key drivers for the changes in margin values is presented in the Report.

PROPOSED COST_LR VALUE FOR THE 2020/21 FINANCIAL YEAR

In accordance with the recommendations of the Report, AEMO proposes the following components of the Cost_LR value to apply for the 2020/21 Financial Year.

Financial Year	Load Rejection Reserve (L) Cost			System Restart (R) Cost		
	2018 Proposed	2018 Approved	2019 Proposed	2018 Proposed	2018 Approved	2019 Proposed
2019/20	$4,738,200	$1,400,000	-	$3,316,000	$2,924,238	-
2020/21	$4,343,500	$1,400,000	$721,000	$3,293,000	$2,899,148	$3,277,661
2021/22	$1,086,600	$1,400,000	N/A[3]	$3,375,000	$2,961,377	N/A[3]

Therefore, the proposed Cost_LR value to apply for the 2020/21 Financial Year is $3,998,661. The significant decrease in the Load Rejection Reserve cost proposed by AEMO compared to the 2018

[3] As per clause 3.13.3C of the WEM Rules, AEMO must submit an updated proposal if it determines the Cost_LR value for "the following Financial Year" to be materially different than the costs provided under clause 3.13.3B. AEMO will submit an updated proposal for the Cost_LR value for the 2021/22 Financial Year to the ERA under clause 3.13.3C(a) by 30 November 2020.

proposal has been largely driven by AEMO's efforts to implement a new dynamic approach to calculating the Load Rejection Reserve requirement which results in an lower MW quantity requirement.

A discussion of the key drivers for the changes to the L component of the Cost_LR value is presented in Appendix 1.

PROCESS

AEMO notes the following processes and improvements that have been implemented for the margin values and Cost_LR proposals:

Margin values and Load Rejection Reserve cost modelling

- This year AEMO calculated proposed margin values and a proposed Cost_LR value for the 2020/21 Financial Year. Given the similar nature of the methodologies for these reviews, AEMO engaged a consultant to provide consultancy services in support of both reviews in order to ensure consistent modelling outcomes.
- In June 2019, AEMO undertook a competitive tender process to engage a consultant. AEMO received and evaluated several submissions from different vendors, and EY was appointed as the consultant.
- AEMO:
  - identified a number of market developments in the WEM that were expected to impact the provision of Ancillary Services in the 2020/21 Financial Year; and
  - worked closely with the consultant to deliver several modelling improvements for the review.

  These matters are discussed in section 3 of the Report, and are summarised as follows:
  - A new dynamic approach to calculating the Load Rejection Reserve requirement.
  - Possible changes in the size of the single largest supply-side contingency.
  - The sculpted approach to determining the volume of LFAS up and LFAS down and new LFAS providers.
  - The 'full runway' method for allocation of Spinning Reserve costs among Market Participants and the impact on bidding behaviour. This addresses a recommendation made by the ERA in the Determination.
  - The requirement to maintain certain levels of the ready reserve standard.
  - The implementation of the Generator Interim Access (GIA) solution.
  - The procurement of non-Synergy Spinning Reserve.
  - The potential for reduction in Load Rejection Reserve as a result of rooftop solar PV.
- AEMO and the consultant developed a number of improvements to the modelling approach, which are discussed in the Report. These improvements include:
  - Modelling the least-cost mix of LFAS providers as part of the preliminary dispatch to ensure that LFAS is modelled in line with operational practice.
  - Integrating the optimisation of both Spinning Reserve and Load Rejection Reserve in a single model to reflect the inherent relationship between these services.
- With reference to the margin values and Load Rejection Reserve cost modelling, the Determination made several recommendations. AEMO has endeavoured to address each of the recommendations as summarised in the following table.

