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The Chairman,  
Australian Energy Market Commission,  
PO Box H166,  
AUSTRALIA SQUARE, NSW 1215

Submission by email: [submissions@aemc.gov.au](mailto:submissions@aemc.gov.au)

## **CONGESTION MANAGEMENT REVIEW – DIRECTIONS PAPER**

Dear Dr Tamblyn,

The National Generator's Forum (NGF) welcomes the release of the Congestion Management Review Directions Paper and is pleased to respond to the questions raised in the paper and provide a view on the issues that the AEMC intends to examine more closely.

Reform of congestion management arrangements has the potential to greatly improve the physical operation of the NEM and the trading of financial instruments that manage market risk. The issuing of the directions paper provides an opportunity to reflect upon the work completed to date and to reassess the way forward. The NGF largely supports the body of work the AEMC intends to undertake but proposes a change in the timing of components and a widening of the scope of work associated with the review of congestion management options.

Efficient physical dispatch and effective financial risk management are fundamental to

the long term sustainability of the NEM. It is critical that evaluation of congestion management options not only include appropriate economic assessment but also take account of risks arising from physical and financial market complexity and uncertainty. This can be achieved by adopting assessment criteria that cover economic efficiency but also include benefits that;

- promote the forward hedge contract market;
- reduce market access uncertainties for existing and new generation;
- promote efficient investment in new generation;
- are practical and easy to implement;
- provides transparent market outcomes;
- addresses both the diversity and uncertainty of network outages that give rise to the risk of congestion;
- minimises transaction costs; and
- avoid added regulatory uncertainty and risk.

It is apparent in the discussion of fundamental congestion management options that the significance of the derivative market, whilst understood, is understated compared with the physical market. A high proportion of the physical electricity supply in the NEM is covered by hedge derivatives of various forms. Contract trading risk can be mitigated by schemes that support the purchase of zonal price differential residues. However, the cost of access to the residues and any residual risk will be quantified as premiums on hedge contract purchased by retailers. The simple question to be answered is whether the proposed increase in price zones for generators will reduce dispatch inefficiencies by more than the cost of increased consumer prices.

The NGF is of the view that assessment of the fundamental options for congestion management should not be undertaken in isolation from the associated reviews listed below.

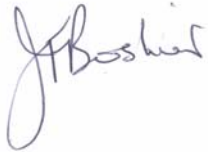
1. the assessment of the materiality of congestion, in relation to the solution implementation costs;
2. the implications of the ERIG review;
3. the NEM regional boundary principles review; and

4. a review of the arrangements associated with generator investment in downstream transmission augmentation to relieve congestion.

The needs, benefits and optimal design of a congestion management regime should only be assessed in an holistic manner in conjunction with all of the change areas identified in the directions paper. The NGF trusts the AEMC will give due consideration to the suggestions and concerns raised in this submission.

If you require clarification of the matters raised by the NGF please do not hesitate to contact me on (02) 6243 5120.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'J Boshier', with a stylized flourish at the end.

John Boshier  
Executive Director

Attach:

## ATTACHMENT

### NGF REPOSE TO AEMC CONGESTION MANAGEMENT REVIEW (CMR) DIRECTIONS PAPER

#### 1. MCE Terms of Reference

**The scope of congestion management review should encompass all important congestion management issues and not be limited by an unnecessarily narrow interpretation of the MCE ToR.**

The lack of substantive advancement in dealing with congestion management since market start highlights the complexity of issues being examined. The directions paper states the need for the AEMC to be circumspect with regard to the range of congestion management options to be considered. At this stage of the CMR process it would not be prudent to limit the scope of this review unnecessarily.

The NGF is concerned that the AEMC has limited the review of congestion management regimes to two options, even though a number of other approaches have been suggested to the Commission in submissions to the CMR issues paper. One of these options (the CSP/CSC proposal) has been the subject of a limited trial and the other (Constraint Based Residues) is highly theoretical. Both have implementation issues and costs that need to be assessed. The complex nature of congestion management in a regional market is such that no options should be discarded without proper review.

#### 2. Approach to the Review

**The need for interim congestion management regimes cannot be determined in isolation from the related reviews.**

The directions paper is unclear as to how the outcomes of the various work programs will be aligned and used to determine any changes to the congestion management framework.

