Determination of the Ancillary Service Margin Peak and Margin Off-Peak parameters for the 2015/16 financial year

31 March 2015

Economic Regulation Authority

WESTERN AUSTRALIA

Contents

DETERMINATION

1. Pursuant to clause 3.13.3A of the *Wholesale Electricity Market Amending Rules* (**Market Rules**), the Economic Regulation Authority (**Authority**) has determined the values for the Margin_Peak and Margin_Off-Peak parameters (**Margin Values**) for the 2015/16 financial year to be 36 per cent and 51 per cent, respectively.

REASONS

Background

2. Synergy is currently the default provider of the Spinning Reserve Ancillary Service[1] under the Market Rules. However, the Market Rules also allow other generators to provide such services through an Ancillary Service Contract provided it is a less expensive alternative.[2]

3. The Margin Values are required under the Market Rules.[3] These parameters reflect the margins applied to the Balancing Price in the settlement calculations of the availability costs to be paid to Synergy for the provision of Spinning Reserve Ancillary Service.

4. Under the Market Rules[4], the Independent Market Operator (**IMO**) must submit a proposal for the Margin Values to the Authority by 30 November of the year prior to the start of the financial year, and the Authority must determine the Margin Values for each financial year by 31 March, prior to the start of that financial year.[5]

5. The Market Rules set out the factors that the IMO must take into account in its proposal for the Margin Values:

    -   the margin Synergy could reasonably have been expected to earn on energy sales forgone due to the supply of Spinning Reserve Service; and

    -   the loss in efficiency of Synergy's scheduled generators that System Management has scheduled to provide Spinning Reserve Service that could reasonably be expected due to the scheduling of those reserves.

6. The IMO submitted its proposal on the Margin Values for the 2015/16 financial year on 28 November 2014.[6] The IMO engaged Jacobs Group (Australia) Pty Ltd (**Jacobs**) to assist in deriving the Margin Values and provided the Authority with a confidential report prepared by Jacobs on the key modelling assumptions used in deriving the Margin Values.

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[1] Spinning reserve is reserve that is synchronised to the system that can respond almost immediately and provide frequency or voltage support for a short duration.

[2] Clause 3.11.8(b) of the Market Rules.

[3] Clause 9.9.2.

[4] Clause 3.13.3A(a).

[5] Required by clause 3.13.3A.

[6] Jacobs' 2015/16 Margin Peak and Margin Off-Peak Review confidential final report (24 November 2014) is included as an attachment to the IMO's proposal of the Margin Values.

7.   As a result of queries made by the Authority on the IMO's proposal and Jacobs' report, the IMO became aware of an error in its proposal and Jacobs' report and submitted a revised proposal on 11 February 2015. Subsequently, further queries were made by the Authority on the revised proposal and Jacobs' revised report. The IMO advised a further error was identified and it submitted a second revised proposal to the Authority on 25 February 2015.

8.   The IMO's original and two revised proposals (with Jacobs' reports as attachments) are available on the Authority's website.[7]

9.   The table below shows the IMO's proposed Margin Values for the 2015/16 financial year on 28 November 2014 (original proposal), 11 February 2015 (revised proposal) and 25 February 2015 (second revised proposal), compared with the approved Margin Values for 2014/15.[8] The table also shows other parameters used in deriving the Margin Values.

Margin Values and other parameters used in deriving the Margin Values

Margin Values	Original proposal on 28/11/2014 2015/16	Revised proposal on 11/02/2015 2015/16	Second revised proposal on 25/02/2015 2015/16	Current 2014/15
Margin Off-Peak (%)	26	45	51	14
Margin Peak (%)	26	31	36	15
Average Annual Spinning Reserve Capacity_Off-Peak (MW)[9]	178.44	178.44	178.44	201.29
Average Annual Spinning Reserve Capacity_Peak (MW)	208.84	208.84	208.84	220.48
Estimated Annual Availability Cost ($M)	7.21	7.25	8.32	5.11
System Marginal Price_Off-Peak ($/MWh)	32.98	32.98	32.98	31.10
System Marginal Price_Peak ($/MWh)	47.23	47.23	47.23	45.83

10. In making the determination on the Margin Values, the Market Rules[10] require the Authority to take into account:

- the Wholesale Market Objectives; and

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[7]   See ERA website, https://www.erawa.com.au/electricity/wholesale-electricity-market/determinations/ancillary-services-parameters/spinning-reserve-margin_peak-and-margin_off-peak

[8] These values have no carbon price components as carbon price was repealed in July 2014.

