CAUSER PAYS PROCEDURE - FACTORS FOR ASYNCHRONOUS OPERATION

DRAFT REPORT AND DETERMINATION

Published: **January 2017**

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

NOTICE OF SECOND STAGE CONSULTATION – CAUSER PAYS PROCEDURE – FACTORS FOR ASYNCHRONOUS OPERATION

National Electricity Rules – Rule 8.9

Date of Notice: 6 January 2017

This notice informs all Registered Participants and interested parties (**Consulted Persons**) that AEMO is commencing the second stage of its consultation on amendments to the Procedure for Determining Contribution Factors (**Causer Pays Procedure**).

This consultation is being conducted under clause 3.15.6A(m) the National Electricity Rules (**NER**), in accordance with the Rules consultation requirements detailed in rule 8.9 of the NER.

Invitation to make Submissions

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

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

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

Closing Date and Time

Submissions in response to this Notice of Second Stage of Rules Consultation should be sent by email to james.lindley@aemo.com.au, to reach AEMO by 5.00pm (Melbourne time) on 27 January 2017.

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

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

Publication

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

EXECUTIVE SUMMARY

The publication of this Draft Report and Determination (Draft Report) commences the second stage of the Rules consultation process conducted by AEMO to consider proposed amendments to the Procedure for Determining Contribution Factors (Causer Pays Procedure or CPP). This procedure applies to recovery of the costs of regulating raise and regulating lower frequency control ancillary services (Regulation FCAS) under clause 3.15.6A of the National Electricity Rules (NER).

As explained in AEMO's Issues Paper published on 28 October 2016[1], the scope of this consultation is limited to considering the CPP changes necessary to incorporate specific provisions addressing the determination of contribution factors when National Electricity Market (NEM) regions operate asynchronously, under clause 3.156A(j)(2) of the NER. The requirement for this consultation, and its timing, is mandated by an October 2016 decision of the Dispute Resolution Panel (DRP) under Chapter 8 of the NER.

A broader consultation on the CPP has since commenced, and will consider in detail a range of issues around cost recovery for Regulation FCAS. For that reason, the key criteria for the current limited consultation are that its outcomes do not require material changes to systems or resourcing for implementation or ongoing operation, and should preserve the flexibility to adopt a range of outcomes from the broader consultation.

AEMO presented three options for the determination of contribution factors for asynchronous operation in the Issues Paper, and expressed the preliminary view that only one option met the consultation criteria – namely to apply the existing methodology used for local Regulation FCAS requirements. This was Option 1 in the Issues Paper.

AEMO received four distinct submissions from seven Consulted Persons (one submission was jointly developed by four companies, but tendered by each company separately).

Three of the submissions supported Option 2 from the Issues Paper – to determine contribution factors after each period of asynchronous operation based on performance relative to frequency during that period, other than for Tasmania. One submission suggested Option 2 best complied with the NER, but for practical reasons recommended Option 3 – to substitute factors based on the historical performance of metered facilities only within the asynchronous region(s). It was noted that the work associated with that option could be minimised by only calculating factors in advance for the most likely synchronous separation events along regional boundaries.

AEMO has reviewed each of the submissions, and this report details its responses to the material issues raised.

For the reasons detailed in this Draft Report, AEMO considers that implementing Option 2 at this stage would not be consistent with the key criteria for this consultation. In particular:

- The potential incentives that Option 2 could create require detailed evaluation.
- In addition to material system changes, Option 2 raises questions about compliance with some aspects of the current NER, and may incentivise undesirable outcomes which require detailed analysis and evaluation.

Implementing Option 3 without further analysis also presents a risk that any potentially undesirable outcomes may be overlooked, and may limit the flexibility to adopt different solutions following the broader consultation. AEMO seeks further feedback on these questions in the second stage of consultation, in order to better assess the risks involved in implementing Option 3 for periods of asynchronous operation.

[1] Available at: http://aemo.com.au/-/media/Files/Stakeholder_Consultation/Consultations/Electricity_Consultations/2016/Causer-Pays-Procedures-Issues-Paper-Dec-16.pdf

After considering the submissions received, at this stage AEMO finds no sound basis to justify a departure from the key criteria expressed in the Issues Paper. Therefore, AEMO's draft determination is to amend the Causer Pays Procedure in line with Option 1 - to include a process for the determination of contribution factors where local Regulation FCAS requirements apply as a result of asynchronous operation for the purposes of clause 3.15.6A(j)(2), based on the steps set out in clause 4.2.2.4 and parts of 4.2.2.5 of AEMO's Efficient Dispatch and Localised Recovery of Regulation Services Business Specification (Business Specification).

During the second stage of consultation, however, AEMO will further investigate the practicalities of implementing Option 3. AEMO seeks specific feedback from stakeholders on the implications of implementing Option 3, and any risks or uncertainties that require more detailed analysis.

The draft CPP is published with this Draft Report.

CONTENTS

1. STAKEHOLDER CONSULTATION PROCESS

As required by clause 3.15.6A(m) of the NER, AEMO is consulting on proposed amendments to the Procedure for Determining Contribution Factors for the recovery of Regulation FCAS costs, commonly referred to as the Causer Pays Procedure (CPP). This consultation is conducted under the Rules consultation process in rule 8.9 of the NER.

This consultation is limited to the determination of contribution factors during periods when one or more regions of the NEM operate asynchronously with other regions.

AEMO's Issues Paper described three possible options for the determination of contribution factors in these circumstances, summarised in section 2.4 of this Draft Report.

Submissions in the first stage of consultation were received from:

- Origin Energy (Origin)
- ERM Power (ERM)
- Australian Energy Council (AEC)
- A 'Coalition' of four wind farm operators – Infigen Energy, Pacific Hydro, Tilt Renewables and Waterloo Wind Farm (Coalition).

Material issues relating to the options for amendment are summarised in section 4 of this Draft Report, and AEMO's responses to submissions are in Appendix B.

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

AEMO's timeline for this consultation is outlined below. Future dates are indicative and may be adjusted depending on the number and complexity of issues raised in submissions.

Deliverable	Date
Notice of first stage consultation and Issues Paper published	28 October 2016
First stage submissions closed	5 December 2016
Draft Report & Notice of second stage consultation published	6 January 2017
Submissions due on Draft Report	27 January 2017
Final Report published	1 March 2017

A glossary of terms used in this Draft Report is available at Appendix A.

2. BACKGROUND

2.1 NER requirements

The CPP sets out how AEMO determines contribution factors in accordance with clause 3.15.6A(j) of the NER, to calculate Market Participants' trading amounts under clause 3.15.6A(i) for the purpose of recovering the costs of Regulation FCAS. Relevant provisions of the NER are reproduced below.

Clause 3.15.6A(j) provides:

(j) AEMO must determine for the purpose of paragraph (i):

(1) a contribution factor for each Market Participant; and

(2) notwithstanding the estimate provided in paragraph (nb), if a region has or regions have operated asynchronously during the relevant trading interval, the contribution factors relevant to the allocation of regulating raise service or regulating lower service to that region or regions,

in accordance with the procedure prepared under paragraph (k).

Clause 3.15.6A(k) provides:

(k) AEMO must prepare a procedure for determining contribution factors for use in paragraph (j) and, where AEMO considers it appropriate, for use in paragraph (nb), taking into account the following principles:

(1) the contribution factor for a Market Participant should reflect the extent to which the Market Participant contributed to the need for regulation services;

(2) the contribution factor for all Market Customers that do not have metering to allow their individual contribution to the aggregate need for regulation services to be assessed must be equal;

(3) for the purpose of paragraph (j)(2), the contribution factor determined for a group of regions for all Market Customers that do not have metering to allow the individual contribution of that Market Customer to the aggregate need for regulation services to be assessed, must be divided between regions in proportion to the total customer energy for the regions;

(4) the individual Market Participant's contribution to the aggregate need for regulation services will be determined over a period of time to be determined by AEMO;

(5) a Registered Participant which has classified a scheduled generating unit, scheduled load, ancillary service generating unit or ancillary service load (called a Scheduled Participant) will not be assessed as contributing to the deviation in the frequency of the power system if within a dispatch interval:

(i) the Scheduled Participant achieves its dispatch target at a uniform rate;

(ii) the Scheduled Participant is enabled to provide a market ancillary service and responds to a control signal from AEMO to AEMO's satisfaction; or

(iii) the Scheduled Participant is not enabled to provide a market ancillary service, but responds to a need for regulation services in a way which tends to reduce the aggregate deviation;

(6) where contributions are aggregated for regions that are operating asynchronously during the calculation period under paragraph (i), the contribution factors should be normalised so that the total contributions from any non-synchronised region or regions is in the same proportion as the total customer energy for that region or regions; and

(7) a Semi-Scheduled Generator will not be assessed as contributing to the deviation in the frequency of the power system if within a dispatch interval, the semi-scheduled generating unit:

(i) achieves its dispatch level at a uniform rate;

(ii) is enabled to provide a market ancillary service and responds to a control signal from AEMO to AEMO's satisfaction; or

(iii) is not enabled to provide a market ancillary service, but responds to a need for regulation services.