It would be helpful if the AEMC were to provide answers to the following questions:-

- How will the AEMC assess the materiality of congestion without knowing the implementation cost?
- How will the outcomes of the limited CSP/CSC trial review be used to assess

a wider CSC/CSP scheme and/or a CBR scheme?

- If the AEMC concludes that none of the options for managing congestion has a net benefit, then what mechanism will be put in place to deal with congestion if its materiality increases in the future?
- How will the AEMC change its approach if, COAG accepts ERIG's position on a revised regulatory test and the need for stronger locational signals for generation?

The NGF recommends an alternate approach that stages the work in a fashion that allows the outcomes of one set of assessments to feed into the analysis of the next. The benefit of this approach is improved clarity for NEM participants, a more integrated solution and the avoidance of unnecessary work.

### 3. Development of Analytic Framework

**The proposed analytic framework should be broadened to generator market access issues to ensure the gamut of congestion management is covered.**

The proposed approach to developing the analytic framework for congestion management includes the breakdown into two distinct problems. That is, physical dispatch risk and trading risk.

The problem of generator "mis-pricing" is really a natural outcome of a decision to adopt a regional market design. Given the MCE's policy decision in relation to nodal price this outcome is inevitable and not, as may be implied, an outcome of the abuse of market power by generators. The regional market is a compromise between pure pricing and effective trading in a market with limited physical inter-meshing, eg managing hedging risk.

The framing of the issue correctly is critical for NEM participants and stakeholders to understand the issues, and to ensure constructive input into the review. For example, it is important to include the impact of potential, (rather than just actual) congestion on the reluctance to trade across regional boundaries. Mitigation measures which are predicated on the assumption that congestion and prices can be forecast perfectly are destined to fail.

The following table attempts to identify different analytic framing, at a high level, ignoring such issues as loop flows and regional boundary locations.

Framework	Perception of Congestion Issues	Suggested Improvements	Issues
AEMC Physical/Trading (Directions paper)	Inefficient dispatch/ inter-regional Basis Risk	More pricing regions for generators/ improved IRSR auction  (Note: the AEMC appears to lump intra-regional congestion into the dispatch area)	Ignores natural bidding behaviour in energy only market design with reliability standards.  Understates importance intra-regional contracting.  Confused assessment of intra vs inter regional hedging risk.
Mis-pricing/ hedging risk (D. Biggar)	Inefficient dispatch/intra & inter regional price risk	Significantly more pricing regions for generators.  Auctions of constraint based residues.	Ignores natural bidding behaviour in energy only market design with reliability standards.  CBR scheme presents major implementation problems.
Generator Participant	Physical access/hedge contracting  (i.e volume and price certainty)	Regulatory framework must deliver transmission to avoid inefficient constraints <sup>1</sup> .  Any new market mechanisms must include appropriate transitional arrangements	The right balance between number of regions and inefficient dispatch (refer section 6 in this paper).  Need assessment of cost/benefit before changing status-quo.

The framework used will influence the focus and direction of the congestion management review going forward.

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<sup>1</sup> That is, any constraint for which the cost is greater than the cost of the transmission augmentation measure.

The categorisation of congestion detailed in the directions paper justifies the focus on mechanisms for enabling participants to better manage trading risk at the expense of an overarching review of all of the elements that need to fit together as part of an effective congestion management framework.

A case in point is the reference to outcomes of the AEMC determination on the economic regulation of transmission services. This review did address revenue and pricing issues facing NSPs but did not adequately address issues associated with;

- improving the linkages between generation investment and the planning of transmission networks; and
- generator investment in 'deep' network augmentations that become part of the shared network and open to 'free rider' use.

The NGF is disappointed that the focus is solely on mechanisms to manage congestion in isolation from the broader issues of a sound framework for driving effective and efficient generation and transmission augmentation and the boundary change principles and process.

#### 4. **Materiality of Congestion**

**The quantification of congestion in the NEM first requires a methodology of assessment, then calculation of congestion, followed by a definition of what constitutes a material problem. It is unlikely a single measure can accurately reflect the impact of congestion in the NEM.**

The key aspects of a congestion materiality study will be:

- a. determining an industry accepted methodology for calculating the quantum of congestion cost; and
- b. establishing the costs of alternative strategies to address the congestion.

