

Final Rule Change Report:
Full Runway Allocation of Spinning Reserve Costs
(RC_2018_06)

Standard Rule Change Process

30 April 2019

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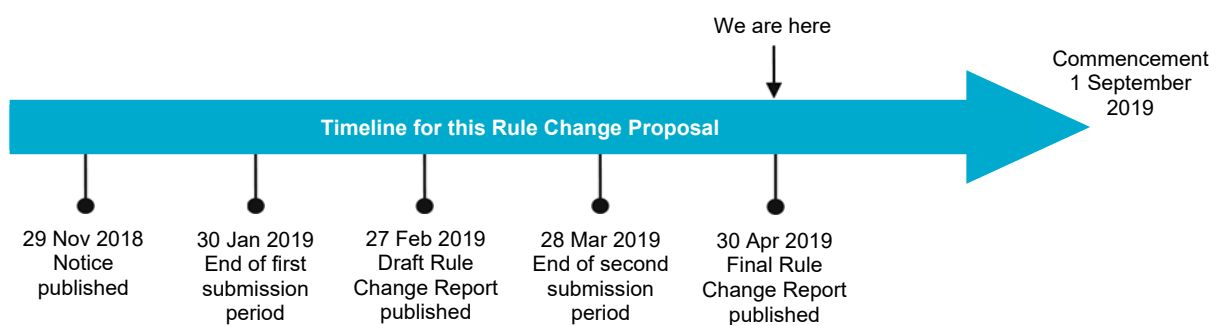
1. Rule Change Proposal, Process and Timeline

On 26 November 2018, the Public Utilities Office (**PUO**) submitted a Rule Change Proposal titled “Full Runway Allocation of Spinning Reserve Costs” (RC_2018_06).

This Rule Change Proposal seeks to replace the current modified runway approach for allocating Spinning Reserve costs under the Market Rules with a full runway approach.

This Rule Change Proposal is being processed using the Standard Rule Change Process, described in section 2.7 of the Market Rules. In accordance with the Rule Change Notice, the timeframes for the first submission period were extended beyond the usual 30 Business Days to account for the Christmas period.

The key dates for progressing this Rule Change Proposal are:



All documents related to this Rule Change Proposal can be found on the Rule Change Panel’s website at [Rule Change: RC 2018 06 – Economic Regulation Authority Western Australia](#).

2. The Rule Change Panel's Decision

The Rule Change Panel's final decision is to accept the Rule Change Proposal in a modified form, as set out in section 8 of this Final Rule Change Report.

2.1 Reasons for the Decision

The Rule Change Panel has made its decision on the basis that the Amending Rules, as amended following the first and second submission periods:

- will remove cross-subsidies created by the current modified runway approach to allocate Spinning Reserve costs, which will remove distortions in bidding behaviour and will lead to more efficient pricing in the Balancing Market;
- will allow the Market Rules to better achieve Wholesale Market Objectives (a), (b) and (d) and are consistent with the remaining Wholesale Market Objectives; and
- are supported by the MAC and in submissions to the Rule Change Proposal.

Additional detail outlining the analysis behind the Rule Change Panel's decision is outlined in section 7 of this report.

2.2 Commencement

The Amending Rules will commence at **8:00 AM** on **1 September 2019**.

3. Proposed Amendments

3.1 The Rule Change Proposal

This section provides a summary of the PUO's Rule Change Proposal. Please refer to the Rule Change Panel's website for full details of the Rule Change Proposal.

The PUO's Rule Change Proposal seeks to replace the current modified runway approach for allocating Spinning Reserve costs under the Market Rules with a full runway approach.

Under the current modified runway approach, the cost of providing the Spinning Reserve Service is recovered from all generators synchronised to the system that have an applicable capacity¹ of over 10 MW in a given Trading Interval. Generators with an applicable capacity of less than or equal to 10 MW do not contribute towards Spinning Reserve costs. The costs for the Spinning Reserve Service are allocated based on a set of predetermined block ranges (see Table 1), with increasing costs for each block.

Table 1: Blocks for the allocation of costs for Spinning Reserve Service under the current Market Rules

Block Number	Block Range (MW)	Block Size (MW)
1	> 200	100
2	>125 and ≤ 200	75
3	>65 and ≤ 125	60
4	>45 and ≤ 65	20
5	>10 and ≤ 45	35

All generators that fall within a block pay an equal share of that block's Spinning Reserve costs. For example, if two generators are in block number 2, with generator A producing 130 MW and generator B producing 195 MW, both would pay an equal proportion of the Spinning Reserve costs for that block, despite their different generation amounts. Therefore, generators that generate at the bottom of a block cross-subsidise generators that generate near the top of a block.

The modified runway approach to allocating Spinning Reserve costs also creates an incentive for generators that have small amounts of capacity that would fall into a higher Spinning Reserve block to bid that capacity at a high price (i.e. at the cap) to account for the higher Spinning Reserve costs. This method of allocating Spinning Reserve costs can distort competition and prices in the Balancing Market because lower cost capacity is bid at higher prices in the Balancing Market, which leaves relatively higher cost capacity competing to meet demand.

Under the proposed full runway approach, the Spinning Reserve costs will be allocated to each generator in a more granular way, according to the causer pays principle, with each generator paying Spinning Reserve costs in line with the generation of its facility (except for generators with an applicable capacity of 10 MW or less). This will remove the potential for distorted bidding behaviour that exists under the current modified runway approach, allowing

¹ Applicable capacity is defined in the Amending Rules Step 1 of Appendix 2 in section 8 of this report.

generators to offer more of their applicable capacity into the Balancing Market, thus producing more competitive prices.

3.2 The Rule Change Panel's Initial Assessment of the Proposal

The Rule Change Panel decided to progress this Rule Change Proposal based on its preliminary assessment that the proposal is consistent with the Wholesale Market Objectives.

4. Consultation

4.1 The Market Advisory Committee

In preparing its Rule Change Proposal, the PUO consulted extensively with stakeholders on the proposed approach. The consultation included multiple discussions at Market Advisory Committee (**MAC**) meetings and the presentation of a Pre-Rule Change Proposal for the MAC's discussion and comment.

8 November 2017 MAC Meeting

Changes to the Spinning Reserve cost allocation model were identified as an issue to be included in the MAC Market Rules Issues List at the 8 November 2017 MAC Meeting.

Ms Jenny Laidlaw noted that, in the past, both the Independent Market Operator and the Electricity Market Review had recommended implementation of a full runway model for allocation of Spinning Reserve costs. Several members of the MAC expressed support for the full runway model.

AEMO indicated that it would be feasible to implement a full runway model in advance of other major energy market reforms.