2.2 Context for this consultation

2.2.1 Cost recovery of localised regulation services rule change

The last major revision of the CPP was in 2008, following the *National Electricity Amendment (Cost Recovery of Localised Regulation Services) Rule 2007* (2007 Rule Change). The 2007 Rule Change and the revised CPP took effect on 1 January 2009, and made the following key changes to the principles and process for recovering the cost of Regulation FCAS:

- Marginal prices for Regulation FCAS were to be calculated for each local market ancillary service requirement (local requirement) for those services, as well as for the whole-of-NEM global requirement.
- The costs of a local requirement for Regulation FCAS were to be recovered only from Market Participants in the region or regions affected.

2.2.2 DRP determination

In October and November 2015, during a series of planned single line outages of the Heywood Interconnector between Victoria and South Australia, there was a local requirement for Regulation FCAS from within the South Australia region of the NEM, the costs of which were significant. AEMO's allocation of those costs under the NER and the CPP was subsequently disputed under rule 8.2 of the NER.

The DRP found that:

- AEMO's determination of contribution factors under the CPP and their application to the costs of local requirements for Regulation FCAS was consistent with the NER for periods when South Australia was synchronous with the rest of the NEM, but
- AEMO had not made a procedure that addressed the requirement in clause 3.15.6A(j)(2) for NEM regions operating asynchronously.

As noted above, clause 3.15.6A(j)(2) requires AEMO to determine contribution factors relevant to allocating Regulation FCAS requirement costs when a region or regions operate asynchronously during a trading interval.

The DRP determination required AEMO to make procedures, or amend the CPP, to address the circumstances in clause 3.15.6A(j)(2) within 5 months – by 3 March 2017.[2]

[2] DRP Final Determination available at: http://www.resolveadvisors.com.au/files/DRP%20FCAS%20dispute%20final%20determination%20and%20supp%20reasons%203%20October%202016%281%29.pdf

2.2.3 Broader causer pays consultation

On 5 December 2016, AEMO published an Issues Paper to commence a comprehensive review of the CPP in consultation with Market Participants, including the principles for allocating local requirement costs. This review was first initiated in late 2015, but was suspended while the dispute process was ongoing.

The outcomes of the review could necessitate a rule change proposal. Following the DRP determination, AEMO considers it is highly desirable for the NER to be amended in any event, to clarify some inconsistencies highlighted in the DRP process, including in relation to clause 3.15.6A(j)(2).

Development of a preferred option could take several months of evaluation and analysis, after which it is likely that proposed NER changes and further CPP changes will be put forward for consultation. These steps cannot be completed within the timeframe required by the DRP determination for the clause 3.15.6A(j)(2) amendment.

2.3 Limited consultation criteria

In view of the limited time available to AEMO to make the changes required by the DRP determination, and the prospect of significant changes arising from the broader review that is now under way, the Issues Paper for this consultation outlined three key criteria:

- This consultation must be limited in scope to the changes necessary to incorporate provisions in the CPP that address clause 3.15.6A(j)(2).
- The methodology for determining contribution factors for this purpose should not require any material change to systems or resourcing for AEMO or Market Participants.
- This consultation should preserve the flexibility to adopt a range of options in the broader causer pays consultation, without seeking to anticipate potential outcomes.

2.4 Summary of Options from Issues Paper

Three options were discussed in the Issues Paper:

- **Option 1**: A process that reflects the methodology currently used to determine contribution factors for the recovery of the costs of all local ancillary service requirements, as set out in AEMO's Efficient Dispatch and Localised Recovery of Regulation Services Business Specification (Business Specification).[3]
- **Option 2**: A process under which AEMO determines contribution factors for an asynchronous period ex post, based on the performance of individual units during the asynchronous period itself. Those factors would be determined in the same way as they are during the historic reference period, to the extent possible in the circumstances. Under this option, Tasmania would be treated differently from other regions because it is permanently asynchronous.
- **Option 3**: A process for the substitution of NEM-wide contribution factors with factors that use historical performance factors for appropriately metered facilities within the asynchronous region(s) only, and a recalculated residual factor.

AEMO's preliminary view was that only Option 1 is practical for the purposes of the current consultation.

[3] Available at: http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Ancillary-services/Ancillary-services-causer-pays-contribution-factors

3. SUMMARY OF MATERIAL ISSUES

The key material issues arising from the proposed amendment options and raised by AEMO or Consulted Persons in the first stage of consultation are summarised in the following table (see section 1 for the full list of stakeholders who contributed submissions):

No.	Issue	Raised by
1.	Scope and purpose of consultation, including views that Option 2 will have to be implemented irrespective of the broader review outcomes, and that Option 1 is not consistent with the DRP determination.	AEMO, AEC, ERM, Origin
2.	Application and interpretation of all principles in clause 3.15.6A(k) in determining a contribution factor methodology for periods of asynchronous operation under NER clause 3.15.6A(j)(2). Most submissions discussed principle (1) (CPP to reflect the extent to which Market Participants contributed to the need for Regulation FCAS). The Coalition submission also discussed principles (3), (4), (6) and (7).	Coalition, AEC
3.	Whether differences in the treatment of causer pays calculations are justified for local FCAS requirements arising in circumstances of synchronous and asynchronous operation respectively.	AEMO, Coalition, ERM
4.	Whether contribution factors should reflect actual performance of facilities relative to frequency during the intervals when local Regulation FCAS requirements are invoked.	AEMO, AEC, Coalition, ERM, Origin
5.	The extent to which the methodology currently applied for asynchronous operation allows sufficient opportunity to mitigate risk.	ERM
6.	Practical issues and implications of options 2 and 3, including requirements for calculating or estimating contribution factors in real time (dispatch timeframe), and potential undesirable outcomes.	AEMO, AEC, ERM, Origin

A detailed summary of issues raised by Consulted Persons in submissions, together with AEMO's responses, is contained in **Appendix B**. A high level discussion of the material issues, with AEMO's conclusions and reasons on each, is set out in section 4.

4. DISCUSSION OF MATERIAL ISSUES

4.1 Scope and Purpose of Consultation

4.1.1 Issue summary and submissions

The Issues Paper set out key criteria limiting the scope of this consultation (see section 2.3 above). Although none of the submissions raised direct issues with these criteria, some comments indicated different views on how those limitations apply to the potential outcomes. In particular:

- The AEC suggested that 'overcoming the deficit in the current process for calculation of causer pays factors during periods of asynchronous operation would be beneficial to framing the potential future review of causer pays factors.'
- ERM's view is that 'irrespective of the future broader consultation these [system changes required for Option 2] will need to be implemented'.
- Origin suggested that Option 1 (in its view "do nothing") would 'defeat the purpose of this consultation and the DRP determination'.

4.1.2 AEMO's assessment

The key criteria expressed in the Issues Paper mean that neither setting a direction for the broader review, nor implementing a solution based on an assumption that it is the right outcome for the broader

review, are valid considerations for determining the CPP amendments to be made in this consultation. The first stage submissions have not provided a sound basis on which AEMO can justify a departure from those criteria.

As is evident from submissions received and the proceedings leading to the DRP determination, there is a wide range of views on the original intent of the 2007 Rule Change and its interpretation. Similarly, there will be a range of views on how the principles underlying the 2007 Rule Change should be applied or adapted to current market and power system conditions. Some of the views expressed in submissions to this consultation may be based on assumptions that have not yet been established or tested. In many cases substantive analysis and extended consultation will be needed to establish whether any particular solution is in the long term interests of electricity consumers.

The purpose of this current consultation, in accordance with the DRP determination, is to inform the making of a procedure under clause 3.15.6A(k) of the NER (by way of amendment of the CPP), addressing the circumstances specified in clause 3.15.6A(j)(2). The DRP determination did not require AEMO to exercise its discretion in a particular way, other than in accordance with the applicable requirements of the NER.

Option 1 represents the procedure that AEMO has applied in practice for periods of asynchronous operation since 2009. If, after consultation, AEMO considers that Option 1 meets the requirements of the NER and is the most appropriate outcome in the circumstances, then it would be consistent with the DRP determination to include that procedure in the CPP.

4.1.3 AEMO's conclusion

It is not appropriate for AEMO to make a determination based on any view of whether the outcome is the 'right' or 'best' solution for determining contribution factors in circumstances other than asynchronous operation. AEMO's determination of the methodology to be applied for asynchronous operation must be based on its assessment of the solution that meets both the current requirements of the NER and the national electricity objective.

4.2 Application of Principles in NER 3.15.6A(k)

4.2.1 Issue summary and submissions

NER clause 3.15.6A(k) is replicated in section 2.1 of this Draft Report, and sets out seven principles AEMO must take into account in preparing a procedure for determining contribution factors for use in paragraph (j). In the Issues Paper, AEMO identified the principle in paragraph (k)(3) as the only one of specific application to clause 3.15.6A(j)(2).

The AEC, ERM and the Coalition all noted that contribution factors should reflect the extent to which a Market Participant contributed to the need for regulation services, which is the principle expressed in clause 3.15.6A(k)(1).

