19 December 2013

Mr John Pierce
Chairman
Australian Energy Market Commission
Level 5, 201 Elizabeth Street
Sydney NSW 2000

Dear Mr Pierce

Consultation Paper – National Energy Amendment (Distribution Network Pricing Arrangements) Rule 2014

The NSW Distribution Network Service Providers, Ausgrid, Endeavour Energy and Essential Energy (the NSW DNSPs) welcome the opportunity to provide a written submission on the *Consultation Paper – National Energy Amendment (Distribution Network Pricing Arrangements) Rule 2014*.

The NSW DNSPs note that the AEMC has consolidated the rule change requests from the Independent Pricing and Regulatory Tribunal of NSW (IPART) and the Council of Australian Government's Standing Council on Energy and Resources (SCER) as they both seek to address concerns relating to the current distribution pricing arrangements under the National Electricity Rules (NER). The IPART rule change deals with consultation, timing, and information requirements, whereas the SCER rule change request draws on the Power of Choice review recommendations and seeks to address concerns about the current lack of incentives and guidance under the distribution pricing framework for DNSPs to set price efficiently.

The NSW DNSPs have previously provided the AEMC with a comprehensive submission to the IPART rule change request (which we broadly supported) in June 2013. The key focus of this submission therefore is to provide the AEMC and other stakeholders with our view on the various aspects of the SCER rule change request and our response to the numerous questions asked by the AEMC in their consultation paper.

SCOPE TO IMPROVE THE DISTRIBUTION PRICING FRAMEWORK

The NSW DNSPs believe that the current distribution pricing framework is fundamentally sound. The current framework has given DNSPs appropriate discretion to deliver network prices that strike an appropriate balance between the economic objectives and the expectations of the community for prices for an essential service to be equitable. There is no evidence that providing DNSPs with some discretion over their pricing decisions has resulted in economic harm. On the contrary, the discretion provided to DNSPs under the current framework to pursue balanced pricing outcomes is likely to have safeguarded retailer and consumer interests compared to the counter-factual of pursuing more aggressive economic tariff reforms against a backdrop of community concerns over X-factor price increases.

Nevertheless, there is considerable scope to improve the current distribution pricing framework. The NSW DNSPs broadly support the amendments that seek to result in greater consultation on network tariffs and to bring forward the timing of the annual price-setting process to provide Retailers with earlier notification of the AER's approval of network prices. The NSW DNSPs also agreed with the AEMC that there is scope to improve the distribution pricing arrangements by providing DNSPs with stronger incentives to set network prices more efficiently.

KEY AREAS OF CONCERN FOR THE NSW DNSPS

The NSW DNSPs do not support a number of the other aspects to the rule change request, such as imposing a requirement on DNSPs to set prices on the basis of long run marginal cost (LRMC). It appears that SCER believes that more efficient pricing outcomes can only be achieved by imposing a heavy handed and prescriptive regime. This is a fundamental change to the distribution pricing framework and is unlikely to be effective in delivering more certain pricing outcomes for stakeholders, particularly in the case of DNSPs under a revenue cap where the volume risks are borne by customers in the form of price volatility over time. The absence of positive incentives in the proposed framework will undermine the incentive of DNSPs to continue to pursue innovative tariff strategies, particularly in respect to the equitable recovery of residual network costs.

The NSW DNSPs urge the AEMC to reject these elements of the SCER rule change request until the economic merit of replacing a framework that is fundamentally sound with a heavy handed and prescriptive approach to distribution pricing is well understood. The NSW DNSPs are looking forward to working productively with AEMC and other Stakeholders to ensure that existing framework can be improved, rather than abandoned.

If you would like to discuss our submission further, please contact Mr Mike Martinson, Group Manager Regulation at Networks NSW on (02) 9249 3120 or via email at michael.martinson@endeavourenergy.com.au or alternatively Mr Robert Telford, Pricing Manager at Ausgrid on (02) 9269 2136.

