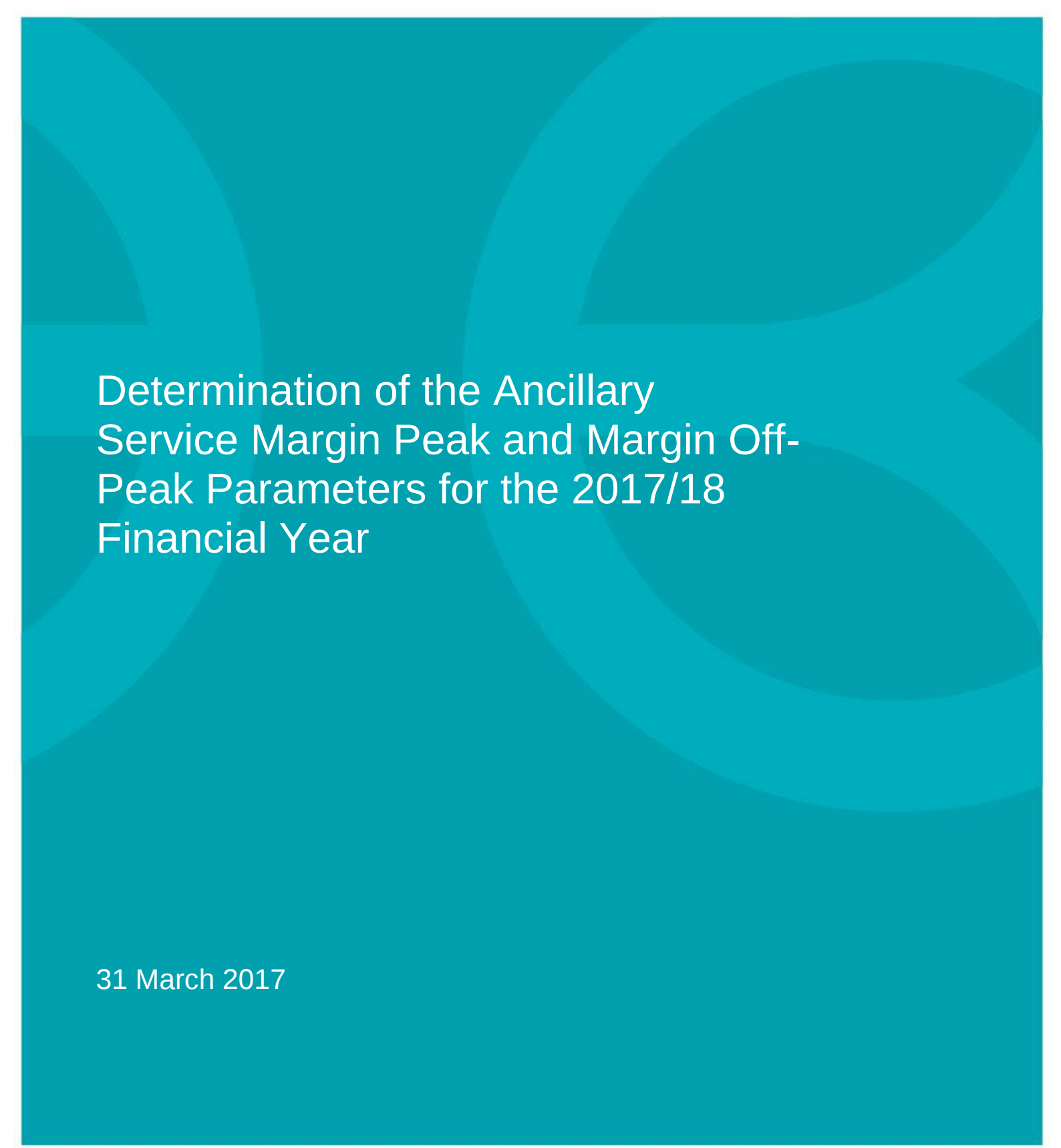




Determination of the Ancillary Service Margin Peak and Margin Off- Peak Parameters for the 2017/18 Financial Year

31 March 2017

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DETERMINATION

1. Pursuant to clause 3.13.3A of the *Wholesale Electricity Market Amending Rules* (**market rules**), the Economic Regulation Authority (**ERA**) has determined the values for the Margin_Peak and Margin_Off-Peak parameters (**margin values**) for the 2017/18 financial year to be 36 per cent and 64 per cent, respectively.