The Coalition submitted that all relevant factors in paragraph (k) must be taken into account in determining a procedure for clause 3.15.6A(j)(2). In addition to paragraphs (k)(1) and (3), the Coalition identified paragraphs (4), (6) and (7) as relevant in this regard. In the Coalition's view:

- The period of asynchronous operation is the only appropriate timeframe over which to determine a Market Participant's contribution to the aggregate need for regulation services in that period for the purposes of paragraph (4).
- Contrary to AEMO's interpretation, during periods of asynchronous operation paragraph (6) requires AEMO to aggregate contribution factors in regions that are asynchronous with another part of the mainland NEM but synchronous with one another, and to normalise those factors based on customer energy during that period.

- Paragraph (7) is relevant because defects in the Australian Wind Energy Forecasting System (AWEFS) result in inaccurate dispatch levels for semi-scheduled generators and this adversely impacts the assessment of whether dispatch levels are achieved at a uniform rate. The Coalition submits that any causer pays methodology should not exacerbate these flaws.

The Coalition agreed with AEMO's interpretation of the principle in paragraph (k)(3).

4.2.2 AEMO's assessment

The role of the principles in clause 3.15.6A(k) was at issue before the DRP, which concluded that 'those principles are not direct constraints on the content of the procedure AEMO is required to prepare; rather they are relevant considerations which AEMO must take into account in preparing the procedure.'[4]

AEMO agrees that it is required to consider the entirety of clause 3.15.6A(k) in determining the CPP, whether in relation to paragraph (j)(1) or (j)(2). While the Issues Paper noted that only paragraph (k)(3) was specifically relevant to paragraph (j)(2), AEMO must also consider the other principles. However, none of these can be considered in isolation from the other NER provisions dealing with Regulation FCAS cost recovery, and the broader national electricity objective.

In relation to the principles highlighted in submissions:

- Paragraph (k)(1) expresses the basic 'causer pays' objective. AEMO is aware that the question of who or what 'causes' a requirement for Regulation FCAS is capable of many economic and situation-specific interpretations. Currently in the NEM, a need for Regulation FCAS represents a requirement for a megawatt (MW) capacity of service to be enabled, such that it is available for use. It is important to note that this requirement is based on an ex ante assessment of the likely maximum amount of the service that could be needed in any given scenario. The amount of that requirement may change over time based on longer term trends in the performance of connected generation and loads relative to system frequency.
- Paragraph (k)(3) is specifically relevant to the determination of contribution factors under paragraph (j)(2), and relates to the allocation of the residual Market Participant Factor for the applicable constraint (CRMPF).
- AEMO agrees that paragraph (4) allows for AEMO to determine different time periods for measuring participant contributions to frequency requirements for the purposes of paragraphs (j)(1) and (j)(2) respectively. However, because the need for Regulation FCAS is not determined by the use of the service in real time, there is no imperative for the measurement period to coincide with the period of asynchronous operation for (j)(2) purposes.
- AEMO considers paragraph (k)(6) is not relevant to paragraph (j)(2) in the context of temporary asynchronous operation, because the aggregation and normalisation process it deals with would never be necessary in that situation. It addresses one of the primary purposes of the 2007 Rule Change, namely to require a combination of contributions based on different frequency indices (as between Tasmania and the mainland NEM) to recover the cost of Regulation FCAS shared between those areas.
- As the Coalition acknowledges, AWEFS issues associated with paragraph (k)(7) cannot be addressed within the scope of this consultation. It is unclear how a methodology based on real time performance would allow Semi-Scheduled Generators to benefit more from paragraph (7), or increase transparency or accountability.

4.2.3 AEMO's conclusion

All principles in clause 3.15.6A(k) require consideration by AEMO in modifying the CPP, although only one – (k)(3) – relates only to contribution factors determined for paragraph (j)(2). AEMO does not

[4] Reasons for Determination of the DRP dated 2 September 2016, at paragraph 140. Available at: http://www.resolveadvisors.com.au/files/DRP%20FCAS%20Reasons%20for%20Determination%202%20September%202016%20-%20Signed%282%29.pdf

consider that any principle mandates a cost recovery methodology using real time performance measurement while mainland NEM regions are operating asynchronously.

4.3 Different Treatment for Synchronous and Asynchronous Operation

4.3.1 Issue summary and submissions

In the Issues Paper, AEMO noted that Options 2 and 3 would both result in different treatment of cost recovery for local requirements during periods of asynchronous operation and those imposed for other reasons. AEMO commented that there was no obvious rationale for differences. ERM and the Coalition responded on this issue.

ERM agreed with AEMO's view, and referred to the intent and principles of the 2007 Rule Change; that regional cost recovery of all local requirements should be based on the fact that a local requirement has been invoked regardless of the cause.

The Coalition took the view that different treatment is appropriate based on the physical reality of the NEM, because the conduct of Market Participants alters between synchronous and asynchronous market operation. The Coalition distinguished between local market ancillary service requirements, which it said are created by AEMO and distort the physical operation of the mainland NEM while it remains synchronous; and asynchronous operation, which is a physical reality and results in a separate local frequency. The Coalition also suggested that ex post determination of contribution factors based on actual performance during asynchronous operation could also be extended to periods of synchronous operation, subject to rule changes.

4.3.2 AEMO's assessment

AEMO's analysis of the 2007 Rule Change process and submissions indicates a common understanding that local requirements could be invoked for reasons other than asynchronous operation, and for any region or combination of regions. As a result there is a single definition of a local market ancillary service requirement in the NER, which makes no reference to the reason for which that requirement is imposed.

Because the cost of Regulation FCAS is currently determined by a requirement for MW capacity to be enabled, and not by the extent to which it is actually used, the conduct of Market Participants during the asynchronous period does not influence the requirement for which the cost is to be recovered.

4.3.3 AEMO's conclusion

AEMO concludes that there is no objective basis for different treatment of local market ancillary requirements during synchronous or asynchronous operation. AEMO acknowledges that system and market conditions have changed significantly since 2007, and more recently these changes have increased the cost of Regulation FCAS in South Australia in particular. The broader CPP consultation will examine whether contribution factors could be determined in a way that better reflects the principle in clause 3.15.6A(k)(1). However, as illustrated in submissions and the DRP proceedings, there are complex issues of interpretation and inter-relationships requiring more extensive analysis than can be performed in this consultation.

4.4 Actual or Historic Performance

4.4.1 Issue summary and submissions

All submissions expressed the view that Option 2 best complies with the NER because it provides a calculation methodology based on unit performance during the asynchronous period, although Origin

agreed with AEMO's assessment that the difficulties noted in the Issues Paper meant Option 2 was not suitable. Submissions indicated that only this 'real time' methodology can capture the contribution of a Market Participant to the need for Regulation FCAS in an asynchronous period.

4.4.2 AEMO's assessment

As already noted in sections 4.2 and 4.3, FCAS providers are compensated for enablement of regulating capability, not delivery. The quantity of Regulation FCAS enabled under any requirement (whether for asynchronous operation or otherwise) is determined by system requirements and Market Participants' behaviour over the long term. Therefore, while there are theoretical advantages in having the contribution factor determined over a period close to the recovery period, real time performance measurement may not necessarily reflect the 'causer pays' principle under the current method of FCAS procurement.

4.4.3 AEMO's conclusion

The real time performance of measurable generating units and loads during an asynchronous event does not determine the requirement for Regulation FCAS during that period. That being the case, and since the NER contemplate that historic performance measures will be used to determine contribution factors generally, AEMO cannot yet conclude that the use of real time performance measures for the purposes of clause 3.15.6A(j)(2) best meets the NER requirements or the national electricity objective.

4.5 Opportunity to Mitigate Risk

4.5.1 Issue summary and submissions

ERM noted that one of the primary objectives of the 2007 Rule Change was to enable 'the cost of local regulation FCAS requirements to be recovered from those market participants who had both the capacity and the ability to mitigate their liability at the time the requirements were needed.' ERM said that only the use of current trading interval values can support efficient risk mitigation solutions, including rebidding, removing generating units from service, and offering additional FCAS volumes. In ERM's view, the current causer pays methodology using distant historical data does not allow basic risk mitigation solutions and prevents economically efficient cost recovery.

4.5.2 AEMO's assessment

AEMO agrees that the provision of opportunities for risk mitigation is an important aspect of the causer pays regime. Ideally, these should incentivise conduct that promotes sustained performance improvement. While the opportunity to respond to price signals in real time can reduce financial risk for some participants, it could also incentivise conduct that is potentially detrimental to power system security, such as the sudden withdrawal of capacity. This in turn may result in the 'causers' of the need for Regulation FCAS not bearing a fair share of the cost.

On the other hand, a calculation methodology based on historical performance, with contribution factors published in advance, may incentivise different risk mitigation measures, such as performance improvement for future periods, secondary market hedging, or investment in frequency control capability.

AEMO recognises that there are pros and cons of both historical and real time calculation methodologies, which require detailed analysis and evaluation.