9 May 2018 MAC Meeting

The MAC discussed the issue as part of the MAC Market Rules Issues List (agenda item 8(c), issue 20/38). The discussion centred on the likely net benefits of progressing this issue before the changes to the market being discussed under the Wholesale Electricity Market Reform Program for 2022.

20 November 2018 MAC Meeting

Mr Matthew Martin noted that the PUO was seeking comments on its Pre-Rule Change Proposal: Full Runway Allocation of Spinning Reserve Costs (RC_2018_06) before its formal submission into the rule change process, and that the issue addressed by the proposal had been discussed by the MAC on several occasions.

Ms Aditi Varma provided an overview of the Pre-Rule Change Proposal with the following key points discussed:

- Mr Daniel Kurz noted that Bluewaters Power (**Bluewaters**) had raised concerns with the block method for Spinning Reserve cost allocation for several years and thanked the PUO for developing the Pre-Rule Change Proposal. Mr Kurz considered that the full runway method is a more appropriate cost allocation method and would remove inefficiencies that affect Bluewaters' Facilities. Mr Kurz had no issues with the drafting of the proposal.

- Ms Varma noted that the drafting had been reviewed by AEMO and RCP Support, and had been updated to reflect their comments, but welcomed any further comments from members and observers.
- Ms Varma advised that AEMO's preliminary cost estimate was around \$250,000 but requested that AEMO review this figure and provide any new update. Mr Martin Maticka responded that AEMO had re-evaluated its estimates to a range between \$220,000 and \$290,000.
- Mrs Jacinda Papps asked whether the magnitude of the proposal's benefits had been assessed. Ms Varma replied that the PUO undertook some static analysis using 2017 historical data, which indicated that smaller generators were able to receive benefits of up to \$1 million across generators.

Mr Shane Cremin considered that the issue with the current block methodology was that it deterred Market Generators from offering inexpensive capacity into the Balancing Market and reducing the Balancing Price. Mr Cremin asked whether any analysis had been done on the effects of removing this disincentive on energy costs. Ms Varma replied that the PUO had not undertaken this analysis but agreed it might be worth undertaking.

In response to a question from Mr Cremin, Mr Kurz advised that while Bluewaters had only assessed the effect on its own dispatch levels, the removal of the effective 200 MW cap imposed by the block method would encourage it to offer additional low-cost capacity into the Balancing Market.

Ms Varma agreed to take the question on notice and report back to the MAC. Mr Cremin expected that the analysis would show potential savings of millions of dollars per year and considered the change should have been made when it was first suggested in 2014.

- Most MAC members and observers were supportive of the proposal and its submission into the formal rule change process. However, Mr Will Bargmann advised that Synergy was not yet able to provide comments on the proposal and intended to do so as part of the formal consultation process.

Mrs Papps asked how AEMO intended to rank two Facilities with the same output level in a Trading Interval. There was general agreement that the choice of method would have no effect on the cost allocation outcomes.

4.2 Submissions Received During the First Submission Period

The first submission period for this Rule Change Proposal was held between 29 November 2018 and 30 January 2019. The Rule Change Panel received submissions from AEMO, the Australian Energy Council, Bluewaters Power, Community Electricity and Perth Energy on the Rule Change Proposal in the first submission period. In accordance with clause 2.7.7 of the Market Rules, a summary of each submission is set out below with the Rule Change Panel's response to each issue raised in section 4.3 of this report. All submissions received were supportive of the Rule Change Proposal.

Although the Rule Change Panel has summarised the submission in accordance with clause 2.7.7 of the Market Rules, the Rule Change Panel has reviewed the submissions in their entirety and taken into account each matter raised by the associated Rule Participants and other submitters in making its decision on RC_2018_06.

The Australian Energy Council’s submission considered that the rule change will better align with the causer pays principle, without distorting bidding behaviour in the Balancing market for Spinning Reserve costs.

Community Electricity considered that the Rule Change Proposal is a quick, simple, cost-effective and broadly supported solution to a long-standing inefficiency in the Wholesale Electricity Market. Community Electricity supported the PUO’s contention that the existing charging structure is economically inefficient because it distorts bidding strategies and dispatch outcomes, and also new-entrant plant configuration design and timing of market entry. Community Electricity agreed with the PUO’s contention that the proposed changes will reduce costs to Market Customers.

Perth Energy stated that the present system has the perverse incentive of encouraging lower cost plant to throttle its output to avoid moving into a higher capacity Spinning Reserve block. Perth Energy further contended that the current regime for allocating Spinning Reserve costs has the potential to restrict the amount of lower cost energy made available to the market, although it was uncertain of the magnitude of this restriction on actual output.

AEMO supported the proposed methodology in the Rule Change Proposal and proposed the following changes:

- to remove the provision in Step 1 of Appendix 2 that excludes Facilities that are not synchronised from the Spinning Reserve Cost allocation. AEMO notes that it is unable to perform the proposed synchronisation check, as this information is not available or stored; and
- to amend the syntax of the equation in the proposed Step 3 of Appendix 2 to more accurately define the variables in the formula and to represent the variables as a function of Trading Interval t.

Bluewaters stated that the existing Spinning Reserve cost allocation under the current Market Rules directly impacts its generators, which each have a capacity of 217 MW but are each economically capped at 200 MW because of the additional Spinning Reserve costs applied to the last 17 MW of its capacity. Bluewaters estimated that implementing this Rule Change Proposal would result in a 3-5% reduction in average Balancing Prices, delivering a reduction in the long-term cost of electricity supplied to customers.

The assessment by submitting parties as to whether the proposal would better achieve the Wholesale Market Objectives is summarised in Table 2.

Table 2: Submissions Comments on the Wholesale Market Objectives

Submitter	Wholesale Market Objective Assessment
AEMO	AEMO agreed with the assessment detailed in section 4 of the Rule Change Proposal that it meets Wholesale Market Objectives (a), (b) and (d).
Australian Energy Council	Submission did not refer to the Wholesale Market Objectives.
Bluewaters	Bluewaters considered that the benefits meet Wholesale Market Objectives (a) and (b).

Submitter	Wholesale Market Objective Assessment
Community Electricity	Supported the submitter's contentions in the Rule Change Notice that it meets Wholesale Market Objectives (a), (b) and (d).
Perth Energy	Submission did not explicitly refer to the Wholesale Market Objectives.

Copies of all submissions received during the first submission period are available on the Rule Change Panel's website.

4.3 The Rule Change Panel's Response to Submissions Received During the First Submission Period

4.3.1 AEMO – Synchronisation Check in Step 1

AEMO proposed to remove the provision in the proposed Step 1 of Appendix 2 that sets a Facility's applicable capacity value to zero if it is not synchronised to the SWIS for the purposes of calculating the Spinning Reserve Cost allocation. AEMO explained that it currently performs the synchronisation check by inference as details relating to synchronisation are not available or stored.