REASONS

Background

2. The values for the Margin_Peak and Margin_Off-Peak parameters are used in the Ancillary Service settlement calculations in clause 9.9.2 of the market rules. These compensate Synergy for the change in costs and revenue incurred by Synergy in its role as the default Spinning Reserve Ancillary Service provider.
3. Synergy is required to hold generation capacity from synchronised generators in reserve. This enables the system manager to respond to large reductions in generation and short duration frequency or voltage fluctuations to prevent involuntary load shedding and further generation loss.
4. These parameters, when applied to the balancing price enable Synergy to recoup the 'availability costs' it incurs for providing spinning reserve to the market. Other generators can also provide spinning reserve through contract to AEMO, if they can do so at lower cost.
5. AEMO's predecessor, the Independent Market Operator, undertook a modelling exercise to estimate the parameter value. AEMO has continued this process and calculation method.
6. The modelling compares a 'real-world' scenario against counterfactual scenarios. The results isolate differences in Synergy's costs and revenues resulting from providing spinning reserve and its interactions with other ancillary services such as load following and load rejection reserves.
7. AEMO undertakes the modelling and submits a proposal for the margin values to the ERA for determination.
8. In proposing the margin values, the market rules require that the AEMO take account of:
 - the margin Synergy could reasonably have been expected to earn on energy sales forgone due to the supply of Spinning Reserve Service; and ¹
 - the reasonable expectation of costs associated with Synergy's scheduled generators efficiency reduction arising from providing Spinning Reserve Service.²

¹ Market Rule 3.13.3A (i)

² Market Rule 3.13.3A (ii)

9. In making its determination, the ERA must undertake public consultation and consider the Wholesale Market Objectives³ and AEMO's proposal.⁴
10. The following table shows the margin values proposed by AEMO for 2017-18 and for 2016-17.

Values	2017-18 proposed	2016-17 approved
Margin peak (%)	36	24
Margin off-peak (%)	64	35
Average annual spinning reserve capacity peak (MW)	221.8	218.1
Average annual spinning reserve capacity off-peak (MW)	190.2	191.9
Modelled availability cost (\$m)	13.29	10.55
System marginal price peak (\$/MWh)	56.27	52.97
System marginal price off-peak (\$/MWh)	39.36	36.17

Public Consultation and Submissions

11. The ERA is required to release an issues paper and invite public submissions.⁵ The ERA published an issues paper on 28 December 2016 and extended the consultation period on 1 February in response to an amended proposal from AEMO.
12. The ERA received one submission from Bluewaters Power.⁶ The submission was critical of a number of elements of the modelling and the process.⁷ In particular, it draws attention to:
- poor model output transparency, including limited information contained in the modelling report;
 - no reconciliation between modelled and real world outcomes; and
 - the use of gas price instead of value.
13. Bluewaters highlighted potential remedies for modelling transparency, including:
- conducting and publishing sensitivity analyses;
 - facilitating contact between market participants and the parties conducting the modelling;
 - consulting market participants on the modelling outputs and the proposal prior to submission; and

³ Refer to Market Rule 1.2 for the objectives of the market.

⁴ Market Rule 3.13.3A

⁵ Market Rule 3.13.3A (b)

⁶ Sutherland A. (2017) Response to Issues Paper – margin values for the 2017/18 financial year, Bluewaters Power, Perth

⁷ The ERA understands the process concerns raised by Bluewaters Power. However, the ERA will only address matters raised where they are germane to the determination. Specifically, questions around modelling transparency and robustness are relevant to the determination.

- allowing stakeholders an opportunity to take action to mitigate costs and market risks (by providing alternative sources of spinning reserve).
14. Bluewaters requested that the ERA specifically examine:
 - the influence of start-up costs on outcome pricing;
 - the apparent dissonance between balancing prices and fuel costs;
 - the value of gas as an input assumption;
 - the difference between past years modelled and actual dispatch and prices; and
 - AEMO ancillary services payments.
 15. AEMO consulted on the modelling input assumptions to the market as a whole, and with individual market participants. However, market participants did not see the modelling outputs before AEMO submitted them to the ERA.
 16. It is for AEMO to decide whether it should disseminate the report's findings to the market in advance of submitting its proposal to the ERA. However, a more detailed explanation of the results could improve the report's content.

