

**Standing Committee of Officials of the
Ministerial Council on Energy**

**NERA Economic Consulting
Review of network incentives for
Distributed Generation and Demand Side Response**

April 2007

Overview

The Ministerial Council on Energy (MCE) and the Council of Australian Governments (COAG) have made commitments to reduce barriers and establish effective mechanisms for distributed generation and demand-side response. Accordingly, in developing a national distribution framework it is necessary to consider incentives and impacts as they relate to these network alternatives. MCE's Energy Market Reform Working Group (EMRWG) commissioned an independent review of the draft National Electricity Rules (the Rules) by NERA Economic Consulting, which was peer reviewed by Allen Consulting Group.

The NERA report, which is being released at the same time as the Exposure draft of the National Electricity Rules, is an independent paper and does not represent a policy position or views of MCE, SCO or EMRWG. The report should be read in the context of the broader energy market reform process. SCO has not yet considered the report's recommendations or made any associated policy decisions. However, to enable a timely response on these issues, stakeholders are asked to provide comment on these recommendations. Some elements may be considered for implementation within the context of finalising the initial distribution Rules, subject to the practicality of the current legislative reform package and the complexity of any changes required.

The following section provides further background and a summary of recommendations. The NERA report itself is attached in two parts as a separate document.

Review of network incentives for Distributed Generation and Demand Side Response

MCE's EMRWG is seeking to integrate consideration of Demand Side Response (DSR) and Distributed Generation (DG) into the development of the national framework for distribution. In particular, EMRWG is interested in the impact of the proposed initial Rules regarding any structural or regulatory impediments that may impede DNSP's incentives to support the development or uptake of economically efficient DSR and DG.

EMRWG commissioned an independent expert review to provide recommendations in this regard. Recommendations from this review are outlined in Tables 1.1 and 1.2. The full report is released with this document.

EMRWG is yet to consider the consultant's recommendations and no policy positions have been reached. However, some elements may be considered for implementation within the context of finalising the initial distribution Rules, subject to the practicality of the current legislative reform package and the complexity of any changes required. Stakeholder comments are therefore sought on the NERA report and its recommendations.

Reform Background

This review supports the 10 February 2006, COAG commitment to improve price signals for energy investors and customers by, among other things:

implementing a comprehensive and enhanced MCE work program, from 2006, to establish effective demand-side response mechanisms in the electricity market, including network owner incentives, effectively valuing demand-side responses, regulation and pricing of distributed and embedded generation, and end user education.

Similarly, the review responds to commitments in the 2004 Energy White Paper, to remove barriers to renewable and distributed generation.

Previous work under MCE has been undertaken in this area by the Renewable and Distributed Generation Working Group (RDG WG). Initially this work focused on increasing clarity and consistency between jurisdictions, through the development of a draft Code of Practice for Embedded Generation (CoPEG) by the Utility Regulators Forum. RDG WG also undertook a public consultation more broadly on barriers to renewable and distributed generation, with resulting recommendations developed in a recent Charles River Associates report (to be released shortly).

However, recommendations to resolve the identified issues in the Rules were necessarily limited as this work was undertaken prior to the development of the national distribution framework. Appropriately, therefore, this work stream has now been integrated into the core work streams developing the economic and non-economic national distribution framework which is the responsibility of EMRWG.

In addition to the NERA review of the economic distribution framework released with this Explanatory Material, a second independent review is underway considering related issues under the retail and non-economic distribution framework. The outcomes from this review will be released in the coming months.

Consultancy

EMRWG engaged NERA Economic Consulting to provide an independent expert review of the proposed electricity distribution Rules, having regard to the effective valuation of DSR measures and DG, and related network owner incentives. EMRWG also engaged Mr Jeff Balchin of the Allen Consulting Group to peer-review NERA's work.

Due to coordination and timing constraints, this review is based on the policy positions for distribution revenue and pricing as released in January 2007 with the exposure draft of the Amendments to the National Electricity Law. The policy detail in the subsequent Exposure Draft Rules may therefore not be fully reflected.

The NERA report includes a range of cases studies and is attached to this paper, presented in two parts:

1. *Part One: Distribution Rules Review – Network Incentives for Demand Side Response and Distributed Generation ; and*
2. *Part Two: Demand Side Response and Distributed Generation Case Studies.*

NERA's report is an independent paper and does not represent a policy position or views of MCE, SCO or EMRWG. The report should be read in the context of the broader energy market reform process.