However, further discussions with AEMO have highlighted that rectification of this issue is complex and should not stall the progress of this Rule Change Proposal, given its benefits. As such, the Rule Change Panel considers AEMO's proposed change to remove the synchronisation check is out of scope of this Rule Change Proposal. The Rule Change Panel notes that the synchronisation check issue may be addressed as part of a future Rule Change Proposal or as part of the Wholesale Electricity Market Reform Program.

4.3.2 AEMO – Equation Syntax in Step 3

AEMO suggested amendments to the syntax of the equation in the proposed Step 3 of Appendix 2:

- to represent the variables in the equation as functions of Trading Interval t ; and
- to more accurately define the variables in the formula.

The Rule Change Panel has determined that AEMO's suggested changes are consistent with the presentation of formulas in the Market Rules, and thus endorses stating the variables in the proposed Step 3 of Appendix 2 as functions of Trading Interval t . The Rule Change Panel has also incorporated AEMO's proposed changes to the definitions of the variables used in the formula for the proposed Step 3 of Appendix 2 (see section 6.3 of this report and Appendix A), with minor enhancements to more precisely define the variables and add clarity to the calculation.

4.4 Submissions Received During the Second Submission Period

The second submission period was held between 27 February 2019 and 28 March 2019. The Rule Change Panel received submissions from AEMO and Bluewaters on the Rule Change Proposal in the second submission period. In accordance with clause 2.7.7 of the Market Rules, a summary of each submission is set out below with the Rule Change Panel's

response to each issue raised in section 4.5 of this report. All submissions received were supportive of the Rule Change Proposal.

Although the Rule Change Panel has summarised the submissions in accordance with clause 2.7.7 of the Market Rules, the Rule Change Panel has reviewed the submissions in their entirety and taken into account each matter raised by the associated Rule Participant in making its decision on RC_2018_06.

AEMO supported the Spinning Reserve Cost Allocation methodology described in the Draft Rule Change Report and did not identify any further issues. AEMO noted the preference by the Rule Change Panel to deliver the changes to the Amending Rules as soon as practicable.

Bluewaters confirmed that the Rule Change Panel's assessment in the Draft Rule Change Report of an indicative net benefit from the Rule Change Proposal of a 4.5% reduction in the average Balancing Price (modelling 17 MW per Bluewaters Facility) was in line with Bluewaters' own analysis. Bluewaters further stated that the benefit which had been modelled on both the 4 MW and 17 MW cases in the Draft Rule Change Report outweighs the expedited implementation cost identified by AEMO in its submission in the first submission period. Consequently, Bluewaters supports the Rule Change Panel's recommendation to implement RC_2018_06 from 1 September 2019. Bluewaters also stated that if there was an opportunity for the implementation date to be brought forward to realise even more of the benefit, Bluewaters would also support this.

The assessment by submitting parties as to whether the proposal would better achieve the Wholesale Market Objectives is summarised in Table 3.

Table 3: Submissions Comments on the Wholesale Market Objectives

Submitter	Wholesale Market Objective Assessment
AEMO	AEMO agreed with the assessment detailed in section 5.4 of the Draft Rule Change Report.
Bluewaters	Bluewaters supports the assessment that the Wholesale Market Objectives (a), (b) and (d) are better met through this proposal.

Copies of all submissions received during the second submission period are available on the Rule Change Panel's website.

4.5 The Rule Change Panel's Response to Submissions Received During the Second Submission Period

The Rule Change Panel notes the support of both AEMO and Bluewaters and that neither submission recommended any further changes. The Rule Change Panel consulted with AEMO on whether the commencement date of this rule change could be brought forward, as suggested by Bluewaters. However, AEMO indicated that the commencement date cannot be brought forward due to the sophisticated system and associated IT changes that are necessary to support this rule change.

4.6 Public Forums and Workshops

No public forums or workshops were held for this Rule Change Proposal.

5. The Rule Change Panel's Draft Assessment

The Rule Change Panel's draft assessment against clauses 2.4.2 and 2.4.3 of the Market Rules and analysis of the Rule Change Proposal are provided in section 5 of the Draft Rule Change Report.

6. The Rule Change Panel's Proposed Decision from the Draft Rule Change Report

The Rule Change Panel's decision in the Draft Rule Change Report was to accept the Rule Change Proposal in a modified form, as set out in section 7 of the Draft Rule Change Report.

The reasons for the Rule Change Panel's proposed decision are set out in section 6.1 of the Draft Rule Change Report.

7. The Rule Change Panel's Final Assessment

7.1 Assessment Criteria

In preparing its Final Rule Change Report, the Rule Change Panel must assess the Rule Change Proposal in light of clauses 2.4.2 and 2.4.3 of the Market Rules.

Clause 2.4.2 of the Market Rules states that the Rule Change Panel "*must not make Amending Rules unless it is satisfied that the Market Rules, as proposed to be amended or replaced, are consistent with the Wholesale Market Objectives*". Additionally, clause 2.4.3 of the Market Rules states that, when deciding whether to make Amending Rules, the Rule Change Panel must have regard to:

- any applicable statement of policy principles the Minister has issued to the Rule Change Panel under clause 2.5.2 of the Market Rules;
- the practicality and cost of implementing the proposal;
- the views expressed in submissions and by the MAC; and
- any technical studies that the Rule Change Panel considers necessary to assist in assessing the Rule Change Proposal.

In making its final decision, the Rule Change Panel has had regard to each of the matters identified in clauses 2.4.2 and 2.4.3 of the Market Rules as follows:

- the Rule Change Panel's assessment of the Rule Change Proposal against the Wholesale Market Objectives is available in section 7.4 of this report;
- the Rule Change Panel notes that there has not been any applicable statement of policy principles from the Minister in respect of this Rule Change Proposal;
- the Rule Change Panel's assessment of the practicality and cost of implementing the Rule Change Proposal is available in section 7.6 of this report;
- a summary of the views expressed in submissions is available in section 4 of this report. Views of the MAC are available in section 4.1 of this report. The Rule Change Panel's responses to the submissions is available in sections 4.3 and 4.5 of this report; and
- the Rule Change Panel does not believe a technical study in respect of this Rule Change Proposal is required and therefore has not commissioned one.

The Rule Change Panel's assessment is presented in the following sections.

7.2 Assessment of the Proposed Changes

The Rule Change Panel's final assessment of the proposed amendments is the same as its assessment detailed in section 5.1 of the Draft Rule Change Report (included in Appendix C).