4.5.3 AEMO's conclusion

The way in which any solution facilitates risk mitigation must account for the fact that different conditions will present different risks for different Market Participants. The location of any synchronous

separation, and the various positions of the full range of Market Participants affected by each resulting local requirement, will affect the available risk mitigation options. The design of a solution must therefore provide for acceptable outcomes under all reasonably possible scenarios, in all NEM regions, in the long term interests of electricity consumers. The most efficient outcome for the NEM as a whole is likely to require modifications to any of the options proposed in this consultation.

AEMO concludes that, at this stage, Option 2 provides no quantifiable advantages in relation to the management of risk overall. The implications of moving to a real time calculation methodology need to be fully explored as part of the broader causer pays consultation.

4.6 Practical Issues and Implications of Options 2 and 3

4.6.1 Issue summary and submissions

The Issues Paper noted that the implementation Option 2, and to a lesser extent Option 3, could be problematic at this stage because:

- Resource-intensive manual processing would be required.
- Reasonable estimates of contribution factors could not be provided during a period of asynchronous operation, as required by NER clause 3.15.6A(nb).

The Issues Paper also explained AEMO's view that Tasmania would need to be excluded from the Option 2 process, meaning it could not be uniformly applied across all NEM regions. AEMO also noted that Option 2 would be difficult to apply for short periods of asynchronous operation.

The AEC and ERM both suggested that AEMO could use data from supervisory control and data acquisition (SCADA) systems to calculate a reasonable estimate of contribution factors in real time. The AEC also said that clause 3.15.6A(nb) 'does not require real time calculation or publication of factors during times of asynchronous operation, allowing time for AEMO to estimate factors where necessary'.

The AEC said Tasmania could be treated appropriately given its permanent asynchronous operation, but ERM considered that Option 2 should apply to local requirements invoked in Tasmania whenever Basslink is unable to transfer Regulation FCAS.

ERM also saw no reason why Option 2 could not be applied for an asynchronous period of even a single dispatch interval, on the basis that it is an ex post settlement adjustment on an as required basis.

Origin's submission agreed that Option 2 was not suitable because of the issues identified by AEMO. In relation to Option 3, Origin proposed that AEMO could select the most probable separation scenarios and publish contribution factors in advance for those combinations of regions, while also publishing raw factors to allow participants themselves to estimate factors for any other scenario.

4.6.2 AEMO's assessment

Currently, the contribution factor calculation process relies on experienced engineers to screen SCADA data collected over the sample period and identify bad data not flagged by automatic screening. AEMO may be able to calculate and publish 5-minute unit performance measures based on SCADA data with some investment in tools and automatic quality assurance, but it is a key criterion of this consultation that no material system changes or resourcing be required.

In any event, 5-minute performance factors would not represent the contribution factors for any period of asynchronous operation. These could only be estimated after the end of the period, so compliance with clause 3.15.6A(nb) remains problematic. AEMO interprets this clause as requiring AEMO to publish an estimate of the contribution factors (representing the proportionate allocation of cost to Market Participants) at the time of asynchronous operation.

AEMO does not consider that the application of Option 2 to Tasmania in periods when Basslink is unable to transfer FCAS would be efficient, for the reasons already canvassed in the Issues Paper.

Clause 3.15.6A(j)(2) refers only to asynchronous operation, and AEMO can find no basis to distinguish between different Basslink operating scenarios as suggested by ERM.

AEMO remains of the view that it will be difficult to assign a representative contribution factor based on individual unit or load performance during a very short separation event. Performance cannot be adequately assessed while market and control systems are being reconfigured to a new frequency. Further, immediately after a separation event, frequency excursions outside the normal operating frequency band are likely, meaning that the 5-minute performance for those dispatch intervals would be ignored. As a result, most or even all of the cost of Regulation FCAS during an asynchronous period could be allocated to Market Customers without appropriate metering (the 'residual'). It is not clear whether this is an appropriate or desirable outcome, having regard to the principles in clause 3.15.6A(k) and the national electricity objective.

In relation to Option 3, AEMO considers that Origin's proposal of selecting the most likely separation scenarios and publishing contribution factors for those combinations of regions is potentially manageable, and would reduce (but not eliminate) the risk of non-compliance with paragraph (nb). AEMO needs to further investigate the practicalities, and the timing within which this option could be implemented if appropriate.

4.6.3 AEMO's conclusion

AEMO remains of the view that the practical issues associated with the implementation of Option 2 are significant enough to rule out its implementation at this stage, with those issues to be investigated in more detail in the broader consultation.

Option 3 appears to present less risk in each of these areas, but AEMO notes the in-principle support expressed in all submissions for Option 2. Implementing Option 3 at this point, without further consultation and analysis, also presents a risk that any potentially undesirable outcomes could be overlooked, and may limit the flexibility to adopt different solutions in the broader consultation. During the second stage of consultation, AEMO proposes to further investigate the practicalities of implementing Option 3. AEMO seeks specific feedback from stakeholders on the implications of implementing Option 3, and any risks or uncertainties that require more detailed analysis.

5. OTHER MATTERS

Since the last revision of the CPP, AEMO has changed its standard form for procedures. AEMO has therefore taken this opportunity to reformat the CPP. This involves changes to text, heading and numbering styles, re-ordering of some content, including the glossary, and non-material amendments of the introductory provisions that are common to most NEM procedures.

The draft CPP at Attachment 1 includes notes describing these changes.

A few obvious errors and omissions noted in the course of the reformatting exercise have been corrected and appear as mark-ups, but there has been no comprehensive review of the CPP provisions other than those that are directly relevant to the subject matter of this consultation. AEMO notes that a comprehensive drafting review is desirable and this will be incorporated in any amendments resulting from the broader CPP review.

6. DRAFT DETERMINATION

After considering the submissions received, AEMO's draft determination is to amend the Causer Pays Procedure in line with Option 1 – to include a process for the determination of contribution factors for

the purposes of clause 3.15.6A(j)(2) based on the steps set out in clause 4.2.2.4 and parts of 4.2.2.5 of the Business Specification.

During the second stage of consultation, however, AEMO proposes to further investigate the practicalities of implementing Option 3 for periods of asynchronous operation, and seeks specific feedback from stakeholders on the potential implications and any risks or uncertainties that require more detailed analysis.

The draft CPP with change-marks is published with this Draft Report as Attachment 1.

APPENDIX A. GLOSSARY

Term or acronym	Meaning
2007 Rule Change	The *National Electricity Amendment (Cost Recovery of Localised Regulation Services) Rule 2007.*
AEC	Australian Energy Council
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator Limited
Appropriate metering	Metering (of generating plant or load) sufficient to allow the individual contribution of the relevant Market Participant to the aggregate deviation in frequency of the power system to be addressed.
Asynchronous	Not connected to another part of the NEM transmission grid by an operational alternating current (AC) link.
AWEFS	Australian Wind Energy Forecasting System
Business Specification	The Efficient Dispatch and Localised Recovery of Regulation Services Business Specification as published by AEMO.
Causer Pays Procedure or CPP	The “Causer Pays: Procedure for Determining Contribution Factors” prepared under clause 3.15.6A(k) of the NER.
CMPF	Constraint Market Participant Factor – the sum of the MPFs applicable to the recovery of the costs of a local requirement from Market Participants with appropriate metering in the region(s) where that requirement applies.
Coalition	Infigen Energy (comprising Renewable Power Ventures Pty Ltd, Lake Bonney Wind Power Pty Ltd and Woodlawn Wind Pty Ltd), Pacific Hydro Clements Gap Pty Ltd, Tilt Renewables Australia Pty Ltd and Waterloo Wind Farm Pty Ltd.
CRMPF	Constraint Residual Market Participant Factor - the RMPF applicable to the recovery of the costs of a local requirement from Market Customers without appropriate metering in the region(s) where that requirement applies.
DRP	Dispute Resolution Panel constituted for a decision under rule 8.2 of the NER.
DRP determination	Determination of the DRP (PRD Gray QC, GH Thorpe and LM McMillan) dated 3 October 2016 and Reasons dated 2 September 2016 in relation to a dispute between Origin Energy Electricity Ltd, AEMO, a group of South Australian wind farm operators, and others.
ERM	ERM Power Limited
FCAS	Frequency control ancillary services
Global, global requirement	Global ancillary service requirement as defined in the NER
Local, local requirement	Local ancillary service requirement as defined in the NER (this arises from a constraint imposed by AEMO that requires FCAS to be sourced from an identified NEM region or regions).
MPF	Market Participant Factor (contribution factor) for a Market Participant with appropriate metering (NER clause 3.15.6A(i)(1)).
NEM	National Electricity Market
NER	National Electricity Rules
Origin	Origin Energy Limited
Regulation FCAS	A regulating raise service or regulating lower service as defined in the NER.
RMPF	Residual Market Participant Factor (contribution factor) for Market Customers without appropriate metering (NER clause 3.15.6A(i)(2)).
SA	The South Australia region of the NEM.
SCADA	Supervisory Control and Data Acquisition