These two aspects need to be addressed first, to allow the determination of what constitutes material congestion. In addition, there needs to be consideration of the type of congestion and how it may affect the broader market or individual market participants on the following bases:

- a. **NEM wide congestion cost and trends**

Accurate measurement of costs is important to assess the effectiveness of regional boundary locations and transmission augmentation.

b. Localised congestion which a small number of participants experiences

Localised costs are important to inform new investment of the likely levels of congestion at connection points.

As noted above, to determine the threshold of materiality there needs to be an assessment of the likely cost of constraint management regimes. The minimum threshold level would be in the order of the cost of implementing a congestion management regime plus the ongoing transaction costs of the scheme. In the absence of detailed congestion option assessments estimates could be calculated and used to determine what level of congestion is material.

In reference to the AEMC's assessment of available data, in chapter 3 of the paper, the NGF notes that a true picture of congestion must include a range of information. A single measure is unlikely to be sufficient.

A thorough assessment of congestion should;

- Include backward looking analysis to provide an indication of the delivered value of network investment;
- Provide forward looking projections for the benefit of new investors. This analysis could be based on planning models that use least cost generation investment assumptions.
- Address the uncertainty of congestion impacts, not only the average or expected level of congestion.
- Include impacts of network outages as they are an important contributor to congestion;
- Exclude generator behaviour that only results in wealth transfers between generator entities and exclude congestion that does not directly result in the dispatch of higher resource cost plant.

This consideration leads to the conclusion that some form of modelling is most probably required to provide a complete assessment of historical and future levels of congestion. An agreed modelling methodology and assumption list for transparency will be important to gain the support of NEM participants.



Congestion could be material, even if transmission constraints never actually bind. One often neglected aspect of congestion materiality assessments is the loss of economic efficiency associated with participants' responses to the potential for congestion to occur. The threat of binding constraints, or changes in strategic behaviour to prevent binding, may be sufficient to create trading risks which, in turn, lead to a material loss of NEM efficiency. Key points to note are:

- congestion (or the potential for congestion) can give rise to trading risks;
- these risks may lead to a loss of efficiency;
- the NEM objective is to maximise efficiency; and therefore
- the relevant measure of congestion is the extent to which trading risks caused by congestion lead to a loss of NEM efficiency

The threat of a binding constraint increases contract trading risks that are reflected in participant behaviour and availability of hedge contracts. Forward looking assessments of congestion materiality would be improved with some accounting of the impact on the hedge contract market resulting from congestion uncertainty.

#### Dynamic Efficiency

If only static efficiency impacts are estimated, congestion will appear much less "material" than if dynamic impacts are included. The level of dynamic efficiency benefits will depend upon the design of the CM mechanism: in particular, the extent to which the mechanism impinges on investment decisions as well as dispatch decisions. So, congestion might be "material" in relation to a CM mechanism which affects investment decisions, but "immaterial" in the context of an alternative CM mechanism which does not affect investment.

The NGF supports further consideration of the magnitude and trends of congestion in the NEM and recommends that the AEMC provide some indication of how the magnitude, trends and nature of materiality will influence the assessments of congestion management regimes.

## 5. Existing Rules

**A number of Rule change reviews are underway that may ultimately impact the level of congestion in the NEM. The likely outcomes of these reviews need to be taken into consideration in the CMR.**

It is noteworthy that two of the NGF's concerns are identified in 4.2.2 section 5 and section 6. Section 5 makes reference to the Rule:-

*“the price for a negotiated transmission service should be subject to adjustment over time to the extent that the assets used to provide that service are subsequently used to provide services to another person, in which case such adjustment should reflect the extent to which the costs of that asset”*

The catch here is that other connecting parties are unlikely to agree to pay charges that reduce the cost to the original investor particularly in the case of a 'deep' augmentation. The 'free rider' concerns and the lack of any firm arrangements to compensate or reimburse a generator for a loss of asset value are outstanding issues the NGF would like to see revisited.