Yours sincerely

Vince Graham
Chief Executive Officer
Ausgrid, Endeavour Energy and Essential Energy

NSW DNSPs' RESPONSE TO THE AEMC's CONSULATION PAPER ON DISTRIBUTION NETWORK PRICING ARRANGEMENTS RULE AMENDMENT

19 December 2013

CONTENTS

1.0 EXECUTIVE SUMMARY 1
1.1 INTRODUCTION .....
2.0 OVERVIEW OF PROPOSED RULE CHANGE 2
2.1 THE DRIVER OF THE PROPOSED CHANGES TO THE DISTRIBUTION PRICING ARRANGEMENTS 2
2.2 AN OVERVIEW OF THE PROPOSED RULE CHANGE 2
2.3 AN OVERVIEW OF THE ISSUES RAISED IN THE AEMC CONSULTATION PAPER
3.0 PROPOSED ASSESSMENT FRAMEWORK 4
3.1 THE NATIONAL ELECTRICITY OBJECTIVE 4
3.1.1 An explanation of economic efficiency in the context of network prices 4
3.2 THE ECONOMIC RELEVANCE OF THE CRITERIA 6
4.0 PROPOSED CONSULTATION APPROACH 7
4.1 OVERVIEW 7
4.2 NETWORK PRICE SETTING PROCESS 7
5.0 Economic Theory of Network Pricing 9
5.1 OVERVIEW 9
5.2 THE ECONOMICS OF NETWORK PRICING 9
5.2.1 Long Run Marginal Cost 10
5.2.2 Potential Customer impact of LRMC-based pricing 11
5.2.3 Residual Cost Recovery 12
5.2.4 Economic Relevance of Transmission Price Signals 14
5.2.5 Economic Relevance of Tariff Class Concept 15
5.2.6 Economic Relevance of the Side Constraint Mechanism 15
6.0 Proposed Amendments to Distribution Pricing Framework 17
6.1 OVERVIEW 17
6.2 THE UNDERLYING RATIONALE FOR THE CURRENT PRICING PRINCIPLES 17
6.3 PROPOSAL TO REQUIRE PRICES TO BE SET ON BASIS OF LRMC 18
6.4 PROPOSAL TO AMEND THE REQUIREMENT TO HAVE REGARD TO CUSTOMER PRICE RESPONSE 19
6.5 THE PROPOSAL TO ADD A NEW PRINCIPLE THAT REQUIRES DNSPS TO TAKE ACCOUNT OF THE CUSTOMER IMPACT 20
6.6 THE PROPOSAL TO AMEND THE RESIDUAL NETWORK COST REVOVERY PRINCIPLE IN THE NER 23
6.7 THE PROPOSAL TO REQUIRE DNSPS TO CONSTITUTE TARIFF CLASSES ON AN ECONOMIC BASIS 23
6.8 THE PROPOSAL TO AMEND THE SIDE CONSTRAINT PROVISIONS IN THE NER 23
6.9 OTHER PROPOSED AMENDMENTS TO PRICING PRINCIPLES 24
7.0 Glossary 25
8.0 Attachment 26
8.1 Long Run Average Incremental Cost Method (LRAIC) 26
8.2 Turvey Approach 26
8.3 Other calculation methodologies) 27
8.3.1 Discounted Total Investment Method (DTIM) 27
8.3.2 RECC 27

8.3.3 Capital Recovery Factor 27
8.4 Total Investment Method 28
8.5 Present Worth Method (PW) 28
8.6 Regression Method 29
Replacement Cost New Method (RCN) 30

1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Australian Energy Market Commission (AEMC) have consolidated the rule change requests from the Independent Pricing and Regulatory Tribunal of NSW (IPART) and the Council of Australian Government's Standing Council on Energy and Resources (SCER) as they both seek to address concerns relating to the current distribution pricing arrangements under the National Electricity Rules (NER). The IPART rule change deals with consultation, timing, and information requirements, whereas the SCER rule change request draws on the Power of Choice review recommendations and seeks to address concerns about the current lack of incentives and guidance under the distribution pricing framework for DNSPs to set price efficiently.

Ausgrid, Endeavour Energy and Essential Energy (the NSW DNSPs) have previously provided the AEMC with a comprehensive submission to the IPART rule change request (which we broadly supported) in June 2013. The key focus of this submission is therefore to provide the AEMC and other stakeholders with our view on the various aspects of the SCER rule change request and our response to the numerous questions asked by the AEMC in their consultation paper.