[9] The Authority understands from the IMO that the Average Annual Spinning Reserve Capacity depends on which generator is running and on the output of the largest generator running. This information is dynamic and changes in each interval. For this reason, the averages vary between simulation runs which has contributed to slightly different numbers for the Average Annual Spinning Reserve Capacity in 2014/15 with and without carbon price.

[10] Clause 3.13.3A.

- the proposal submitted by the IMO.

11. The Authority must also undertake a public consultation process, which must include publishing an issues paper and issuing an invitation for public submissions.[11] On 4 March 2015, the Authority published a notice and an Issues Paper inviting public submissions on the IMO's proposal. The period for public submissions closed on 18 March 2015. No public submissions were received.

Assessment

12. The Authority has assessed the proposed Margin Values against the factors set out in the Market Rules[12] by taking into account:

- the Wholesale Market Objectives.

- whether the proposed values by the IMO reflect what Synergy could reasonably have been expected to earn on energy sales forgone due to the requirement to supply Spinning Reserve Ancillary Services; and the loss in efficiency of Synergy's scheduled generators that System Management has scheduled to provide spinning reserve service that could reasonably be expected due to the scheduling of those reserves.

- issues raised in the public submissions.

Wholesale Market Objectives

13. The Authority has considered whether the proposed Margin Values are consistent with the Wholesale Market Objectives. The Authority notes that the calculations of Margin Values are based on Spinning Reserve being provided by Synergy's facilities or through Ancillary Service contracts.[13] The Authority considers that this current arrangement may not produce an efficient outcome for the market as a whole, and that the introduction of a co-optimised energy and Ancillary Services market would better promote the Wholesale Market Objective under clause 1.2.1(b) of the Market Rules.[14]

14. Under such an arrangement, separate markets would exist for each Ancillary Service as well as for energy. Market Participants would be able to offer their facilities into the markets in which they were willing and able to participate, and the co-optimisation process would use the offers received for the different markets to determine the optimal dispatch. However, the Authority acknowledges that the introduction of a co-optimised energy and Ancillary Services market will be dependent on the outcomes of the Electricity Market Review.

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[11] Required by clause 3.13.3A(b) of the Market Rules.

[12] Clause 3.13.3A

[13] As of 2014 Bluewaters power station provides Spinning Reserve under an Ancillary Service contract. A small quantity of Spinning Reserve is also provided by Interruptible Load under Ancillary Service contracts.

[14] The Wholesale Market Objective under clause 1.2.1(b) is to encourage competition among generators and retailers in the South West Interconnected System, including by facilitating efficient entry of new competitors.

Energy sales forgone and loss in efficiency

15. The Authority notes there have been some modifications to the methodology used to derive the Margin Values compared with previous years. Consistent with previous year's approach, Jacobs estimated the availability cost that could reasonably be expected to be incurred by Synergy for providing Spinning Reserve,[15] by undertaking market simulations that compare the revenue and generation cost outcomes with and without the provision of Spinning Reserve by Synergy.

16. In this year's review, Jacobs also took into account the impact of providing Load Rejection Reserve[16] on the availability cost. It considers there is an interaction cost effect between the cost of providing Spinning Reserve and the cost of providing Load Rejection Reserve, with the cost of providing both forms of reserve generally higher than the sum of providing each reserve separately. Jacobs labelled the difference between these two quantities as the Interaction Cost. Jacobs consulted with the IMO and determined that the availability cost of providing Spinning Reserve should be the base availability cost[17] plus the Interaction Cost of providing both Spinning Reserve and Load Rejection Reserve. The Interaction Cost is allocated proportionally to Spinning Reserve and Load Rejection Reserve requirements.[18]

17. In its report, Jacobs describes the formulation of the Interaction Cost as the difference between the cost of providing both Spinning Reserve and Load Rejection Reserve and the sum of the costs of providing those reserves individually. This appears inconsistent with the calculation of the Interaction Cost as shown in the table of results (Table 10-2 and Table 10-3) in Jacobs' report[19] where the Interaction Cost is described as the difference between the cost of providing Spinning Reserve given the provision of Load Rejection Reserve and the cost of providing Spinning Reserve only.

18. The IMO has provided further information on the calculation of the Interaction Cost demonstrating the two formulations of the Interaction Cost are algebraically equivalent (see Appendix 1 to this decision). The Authority has examined this issue with the IMO and accepts that these two formulations are algebraically equivalent and there is no impact on the results. However, this inconsistency causes confusion and the Authority considers consistent formulations and terms should be used in future years.

19. The Authority has assessed the modifications made to Jacobs' methodology in modelling Synergy's availability cost. The Authority considers it reasonable to include the interaction cost effect in calculating the availability cost that could reasonably be expected to be incurred by Synergy for providing Spinning Reserve. These

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[15] Spinning reserve is reserve that is synchronised to the system that can respond almost immediately and provide frequency or voltage support for a short duration.