APPENDIX B. SUMMARY OF SUBMISSIONS AND AEMO RESPONSES

No.	Name	Issue	AEMO response
SCOPE AND PURPOSE OF CONSULTATION			
1.	AEC	While acknowledging that AEMO views only the first option as 'practical for the purposes of the current consultation,' it is important to outline an option which best meets the NER and results in efficient outcomes regardless of potential future reviews, and their outworking.	AEMO agrees with this objective, and considers that an efficient outcome must be shown to: • have net benefits greater than the status quo, and • be consistent with the national electricity objective. While this is a standalone consultation, it must be acknowledged that there is a broader consultation in progress, canvassing aspects of the causer pays process and implications for the market that cannot be examined in detail in the time available for this consultation. Accordingly, it is a fundamental principle of this consultation that the outcome of the broader review should neither be anticipated nor prejudiced.
2.	AEC	Overcoming the deficit in the current process for calculation of causer pays factors during periods of asynchronous operation would be beneficial to framing the potential future review of causer pays factors.	This consultation has to meet the tight timeline imposed by the DRP determination. While it is asserted that the current process has shortcomings, the implications of some possible solutions may be undesirable for some stakeholders. It would be irresponsible to implement a process whose effects have not been sufficiently investigated and found to be in the long term interests of electricity consumers, and more beneficial than the current process. The time and resources to conduct such an investigation is simply not available during the short period allowed for this consultation. AEMO has commenced a broader review of the CPP that will canvass these issues fully.
3.	ERM	It is clear that the current AEMO methodology for the recovery of local FCAS regulating services requires significant review in light of this change in AEMO's policy for the implementation of local FCAS regulating services for other than a region being electrically islanded or Basslink being unable to transfer FCAS from the mainland.	The maintenance of power system security is of paramount importance and AEMO currently imposes these constraints as part of a suite of measures designed to ensure the system is able to recover from credible contingency events. The nature and extent of those measures depends on the combination of circumstances and conditions prevailing at any time, and current requirements will require review and adjustment over time. The market response to those measures is not something that AEMO can or should control. However, market outcomes are certainly a matter for concern and this was the driver for AEMO's broader review into whether the current cost recovery regime remains fit for purpose.
4.	ERM	[In response to AEMO's observation in the Issues Paper that, on the basis that system changes are not justified ahead of the broader consultation, Option 2 will be a labour intensive process:] We believe that AEMO should consider that to be fully compliant with the Rules and the intent of the Rules, Option 2 should be implemented as soon as practically achievable regardless of the fact a broader consultation will commence sometime in the future. It is also our view that irrespective of the future broader consultation these system changes will need to be implemented and may facilitate improvements for the calculation of causer pays factors for all Trading Intervals to move the reference point closer to real time outcomes as opposed to the current delayed historical process.	See response to No. 2. Other than the absence of a procedure that specifically addresses clause 3.15.6A(j)(2), AEMO is not aware of any existing non-compliance with the NER. The implementation of Option 2 Further, utilising AEMO's existing systems and procurement processes may raise compliance questions, however. In particular: • As discussed in No. 26, implementing Option 2 could result in non-compliance with the requirement to publish estimated contribution factors during asynchronous operation. • As the amount of Regulation FCAS procured is not determined in real time, a real time recovery methodology may not be consistent with the principle in clause 3.15.6A(k)(1). Moving the reference point closer to real time is an option that is being explored in the broader consultation, but this is not the same as real time calculation.

No.	Name	Issue	AEMO response
5.	Origin	Option 1 is in our view “do nothing”. We do not agree that AEMO make changes to the existing procedure in order to comply with Option 1. In fact, in Origin’s opinion, this reverse engineering proposal will defeat the purpose of this consultation and the DRP determination.	The DRP determination required AEMO to make a procedure to address clause 3.15.6A(j)(2). It did not require AEMO to exercise its discretion in a particular way, other than in accordance with the applicable requirements of the NER. Option 1 represents the procedure that AEMO has applied in practice for periods of asynchronous operation since 2009. If, after consultation, AEMO considers that Option 1 meets the requirements of the NER and is the most appropriate outcome in the circumstances, then it would be consistent with the DRP determination to include that procedure in the CPP.
APPLICATION OF PRINCIPLES IN NER 3.15.6A(k)			
6.	AEC, Coalition	The NER require AEMO to prepare a procedure for determining contribution factors which take into account the principle that “the contribution factor for a Market Participant should reflect the extent to which the Market Participant contributed to the need for regulation services.” [NER 3.15.6A(k)(1)]	AEMO notes that the role of the principles in paragraph (k) was specifically considered by the DRP. AEMO agrees that all principles in clause 3.15.6A(k) must be considered when making procedures for contribution factors to apply under paragraphs (j)(1) and (j)(2). However, clause 3.15.6A(k)(1) cannot be considered in isolation. It expresses an objective to be considered in making the CPP, but it is one of a number of relevant considerations and can only be given effect within the framework of the remaining rules for the recovery of Regulation FCAS costs. Paragraph (k)(1) is, moreover, a principle that lends itself to many economic interpretations. The extent to which each Market Participant, or its customers, contributed to a need for Regulation FCAS (being a requirement for a service to be enabled) is dependent on many factors, several of which are inter-related. Some are not measurable or are outworkings of matters wholly external to Market Participants. Any ‘causer pays’ methodology in the current market and system conditions will necessarily represent a compromise attributing different weight to these contributing factors.
7.	Coalition	AEMO is required by clause 3.15.6A(j) of the NER to take into account the principles in clause 3.15.6A(k) in preparing a procedure for the purposes of clause 3.15.6A(j)(2) ... While paragraphs (k)(3) and (k)(6) are the only paragraphs which specifically mention asynchronous operation, each of the factors in clause 3.15.6A(k) must be considered for its relevance to preparing a causer pays procedure for periods of asynchronous operation. Fundamentally a causer pays procedure must 'reflect the extent to which the Market Participant contributed to the need for the regulation services'.	See response to No. 6. The Issues Paper focused on the role of principles (k)(3) and (k)(6) because they were identified in the DRP determination as having specific relevance to paragraph (j)(2). This was not intended to infer that the other principles are not relevant.
8.	Coalition	In respect of clause 3.15.6A(k)(3), the Coalition agrees with AEMO's interpretation that the residual contribution factor for Market Customers, as between the regions on either side of a synchronous separation is to be proportionate to the total customer energy in each group of regions.	Noted.
9.	Coalition	Under clause 3.15.6A(k)(4) AEMO is provided with a discretion to determine the relevant timeframe over which an individual Market Participant's contribution to the aggregate need for regulation services will be determined. In exercising this discretion AEMO	The current timeframe of 28 days was selected by AEMO in consultation with stakeholders as it was likely to produce a reasonable average of performance sufficient to reduce the impact of short term operational issues being reflected in contribution factors. AEMO agrees that the NER allow for a different timeframe over which to determine contributions in relation to paragraph (j)(2), but notes that the need for regulation services

No.	Name	Issue	AEMO response
		must act reasonably in the context of its responsibility to prepare a causer pays procedure.	in a temporarily asynchronous region is not determined during that asynchronous period. Rather, the amount of regulation procured is determined by analysis of long term trends.
10.	Coalition	In respect of clause 3.15.6A(k)(6), the Coalition disagrees with AEMO's interpretation. AEMO interprets paragraph (k)(6) as applying only to global requirement costs. The text of the paragraph does not support this interpretation as no mention is made of global market ancillary services requirements. The Coalition interprets paragraph (k)(6) as recognising that once a mainland region is operating asynchronously, the mainland region or regions on each side of the network separation are operating asynchronously… In circumstances such as these, the causer pays procedure for the asynchronous period will need to provide for the aggregation of contributions: in an asynchronous region; and in regions which are asynchronous from another part of the mainland NEM but synchronous with one another. The causer pays procedure will then need to normalise the aggregated contribution factors so that the total contributions from the asynchronous region or regions is in the same proportion as the total customer energy for that region or regions. Unlike clause 3.15.6A(k)(3) which refers to Market Customers and, therefore, appears directed at the formula in clause 3.15.6A(i)(2), clause 3.15.6A(k)(6) is focused on asynchronous operation of regions generally (i.e. is relevant to both Market Generators and Market Customers). Consequently, the normalisation required by clause 3.15.6A(k)(6) will affect the calculation of the 'MPF' and 'AMPF' factors in the formulae under clauses 3.15.6A(i)(1) and 3.15.6A(i)(2) of the NER. AEMO refers to sections 5.9 and 5.10 of the CPP in respect of the normalisation and aggregation process undertaken in compliance with clause 3.15.6A(k)(6). Section 5.9 of the CPP provides for a process for determining a single set of causer pays factors for the mainland and Tasmanian region by normalising the figures for regional demand. This is required by clause 3.15.6A(k)(6) as Tasmania is always operating asynchronously with the mainland NEM. As the asynchronicity between the mainland NEM and Tasmania is a constant physical reality of the NEM, the MPF for both the mainland NEM (in synchronous operation) and Tasmania are able to be calculated on the basis of historic data. In contrast, the asynchronous operation of a region of the mainland NEM is not a constant. Compliance with clause 3.15.6A(k)(6) could only, therefore, be undertaken through normalisation on the basis of total customer energy during the asynchronous period of operation.	Principle (k)(6) is solely concerned with the aggregation of contributions, and guides the normalisation of contributions for that purpose (i.e. by reference to total customer energy). An aggregation and normalisation process is only necessary if contributions based on different frequency indices need to be combined in order to recover the cost of FCAS requirements across those regions (i.e. global requirements) This was indeed one of the primary purposes of the 2007 Rule Change, and has no relevance to local requirements (arising as a result of asynchronous operation or otherwise). This aggregation can only apply as between (a) the region(s) on one side of a synchronous separation and (b) the regions(s) on the other. The drafting does not allow for aggregation of contribution factors for multiple regions on the same side of a synchronous separation, because it specifically groups them (the total contributions from any non-synchronised region or regions … the total customer energy for that region or regions'). This is consistent with the fact that regions that are synchronous with each other would operate on the same frequency and therefore separate contribution factors would not be required. As the Coalition notes, the CPP include a normalisation procedure for the aggregation of contribution factors across the permanently asynchronous regions of Tasmania and the mainland NEM, as required by (k)(6). There would never be any reason to aggregate contributions across a temporary synchronous separation in the mainland NEM, because Regulation FCAS costs during that period would be recovered from each set of regions separately.