The report includes a range of recommendations directly relevant to the initial Rules on distribution revenue and pricing. These recommendations are highlighted in Table 1.1, which

is extracted from the NERA report and does not reflect agreed MCE views. EMRWG requests specific comment on these recommendations in the context of whether and how they should be incorporated in the initial Rules. EMRWG will review stakeholder comments and then consider policy decisions on these recommendations. Some recommendations may be considered for implementation within the initial Rules but this will be necessarily subject to the practicality of timelines for the current package and the complexity of any changes required.

The NERA report also raises issues beyond the scope of distribution revenue and pricing but relevant to other work streams and the broader energy reform context (Table 1.2). These work streams are already considering these issues further and include:

- the retail and non-economic distribution framework;
- the Smart Meters Working Group (SMWG), which is currently examining a possible roll out of smart meters in the NEM;
- related jurisdictional roles.

In addition, EMRWG would like stakeholders to consider and comment on whether the proposed changes as a package effectively improve the balance of incentives for network owners to compare network alternatives to network expansions.

Table 1: Summary of potential DSR and DG incentive barriers

Table 1.1

Summary of potential DSR and DG incentive barriers – revenue and pricing Rules

Stage of regulatory process / rules	Potential barrier <i>Materiality</i>¹	Recommendations	Discussion reference	Existing Rule reference	Relevant exposure draft rules
Form of regulation	For smaller scale DG the costs of regulatory specific arrangements will outweigh the benefits of tailored connection/use terms and conditions. <i>Moderate – will depend upon the size of the DG proponent and so the extent of countervailing power.</i>	The Rules should require that, once the appropriate form of regulation is determined for domestic distribution use of system charges, DNSPs should be required to allow such customers to install and use PV on the basis of the same usage and capacity tariff elements applying to equivalent sized load.	Section 4.3.2	Schedule 6.5, clauses 6.5.6 and 6.6.1	
Control setting method	Recognition of network support payments as an expenditure item in building blocks cost build-up. <i>High – for network support to be an economic alternative to network assets (for DNSPs), it must be adequately recognised in regulated costs.</i>	Provision in the Rules for the inclusion of payments made by DNSPs for ‘network support’ expenditure in the derivation of the building block revenue requirement should be retained. The method for recognising network support payments in the derivation of the building block revenue requirement should provide unbiased incentives for the efficient substitution of network support for network augmentation.	Section 5.2	Clause 5.5 of schedule 6.3, clauses 6.5.3(d) and 6.2.5(d)(7)(iii)	Cf 6.5.6 and 6.5.7
	Preference for capex over opex due to regulated WACC being greater than DNSPs’ actual or perceived WACC. <i>Moderate – will depend upon the extent of</i>	The revenue rule approach to WACC determination should avoid creating systematic upward bias in the WACC. Equally it should not create systematic downward bias, either for the purpose of balancing DSR and DG incentives or	Section 5.2.1	Clause 6.2.5(d)(5) and schedule 6.1	Cf 6.5.2

¹ Materiality is rated as low, moderate or high based on the likely potential to distort efficient market outcomes.

Stage of regulatory process / rules	Potential barrier <i>Materiality1</i>	Recommendations	Discussion reference	Existing Rule reference	Relevant exposure draft rules
	<p><i>any WACC estimation error/bias.</i></p> <p>Efficiency benefit sharing mechanisms are more difficult to apply to capex than opex, leaving less pressure to minimise capex.</p> <p><i>Moderate – regulatory treatment of DSR/DG costs and other network costs should be balanced for relative incentives not to be distorted.</i></p> <p>Management predilection for investment in own assets so as to grow business and/or reinforce market power.</p> <p><i>Low – occurs in all industries and markets.</i></p>	<p>any other reason.</p> <p>The range of regulatory measures available to address the potential imbalance of incentives as between capital and operating cost expenditure should include:</p> <ul style="list-style-type: none"> ▪ allowing (but not requiring) the AER to include a capital expenditure efficiency incentive mechanism in the building blocks control setting method for individual DNSPs; and ▪ requiring the AER to consult on the potential DSR and DG incentive implications of any proposed operating or capital expenditure efficiency incentive mechanism. <p>The distribution revenue rule should include operating and capital expenditure assessment criteria that require the AER to be satisfied that the forecast expenditure reasonably reflects efficient non-network alternatives available to a DNSP.</p>	Section 5.2.1.1	New rule + include an equivalent to transmission clause 6A.6.5(b) using the principles suggested in section 5.2.1.1	Cf 6.5.5
Regulatory test	<p>Two path regulatory test creates possibility for greater market benefit options (eg, non-network) to be disadvantaged relative to cheaper NPV cost network options.</p> <p><i>Low to Moderate – the extent of this problem is not clear, and has to be balanced against the greater complexity of the market benefits limb of the regulatory test</i></p>	No recommendations – to be addressed as part of network extensions/expansions review.	Section 5.4.2	Section 5.6.5A	Cf 6.5.6(c) and 6.5.7(c)