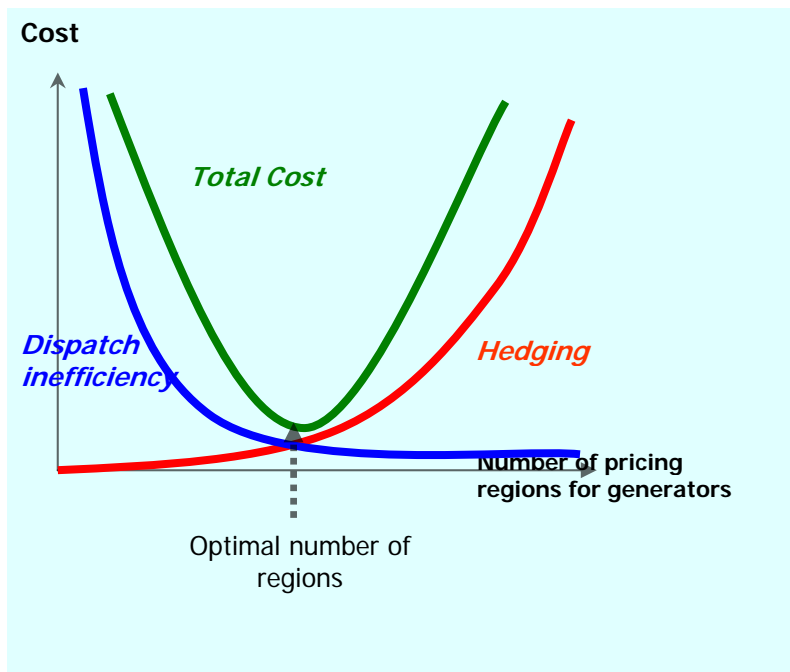
The policy debate on existing Rules is ongoing and ERIG's proposal to change the Regulatory test to a two stage process and changes to NEM transmission planning, if implemented will significantly alter the regulatory framework for transmission development. These policy changes will influence the level and duration of congestion. With regard to section 6 of the directions paper, the principles and process for altering pricing regions and regional boundaries is still under review. The arrangements for managing congestion must be consistent with these developments.

## 6. Overview of Options for Managing Congestion

**The NEM was established with a number of pricing regions for generators that was considered optimal at the time. Any incremental increase in the number of pricing regions should be considered only after careful analysis of the impact on the hedge contract market.**

The NGF acknowledges that more granular pricing of generation may increase trading

risks associated with the basis risk between the generator nodes and the regional reference nodes. In simple terms an assessment of increased generation nodes could be considered in terms of a balance between the costs of increasing the number of regions against the benefits of reduced dispatch inefficiency – refer diagram below.



The optimal number of regions could well be the current structure with adjustment for outcomes of the Snowy regional boundary review. Like the quantification of materiality, the NGF believes there needs to be a clear and industry accepted methodology for the calculation of the costs and benefits of this approach before analysis is undertaken.

## 7. Congestion Information

**The provision of congestion information for the NEM is extensive; however additional targeted information that allows participants to better project congestion would help reduce congestion risk.**

The NGF supports the provision of more detailed congestion information that allows participants to;

- prepare for occasions when constraints occur;
- ensure trading strategies are consistent with congestion risks; and

- better assess current and future market access at key locations around the NEM.

The NGF also supports an assessment of how the existing network could be better utilised with the provision of information that provides more operational transparency. One area that could be assessed is different transmission operating protocols such as the use of short time overload capability and network support schemes.

The market may benefit from better information in terms of the utilisation and congestion of National Transmission Flow Paths, (as defined in the current ANTS).

## 8. **Incremental changes to congestion management framework**

**The incremental changes proposed by the AEMC are components of the broader congestion framework that should be tested before more disruptive options are considered.**

### Dispatch Rules

The paper correctly acknowledges the fact that NEMMCO is still in the process of rolling out the “fully optimised” Option 4 constraint formation across the NEM. Although this task is largely complete, it remains necessary to assess schemes to increase the utilisation of the network for the value of the interim congestion management schemes to be measurable. It is recognised that the use of Option 4 formulation increases the materiality of “gatekeeper” effects.

### Regional Boundary Change

The AEMC acknowledges that a clearer and more transparent process and criteria for regional boundary change evaluation will help address the congestion in the NEM. Improving the regional boundary review processes along with other more incremental initiatives may eliminate the need for more fundamental changes. A key principle to factor into that review is that region boundaries should ignore State borders. On the other hand, if the boundary change criteria review results in a high hurdle for boundary change, then the need for a routine management tool for material short-term congestion becomes more important.