[16] Load Rejection Reserve is the service of holding capacity associated with a Scheduled Generator or Dispatchable Load in reserve so that the Scheduled Generator can reduce output rapidly or the Dispatchable Load can increase consumption rapidly in response to a sudden decrease in SWIS load.

[17] Base availability cost is the availability cost of providing Spinning Reserve only, with no provision of Load Rejection Reserve.

[18] Jacobs' model determines a Spinning Reserve requirement for every interval. As Jacobs is apportioning a 'total cost' it is apportioned using the average of the Spinning Reserve requirement over all relevant intervals.

[19] See ERA website, https://www.erawa.com.au/electricity/wholesale-electricity-market/determinations/ancillary-services-parameters/spinning-reserve-margin_peak-and-margin_off-peak

modifications serve to enhance the accuracy of the model and fulfil the requirements under the Market Rules.

20. The Authority notes that Jacobs has modelled an overall positive cost for providing Load Rejection Reserve only,[20] whereas the Authority's determination on 18 March 2013[21] on the cost of Load Rejection Reserve for the 2015/16 financial year was zero. The Authority's Load Rejection Reserve determination was based on System Management's submission at the time that there was no information demonstrating that the Load Rejection Reserve Ancillary Service was provided at a particular (unremunerated) cost to any Market Participant.

21. The Authority notes that subsequent to its Load Rejection Reserve determination, System Management engaged Jacobs to conduct a Load Rejection study in June 2014 to assess the cost of various levels of Load Rejection Reserve. System Management provided a confidential version of the report to the Authority. The findings suggested that there was a slight cost to provide the current level of Load Rejection Reserve of 120 MW. This work has been updated in the current Margin Values review. The Authority considers this approach to be reasonable.

22. The Authority also notes that the IMO and Jacobs undertook the following measures to improve the quality of the modelling assumptions:

- System Management reviewed Jacobs' modelling and network topography assumptions used in the study, and provided updated load profiles by region.

- The IMO provided to the Authority a draft confidential assumptions report outlining the methodology and assumptions proposed for the review.

- The IMO published a public version of the draft assumptions report[22] which excluded confidential Market Generator details, and invited stakeholders to either request a meeting to consult directly with the IMO and Jacobs or to provide written submissions on the report.[23]

- The IMO requested feedback from all the Market Generators on full extracts of the key assumptions for their facilities[24], and used the feedback provided by stakeholders to update input assumptions.

23. The Authority notes the Jacob's 2014 report included a backcasting exercise which compared previous modelled outcomes with actual results. This exercise has not been conducted for the 2015 review. The Authority considers regular comparisons of modelling predictions with actual outcomes provides a useful check that the model

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[20] Table 10-2 and Table 10-3 in Jacobs' final report, https://www.erawa.com.au/cproot/13378/2/Revised%20submission%20under%20Clause%203.13.3A(a)%20–%2025%20February%202015%20.PDF

[21] ERA website, 18 March 2013, Determination of the Ancillary Service Cost_LR Parameter, https://www.erawa.com.au/cproot/11212/2/20130318%20-%20Determination%20of%20the%20Ancillary%20Service%20Cost_LR%20Parameter.pdf

[22] 3 October 2014, 2015/16 Margin Peak and Margin Off-Peak review assumptions report – public, http://www.imowa.com.au/docs/default-source/rules/other-wem-consultation-docs/2015_16-margin-review-assumptions-report---public.pdf?sfvrsn=0

[23] Community Electricity provided the only submission, and the IMO and Jacobs' response to the submission is available in Jacobs' final report.

[24] The IMO received feedback from 18 Market Generators, 14 suggesting changes to their facility assumptions.

is valid. The Authority considers such checks should be done on a regular basis and considers should be done as part of the next review.

24. The Authority notes that this year some facilities previously considered to contribute to Spinning Reserve through their provision of Load Following Up service have been disqualified from providing Spinning Reserve by System Management,[25] due to technical limitations of these units (i.e. timeliness of automatic generator control response or the ramp rate being too slow to provide Spinning Reserve). However, the settlement system makes no distinction between qualifying and non-qualifying Load Following Up and deducts the total amount of Load Following Up when calculating the quantity of Spinning Reserve for which Synergy is paid.[26] This results in the quantity for which Synergy is paid being too low.[27]

25. To ensure Synergy is not underpaid, the Margin Values have been derived after excluding all Load Following Up (regardless of whether it provides Spinning Reserve or not). While this approach ensures that Synergy is correctly compensated, it is unsatisfactory for the long term as it does not accurately represent actual Spinning Reserve provision of Load Following Up facilities. The Authority considers that the IMO needs to resolves these issues prior to the next Margin Values review.