Stage of regulatory process / rules	Potential barrier <i>Materiality1</i>	Recommendations	Discussion reference	Existing Rule reference	Relevant exposure draft rules
Service incentives	<p>Service incentive schemes may give rise to motivation for greater use of network solutions to constraints.</p> <p><i>Moderate to high – will depend upon the scale/scope of rewards/penalties and specification of service standards/targets</i></p>	<p>Where the perceived ‘firmness’ of DSR and DG present a potential barrier to their efficient uptake by DNSPs, the Rules should not prevent DNSPs from entering into service contracts with DSR and DG service providers that transfer the relevant service incentive scheme payments and penalties to such providers.</p>	Section 6.1.3	Equivalent to transmission clause 6A.7.4	Cf 6.6.2
		<p>The potential DSR and DG incentive impacts of service incentive schemes should be considered by the AER when specifying the operational detail, service targets and applicable penalties and rewards for such schemes. This may be achieved by including this as a principle under the initial distribution rule (equivalent to clause 6A.7.4 of the transmission rule).</p>	Section 6.3	New rule, equivalent to transmission clause 6A.7.4	
Form of price control	<p>Revenue control provides incentive for DSR and DG on DNSPs but not customers. Price cap provides incentive for DSR and DG on customers but not DNSPs.</p>	<p>Price caps should be preferred over revenue controls for the purpose of facilitating the utilisation of DSR and DG, particularly once advanced meters and the easing of side constraints improve the opportunity for more efficient forms of pricing.</p>	Section 7.6	New rule	Cf 6.2.5
		<p>That the Rules should permit the AER to establish an incentive mechanism that compensates DNSPs operating under the price cap form of control for the revenue lost as a consequence of undertaking efficient DSR initiatives.</p>			

Stage of regulatory process / rules	Potential barrier <i>Materiality</i> ¹	Recommendations	Discussion reference	Existing Rule reference	Relevant exposure draft rules
Pricing Principles	<p>Prudent discounts – there is potential for discounting to be efficient (ie, avoid inefficient bypass) or to be inefficient (dissuade efficient bypass).</p> <p><i>Low – mitigated by revenue sufficiency risk.</i>²</p> <p>Side constraints – existing constraints limit DNSPs’ ability to set tariffs that reflect the economic costs of service</p> <p><i>High – even where DNSPs’ incentives are well aligned, efficient outcomes may be prevented.</i></p>	<p>The initial distribution rules should not prevent DNSPs from offering prudent discounts.</p> <p>The requirement for the periodic review of side constraints should be retained in the initial Rules.</p>	<p>Section 7.7.3.3</p> <p>Section 7.8.1</p>	<p>Clause 6.6.6</p> <p>Clause 6.6.4</p>	<p>Cf 6.18.5 and 6.18.4</p> <p>Cf 6.18.6</p>
	<p>Tariff reassignment – obsolete or anomalous tariffs are restricted from closure. AMI tariffs not able to be mandated.</p> <p><i>High – even where DNSPs’ incentives are well aligned, efficient outcomes may be prevented</i></p>	<p>Where tariff reassignment restrictions are to be included in the Rules, these should be limited to principles that ensure tariff assignment and reassignment is based upon:</p> <ul style="list-style-type: none"> ▪ customers’ usage and connection characteristics, ie, the drivers of network costs; and ▪ providing equal treatment to customers with similar usage and connection characteristics. <p>DNSPs should be required to reassign customers to a time of use tariff following installation of advanced metering infrastructure at a customer’s connection point.</p> <p>Reassignment should be accompanied by a requirement for customer education regarding ways in which they can manage their demand to</p>	<p>Section 7.8.2</p> <p>Section 7.8.2.1</p>	<p>New rule</p>	

² This is true under both price caps and revenue caps: see NERA, Distribution Pricing Rule Framework, section 4.2.2, December 2006.