### Pricing for ‘constrained- on’ Generators

The NGF supports the concept of pricing for ‘constrained on’ generation for the simple reason that generators can be dispatched into high cost bands but only receive the lower spot price. The most appropriate regime for payment is unclear in the absence of a thorough review. The NGF supports the AEMC’s program of work to investigate these matters but offers the following points for consideration;

- Payments should be based on the generator’s offer price and RRP as this represents the full value of the price mis-match.
- Funding should be transparent and to the extent possible be able to be forecast.
- Hedging against such payments is unlikely, so arrangements that minimise large swings in funding need to be considered.

#### Improvements to IRSR

The NGF supports the work program proposed by the AEMC to review options to improve the SRA Rules and auction process. Whilst the firmness of the IRSR instruments will always be limited by forced or planned transmission outages, enhancements that increase the term should be considered. For example, as the NGF has argued previously, the current arrangements for the funding of negative residues through auction proceeds should be extended to cover all time periods, replacing NEMMCO’s current practice of netting negative residues off positive residues within each settlement week.

#### **9. Options for fundamental changes**

**The potential net benefits of congestion management through negotiated transmission augmentation should be included in the scope of the CMR.**

The NGF believes the scope of this part of the review unnecessarily limits the range of options to be considered, preventing the assessment of congestion management in a holistic manner and increasing the risk of a sub-optimal outcome. At the very least the AEMC should include further review of the issues surrounding negotiated transmission augmentation which provides generators with an increased level of access. Specifically, how the value of such an investments can be maintained over time, or how compensation can be paid to investors that have their access limited due to ‘free riding’

new entrants.

In regard to 'deep connection' charges, the AEMC expresses a concern on p.69 of the directions paper that new generators may be imposed with a cost in congested areas whilst existing generators are quarantined despite it being the new generator's locational decision which causes the inefficient level of congestion. This is clearly expressing a view that grandfathering access rights is out of consideration and that new generators should not have access costs imposed. However, any CSP/CSC and CBR schemes will require a decision on the allocation of rights – grandfathering, auctioning or a mixture of both. Many submissions to the CMR issues paper argue that grandfathering may in fact provide net market efficiency and the NGF believes that grandfathering of access rights cannot be discarded without a more in-depth assessment of the pros and cons.

Further, the NGF holds the view that benefits may be derived from exposing new entrants to some form of locationally derived deeper connection costs<sup>2</sup>.

#### Interim Congestion Management Measures

Section 6 of the directions paper specifically acknowledges the CMR ToR requirement to consider interim congestion management solutions. This requirement opens up the need to determine the threshold of implementation and the market impact implications of residues being rendered valueless at some time in the future when transmission is augmented. A position on this issue, together with the much debated allocation issue needs to be determined up front to allow participants to better understand the potential impacts on market operations of the option under consideration.

Designs of congestion management options need to consider the diverse range of causes, locations and uncertainty of network outages that give rise to congestion. If network outages are diverse then interim solutions only offer partial solutions. Where there exists a high degree of congestion uncertainty solutions that rely on predicting congestion in advance will be ineffective. A limited CSP/CSC or CBR scheme implemented at a specific location with a historically determined level of congestion may

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<sup>2</sup> IES undertook an analysis of this issue on behalf of a group of generators (refer table 3.3 p.28). Based on the scope of the study and assumptions, the study identified that market benefits could be delivered through reduced generation and transmission costs with locational signals that include a component of network augmentation costs.

be totally ineffective if instances of congestion are shown to be diverse and uncertain over time. They are unlikely to capture significant benefits of more efficient generation or transmission investment decisions. The reason for this is that such limited congestion pricing schemes will most likely be implemented only after new generation capacity gives rise to the congestion.

If new generation investment causes material congestion then an interim congestion management scheme may be implemented. Appropriately, there is no guarantee that transmission augmentation to relieve congestion will pass the market benefits leg of the Regulatory test. However, given the high capital cost and lumpiness of new generating capacity the transmission augmentation has a high probability of proceeding for reliability reasons. This outcome will not guarantee the delivery of the most efficient outcomes for the NEM.

These problems could be avoided if the cost of associated transmission augmentation were internalised within the proposed new investment. If the location of new generation capacity is determined in the absence of appropriate price signals, then sub-optimal transmission investment will likely follow sub-optimal generation development.

Congestion management arrangements could provide the incentive for proponents to negotiate with the relevant TNSP to augment the network, with confidence that the value would not be eroded by future 'free-riders'.