Recommendation	AEMO Action
Specifically consider the effect that 'modified runway' allocation of SRS liabilities has on generators' bidding behaviour, balancing prices and the SRS requirement during low load periods	To reflect the current state of the WEM Rules, the impact of the 'full runway' (instead of the 'modified runway') has been considered and is reflected in the offer profiles of the generating units. This is discussed in section 3.3 of the Report.
Provide clarity on the technical reasons to exclude load following capacity from counting towards available SRS	AEMO has clarified the technical reasons for excluding some LFAS capacity from counting towards available SRAS in its response to the ERA's report on the 2019-20 Ancillary Services Requirements[4]. This is discussed in section 2.2 of the Report.
Clarify its practice for the management of LRRS including its over-frequency risk evaluation method Re-examine planning for and actual use of LRRS	A detailed summary of the operational practice for the management of Load Rejection Reserve is provided in Appendix G of the Report. A detailed summary of the Load Rejection Reserve requirement used in the proposed Cost_LR value, is provided in section 3.4 of the Report.
Re-examine the historical incidence of plant re-scheduling	AEMO undertook a detailed backcasting analysis as summarised in section 5 of the Report.
Review the modelling assumptions	AEMO has undertaken a robust review of the modelling assumptions. The process undertaken is summarised in this letter and the final assumptions are summarised in section 4.2 of the Report. In this review, including through the backcasting exercise, AEMO and the consultant identified a number of assumptions that were verified with the relevant Market Participants, or were modified where necessary, to ensure the model used to simulate the Wholesale Electricity Market is fit for purpose and does not produce material errors, and modelled dispatch outcomes are well aligned with historical dispatch observations . These are discussed in sections 4.2 and 5.6 of the Report.
Consider and account for the automatic contribution from inverter-connected generation such as solar PV that would trip or decrease output when over-frequency occurs, due to its over-frequency settings.	AEMO has neither the means to quantify nor monitor the amount of aggregate PV output reduction in response to over-frequency events. This limits AEMO's ability to incorporate over-frequency responses from rooftop PV into the dynamic LRR requirements. This matter is addressed in more detail in section 3.8 of the Report.

Assumptions Process

- On 18 September 2019, AEMO published a draft public version of the Methodology and Assumptions Report on the Market Web Site[5]. This report provided an overview of the model used to simulate the Wholesale Electricity Market, including key inputs and outputs used. AEMO invited interested stakeholders to provide written submissions.
- On 24 September 2019, AEMO held a public workshop for interested parties to discuss the draft public version of the Methodology and Assumptions Report. The workshop was attended by representatives from 4 Market Participants and representatives from the ERA. The presentation prepared by the consultant is published on the Market Web Site[5].

[4] Available here: http://www.erawa.com.au/cproot/20626/2/AEMO-response-to-ERA-s-Ancillary-Services-report---2019-20.pdf.
[5] Available on AEMO's website here: https://www.aemo.com.au/Electricity/Wholesale-Electricity-Market-WEM/Security-and-reliability/Ancillary-services/Ancillary-Services-Parameters.

- By 2 October 2019, AEMO received one written submission on the draft public version of the Methodology and Assumptions Report. AEMO's views on the matters raised in the written submission, and the consequential amendments to the modelling methodology, are outlined in section 1.2 of the Report.
- As recommended by the ERA in the Determination, on 2 August 2019 AEMO undertook a confidential, individual consultation process with 14 Market Generators relating to their generation facilities. 13 Market Generators provided feedback, and a number of input assumptions were updated. The Report includes the final assumptions used in the modelling, some of which were refined through the backcasting exercise to ensure modelled outcomes are well aligned with historical outcomes.

Quality Assurance

- The Determination (on pages 11 and 12) made several recommendations relating to the quality assurance process used for modelling inputs and outputs. AEMO has addressed each of the recommendations as summarised in the following table.

Recommendation	AEMO Action
Review recent changes to the load and generation profile	Forecast load was applied as per the most recent AEMO WEM ESOO (June 2019). Generation profiles were reviewed and applied for the modelling, as a result of the backcasting and model calibration exercise discussed in section 5 of the Report.
Ensure a detailed discussion of the results be provided, including reconciling modelled results with observed practice	A detailed discussion of the results is provided in section 9 of the Report. Reconciling modelled results with observed practice was undertaken as a result of the backcasting and model calibration exercise discussed in section 5 of the Report.
Ensure sensitivity analyses be conducted prior to conducting the modelling exercise proper and include a detailed discussion of the results in the draft assumptions report	Sensitivity modelling was performed to validate the results of the base case modelling and test the reaction of modelling outputs to assumed variations in inputs. A discussion of the sensitivity analysis undertaken is included in section 7 of the Report.
Rigorously test input assumptions for the model with MPs, including using blank forms to collect modelling input data prior to conducting a backcasting exercise	AEMO issued blank forms to 14 Market Generators on 2 October 2019. AEMO received responses, including several partly-complete forms, from 13 Market Generators.
Ensure backcasting analysis be conducted in every process and results be used to validate the input assumptions	A discussion of the backcasting analysis and associated calibration of the model is included in section 5 of the Report.
Ensure a detailed discussion of results and possible limitations of the modelling be provided in the final assumptions report	A detailed discussion of the results and possible limitations of the modelling is provided in section 9 of the Report.
Submit all supporting information, including modelling output workbooks, together with its proposal, by 30 November	AEMO has provided the ERA with the Report. However, due to delays in modelling due to issues identified during AEMO's QA processes, the public version of the Report and the modelling output workbooks will be provided to the ERA as soon as practicable.