1.2 SCOPE TO IMPROVE THE DISTRIBUTION PRICING FRAMEWORK

The NSW DNSPs believe that the current distribution pricing framework is fundamentally sound. The current framework has given DNSPs appropriate discretion to deliver network prices that strike an appropriate balance between the economic objectives and the expectations of the community for prices for an essential service to be equitable. There is no evidence that providing DNSPs with some discretion over their pricing decisions has resulted in economic harm. On the contrary, the discretion provided to DNSPs under the current framework to pursue balanced pricing outcomes is likely to have safeguarded retailer and consumer interests compared to the counter-factual of pursuing more aggressive economic tariff reforms against a backdrop of community concerns over X-factor price increases.

Nevertheless, there is considerable scope to improve the current distribution pricing framework. The NSW DNSPs broadly support the amendments that seek to result in greater consultation on network tariffs and to bring forward the timing of the annual price-setting process to provide retailers with earlier notification of the AER's approval of network prices. The NSW DNSPs also believe that there is scope to improve the existing distribution pricing arrangements by providing DNSPs with stronger incentives to set network prices more efficiently.

1.3 KEY AREAS OF CONCERN FOR THE NSW DNSPS

The NSW DNSPs do not support a number of other aspects of the rule change request, such as imposing a requirement on DNSPs to set prices on the basis of long run marginal cost (LRMC). It appears that SCER believes that more efficient pricing outcomes can only be achieved by imposing a heavy handed and prescriptive regime. This is a fundamental change to the distribution pricing framework and is unlikely to be effective in delivering more certain pricing outcomes for stakeholders, particularly in the case of DNSPs under a revenue cap where the volume risks are borne by customers in the form of price volatility over time. The absence of positive incentives in the proposed framework will clearly undermine the incentive of DNSPs to continue to pursue innovative tariff strategies, particularly in respect to the equitable recovery of residual network costs.

The NSW DNSPs agree with the AEMC that stakeholder consultation is an important means by which network tariffs and prices can be developed and understood by consumers. However, the prescriptive nature of the proposed SCER rule change is likely to inhibit efforts by the DNSPs to engage meaningfully with customers by removing discretion in critical aspects of the price setting process.

The NSW DNSPs urge the AEMC to reject these elements of the SCER rule change request until the economic merit of replacing a framework that is fundamentally sound with a heavy handed and prescriptive approach to distribution pricing is well understood. The NSW DNSPs are looking forward to working productively with AEMC and other Stakeholders to ensure that existing framework can be improved, rather than abandoned.

2.0 OVERVIEW OF PROPOSED CHANGES TO PRICING FRAMEWORK

2.1 THE DRIVERS OF THE PROPOSED CHANGES TO THE DISTRIBUTION PRICING ARRANGEMENTS

The NSW DNSPs note that the consultation paper combines two rule change requests, being the SCER rule change which draws on the Power of Choice review recommendations and seeks to address how revenue should be recovered through the way distribution network prices are structured, and the IPART rule change which deals with consultation, timing, and information requirements. The NSW DNSPs provided a comprehensive submission to the original IPART rule change request (which we broadly supported) and we build on that submission in responding to this review.

The SCER rule change request identifies a number of issues in the current distribution network pricing framework. These include:

- the need for consultation on a DNSP's proposed network tariff structures and earlier provision of more detailed network pricing information;
- requiring DNSPs to set cost reflective network tariffs in accordance with Long Run Marginal Cost (LRMC) to reflect efficient network costs;
- requiring DNSPs to take into account consumer impacts in designing efficient network tariffs;
- allowing recovery of residual network costs in a manner that is efficient and does not distort or undermine flexible pricing;
- amending the tariff class provisions to promote clarity and certainty in how DNSPs should group customers into different tariff classes; and
- extending the operation of side constraints on annual network price changes.

The IPART rule change request identified a number of issues, including that the current annual network pricing process:

- does not provide for adequate notification of network prices creating difficulties for retailers in passing on annual network price changes to consumers;
- lacks consultation with retailers and consumers in the development of network prices; and
- does not provide certainty for retailers and consumers with regard to forward network prices.

2.2 AN OVERVIEW OF THE PROPOSED RULE CHANGE

The proposed amendments to the distribution pricing arrangements are comprised of number of elements, as summarised below.