No.	Name	Issue	AEMO response
11.	Coalition	Clause 3.15.6A(k)(7) indicates that the causer pays procedure must take into account that semi-scheduled generators will not be assessed as contributing to the deviation in the frequency of the power system if the semi-scheduled generating unit meets one of three criteria in the relevant dispatch interval. One of these criteria is that the semi-scheduled generating unit achieves its dispatch level at a uniform rate. The submission identifies flaws in the AWEFS system relating to the calculation of dispatch levels and the discrepancy between compliance with a dispatch instruction and achieving a dispatch level at a uniform rate, and notes: The AWEFS' flaws should be addressed from both a technical and regulatory perspective to ameliorate harsh treatment of wind farms under the NER. While these technical and legislative changes are outside the scope of the current review, the Coalition considers that the methodology chosen by AEMO for the causer pays procedures should not exacerbate these system flaws. A methodology based upon actual performance data is more reasonable with respect to the actual frequency performance in the islanded region/s and more transparent and accountable.	AEMO notes that the AWEFS process has room for improvement and that some changes are already progressing in separate forums. However, it is not clear how a causer pays methodology based on actual performance data would promote the objective in paragraph (k)(7) by assisting semi-scheduled generators to achieve dispatch targets at a uniform rate. In relation to transparency, Option 2 is arguably a less transparent process because contributions will be unknown and not ascertainable in advance. In relation to accountability, real time performance during temporary asynchronous operation will be based on behaviour that is unlikely to be representative of the normal operation and trends on which AEMO determines the need for Regulation FCAS when a separation event occurs (being the local requirement imposed through constraint equations).
DIFFERENT TREATMENT FOR SYNCHRONOUS AND ASYNCHRONOUS OPERATION			
12.	Coalition	Once a separation event occurs between mainland NEM regions, the mainland NEM is asynchronous on each side of the separation. For this reason, the Coalition considers that it is appropriate for new contribution factors to be determined for each asynchronous region or group of regions. The Coalition's position is that the clear physical distinction between synchronous and asynchronous operation of the mainland NEM justifies [the divergence in treatment of local requirements between synchronous and asynchronous operation]. Contribution factors should be determined (and FCAS costs settled) on the basis of the physics of the NEM. … The conduct of Market Participants alters between synchronous and asynchronous market operation. The only way to account for this difference in behaviour consistently with the principle in clause 3.15.6A(k)(1) is to determine contribution factors ex post based on performance during the asynchronous period. The Coalition considers that this approach could also be adopted more broadly (through amendments to the NER) so that contribution factors would also be determined on the basis of actual performance during periods of synchronous operation and FCAS costs would be settled against synchronised regions (even where a [local market ancillary service] constraint has been applied).	The 2007 Rule Change and the cost recovery process were developed assuming no difference between local requirements imposed as a result of synchronous or asynchronous operation. A single category of 'local ancillary service requirements' was provided for, and the same cost recovery principles applied to those requirements irrespective of the particular circumstances for which they were imposed. The Coalition says that recovery of Regulation FCAS costs should reflect the extent to which a Market Participant contributed to the need for those services by reference to the physical behaviour of the system and market participants at the time those services are actually being used. However, the cost of Regulation FCAS is currently determined by a requirement for MW capacity to be enabled, not by the extent to which it is actually used. The 'need' (for which the cost is incurred) is the MW capacity to be enabled under the constraint, either before or immediately after the occurrence of a synchronous separation event. That need is not determined by the performance of units during the subsequent separation, but based on past operating experience – including the historic performance of generating units (and loads) in the affected region(s). As system and market conditions have changed over the last 10 years, AEMO agrees that the broader CPP consultation should examine whether contribution factors could be determined in a way that better reflects the principle in (k)(1), however (as illustrated in submissions and the DRP proceedings), there are complex issues of interpretation that require more extensive analysis than can be performed in this consultation.

No.	Name	Issue	AEMO response
13.	Coalition	Local market ancillary service requirements [LMAS] are created by AEMO; whereas, asynchronous operation is a physical reality. Local ancillary service requirements result from the imposition by AEMO of a LMAS requirement on a region. An imposition of such a constraint on a region which is operating synchronously with the rest of the mainland NEM has the effect of artificially isolating that region in respect of the provision of FCAS. AEMO's isolating of a region through the imposition of a LMAS requirement which is otherwise operating synchronously, places the region subject to the constraint at a competitive disadvantage in the NEM. While the constraint is in place, FCAS may only be sourced from Market Generators registered to provide FCAS in the constrained region. The constraint acts as a distortion of the physical operation of the mainland NEM: while the physical mainland NEM is operating according to the laws of physics and consequently enables the provision of FCAS across the mainland NEM, AEMO isolates the constrained region with the consequence of price distortion through an imposed limitation on FCAS supply. The separate automatic generator control (AGC) used to manage a region while synchronised to the mainland NEM has to be physically referenced to the same frequency as the rest of the NEM. This means that the LMAS is an arbitrary economic construct which is physically providing global services while being labelled 'local'. There is no local frequency reference that can be used, until a region is physically separated from the rest of the mainland NEM (using a local frequency when synchronised would cause hunting between regions). Once regions are separated the local frequency reference is the frequency available to the AGC located in the separated region. Consequently, the local frequency should be the basis for calculating the contribution of a Market Participant to the need or regulation services during a period of asynchronous operation.	All FCAS requirements are created by AEMO. In all cases it is the cost of the services enabled to meet those requirements that is being recovered. All local Regulation FCAS requirements result from circumstances under which a particular region or set of regions is, or is at risk of being, unable to acquire these services from other NEM regions when required. The imposition of FCAS constraints by AEMO as system operator is not relevant to this consultation. The 2007 Rule Change deliberately did not distinguish between local requirements arising in synchronous or asynchronous circumstances. The reasons for a local requirement for regulation FCAS enablement do not affect the cost recovery mechanism. Importantly, it is not the actual use of regulation FCAS capability at any time that determines its cost, but the requirement for it to be available and ready to respond. An FCAS requirement determines the quantity of FCAS that is enabled in this way, not the amount of the regulating service that is actually used.
14.	Coalition	Any separation event in the NEM should activate a thorough investigation into the performance of the generators to ensure that appropriate control action and frequency response is provided. The calculation of an ex post contribution factor would ensure that detailed examination of performance is undertaken.	AEMO has a rule requirement (NER 4.8.15) to analyse and report on such events. AEMO has and will conduct investigations for major events for various reasons. It is likely that any separation event would meet the reporting requirement, and that frequency control within separated regions will be one of the subjects of analysis. AEMO does not consider that any ongoing requirement to calculate ex post contribution factors would enhance ad hoc reporting capability for such events.
15.	ERM	ERM Power agrees with AEMO's view in that there is no obvious rationale for treating local requirements imposed for different causes differently and refers AEMO to the intent and guiding principles of the original rule change in that regional cost recovery of all local requirements should be based on the fact that a local requirement has been invoked regardless of the cause.	Noted. AEMO agrees with ERM's observation.