However, the Rule Change Panel has also identified a manifest error in the Market Rules that it considers should be addressed as part of this Rule Change Proposal, as discussed in section 7.3.2 of this report.

7.2.1 Issues Identified during the First Submission Period

AEMO suggested removing the synchronisation check in the proposed Step 1 of Appendix 2 and changes to the equation and syntax in the proposed Step 3 of Appendix 2, both of which are detailed in section 4.3 and Appendix A of the Draft Rule Change Report.

The Rule Change Panel stated that the removal of the synchronisation check was out of scope of this Rule Change Proposal due to the complexities in rectifying this issue. The Rule Change Panel endorsed and incorporated some of AEMO's proposed changes to the equation and syntax in the proposed Step 3 of Appendix 2, with minor enhancement to more precisely define the variables and add clarity to the calculation.

7.3 Additional Amendments to the Proposed Amending Rules

7.3.1 Additional Amendments following the First Submission Period

Based upon AEMO's submission, the Rule Change Panel amended the proposed Amending Rules to more accurately define the variables and terms used in the formula in the proposed Step 3 of Appendix 2, and made refinements to the proposed Step 4 of Appendix 2 of the Market Rules. These additional amendments are presented in detail in Appendix A and are explained in section 4.3 of this report.

7.3.2 Additional Amendments following the Second Submission Period

The Rule Change Panel identified a further change to the drafting in the Draft Rule Change Report. A manifest error has been identified in clause 2.30.7A that refers to 'Reserve Share (p,t)' which should be SR_Share (p,t), as per Appendix 5 of the Market Rules.

As this is a minor issue and is related to the topic of Spinning Reserve, the Rule Change Panel considers this correction is within the scope of this Rule Change Proposal. The Rule Change Panel does not consider further consultation is necessary as the underlying meaning and intent of clause 2.30.7A does not change.

The additional amendments are shown in Appendix B of this report.

7.4 Assessment against the Wholesale Market Objectives

The Rule Change Panel considers that the proposed amendments to the Market Rules are consistent with the Wholesale Market Objectives because the Amending Rules will:

- provide more cost-reflective signals to generators of the Spinning Reserve costs associated with different levels of generation, which promotes Wholesale Market Objective (a);

- lead to greater competition through more cost-reflective pricing of the Spinning Reserve service, and remove the inherent cross-subsidy created by the current modified runway approach, which promotes Wholesale Market Objective (b); and
- lead to more efficient prices in the Balancing Market, which promotes Wholesale Market Objective (d).

The Rule Change Panel also considers that the proposed changes are consistent with the remaining Wholesale Market Objectives.

7.5 Protected Provisions, Reviewable Decisions and Civil Penalties

This Rule Change Proposal does not amend any Protected Provisions, Reviewable Decisions, or civil penalty provisions.

7.6 Practicality and Cost of Implementation

7.6.1 Cost

AEMO noted in its second period submission the Rule Change Panel's preference to deliver the proposed changes to the Amending Rules as soon as practicable and provided a revised cost estimate of \$215,000 to deliver the required system changes to AEMO's existing settlement system.

Bluewaters noted in its second period submission that it would be required to make minor system changes. However, Bluewaters considered the costs were immaterial when compared to the impact of the existing cost allocation methodology, which it considers, economically caps Bluewaters' Facilities.

With the lower cost estimate provided by AEMO and the significant benefits that will accrue from implementing this Rule Change Proposal, the Rule Change Panel has not changed its view from the Draft Rule Change Report. The Rule Change Panel considers that the \$215,000 cost estimate and the four-month implementation time from the publication of this Final Rule Change Report are justified.

7.6.2 Practicality

AEMO confirmed in its second period submission that the proposed commencement date of 1 September 2019 allows AEMO sufficient time to implement the necessary system changes. Similarly, Bluewaters noted in its second period submission that implementation of its system changes would be achievable within a week of the Final Rule Change Report being published.

As no material challenges have been raised in respect of the practicality of implementation, the Rule Change Panel continues to hold the view that the Amending Rules should commence on 1 September 2019, which is as soon as practicable.

8. Amending Rules

The Rule Change Panel has decided to implement the following Amending Rules (~~deleted text~~, added text):

...

2.30.7A. If AEMO approves the aggregation of Facilities of a Scheduled Generator then each individual facility in that aggregated Facility that injects energy at an individual network connection point to the South West interconnected system must be treated as an individual Facility for the purpose of determining the Reserve ShareSR_Share (p,t) values under Appendix 2.

...

Appendix 2: Spinning Reserve Cost Allocation

This Appendix determines the value of SR_Share (p,t) of the Spinning Reserve service payment costs in Trading Interval t to be borne by Market Participant p.

In this Appendix the relevant Market Participant p is the Market Participant to whom a facility is registered, with the exception that in the case of unregistered generation systems serving Intermittent Loads, the relevant Market Participant p is the Market Participant to whom the Intermittent Load is registered.

The calculations in this Appendix are based on data for a set of applicable facilities (indexed by f) where this set comprises all Scheduled Generators and all Non-Scheduled Generators registered during Trading Interval t, except those Intermittent Generators exempted under clause 2.30A.2. This set also includes all unregistered generation systems serving Intermittent Loads.

Step 1: For the purpose of determining the SR_Share (p,t) values, each applicable facility f has an applicable capacity associated with it for Trading Interval t.

- If facility f is an Intermittent Generator with an interval meter then this is double the MWh average interval meter reading for the Trading Month containing Trading Interval t.
- If facility f is a Scheduled Generator with an interval meter then this is double the MWh interval meter reading for Trading Interval t.
- If facility f is a Scheduled Generator that is the sum of more than one aggregated Facility, each with an interval meter and each injecting energy at an individual network connection point to the South West interconnected system, then each individual Facility is treated as an individual Scheduled Generator under Appendix 2.
- If facility f is a Synergy Intermittent Generator without an interval meter then this is double the average monthly MWh sent out generation of that facility based on SCADA data over the Trading Month containing Trading Interval t.

- If facility f is a Synergy Scheduled Generator without an interval meter or an unmetered generation system serving Intermittent Load then this is double the MWh sent out generation of that facility based on SCADA data for Trading Interval t.

The applicable capacity value is set to zero if:

1. facility f was not synchronised to the SWIS during the whole Trading Interval t, or
2. the applicable capacity value for facility f resulting from the process described in the bullet points in this Step 1 is less than or equal to 10 MW.

Step 2: For Trading Interval t, rank all applicable facilities in ascending order from the facility with the lowest applicable capacity to the facility with the highest applicable capacity, as determined in accordance with Step 1. If two or more facilities have the same applicable capacity in Trading Interval t, these facilities are ranked in random order by AEMO.