Assumptions

17. As with previous years, the gas transport assumptions include a fixed component. Although small, this is not consistent with the concept of only using marginal costs in balancing market offers.
18. Jacobs has previously argued that the fixed component is included because it is not recoverable through other mechanisms.⁸ Given the modelling exercise seeks to emulate the market as it exists, the assumption's validity appears weak. The ERA considers AEMO should revise this assumption in the next assessment, in line with recommendations in past determinations.⁹
19. Nevertheless, the influence of including a fixed component on the margin values is unlikely to be material because:

⁸ ERA (2015) Determination of the Ancillary Service Margin Peak and Margin Off-Peak parameters for the 2015/16 financial year, Economic Regulation Authority, Perth, p7, paragraphs 27 and 28
<https://www.erawa.com.au/cproot/13419/2/Determination%20of%20the%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20parameters%20for%20the%202015%2016%20financial%20year.pdf>

⁹ ERA (2016) Determination of the Ancillary Service Margin Peak and Margin Off-Peak parameters for the 2016/17 financial year, Economic Regulation Authority, Perth, p6, paragraph 31
<https://www.erawa.com.au/cproot/14175/2/Determination%20Paper%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20for%20201617.PDF>;

ERA (2015) Determination of the Ancillary Service Margin Peak and Margin Off-Peak parameters for the 2015/16 financial year, Economic Regulation Authority, Perth, p7, paragraph 27-28
<https://www.erawa.com.au/cproot/13419/2/Determination%20of%20the%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20parameters%20for%20the%202015%2016%20financial%20year.pdf>

ERA (2014) Determination of the Ancillary Service Margin Peak and Margin Off-peak Parameters for the 2014/15 Financial Year, Economic Regulation Authority, Perth, p5, paragraphs 26-27
<https://www.erawa.com.au/cproot/12152/2/Determination%20of%20the%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20Parameters%20for%20the%202014-15%20financial%20year.pdf>

- margin values modelling involves comparing the relative difference between four scenarios with and without different reserves. Gas transportation charges are common across all four scenarios; and
 - the fixed component is a relatively small component of the total price.
20. Bluewaters questioned the use of gas pricing that referenced a combination of contract prices and spot prices and whether the contract price reflected the value of gas. It argued that gas pricing assumptions reflecting spot market prices would provide a more appropriate measure of the gas value.
 21. Spot market pricing is problematic because there is no price transparency for two of the three short-term gas trading platforms. The short term trading market also lacks liquidity. Determining what the spot market price would be in place of a contract, or as an alternative to generating electricity would introduce considerable uncertainty to the forecasting process.
 22. Notwithstanding uncertainty in spot market prices, the market rules specify the ERA in determining the margin values take account of:
 - the margin Synergy could reasonably have earned on foregone sales; and
 - the change in Synergy's operating costs as a function of efficiency changes due to scheduling the reserve.¹⁰
 23. The rules imply an equivalence between the balancing market inputs and inputs to the modelling exercise from which the margin values are determined.
 24. For the purposes of setting margin values, the ERA is satisfied that the assumptions reflect current practice in the balancing market and hence are a reasonable basis on which to determine the margin values.

Assessment

25. Comparing actual ancillary services payments against their forecasts used to set the margin values would be of limited value. There are reasons why actual outcomes will differ from modelled outcomes. Differences in load, temperature and outage patterns will all contribute positively or negatively to differences. Reconciliations between forecast ancillary service payments with actual payments are of limited benefit unless the model uses the same real world inputs.
26. The ERA compared modelled forecast and historical dispatch patterns to determine how similar the broad patterns were. That analysis found differences between the two. While differences are to be expected, they warrant deeper future consideration to ensure the model is appropriately calibrated.
27. Back-casting is one mechanism of confirming a model's capability at accurately forecasting behaviour under real world conditions, and as noted by Bluewaters Power, improves market confidence in the process.
28. Back-casting is where a model is run covering a period using actual rather than forecast input parameters (such as load, outages and temperature) with the results compared to real market outcomes. The model inputs and decision-making