Table 1: Summary of Key Elements of Rule Change Request	
Key Issue	**Proposed Amendment**
Efficient Pricing	To require DNSPs to set prices on basis of LRMC and by having regard to the following considerations: • The impact of proposed prices on customers and the additional costs associated with peak demand; • The extent to which LRMC may vary depending on customer location; and • The transaction costs associated with implementing tariffs.
Stakeholder Engagement and pricing certainty	To require DNSPs to develop a Pricing Structure Statement (PSS). This document will provide detailed information on the DNSP's proposed network tariffs in the next regulatory control period. The timing of annual pricing process to be brought forward as appropriate to allow earlier notification of approved network tariffs.
Recovery of residual network costs	To prescribe a mechanism for recovering residual network costs in an economically efficient and non-distortionary manner.
Determining tariff classes	To require DNSPs to constitute a tariff class of customers on an economically efficient basis and avoid unnecessary transaction costs.
Side Constraints	Clarify the side constraint provisions apply to consumers regardless of whether have interval meters or traditional accumulation meters. Apply the side constraint provisions between, as well as within, regulatory control periods.

3.0 PROPOSED ASSESSMENT FRAMEWORK

3.1 THE NATIONAL ELECTRICITY OBJECTIVE

The AEMC noted that its assessment of the proposed rule request must consider whether the proposed changes to the distribution pricing arrangements promote the National Economic Objective (NEO) as set out under Section 7 of the National Electricity Law.

The NEO is defined in section seven of the National Electricity Law (NEL) and states:

"The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to: (a) price, quality, safety, reliability and security of supply of electricity; and (b) the reliability, safety and security of the national electricity system."

The NSW DNSPs agree with the AEMC that the NEO is the over-arching objective of the assessment of a proposed rule change and that the NEO refers to three limbs of efficiency: allocative efficiency, productive efficiency and dynamic efficiency.

In light of the nature of the proposed rule change the NSW DNSPs believe that the key issue for the AEMC is to assess the extent to which the various elements of the rule change request contribute to an improvement in allocative efficiency. This is not to suggest that the other aspects of economic efficiency (productive and dynamic efficiency) are not important, but rather that they are less relevant to this proposed rule change and are dealt with elsewhere in the NER, such as the rules and principles governing the determination of the revenue requirement and the provisions of incentives in the control mechanism. The recognition of the importance of allocative efficiency will ensure that the AEMC's assessment of the merit of the proposed changes to the distribution pricing framework will focus on the extent to which these changes are in the long-term interests of all electricity users, rather than addressing the needs of particular interest-groups or focusing on short-term outcomes.

The AEMC stated in its consultation paper that it believes that the SCER and the IPART rule change requests seek at a basic level to achieve the same objective of:

- a greater consultation on the development of network tariffs; and
- a greater level of pricing certainty with respect to changes to network tariff structures and network tariff pricing levels.[1]

While the NSW DNSPs support the amendments relating to greater consultation on network tariffs to meet the information requirements of Retailers and other stakeholders, the NSW DNSPs are concerned that the SCER rule change request seeks to achieve greater price certainty by imposing a heavy handed and prescriptive approach to distribution pricing, similar to what currently exists in relation to transmission pricing. The NSW DNSPs believe that this response to current concerns is not warranted as it is critically important that DNSPs continue to have considerable discretion under the NER to set prices in a manner that balances economic and other objectives, particularly in the current environment where most DNSPs face an unprecedented uncertainty in their volume environment.

3.1.1 An explanation of economic efficiency in the context of network prices

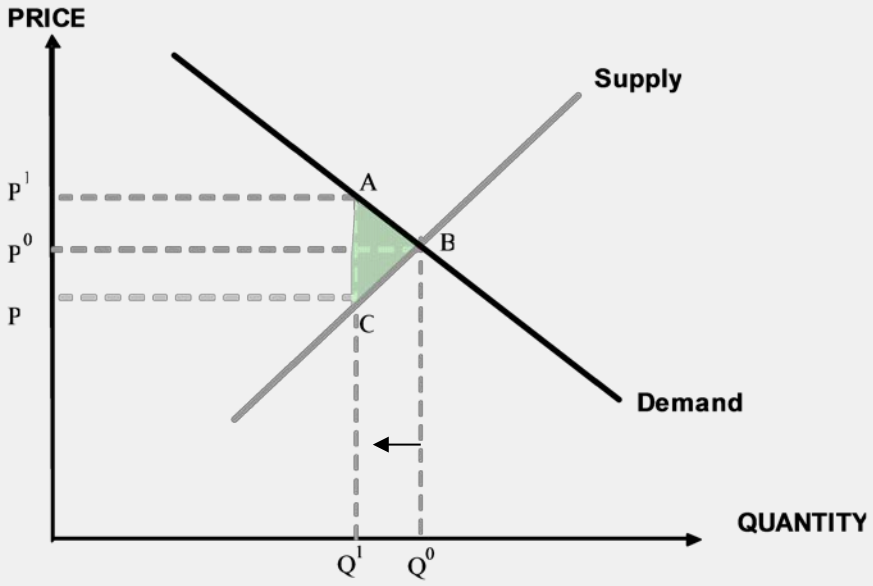
It is important that all stakeholders have a clear understanding of the economic concepts underpinning the AEMC's assessment of a proposed rule change. It is only with this knowledge that stakeholders can play an effective role in the engagement process, particularly in light of the inherent complexity associated with setting prices in a dynamic and highly regulated environment. To assist stakeholders and the AEMC in this regard, the NSW DNSPs provide a simple explanation of the concept of economic efficiency below:

[1] AEMC 2013, Information – Proposed Rule Amendment to Distribution Pricing Framework, November, p.27

Box 1: Explanation of the economic concept of allocative efficiency

Consider a simple example of a monopolist that supplies a regulated service to 100,000 customers in a given network area. The supply curve in the figure below is based on a monopolist with fixed costs of $1 million per annum and an assumed marginal cost of $1 per unit (kWh).

According to economic theory the optimal outcome from an economic welfare perspective is to set the marginal price at $1 per kWh ($P^o$) and to recover the fixed cost of $1 million by applying a fixed charge to every customer of $10 per annum. This is denoted at the intersection of the demand and supply curve (point B).



Consider the hypothetical situation where the community concerns over the fixed charge forced the DNSP to no longer recover the residual costs in this manner. One approach is to recover these costs by increasing the marginal price from $1 per unit to $2 per kWh. Customers will respond to the increase in marginal price by reducing the quantity demanded from Q^0 to Q^1. This is a sub-optimal outcome from an economic perspective because customers are denied the opportunity to consume more of the regulated service in the situation where they collectively value the increase in consumption from Q^o to Q^1 at higher than the marginal cost of production. The loss of economic welfare from setting the marginal price above marginal cost is denoted in the figure above as the shaded triangle (denoted by ABC in figure above).

An alternative approach is to reform the structure of the tariff to enable the residual costs to be recovered from a new charging parameter. This reform will maximise economic welfare if customers are not expected to be respond to this new charging parameter by changing their network usage. Interestingly it will achieve this economic outcome in a manner that addresses equity concerns associated with high fixed charges.

3.2 THE ECONOMIC RELEVANCE OF THE CRITERIA

The AEMC proposes to assess the merit of the proposed changes to the distribution pricing arrangements against a broad range of criteria, as summarised below:

- Efficient Pricing
- Stakeholder Engagement and Predictability
- Allocation of risks
- Regulatory Burden

The NSW DNSPs believe that effective consultation on this proposed rule change relies on stakeholders having a clear understanding of the concept of economic efficiency, particularly in relation to the economic relevance of assessment criteria. To assist the AEMC and other stakeholders to understand in a practical manner the role played by each of the above criteria in the assessment framework, the table below provides an explanation of the economic relevance of each criterion. In order to ensure that the assessment process is transparent the NSW DNSPs have assigned a weighting of importance to each criterion.

Table 2: Summary of Criteria from economic perspective

Criteria	Economic Relevance	Explanation of economic relevance
Efficient Pricing	●●●●●	To minimise the economic welfare by setting prices to the extent possible reflective of economic cost and recovering residual costs in a manner that causes the least distortion of the efficient usage patterns.
Stakeholder Engagement	●●●	Retailers need to have sufficient time to be able to minimise the cost of implementing network tariff reforms. They also need to understand the underlying rationale of the DNSP's network pricing approach to be able to optimally recover these costs and to reflect network price signals to the extent desirable in a competitive market. End-customers need to understand their retail tariffs in order to respond to these incentives in an economically desirable manner.
Predictability	●●●●	Pricing arrangements that promote predictable outcomes encourage market participants to make long-term investments that enhance economic welfare.
Allocation of Risks	●●●	Risk should be allocated to the party best able to mitigate the adverse economic welfare implications of being exposed to this risk.
Regulatory Burden	●●●●	A change to the pricing arrangements should not impose unnecessary risk, be difficult for stakeholders to administer or be excessively costly relative to expected benefits.
LEGEND: ●●● = important; ●●●● = highly important; ●●●●● = critically important		