Step 3: For each facility f determine the Facility Spinning Reserve Share for Trading Interval t as:

$$FSRS(f, t) = \frac{\sum_{i=1}^{rank(f,t)} \frac{MW(i, t) - MW(i - 1, t)}{MW(n, t) \times (n + 1 - i)}}{1}$$

Where:

n is the total number of applicable facilities in the ranked list for Trading Interval t determined in Step 2.

rank(f,t) is the rank of facility f for Trading Interval t, as determined in Step 2.

MW(i,t) is the applicable capacity of the facility with rank i for Trading Interval t, where MW(0,t) = 0.

Step 4: Calculate the SR Share(p,t) value for Market Participant p for Trading Interval t as:

$$SR\ Share(p, t) = \sum_{f \in F} \frac{FSRS(f, t)}{1}$$

Where:

F is the set of applicable facilities belonging to Market Participant p.

f is a member of the set in F.

FSRS(f,t) is the Facility Spinning Reserve Share for facility f in Trading Interval t calculated in Step 3.

The methodology makes use of the data in Table 1.

Block Number	Block Range (MW)	Block Size (MW)
1	>200	100
2	>125 and ≤ 200	75

3	>65 and ≤ 125	60
4	>45 and ≤ 65	20
5	>10 and ≤ 45	35

Table 1: Data for Determine Reserve_Share(p,t)

For each Block, indicated by block number b, in Table 1, the Reserve Block Share is:

If $\text{Sum}(f(i \leq)) > 0$

$$\text{RBS}(b) = [\text{Block Size}(b) / \text{Sum}(i, \text{Block Size}(i))] / \text{Sum}(f(i \leq), \text{TIS}(f))$$

If $\text{Sum}(f(i \leq)) = 0$

$$\text{RBS}(b) = 0$$

Where

Block Size(i) is the size of the Block with block number i listed in Table 1.

$f(i \leq)$ is the subset of applicable facilities that had applicable capacities for Trading Interval t lying within the block range of any Block with a block number value of b or less.

$\text{TIS}(f)$ is 1 if the applicable facility f was synchronised to the SWIS during Trading Interval t, and is zero otherwise.

For each Block b in Table 1, the Reserve Generator Share is:

$$\text{RGS}(b) = \text{Sum}(i \geq, \text{RBS}(i))$$

Where

$i \geq$ is the set of Blocks listed in Table 1 that have a block number i greater than or equal to b.

For each Market Participant p, its unadjusted share of the Spinning Reserve service payment costs for the Trading Interval is:

$$\text{USHARE}(p) = \text{Sum}(f(p), \text{RGS}(b(f)) \times \text{TIS}(f))$$

Where

$f(p)$ is the set of applicable facilities for the Market Participant p that have applicable capacities within one of the block ranges listed in Table 1.

$b(f)$ is the block number of the Block in Table 1 that has a block range that corresponds to the applicable capacity of the applicable facility f.

$\text{TIS}(f)$ is 1 if the applicable facility f was synchronised to the SWIS during Trading Interval t, and is zero otherwise.

For each Market Participant p, its adjusted share of the Spinning Reserve services payment costs for Trading Interval t is:

$$\text{SR_Share}(p,t) = \text{USHARE}(p) / \text{sum}(q, \text{USHARE}(q))$$

Where

~~q is the index of the set of all Market Participants.~~

Appendix A. Amendments following the First Submission Period

The Rule Change Panel made amendments to the proposed Amending Rules following the first submission period. These changes are as follows (~~deleted text~~, added text):

Appendix 2: Spinning Reserve Cost Allocation

This Appendix determines the value of SR_Share (p,t) of the Spinning Reserve service payment costs in Trading Interval t to be borne by Market Participant p.

In this Appendix the relevant Market Participant p is the Market Participant to whom a facility is registered, with the exception that in the case of unregistered generation systems serving Intermittent Loads, the relevant Market Participant p is the Market Participant to whom the Intermittent Load is registered.

The calculations in this Appendix are based on data for a set of applicable facilities (indexed by f) where this set comprises all Scheduled Generators and all Non-Scheduled Generators registered during Trading Interval t, except those Intermittent Generators exempted under clause 2.30A.2. This set also includes all unregistered generation systems serving Intermittent Loads.

Step 1: For the purpose of determining the SR_Share (p,t) values, each applicable facility f has an applicable capacity associated with it for Trading Interval t.

- If facility f is an Intermittent Generator with an interval meter then this is double the MWh average interval meter reading for the Trading Month containing Trading Interval t.
- If facility f is a Scheduled Generator with an interval meter then this is double the MWh interval meter reading for Trading Interval t.
- If facility f is a Scheduled Generator that is the sum of more than one aggregated Facility, each with an interval meter and each injecting energy at an individual network connection point to the South West interconnected system, then each individual Facility is treated as an individual Scheduled Generator under Appendix 2.
- If facility f is a Synergy Intermittent Generator without an interval meter then this is double the average monthly MWh sent out generation of that facility based on SCADA data over the Trading Month containing Trading Interval t.
- If facility f is a Synergy Scheduled Generator without an interval meter or an unmetered generation system serving Intermittent Load then this is double the MWh sent out generation of that facility based on SCADA data for Trading Interval t.

The applicable capacity value is set to zero if:

1. facility f was not synchronised to the SWIS during the whole Trading Interval t, or

2. the applicable capacity value for facility f resulting from the process described in the bullet points in this Step 1 is less than or equal to 10 MW.

Step 2: For Trading Interval t , rank all applicable facilities f in ascending order from the facility with the lowest applicable capacity to the facility with the highest applicable capacity, as determined in accordance with Step 1. If two or more facilities have the same applicable capacity in Trading Interval t , these facilities are ranked in random order by AEMO.

STEPtep 3: For each facility f determine the Facility Spinning Reserve Share for Trading Interval t as:

$$FSRS(f, t) = \frac{\sum_{i=1}^{rank(f)} \frac{MW(i) - MW(i-1)}{MW(n) \times (n+1-i)}}{\sum_{i=1}^{rank(f,t)} \frac{MW(i, t) - MW(i-1, t)}{MW(n, t) \times (n+1-i)}}$$

Where:

~~i is the ranking number of facility f determined in Step 2.~~

~~n is the total number of applicable facilities in the ranked list for Trading Interval t determined in Step 2.~~

~~$rank(f, t)$ is the rank of facility f for Trading Interval t , as determined underin Step 2.~~

~~$MW(i, t)$ is the applicable capacity associated with of the facility f atwith rank i for Trading Interval t , where $MW(0, t) = 0$.~~

~~$MW(i-1)$ is the applicable capacity associated with the facility ranked immediately prior to facility ranked i . Where $i=1$, the value of $MW(i-1)$ is zero.~~

~~$MW(n)$ is the applicable capacity associated with the facility at rank n .~~

Step 4: ~~For each Trading Interval t , c~~Calculate the $SR_Share(p, t)$ value for ~~each~~ Market Participant p in Trading Interval t as:

$$SR_Share(p, t) = \sum_{f \in F} FSRS(f, t)$$

Where:

F is the set of applicable facilities belonging to Market Participant p .

f is a member of the set in F .