26. The Authority notes that the IMO has identified options to address this issue for the longer term and has presented these at the MAC meeting on 18 March 2015,[28] and that the IMO will explore these options after the outcomes of the Electricity Market Review are known.

27. The Authority notes that Jacobs has included 50% of the fixed cost component of the gas transport cost in the marginal costs for gas-fired generators in its dispatch modelling. The Authority notes this approach is consistent with modelling assumptions used in previous years. However, as noted in its 2014 decision, it is not clear to the Authority why any element of the fixed cost has been included in formulating the marginal cost for gas-fired generators.

28. The Authority considers dispatch modelling should generally be based on marginal costs. The Authority understands Jacobs have included these fixed costs because it considers generators have no other way of recovering the fixed cost component of their gas transport cost apart from their energy payments, as these costs are not covered by reserve capacity payments. The Authority is not convinced this is a valid reason and should be addressed prior to the next review of margin values. However, as the approach is consistent with previous years and gas transport costs form only a very small element of total cost for a limited number of generators, the Authority does not consider that inclusion of these costs has had a material impact.

29. The Authority has reviewed the input assumptions to Jacob's model and is satisfied that these are reasonable.

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[25] Clause 2.2.13 of the Power System Operation Procedure: Ancillary Services provides that System Management may revise from time to time the quantity of Spinning Reserve that a Scheduled Generator, Dispatchable Load or Interruptible Load is certified to provide based on the Facilities response to actual system events and, or changes to standing data or control system settings.

[26] The settlement system assumes that all Load Following Up capacity is considered to be Spinning Reserve and deducts that capacity from the quantity paid for Spinning Reserve. This is reflected in Clause 3.10.2 and clause 9.9.2 of the Market Rules.

[27] The Margin Values are applied to the Balancing Price in the settlement calculation of the availability cost to be paid to Synergy for Spinning Reserve provision.

[28] IMO website, MAC 79 meeting papers, http://www.imowa.com.au/docs/default-source/Governance/Market-Advisory-Committee/mac-meeting-no-79-papers.pdf?sfvrsn=0

30. The Authority is satisfied that in proposing the Margin Values, the IMO has taken into account:

   • the margin Synergy could reasonably have been expected to earn on energy sales forgone due to the supply of Spinning Reserve Service; and

   • the loss in efficiency of Synergy's scheduled generators that System Management has scheduled to provide Spinning Reserve Service that could reasonably be expected due to the scheduling of those reserves.

Issues raised in public submissions

31. The Authority did not receive any public submissions in response to its issues paper on the IMO's proposal on the Margin Values for the 2015/16 financial year.

CONCLUSION

32. Based on the assessment provided above, the Authority determines that the values for the Margin_Peak and Margin_Off-Peak parameters for the 2015/16 financial year are 36 per cent and 51 per cent, respectively.

APPENDIX 1

For each modelling run, four scenarios are modelled (all of which assume that Load Following Ancillary Service is being provided on a competitive basis):

- Scenario A: no LRR, no SR
- Scenario B: no LRR, SR
- Scenario C: LRR, no SR
- Scenario D: LRR, SR

For each trading interval and each scenario Synergy's profit is calculated, based on the modelled System Marginal Price, Synergy generation level and Synergy costs, e.g. profit(A) is the profit for Scenario A.

The different availability costs for each trading interval are calculated as the difference in Synergy's profit between the two scenarios of interest. The availability costs of interest are:

LRR Only: profit(A) – profit(C)

SR Only: profit(A) – profit(B)

Both: profit(A) – profit(D)

Incremental SR, given LRR: profit(C) – profit(D)

Incremental LRR, given SR: profit(B) – profit(D)

The availability cost of providing the two services (the 'Both' cost) need to be divided between the two services, so that each service is assigned its 'stand-alone' cost plus an adjustment factor (the Interaction Cost). Under this definition:

LRR Only Cost + SR Only Cost + Interaction Cost = Both Cost

so

Interaction Cost = Both Cost – LRR Only Cost – SR Only Cost

= (profit(A) – profit(D)) – (profit(A) – profit(C)) – (profit(A) – profit(B))

= profit(B) + profit(C) – profit(A) – profit(D)

= (profit(C) – profit(D)) – (profit(A) – profit(B))

= Incremental SR, given LRR Cost – SR Only Cost

and also equals

= (profit(B) – profit(D)) – (profit(A) – profit(C))

= Incremental LRR, given SR Cost – LRR Only Cost