Stage of regulatory process / rules	Potential barrier <i>Materiality</i> ¹	Recommendations	Discussion reference	Existing Rule reference	Relevant exposure draft rules
	<p>Geographic tariff averaging prevents DNSPs from sending efficient pricing signals.</p> <p>Capacity charging – currently no rule requirement for DNSPs to review and reset capacity charges following sustained customer maximum demand reductions, this may create disconnect between customers investing in DSR or DG, and realising financial benefits of lower network charges.</p> <p><i>Materiality varies by jurisdiction:</i> <i>Low – where policies/procedures published</i> <i>High – where no policies/procedures published and customers are thereby limited in their ability to realise network cost savings</i></p>	<p>affect their bill. Further work is required to identify whether this is a role best served by retailers or DNSPs.</p> <p>The initial Rules should not include requirements for geographic tariff averaging, and instead leave such decisions to the discretion of DNSPs, subject to compliance with generic principles for efficient pricing. Any jurisdictional variation agreed under the AEMA should be handled through the derogation process.</p> <p>DNSPs should be required to submit to the AER for approval and publish protocols for the assessment and review of capacity demand and determination of capacity charges including:</p> <ul style="list-style-type: none"> ▪ the period over which capacity demand will be reassessed before capacity charges are reset (say, every 12 months). 	<p>Sections 7.8.3 and 9.2.1</p> <p>Section 7.9.2</p>	<p>Clauses 6.6.5(a) and 6.5.6(e)(3)</p> <p>+ additional requirement for this to be approved by the AER</p>	
Competitive neutrality in generation	Negotiation arrangements for DG connection and usage charges gives rise to potential for inequitable regulatory treatment of distribution connected generators relative to transmission	<p>The initial Rules should not permit DNSPs to levy on DGs either positive DUOS charges for energy exported to the grid or deep connection costs.</p> <p>Voluntary payments from DGs to DNSPs should</p>	Section 8.2.1.1	Not currently included, may go in 6.6.1	

Stage of regulatory process / rules	Potential barrier <i>Materiality</i>	Recommendations	Discussion reference	Existing Rule reference	Relevant exposure draft rules
	connected generators. <i>Moderate to high – will depend upon the size of the DG proponent and existence of countervailing power.</i>	be permitted where a DG agrees to pay for upstream augmentations in order to increase energy transfer capability, in the same way that a transmission connected generator can pay for upstream augmentations of the transmission system.			
Pricing of negotiated DG connection charges	Pricing of negotiated connection charges may be affected by misuse of market power. <i>Moderate to high – will depend upon existence of countervailing power and level of regulatory scrutiny and enforcement of negotiating frameworks</i>	The initial Rules should retain a requirement for DNSPs to submit their proposed negotiating framework for DG connection charges to the regulator for approval and subsequent publication. The Rules should require the AER to be satisfied that this framework: <ul style="list-style-type: none"> ▪ provides for a robust procedure for the negotiation of connection agreements, including information exchange; ▪ requires DGs only to fund shallow connection costs, where shallow is defined as the nearest point of the existing shared distribution network; and ▪ provides for DG proponents to be made aware of the options for the funding of deep connection costs or the connection constraint consequences of these not being funded (either by the DG or customers), including measures to ensure the provision of sufficient information to apply the regulatory test so as to determine the extent of any appropriate user-funded network augmentation. 	Section 8.3	Clauses 6.6.7 (in particular 6.6.7(c)(1)) and 6.6.5(a)(2)	Cf 6.7 and 6.7.5
Avoided TUOS payments	Payment of avoided TUOS charges to DGs creates a double incidence of costs to	The Rules should remove the requirement for DNSPs to make avoided TUOS payments to	Section 8.4.3	Rule 5.5(h) and (i)	

Stage of regulatory process / rules	Potential barrier <i>Materiality1</i>	Recommendations	Discussion reference	Existing Rule reference	Relevant exposure draft rules
	<p>DNSPs with no corresponding benefit and may thereby motive DNSPs to impede DG uptake.</p> <p><i>High – double costs incidence with no corresponding benefit will tend to motivate obstruction</i></p>	<p>DGs.</p> <p>The Rules should continue to provide for both TNSPs and DNSPs to make network support payments to DGs, EGs or DSR providers, where the planning and regulatory test obligations under the Rules establish that such non-network solutions represent the most efficient means of alleviating a network constraint.</p>		<p>Note this is a chapter 5 rule rather than chapter 6</p>	

Table 1.2
Summary of potential DSR and DG incentive barriers – non-revenue and non-pricing Rules