$FSRS(f, t)$ is the Facility Spinning Reserve Share for facility f in Trading Interval t calculated in Step 3.

Appendix B. Amendments following the Second Submission Period

The Rule Change Panel made amendments to the proposed Amending Rules following the second submission period. These changes are as follows (~~deleted text~~, added text):

- 2.30.7A. If AEMO approves the aggregation of Facilities of a Scheduled Generator then each individual facility in that aggregated Facility that injects energy at an individual network connection point to the South West interconnected system must be treated as an individual Facility for the purpose of determining the ~~Reserve~~ ShareSR_Share (p,t) values under Appendix 2.

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Appendix C. Assessment of the Proposed Changes from the Draft Rule Change Report

General Concept of the Rule Change Proposal

In its Rule Change Proposal, the PUO seeks to replace the current modified runway approach for allocating Spinning Reserve costs with a full runway approach that allocates Spinning Reserve costs to each generator in a more granular way.² The full runway approach is more in line with the causer pays principle and reduces the distorted bidding behaviour³ in the Balancing Market that results from the current modified runway method.

The Rule Change Panel agrees with the PUO's general concept, as set out in its Rule Change Proposal. The current modified runway approach for allocating Spinning Reserve costs benefits those generators who generate near the top of a Spinning Reserve block at the expense of generators at the lower end of the Spinning Reserve block, as all generators within a block share the Spinning Reserve costs of that block equally. This cross-subsidy gives generators an incentive to generate until they reach the top of a Spinning Reserve block, and to avoid generating at the bottom end of a block. The modified runway approach imposes significant costs on any small amounts of capacity that fall into a higher MW range Spinning Reserve block. The Rule Change Panel's assessment is that the full runway approach removes these barriers to more competitively priced generation.

Formula for Spinning Reserve Cost Allocation

As described in section 4.3 of this report, AEMO suggested changes to the proposed Step 3 of Appendix 2 of the Market Rules, which the Rule Change Panel has incorporated with minor amendments to provide further clarity to the interpretation of Step 3.

Additionally, the Rule Change Panel has decided to remove the definition of the term 'i' from the proposed Step 3 in Appendix 2, as stated in this Rule Change Proposal, because it is not required.

The Rule Change Panel has also made refinements to the description of the proposed Step 4 of Appendix 2 to make it consistent with the terminology used elsewhere in Appendix 2.

These changes are reflected in the revised Amending Rules in section 7 of this report and detailed in Appendix A.

Analysis of the Rule Change Proposal Spinning Reserve Cost Allocation

The Rule Change Panel has analysed the likely benefits of the Rule Change Proposal. Based upon the methodology described below, the Rule Change Panel's analysis indicates that adoption of this Rule Change Proposal is likely to:

1. have a material impact on the Balancing Price as a result of the more efficient allocation of Spinning Reserve costs, leading to a decrease in the Balancing Price, on average; and
2. drive efficiency gains in the Balancing Market by utilising more efficient (i.e. lower cost) generation plant.

² Generators generating 10 MW or less will still not have to pay Spinning Reserve costs under the proposed Full Runway methodology.

³ Described in section 3.1 of the Draft Rule Change Report.

Given the magnitude of the analysis detailed below, the benefits of adopting this Rule Change Proposal outweigh the estimated costs.

Methodology

To estimate the likely benefits of adopting this Rule Change Proposal, the Rule Change Panel conducted a simplified scenario analysis of the impact of the proposed changes on the Balancing Market over 2018.⁴ The assumptions underpinning the scenario analysis are:

1. 2018 is typical of years going forward; and
2. Only Bluewaters' Facilities' behaviours were modified.

The scenario analysis centred on estimating the impact of the Rule Change Proposal on the Balancing Price and on efficiency gains to the market. Minimum generation considerations were not modelled.

Analysis

The Rule Change Panel analysed the impact of using the full runway method to allocate Spinning Reserve costs by focussing on Bluewaters' Facilities.⁵

For each of its Facilities, Bluewaters typically bids just under 200 MW of its 217 MW of capacity into the Balancing Market at a competitive price (not at the Price Cap). Bluewaters bids the remaining 17 MW of capacity at the Price Cap due to the Spinning Reserve costs.⁶ The Rule Change Panel's analysis focused on this remaining 17 MW of capacity (per Bluewaters' Facility) potentially being available to the Balancing Market. Allowance was made for the Bluewaters capacity that is currently required for its Spinning Reserve contracts.⁷ That is, the capacity considered in the Rule Change Panel's analysis was the capacity left over after Bluewaters' Spinning Reserve contract amounts were deducted from the 17 MW of unutilised capacity (this net capacity amount is referred to as the '**Analysis MW**').

The assumptions for this analysis were that:

- Bluewaters' Facilities (both Bluewaters 1 and Bluewaters 2) each have a capacity of 217 MW for 2018;
- Bluewaters can potentially offer in up to the Analysis MW amount per Trading Interval, if available;
- for each Trading Interval, Bluewaters bids the Analysis MW per Facility at the highest priced block of both of the Bluewaters Facilities (for blocks not priced at the cap) for that particular Trading Interval;⁸
- for each Trading Interval, there is a benefit to the market only if the price of the Analysis MW per Facility is below the Final Balancing Price for that Trading Interval; and
- no other Market Participants change their bidding patterns.

⁴ The period analysed was from the 8:00 AM, 1 January 2018 Trading Interval, to the 7:30 AM, 1 January 2019 Trading Interval. References to 2018 in this report refer to this analysis time period.

⁵ Other generators were not modelled due to the difficulty in establishing how much additional capacity they could make available under the full runway method.

⁶ Stated in Bluewaters submission on RC_2018_06, available on the Rule Change Panel's webpage.

⁷ Spinning Reserve is contracted annually through a competitive tender process conducted by AEMO.