4.0 PROPOSED CONSULTATION APPROACH

4.1 OVERVIEW

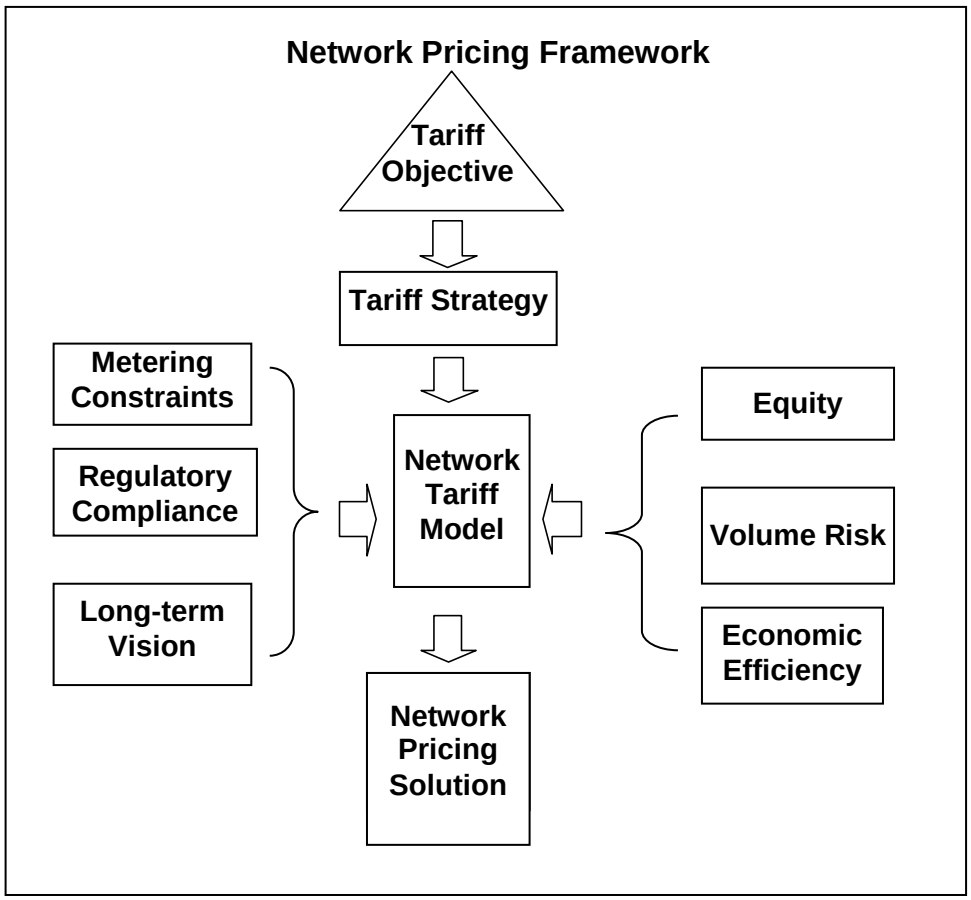
The proposed changes to the distribution pricing arrangements seek to achieve greater consultation on the development of network tariffs and to provide retailers and other stakeholders with a greater level of certainty with respect to changes in the level and structure of network tariffs during the regulatory control period. These outcomes are expected to be achieved by requiring DNSPs to prepare a Pricing Structures Statement (PSS). This document would contain information on the DNSP's proposed tariff strategy and would form the basis of the DNSP's consultation with retailers and other interested parties.

The NSW DNSPs support in principle this approach, but recognise that there is need for the new pricing framework to appropriately balance the desire to provide price certainty to retailers and other stakeholders with the need to ensure that DNSPs have sufficient flexibility to change their network tariff strategy in response to unanticipated developments.

4.2 NETWORK PRICE SETTING PROCESS

To ensure that the objectives are achieved in an effective and efficient manner it is important that any changes to the distribution pricing arrangements are based on a clear understanding of the network price-setting process. While the AEMC's consultation paper[2] provides a sound understanding of the network price setting process from a pricing principles perspective, the NSW DNSPs believe that this representation is incomplete as it does not take into account the important role played by non-economic factors in the network pricing function.