### Constraint Based Residues

Mis-pricing is a term used to express the difference between a generator nodal price and the RRP. As mentioned earlier, this difference is a natural outcome of a decision to adopt a regional structure for the NEM, rather than a nodal pricing regime, which the MCE has ruled out.

The NGF acknowledges that the body of work in relation to CBR is a theoretical exercise. However, it does raise a number of issues that need to be considered as part of any assessment;

- The mis-match between the hypothetical local price and the regional reference price (called mis-pricing by D. Biggar) is an outcome of the NEM design that was accepted by the designers of the market. This pricing mis-match is sometimes acceptable because a move closer to theoretically pure nodal pricing for generators will increase basis risks and therefore the risk premiums customers pay for hedge contracts.
- The potential benefits of a CBR scheme may be overvalued as pricing mis-

matches will naturally occur in an 'energy only' market, designed to be over supplied at all times to satisfy system security and reliability standards at times of maximum peak demand.

- Again the issue of pricing mis-match in the NEM may be overstated. The level of inefficient dispatch under most market conditions taking account of the typical level of hedge contracts that participants manage will be less than that indicated by magnitude of price differentials.
- The CBR scheme does address the need for 'firmness' (defined as the ability to use instruments such as the IRSRs to hedge a financial transaction) but is still reliant on effective regulatory processes to deliver efficient transmission augmentation to address congestion. CBRs cannot hedge against transmission equipment outages. Thus, under a CBR regime generators are exposed not only to volume risk, as they are now, but also to price risk. These risks are mitigated by the purchase of CBRs but the potentially large residual risk can only be quantified into contracting premiums to retailers.
- Generators will be faced with a very large number of constraint equations, each of which will need to be assessed in terms of the Generators' willingness to pay at a CBR auction. For every single transmission constraint in the NEMMCO constraint library, there is a material risk that the constraint might bind; if there were zero risk, the constraint would not be in the library. Therefore, there must be some trading risk associated with every single constraint and so it is possible that every constraint should be covered by a CBR measure. For trading, it is the risk of congestion that matters, rather than the level of actual congestion.
- There is no consideration of the need to be able to forecast zonal prices and transmission capacity. For CBR units to be effective, participants must be able to forecast with some certainty the likely price differentials and levels of congestion.
- It is noteworthy that up to 70 generator pricing zones are required to significantly reduce price mis-match. This number of zones would significantly increase trading risks.

#### Implementation, Allocation and Investment

As part of the process to thoroughly assess the costs and benefits of these types of scheme the NGF is of the view the following implementation issues, in relation to CSC or



residue allocation need to be resolved;

- a. Would there be a threshold of congestion materiality on a constraint cut-set that would result in a congestion management scheme being implemented or would a scheme be applied automatically whenever a constraint equation was binding?
- b. How the allocated CSCs or residues are impacted by the incremental development of the transmission network.
- c. How negotiated transmission augmentations that are funded with the express purpose of reducing material congestion fit with an implemented congestion regime.

Unless the major implementation issues of congestion support pricing regimes are solved then CSP/CSC and CBR remain exercises in theoretical economics. The lessons from the Snowy Region CSC/CSP trial need to be drawn out and evaluated.

## **10. Way Forward**

Policy makers, Rule makers and participants have been wrestling with the issue of managing congestion in the NEM's regional structure since the market commenced. The move to the fully optimised Option 4 intra-regional constraint management formulation has been the single most important response, however the Snowy constraint issues remain unresolved. This fact highlights the need to proceed with caution and thorough analysis.

The NGF supports the AEMC's program of assessment of the identified areas but proposes a parallel work program, with good integration across the workstreams. That is;

- a. Respond to the COAG/MCE directions resulting from the ERIG initiative.
- b. Complete the regional boundary principles review.
- c. Re-consider the issue of the eroding value of downstream funded network augmentations and dynamic efficiency effects,
- d. Assess/estimate the implementation cost for a series of congestion management options, and

- e. Undertake and complete the congestion materiality review, relating these to the cost of potential mitigation measures.

It is likely that a final assessment of whether or not congestion mechanisms such as CSP or CBR may provide net benefits to consumers cannot be formed until a clearer picture is available of the other congestion-related NEM arrangements.