No.	Name	Issue	AEMO response
16	ERM	It is also worth considering why the rule change included the requirements of Clause 3.15.6 (j)(2) of the NER and why the word asynchronous was included in that Clause. At the time of the original rule change, the existing participant derogation for the regional recovery of FCAS regulation services in Tasmania was due to expire on 31 December 2006, (later extended to 31 December 2008 by the ACCC). An additional intent of the rule change was to allow for regional recovery of local FCAS regulating services requirements under market conditions where Tasmania, (or possibly other regions in the future), remained electrically connected to the mainland but Basslink, or any other interconnector, is unable to transfer FCAS services. Combined with the assurances from NEMMCO that local FCAS regulation services requirements would only be invoked when a region(s) was electrically islanded and to cater for the expiry of the Tasmanian derogation, the AEMC considered that: > Local market ancillary service requirements, or local FCAS requirements, are required in abnormal circumstances where only local market participants have the technical capability to provide FCAS. This is most often the case when a region becomes isolated – or "islanded" – due to planned and/or forced outages of transmission elements. A region that has become islanded can also be described as operating asynchronously from other regions within the NEM. It is also worth noting that the purpose for inclusion of Clause 3.15.6 (j)(2) in the NER was to place a positive obligation on NEMMCO to ensure that a local contribution factor was always calculated whenever a region(s) was determined to be operating asynchronously. This was to cater for the Tasmanian situation with Basslink and the impending expiry of the derogation for regional recovery of local Tasmanian FCAS regulating services requirements under some Basslink operation conditions or failure. It was not intended to imply that NEMMCO should not calculate a local contribution factor under other Market conditions where a local FCAS regulation services requirement had been invoked.	ERM's point illustrates the reality that at the time of the 2007 Rule Change it was understood that local recovery might occur in circumstances other than electrical separation between regions. Unfortunately in retrospect, the terms 'asynchronous' and 'islanding' were largely used as synonyms for a local requirement. It explains how AEMO's current practice of calculating estimates of local recovery factors in real time arose, and why this is performed for all instances of local Regulation FCAS requirements, not just those arising as a result of asynchronous operation. An equivalent of clause (j)(2) was not included in the original 2007 Rule Change proposal. It was added by the AEMC as an intended clarification - as ERM notes, a 'positive obligation' on AEMO (then NEMMCO) to ensure calculation of a local contribution factor in circumstances of asynchronous operation, but not necessarily only in those circumstances. The purpose of a local contribution factor is, of course, to provide for recovery of the costs of a local requirement from Market Participants in the region(s) to which that requirement relates.
ACTUAL OR HISTORIC PERFORMANCE			
17.	AEC	We support the solution proposed in option two because the option closely reflects actual performance relative to the frequency requirements in asynchronous regions…Options 1 and 3 are less preferable because both are based on historical values and do not capture the actual conduct of a market participant during the Dispatch or Trading Intervals when local frequency control ancillary services (FCAS) regulation service requirements	See responses to No. 6, 13, 16 and 17.

No.	Name	Issue	AEMO response
		are invoked. We believe option 2, based on factors for appropriately metered facilities within the asynchronous region is the optimal solution of the three options proposed.	
18.	Coalition	Currently, the causer pays factors for synchronous periods are derived from historic data indicating the contribution of a Market Generator to frequency deviation. This historic data has no relevance to the issue of the extent to which a Market Participant contributed to the need for regulation services during a period of asynchronous operation. Consequently, the principle in clause 3.15.6A(k)(1) will not be accounted for in a methodology which derives causer pays factors applicable to periods of asynchronous operation from historic data reflecting the contribution to the need for regulation services in a synchronous period. In order to take into account the principle in clause 3.15.6A(k)(1), a methodology based on actual performance during the particular asynchronous period is required. AEMO is provided with a discretion to determine the relevant timeframe over which an individual Market Participant's contribution to the aggregate need for regulation services will be determined... In respect of a procedure for periods of asynchronous operation within the mainland NEM, the appropriate period of time (considered in the context of the other principles set out in clause 3.15.6A(k)) would be the period of asynchronous operation. There is no other timeframe which can accommodate the principles in paragraphs (k)(1) and (k)(6). Processes which distort the physical and economic operation of the NEM should be avoided. The Coalition's view is that basing processes on actual performance is less likely to have a distorting impact.	NER clause 3.15.6A(na) requires contribution factors to be published 10 working days before they apply. Clause 3.15.6A(n) requires AEMO to publish the "historical" data used in determining contribution factors. The 2007 Rule Change specifically contemplated historical performance analysis and there is no indication that different principles apply in relation to asynchronous operation. Because the contribution is to the need for regulation services (i.e. the requirement rather than the use), the rationale for different treatment is not immediately obvious, and requires further analysis. While real time contributions to the need for Regulation FCAS may be the ultimate cost recovery solution, it is difficult to reconcile with the existing concept of FCAS procurement, under which: • providers are not paid for actual use during the same period; and • the availability requirement is based on historical operating experience and system standards.
19.	ERM	The NGF as the rule change proponent agreed to adopt NEMMCO's proposal to determine the regional contributions as and when required during the settlement calculation process with the calculation based on the trading interval values that applied at the time of a local FCAS regulation services requirement being implemented by NEMMCO for any reason, in any region or combination of regions…. the current AEMO methodology for the recovery of local FCAS regulating services requires significant review [given the greater incidence of] local FCAS regulating services for other than a region being electrically islanded or Basslink being unable to transfer FCAS from the mainland. This is to ensure that the methodology meets the intent of the original rule change to determine cost recovery based on a participant's conduct at the time a local regulating FCAS requirement is invoked and to calculate the regional contributions as and when required during the settlement calculation process with the	The imposition of local Regulation FCAS requirements in SA when loss of Heywood is credible, although limited, has had a significant financial impact. Faced with changing power system conditions, AEMO recognises the potential for local Regulation FCAS to be used differently in future. While there are only limited opportunities to address the impacts and behavioural incentives through AEMO's cost recovery methodology, AEMO has initiated the broader review to investigate what can be done. In relation to the intent of the 2007 Rule Change, and in particular NEMMCO's statements with regard to the determination of regional contributions, AEMO does not share ERM Power's view that cost recovery was intended to reflect individual Market Participant conduct at the time of imposition of a local requirement. The extract from NEMMCO's submission omits the qualification that the contribution factor calculation should use current trading interval values "of customer energy". The NEMMCO submission was concerned with the practicality of pre-publishing regional factors for combinations of regions that may not be used – not with calculating them afresh at the time.

No.	Name	Issue	AEMO response
		contribution factors calculated using current trading interval values.	
20.	ERM	Only Option 2 meets the requirement that the contribution factor for a Market Participant should reflect the extent to which the Market Participant contributed to the need for regulation services“ Only option 2 meets this rule requirement	The amount of regulation services required is decided by AEMO by analysing historical performance. The actual performance of appropriately metered generation or load during a separation event does not directly adjust that requirement. If appropriately metered Market Participants demonstrate improvements over time in performance in response to high Regulation FCAS costs, this will be taken into account in setting the regulation requirement. However, AEMO cannot base its assessment on behavioural changes in response to (for example) high price events or abnormal system conditions as might occur on a separation event.
21.	Origin	Option 2 proposes to determine ex-post contribution factors based on the unit performance during the asynchronous period. While Origin believes this option best complies with the Rules, we agree with AEMO that this option is not suitable due to the very issues AEMO highlighted in the consultation paper.	Noted. Those issues included the significant resources required to develop the manual processes involved, the different treatment required for Tasmania and the practicality of applying the methodology for short periods of synchronous separation.
OPPORTUNITY TO MITIGATE RISK			
22.	ERM	One of the key principles in guiding the 2007 rule change was that participants should be able to manage or mitigate their risk with regard to local FCAS regulating services costs. The AEMC accepted that one of the primary objectives of the rule change proposal was; ‘To implement a NEM-wide solution that enables the cost of local regulation FCAS requirements to be recovered from those markets participants who had both the capacity and the ability to mitigate their liability at the time the requirements were needed.’… ERM Power believes that to meet the original principles and intent of the 2007 rule change any methodology must be based on the principle that the allocation of costs for the recovery of all local FCAS regulating services requirements must be based on the calculation of causer pays factors using the current trading interval values that apply at the time that the local FCAS regulating services requirements are invoked by the Market Operator. It is only through the use of the current trading interval values that participants may implement efficient risk mitigation solutions. Risk mitigation solutions could include but not be limited to: • Rebidding to maintain a steady output using a digital bid structure and maintaining this steady output; • Removing a generating unit or scheduled load from service; • Offering additional volume into FCAS services; and • In the case of wind farms, using control systems to maintain a steady predetermined output in conjunction with rebidding to maintain a steady output using a digital bid structure.	As discussed in item 1, this discussion is beyond the scope of the current consultation. However, there are a number of reasons why Option 2 may not produce optimal outcomes in terms of risk mitigation opportunities. Publishing MPFs 10 business days in advance and providing real time estimates were intended to improve transparency and therefore increase opportunities for risk management. Pricing responses operate as a signal to the market in the longer term to incentivise investment to improve performance and/or to enter the market to provide FCAS. If Generators’ contribution to Regulation FCAS costs during asynchronous operation is determined based on performance in that period, they may respond by changing their availability (e.g. withdrawing capacity). This is likely to increase uncertainty during a separation event, and could significantly impact AEMO’s ability to manage the system in accordance with security and reliability standards. In addition to potential system security issues, there is doubt about the effectiveness of signals that might be provided to the market, as: • Generators whose past performance may have contributed to the need for a particular level of Regulation FCAS requirement have the opportunity to reduce or avoid that cost by withdrawing generation. • Such behaviour is unpredictable and responsive to price, therefore very difficult to factor into an assessment of future requirements. • Generators remaining online will pay proportionately more for marginally negative contributions, making it even more difficult to estimate contribution factors and potentially exacerbating any system security issues if those generators in turn reduce output. More detailed analysis is required to quantify any pros and cons of Option 2, including possible system security impacts. As such detailed investigation is not feasible within the timeframe available for this consultation, it would not be prudent to implement that option at this stage.