Stage of regulatory process / rules	Potential barrier <i>Materiality</i> ³	Recommendations	Discussion reference	Rule reference
Negotiate Arbitrate Form of Regulation	There is a need for alignment of the price and non-price aspects of the dispute resolution framework.	Any changes to the principles for dispute resolution arising from the current review of Chapter 6 should ensure that consequent changes (or relevant transition measures) are made for the Chapter 5 dispute framework.	Section 4.3	Chapter 5
Service reliability standards	Deterministic standards encourage DNSPs to rely on network solutions. <i>Moderate – reduced ‘firmness’ of non-network solutions creates disincentive for DNSPs to rely on such solutions</i>	It is important that jurisdictional standard setters be cognisant of the DSR and DG incentive implications of network planning or service reliability standards. Consideration should be given to the use of probabilistic planning standards and their relative costs and benefits as compared with deterministic standards.	Sections 5.4.1, 6.2 and 8.2.1.1	Chapter 5
Metering	Current predominance of accumulation metering for small customers is an impediment to efficient, capacity-based pricing. <i>Moderate to high – metering technology limitations are a critical reason for current over-reliance on usage-based tariffs</i> Priority for roll-out of AMI for customers subject to large scale PV roll-out. <i>Moderate – metering technology is a potentially significant limitation on success of PV.</i>	Potential benefits in terms of improved pricing and incentives for DG and DSR should be taken into account in evaluation of large scale AMI roll-out. DNSPs should be encouraged or required to ensure that customers subject to large scale PV roll-out receive priority in the roll-out of AMI, thereby facilitating the development of network tariff structures that provide efficient signals for the installation of PV.	Section 5.2 Section 8.2.2.1	N/a N/a
Losses	Averaged distribution loss factors unlikely to give sufficient credit for impact of DG on	Further analysis be undertaken on whether the current treatment of losses is consistent with promoting	Section 8.2.2.3	Chapter 3

³ Materiality is rated as low, moderate or high based on the likely potential to distort efficient market outcomes.

Stage of regulatory process / rules	Potential barrier <i>Materiality</i> ³	Recommendations	Discussion reference	Rule reference
	marginal losses. <i>Moderate – extent of effect not clear, but may be very significant in some cases.</i>	efficient distributed generation projects.		
Constraints on energy export	Non-price connection terms and conditions in Chapter 5 have the potential to create impediments for DG.	That further work be undertaken to investigate whether the non-price connection terms and conditions provided in Chapter 5 of the Rules create any impediments to the efficient utilisation of distributed generation capacity.	Section 8.3.1	Chapter 5
Access to load control infrastructure	Full benefits of AMI direct load control may not be realised where DNSPs, retailers and DSR intermediaries do not have access to such facility. <i>Low to moderate – not clear that DNSPs would have incentive not to allow retailer access, however, where they do the costs in terms of foregone retailer benefits may be significant.</i>	Where a direct load control facility is available at a customer’s connection point, consideration should be given to ways to ensure the controller of this infrastructure provides access (on reasonable or regulated terms) to that customer’s retailer, DNSP, TNSP or other DSR intermediary engaged by the customer for the purposes of load control.	Section 9.1.2	New rule (possibly not in chapter 6)
Connection information	Provision of adequate and timely information on network constraints is important for DG locational decision-making. <i>Low to moderate – unclear how important this information is to DG location decisions.</i>	A review of the information requirements in chapter 5 of the Rules is necessary to ensure that: <ul style="list-style-type: none"> ▪ DNSPs provide DG proponents with the information necessary to apply the regulatory test to a DG connection proposal; ▪ DNSPs provide information on the emergence of network constraints as well as areas of substantial under-utilised existing transfer capability in order to allow prospective DGs to identify and site in the best location by reference to: <ul style="list-style-type: none"> – alleviating network constraints (and potentially earning network support payments); or – maximising energy transfer capability without 	Section 9.2.2	Chapter 5

Stage of regulatory process / rules	Potential barrier <i>Materiality</i> ³	Recommendations	Discussion reference	Rule reference
		<p style="text-align: center;">incurring additional deep connection costs;</p> <ul style="list-style-type: none"> ▪ DG proponents reveal their intended energy export levels such that DNSPs can accurately assess deep connection costs and formulate any connection constraint conditions that are required to protect network performance where: <ul style="list-style-type: none"> – the DG proposal does not satisfy the regulatory test; and – the DG proponent chooses not to fund the deep connection costs. 		