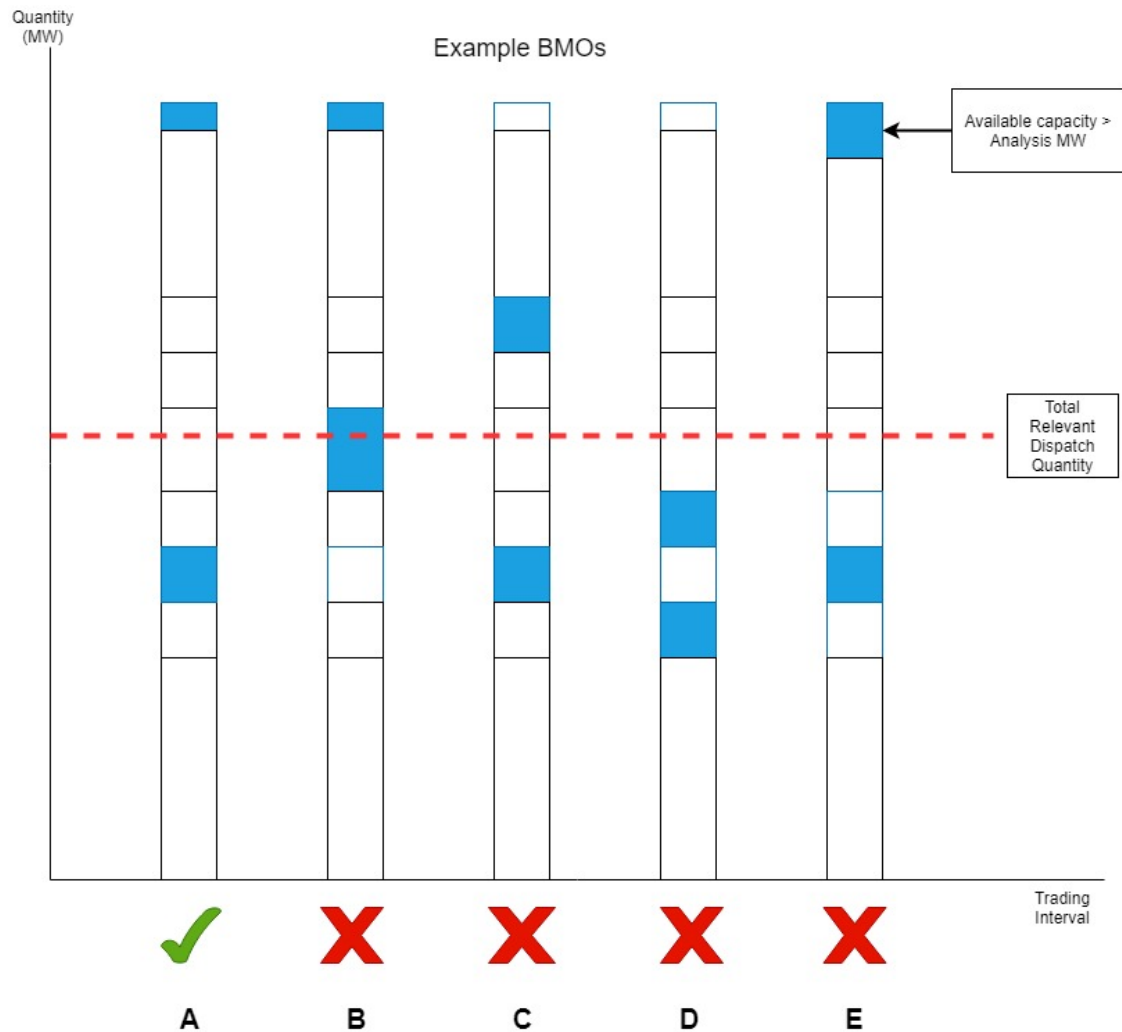
⁸ For example, in the 8.00 AM, 1 March 2018, Trading Interval, Bluewaters' highest priced bid into the BMO (not including the amounts bid into the cap) was \$23.50/MWh for Bluewaters 1 and \$23.88/MWh for Bluewaters 2. The assumed price for the Analysis MW is the higher of the two bids, which was \$23.88/MWh.

Analysis of the Balancing Market BMOs

Each Trading Interval was evaluated individually over 2018. Where it was assumed that Bluewaters would provide a benefit (as described below) then the Balancing Merit Order (BMO) was re-evaluated to determine if there was an impact on the Balancing Price and to calculate efficiency gains to the market.

The scenarios demonstrating when benefits are considered are illustrated graphically in Figure 1, where the blue coloured blocks indicate the location of Bluewaters' capacity in the BMO for that Trading Interval.

Figure 1: Bluewaters BMO Benefits Scenarios



In detail, the scenarios are as follows:

Table 4: Scenarios in Bluewater Analysis

Scenario	Impact on Analysis
A Bluewaters bids in quantities that are below the marginal unit and only the Analysis MW at the Price Cap.	Is assessed as providing a benefit to the market.

Scenario	Impact on Analysis
B Bluewaters is the marginal unit.	Since it is assumed that Bluewaters prices at the highest price it offers into a BMO for a particular Trading Interval, where it is the marginal unit there is no benefit to the market, as the additional MW offered would not impact the Final Balancing Price or produce an efficiency gain.
C Bluewaters bids both below and above the marginal unit in the BMO, but does not bid at the cap.	Since it is assumed that Bluewaters prices at the highest price it offers into a BMO for a particular Trading Interval, offering in the Analysis MW at a price above the Final Price would have no benefit to the market.
D All of Bluewaters capacity is bid in below the marginal unit in the BMO.	There is no spare capacity to offer into the market, and thus no benefit is available to the market.
E Bluewaters has more than just the Analysis MW bid in at the price cap.	No benefit is assumed, as the amount priced at the cap is assumed to be priced there for a reason other than Spinning Reserve costs.

Efficiency Gain

An efficiency gain is where the Analysis MW are offered into the BMO and lower priced generation is utilised compared to the actual BMO for that Trading Interval. That is, the market benefits from efficiency gains derived by the usage of lower priced generation, as illustrated in Figure 2, where the blue coloured blocks are Bluewaters' capacity bid into the BMO that are under the marginal unit, whilst the purple coloured blocks are the Analysis MW available for that same Trading Interval.