¹⁰ Market rule 3.13.3A

- structures may then be tuned to produce results that more closely emulate the real world.
29. The most recent back-casting exercise compared model outputs from the 2012-13 financial year. Jacobs found there was relatively close alignment between the modelled back-cast and actual generation in the sample period.
 30. However, there have been considerable changes in the market since Jacobs undertook a back-casting study including the carbon pricing mechanism repeal, changes to input costs and Synergy's re-aggregation.
 31. Sensitivity analysis tests the influence of changes to individual parameters on modelled outputs. It enables more targeted input scrutiny and supports a deeper understanding of modelling outputs, identifying errors and a clearer explanation of modelling outcomes.
 32. Sensitivity analysis would reinforce modelling robustness. Input parameter assumptions were subject to substantial revision from some market participants for the 2017/18 financial year. Understanding the relative importance of parameters on the overall modelling outputs aids targeted scrutiny of assumption revisions provided by market participants.
 33. The ERA notes that AEMO did not undertake a back-casting exercise to support its proposal despite recommendations to do so in the last two determinations.¹¹ The ERA considers AEMO should undertake both sensitivity analysis and a back-casting exercise to improve modelling quality assurance and market participant confidence to support all future margin values proposals.
 34. Bluewaters Power has posed the question as to whether third party providers can reduce the margin values by providing spinning reserve to the market.
 35. The modelled approach to pricing spinning reserve has inherent limitations. For practical reasons, it cannot identify the least cost means of providing spinning reserve to the market, only the anticipated least cost spinning reserve from Synergy's portfolio.
 36. It is impractical for the margin values assessments to incorporate hypothetical alternative spinning reserve quantities. This would incorporate reserves that unless contracted, may not be there when required.
 37. Deriving margin values from modelling that included uncertain reserves would not enable Synergy to recoup the costs it incurs for spinning reserve. Only scenarios underpinned with contracts would reflect Synergy's probable change in costs. Any

¹¹ The Authority recommended AEMO conduct revised back casting exercise to support this determination in 2016, and as an ongoing quality assurance measure in 2015. Refer:

ERA (2016) Determination of the Ancillary Service Margin Peak and Margin Off-Peak parameters for the 2016/17 financial year, Economic Regulation Authority, Perth, p7, paragraph 33
<https://www.erawa.com.au/cproot/14175/2/Determination%20Paper%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20for%20201617.PDF>; and

ERA (2015) Determination of the Ancillary Service Margin Peak and Margin Off-Peak parameters for the 2015/16 financial year, Economic Regulation Authority, Perth, p6-7, paragraph 23
<https://www.erawa.com.au/cproot/13419/2/Determination%20of%20the%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20parameters%20for%20the%202015%2016%20financial%20year.pdf>

scenarios based on hypothetical capacity would not reflect the margin Synergy could reasonably have expected to earn and would not conform to the market rules.

38. Market rules allow market participants to provide spinning reserve to the market.¹² The ERA can only approve a contract to avoid a spinning reserve shortfall or if such a contract would reduce the market's ancillary service costs.
39. Notwithstanding this, the modelled approach is a second best means to identifying the cost of providing spinning reserve. A better solution is the co-optimised dispatch and ancillary services market recommended by the ERA and the Electricity Market Review.¹³

CONCLUSION

40. After review of the modelling outputs and comparison with historical dispatch patterns, the ERA is satisfied that AEMO's proposal complies with the market rules. Specifically, the ERA considers that it accounts for:
 - the margin Synergy could reasonably have been expected to earn on energy sales foregone due to providing spinning reserve during peak and off-peak periods; and
 - the change in Synergy's scheduled generator efficiency that System management will schedule to provide spinning reserve during peak and off-peak periods.
41. Process transparency and the market participant confidence in the process outputs could be improved if AEMO expanded explanation of the modelling results and annually conducted:
 - sensitivity analysis to inform result interpretation; and
 - back-casting to test the modelling outputs' veracity against "real world" outcomes and provide a point of comparison for AEMO's availability payments to Synergy.

¹² Market Rule 3.11.8

¹³ Public Utilities Office (2016) Design Recommendations for Wholesale Energy and Ancillary Services Market Reforms: Position Paper, Department of Finance, Perth pp13-15;
https://www.finance.wa.gov.au/cms/uploadedFiles/Public_Uilities_Office/Electricity_Market_Review/Position-paper-Energy-Market-Operations-and-Processes.pdf

Also

ERA (2016) Determination of the Ancillary Service Margin Peak and Margin Off-peak Parameters for the 2016/17 Financial Year, Economic Regulation Authority, Perth p3,
<https://www.erawa.com.au/cproot/14175/2/Determination%20Paper%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20for%20201617.PDF>

ERA (2015) Determination of the Ancillary Service Margin Peak and Margin Off-peak Parameters for the 2015/16 Financial Year, Economic Regulation Authority, Perth p4,
<https://www.erawa.com.au/cproot/13419/2/Determination%20of%20the%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20parameters%20for%20the%202015%2016%20financial%20year.pdf>

ERA (2014) Determination of the Ancillary Service Margin Peak and Margin Off-peak Parameters for the 2014/15 Financial Year, Economic Regulation Authority, Perth, p3,
<https://www.erawa.com.au/cproot/12152/2/Determination%20of%20the%20Ancillary%20Service%20Margin%20Peak%20and%20Margin%20Off-Peak%20Parameters%20for%20the%202014-15%20financial%20year.pdf>