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23.	ERM	The current causer pays methodology for asynchronous operation, which uses distant historical data, fails to allow basic risk mitigation solutions by participants and prevents economically efficient cost recovery based on a participant's conduct at the time local FCAS regulating requirements are invoked by the Market Operator.	See response to No. 22. The way in which any solution provides for risk mitigation must account for the fact that different conditions will apply depending on the location of any synchronous separation, and the position of Market Participants affected by each resulting local requirement. The design of a solution must provide for acceptable outcomes under all reasonably possible scenarios. To illustrate, some of the largest generating units in Queensland do not provide Regulation FCAS, and therefore lack a natural hedge against high ancillary service prices. This contrasts with SA where the largest thermal generators tend to be registered FCAS providers.
PRACTICAL ISSUES AND IMPLICATIONS OF OPTIONS 2 OR 3			
24.	AEC	AEMO currently receives highly granular SCADA data from scheduled generation, semi-scheduled generation and major loads, which it uses to operate the system. These valuable data assets should be used to achieve efficient market outcomes where possible. By leveraging existing data assets to calculate contribution factors for asynchronous regions, all market participants can see their impact on the market during times of separation. The Issues Paper states that it would be impractical to publish these calculations in real time. However, the NER (section 3.15.6A(nb)) do not require real time calculation or publication of factors during times of asynchronous operation, allowing time for AEMO to estimate factors where necessary. Tasmania can be treated appropriately given its permanent separation from the NEM.	Final market participant factors cannot be based on raw SCADA data, because it is typically less reliable than metering data. This means that any solution determining contribution factors in real time will result in less certainty for Market Participants. This may ultimately be acceptable, but has not yet been tested. Market Participants will not be in a position to gauge their market position solely by reference to their own real time contribution to frequency. Liability is not determined by the absolute value of a participant's contribution factor, but by its percentage relative to the aggregate Market Participant contribution factors. AEMO is specifically required by clause 3.15.6A(nb) to publish an estimate of the paragraph (j)(2) contribution factors 'when a region is or regions are operating asynchronously'. AEMO interprets this to mean that the estimate must be published at the time of asynchronous operation. The qualification that the estimate is for information purposes supports this interpretation, which is the basis for the current estimation process.
25.	Coalition	Option 3 also does not recognise that an asynchronous state will exist in the mainland NEM on both sides of a separation event.	Any temporary synchronous separation on the mainland NEM will result in separate local requirements for regulation FCAS, on either side of the separation. All options recognise this. Under Option 3, during asynchronous operation contribution factors would be calculated separately for the region or set of regions on either side.
26.	ERM	We believe it is possible that AEMO has misinterpreted the requirements of Clause 3.15.6A(nb) in that the expectation is that the Market Operator simply publish its best estimate based on generation output at the time local FCAS regulation requirements are invoked to assist market participants to mitigate risks associated with the Market Operator invoking local FCAS regulation requirements. In the AEMC's final determination on the original rule change, it was indicated that: The Commission considers that publishing an estimate of the contribution factors for those market participants affected by islanding once the islanding event has occurred will assist participants to manage the financial risks associated with localised regulation FCAS requirements, for example, by adjusting generation output in response to a sudden increase in FCAS costs. The Commission understands that NEMMCO is able to determine approximate cost allocation factors for use in the dispatch	The current MPF calculation process relies on experienced engineers to screen data to identify bad data not flagged by automatic screening. During a separation event the reconfiguration of control systems depends on various factors such as location of the separation and availability of control systems. Although SCADA/EMS is geared to handle this, a significant amount of work is required for that information to propagate to the MPF calculation tools and processes. It was never contemplated during the 2007 Rule Change that this type of process be adopted for the purposes of paragraph (j)(2). As stated in paragraph (k)(3) and supported by AEMC and NEMMCO statements at the time, the requirement is to produce estimated factors that represent an allocation of the costs of the relevant local requirement to Market Participants in the affected region(s) based on customer energy at the time. This process was an alternative to the undesirable requirement (from NEMMCO's perspective) to publish sets of contribution factors for all combinations of regions in advance, when most would never be used. If the intent had been to calculate new individual MPFs based on performance during the actual period of asynchronous operation, paragraph (nb) would have been worded very

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		timeframe for the duration of an islanding event and that the publication of these estimated factors would assist market participants to mitigate risks associated with regulation FCAS requirements. Clause 3.15.6A(nb) of the Rules to be made therefore requires NEMMCO to calculate and publish real time estimates of the contribution factors for market participants in a region that is operating asynchronously. Supporting this, AEMO is in constant receipt of 4 second SCADA data from all scheduled and semi-scheduled generating units, major loads and major load supply switchyards which is used in real time to ensure the system remains secure under credible operating conditions. We believe this data is also available to be processed to allow a reasonable estimate to be calculated in real time to satisfy the requirements of Clause 3.15.6A(nb) of the Rules.	differently. It is impossible in the dispatch timeframe to estimate a contribution factor that must, by definition, apply for the whole period of asynchronous operation and therefore cannot reasonably be determined (even approximately) until that period ends.
27.	ERM	AEMO argues Option 2 cannot be applied uniformly for all regions because it is impractical to treat Tasmania in the same way as regions that may be temporarily asynchronous. Tasmania is permanently asynchronous, but Basslink can transfer Regulation FCAS depending on operating conditions. We see no issue in this regard. As per the intent of the original rule change, whenever Basslink is unable to transfer FCAS regulation services between the Mainland and Tasmania and local FCAS regulation services requirements are invoked in Tasmania, the calculation for regional recovery of local FCAS regulation services requirements should be in accordance with the methodology outlined in Option 2 and not in accordance with AEMO's currently implemented methodology.	See response to No. 26. There is no basis in the NER on which to apply ERM's proposed solution. Paragraphs (j)(2) (and paragraphs (k)(3) and (k)(6)) all refer to regions operating asynchronously, not to the ability to transfer FCAS between regions. Separate factors are already calculated for Tasmania and the mainland NEM because they always operate on separate frequencies. AEMO sees no reason to determine a new set of contribution factors on a different basis when FCAS transfer across Basslink is limited, which occurs relatively frequently and would therefore require significant resources to be allocated to that task.
28.	ERM	AEMO believes there would be other occasions when the methodology simply could not be applied in practice because the asynchronous period is not long enough. As Option 2 is an ex post settlement adjustment on an as and when required basis we see no reason that regional cost recovery of local FCAS regulation services requirements could not be calculated even if AEMO were to invoke these requirements for a single Dispatch Interval.	As noted in the Issues Paper, practical issues would arise because of delays in reconfiguring market systems and automatic generation control (AGC) systems. During these dispatch intervals (DIs) individual unit or load performance cannot be adequately assessed. Further, immediately after a separation event frequency excursions outside the normal operating frequency band are likely to occur in a significant number of DIs. In accordance with the CPP (clause 5.5.3), the 5-minute performance for those DIs would be ignored. As a result, most or even all of the cost of Regulation FCAS during an asynchronous period could be allocated to Market Customers without appropriate metering (the RMPF). It is not clear whether this is an appropriate or desirable outcome, having regard to the principles in clause 3.15.6A(k) and the national electricity objective, and this question requires further analysis.
29.	Origin	While Origin believes [Option 2] best complies with the Rules, we agree with AEMO that this option is not suitable due to the very issues AEMO highlighted in the consultation paper.	Noted. Those issues included the significant resources required to develop the manual processes involved, the different treatment required for Tasmania and the practicality of applying the methodology for short periods of synchronous separation.

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30.	Origin	AEMO indicated that with Option 3 they would be unable to comply with clause 3.15.6A(nb)…It is true there are number of combinations possible for asynchronous operation. However, AEMO can pick one or two most probable scenarios (eg: SA and/or QLD) and publish numbers. In our reading of the clause (because of the qualifier within brackets) we believe it is possible for AEMO to draft the procedure to effect the above proposal. In addition AEMO can publish raw factors so that participants can estimate contributions in an unlikely event of other scenarios.	Although the CPP does not need to contain provisions for the determination of estimated contribution factors, paragraph (nb) still requires AEMO to publish those estimated factors when regions are operating asynchronously. See response to No. 24. AEMO considers that Origin's proposal of selecting the most likely separation scenarios and publishing contribution factors for those combinations of regions could be manageable if Option 3 were implemented, and that the risk of non-compliance with paragraph (nb) would be minimised (although not eliminated) by implementing Origin's proposal. Implementation timing and resources remain an issue for AEMO to consider further..

ATTACHMENT 1 – DRAFT PROCEDURE FOR DETERMINING CONTRIBUTION FACTORS

Refer to separate document published with this Draft Report