Recommendation	AEMO Action
Ensure a proper quality assurance process has been conducted on the proposals and their supporting documentation with supporting statements on how the quality assurance was conducted and any issues identified.	AEMO has undertaken a robust quality assurance process on the deliverables and final results including: • Reviewing all input assumptions in collaboration with the consultant and Market Participants. • Reviewing the modelling structure in collaboration with the consultant. • As part of the backcasting exercise, carrying out a detailed review of modelled dispatch outcomes and recommending model calibration changes to ensure alignment with actual historical outcomes. • Comprehensive algorithmic assessment and checks of the post-optimisation results at an interval level using analytical tools (e.g. Python) to confirm the integrity of the calculations. • Extensive reviews of the optimisation results and accompanying analysis. This resulted in changes in the preliminary dispatch model and optimisation methodology as outlined in section 5 of the Report. • Extensive review of the Report provided to the ERA in support of this proposal. The consultant has undertaken quality assurance in accordance with the approach outlined in Appendix F of the Report.

System Restart

- AEMO's proposed R component of the Cost_LR value for the 2020/21 Financial Year is not materially different from the 2018 proposal, but must be included in the Cost_LR value to apply during the 2020/21 Financial Year.
- The proposal for the R component of the Cost_LR value for the 2020/21 Financial Year was $3,293,000. The Determination approved an R component of $2,899,148.
- In the Determination, the ERA acknowledged the challenges of procuring System Restart Services and made some recommendations. AEMO is examining the best approach for procuring System Restart Services for the remainder of the Review Period and will continue to engage with the ERA regarding this matter.
- As two of the Ancillary Service Contracts for System Restart Facilities expire in June 2021, and are practicably unable to be renegotiated for the 2020/21 Financial Year, AEMO has proposed the R component of the Cost_LR value for the 2020/21 Financial Year based on these contracts.

Please contact Mark Katsikandarakis on (08) 9469 9932 or Teresa Smit on (08) 9469 9992 if you have any queries or would like to discuss further.

Yours sincerely

[redacted]

Cameron Parrotte
Executive General Manager, Western Australia

Attachments:

- Attachment 1: Ancillary services parameter review 2019 final report (confidential version)

APPENDIX 1 – SUMMARY OF SYSTEM RESTART SERVICE COST

The System Restart Service is defined in clause 3.9.8 of the Market Rules:

> *System Restart Service is the ability of a Registered Facility which is a generation system to start without requiring energy to be supplied from a Network to assist in the re-energisation of the SWIS in the event of system shut-down.*

The System Restart Service is only required when there is a shutdown of the South West Interconnected System (**SWIS**). Ideally, the service will never be required. However, if a shutdown event were to occur and the service were to fail, then the SWIS may be without power for several days.

AEMO requires at least three Facilities to provide the System Restart Service to ensure reliability during contingency events, including planned and forced outages affecting two out of the three Facilities concurrently. In addition, to mitigate the risk of common failure, Facilities providing the System Restart Service should not be in the same geographical or electrical area (sub-networks); and have the capability and in a location able to re-energise other generation to enable restart of the system.

Consequently, the requirement for the System Restart Service is a Facility providing restart capability in each of the three electrical sub-networks, being North Metropolitan, South Metropolitan and South Country.

AEMO has entered into Ancillary Service Contracts with Market Participants for the System Restart Service under clause 3.11.8A of the WEM Rules.

Under these contracts, service providers are paid monthly. The contracts provide a payment adjustment mechanism to address periods when the System Restart Service is, or is taken to be, unavailable. The contracts for the North and South Metropolitan areas will end on 30 June 2021. AEMO has commenced preliminary work to procure the System Restart Service in these two sub-network areas[6].

The South Country contract commenced in October 2018, and hence the CPI adjustment in the subsequent years is applied from October other than from July.

Further information regarding these calculations is set out in the confidential Appendix 2.

[6] AEMO intends to release an expression of interest followed by an invitation to tender in early 2020.

APPENDIX 2 – CONDIFDENTIAL SYSTEM RESTART CALCULATIONS

AEMO has the following contracts for the System Restart Service:

[7] Based on the WA Department of Treasury's Consumer Price Index Forward Estimates - http://www.treasury.wa.gov.au/Treasury/Economic_Data/Economic_Forecasts.

[8] The review period for the Synergy (Kemerton) System Restart Service is from October to September and the costs have been calculated with CPI adjustments taking this into account.