Figure 2: Methodology Concept

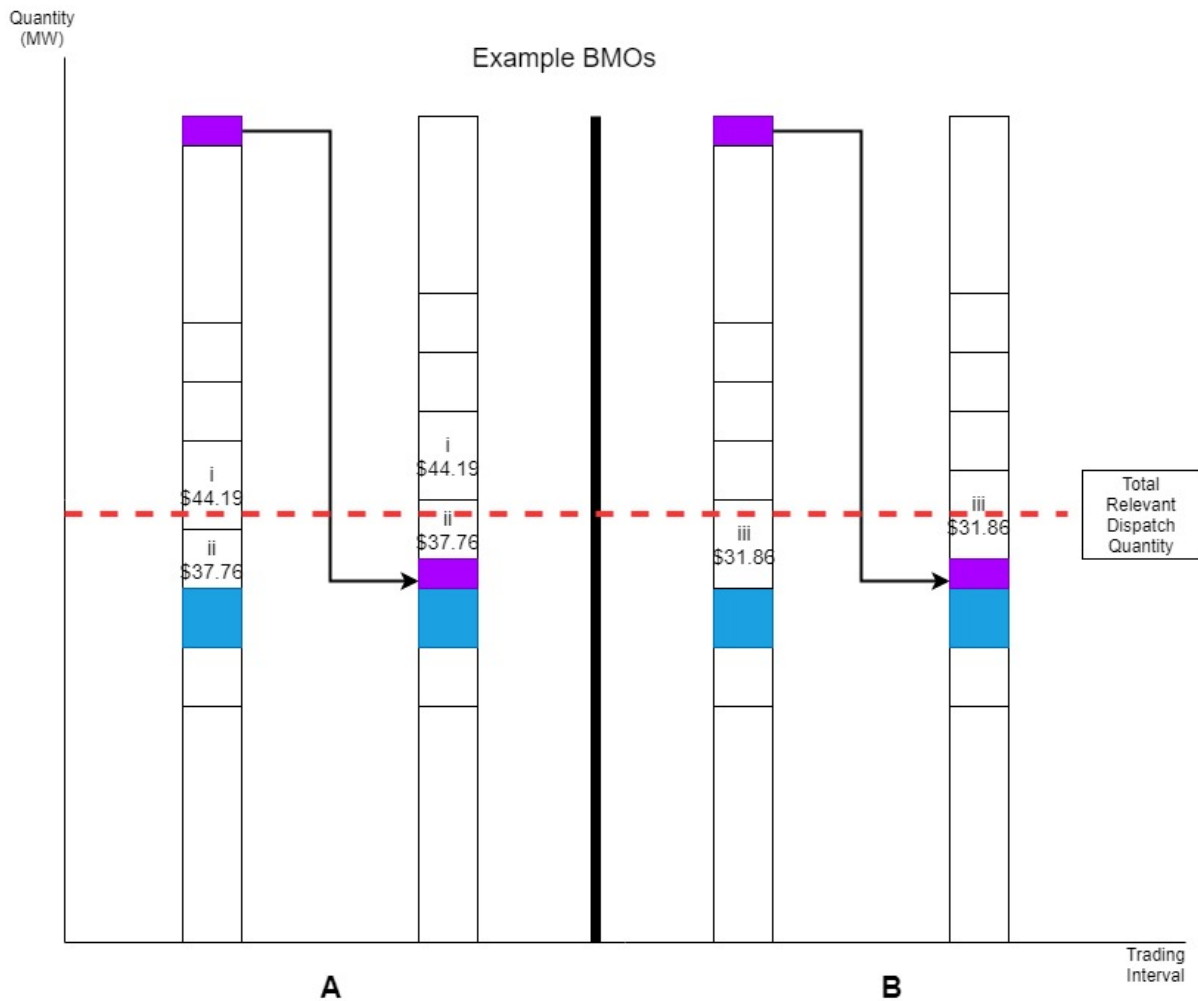


Figure 2 illustrates:

- Scenario A, where the Balancing Price decreases due to the Analysis MW being made available at the highest Bluewaters bid price, which shifts the marginal block from being (i) to the next lower priced block (ii), i.e. from block (i) at \$44.19/MWh to block (ii) at \$37.76/MWh; and
- Scenario B, where the Balancing Price does not decrease due to the Analysis MW being made available at the highest Bluewaters bid price, as the total Relevant Dispatch Quantity still remains within the block provided by the marginal unit (iii).

Regardless of the effects on the Balancing Market Price, there are efficiencies gained in the market through the use of lower cost plant. The efficiency gain was identified as occurring either:

- where the Balancing Price of a Trading Interval did not change with the addition of the Analysis MW (this was calculated as the cost of the MW in the marginal unit block for a Trading Interval minus the Analysis MW priced at the highest Bluewaters priced block); or
- where the Balancing Price of a Trading Interval changed with the addition of the Analysis MW (this calculation was based on the amount of Analysis MW available for that Trading Interval, the MW portion in the marginal unit block, and the MW portion in the next

highest BMO block minus the Analysis MW priced at the highest Bluewaters priced block).

Where the methodology conditions were not met (i.e. Bluewaters was deemed not to offer in any Analysis MW for a Trading Interval), it was assumed that there was no efficiency gain.

Based upon this analysis, the estimated efficiency gain for the addition of the Analysis MW over 2018 was over \$1 million. Thus, the analysis indicates that there is a significant efficiency gain to the market that can be achieved through the adoption of this Rule Change Proposal.

Effect on Average Balancing Price

The effect on the Balancing Price over 2018 was calculated as a simple average of the price difference between the Balancing Price (where the Analysis MW provided a change in the Balancing Price) and the actual Final Balancing Price. The scenarios set out in Figure 1 demonstrate the situations where Bluewaters is able to make the Analysis MW available into the BMO that could have an impact on the Balancing Price. Where the addition of the Analysis MW did not change the Balancing Price, it was considered that there was no benefit to Balancing Market Prices.

The estimated impact of the Analysis MW over 2018 was a decrease in the Average Balancing Market Price of approximately \$0.70/MWh, which equates to around a 1.5% decrease in the average Final Balancing Price.⁹

Bluewaters stated in its submission that approximately 17 MW of capacity could be available per Facility under the full runway method, as proposed in this Rule Change Proposal. The Rule Change Panel conducted further analysis based upon this entire 17 MW of capacity being made available to the Balancing Market, using the same methodology described above for analysing the Analysis MW. The result of this analysis was an estimated decrease to the 2018 Average Balancing Market Price of \$2.10/MWh, which equates to around a 4.5% decrease in the average Final Balancing Price. The Rule Change Panel notes that this is in the range estimated by Bluewaters in its submission.

Therefore, the Rule Change Panel is of the view that adoption of this Rule Change Proposal is likely to have a material impact upon the Balancing Price (likely lowering the Balancing Price), which is likely to have flow on effects to the broader market.

A cautionary note is that this analysis did not model the potential change in bidding behaviour of all Market Participants under the proposed full runway cost allocation model in this Rule Change Proposal due to the different costs per MW for each generator. However, based on analysis of changes only to Bluewaters' bidding, the likely impact would be greater efficiency in the market due to greater availability of energy at more competitive prices.

Additionally, implementing the Rule Change Proposal will increase competition, as more generators are likely to offer more energy into the Balancing Market at lower prices, as Spinning Reserve costs are more efficiently allocated.

⁹ For 2018, the simple average Balancing Price was calculated at \$46.84/MWh per Trading Interval.