A more complete view of the network price setting process is shown in the figure below:



[2] AEMC 2013, Information – Proposed Rule Amendment to Distribution Pricing Framework, November, Figure 6.1, p.31

The important point to note from the figure above is that the price-setting function involves a broad range of considerations. For example, an important aspect to the network pricing process is the need to strike an appropriate balance between economic and equity objectives. While the pricing principles in the NER provide some guidance to DNSPs on how to set network prices to enhance economic welfare, the extent to which the DNSP trades off economic welfare to pursue equity and other objectives is currently a matter for the DNSP to resolve.

This is the logic for providing DNSPs with flexibility in relation to the extent that they set network prices reflective of economic principles and the current distribution pricing arrangements ensure that DNSPs have adequate pricing flexibility to deliver an appropriate balance between these at times competing objectives.

5.0 Economic Theory of Network Pricing

5.1 Overview

The concept of LRMC has a central place in the economic theory of pricing. It is only by setting prices according to marginal cost that consumers will take into account future costs of meeting demand when making consumption and investment decisions. Efficient price signals also provide incentives for optimal investment in the network and its alternatives – demand side responses and distributed generation. However, the pricing of network services is a practical exercise that takes place in an environment of limited cost information, technical complexity and uncertainty.

It is important for the AEMC to assess this rule change request with a clear recognition that the setting of distribution prices is a broader function than signalling economic costs. This is because the presence of economies of scale means that supplying distribution network services at marginal cost will not be financially sustainable. This gives rise to a tension between economic efficiency and revenue adequacy. In such circumstances, economic efficiency requires that the DNSP recover these residual network costs with minimal distortion to efficient usage of the network, such as through the fixed charge. In practice, the extent that DNSPs can rely on fixed charges to recover sunk costs is likely to be limited by equity issues.

On the other hand, the inefficient recovery of these costs through usage charges is likely to expose the DNSP to unacceptable revenue risk, particularly in the environment where many customers are better placed to respond to these inefficient price signals by investing in solar PV systems, switching to gas and upgrading to more energy efficient appliances.[3] In this type of pricing environment it is important that DNSPs continue to have significant discretion under the distribution pricing arrangements as to how they recover residual network costs.

A light handed approach will ensure that network prices will be set in a manner that strikes an appropriate balance between economic and non-economic objectives. To adopt a heavy handed economic approach is likely to result in DNSPs pursuing pricing strategies that may contribute to the achievement of the NEO, but may impose unacceptable bill shocks on vulnerable customers if government is not given the opportunity to adjust their Community Service Obligations (CSO) in response to the pursuit of economic pricing reforms.

5.2 The Economics of Network Pricing

In simple terms there are two economic challenges associated with setting network prices. The first challenge is to decide how best to signal the economic cost of network congestion.[4] From an economic perspective, this decision involves the following key considerations:

- Should the same peak price apply to all customers on a given network tariff, regardless of where they are located?
- What charging parameter should be used to convey this signal to customers?
- What time peak period definition should be adopted?
- What level should the peak price be?

The second economic challenge is to decide how best to recover residual network costs from customers. From an economic perspective, this decision involves the following key considerations:

- To what extent can the residual costs be recovered through charging parameters with stable or growing volumes, such as the fixed charge.

[3] The impact of an increased exposure to revenue risk on the pricing decisions of a DNSP will depend on the incentives offered under the control mechanism. For example, the DNSP subject to a WAPC has a strong incentive to mitigate the risks associated with the recovery of residual network costs. The incentive is considerably weaker under the revenue cap.

[4] This assumes that there are no practical constraints (such as insufficient metering functionality) to the application of the concept of LRMC to the setting of peak prices.

- To what extent can these costs be recovered from customers with stable and price inelastic network usage patterns.
- To what extent is it possible to re-assign customers on an inefficient network tariff with declining and elastic network usage patterns to a more efficient tariff where residual costs are recouped through the fixed charge or charging parameters with similar attributes.

In the situation where practical constraints exist (such as insufficient metering functionality) where it is not possible to signal LRMC in a meaningful manner, the economic challenge in relation to setting network prices relates to how best to recover residual network costs from customers.

5.2.1 Long Run Marginal Cost

The concept of Long Run Marginal Cost (LRMC) has a central place in the economic theory of pricing. It is only by setting prices according to marginal cost that consumers will take into account future costs of meeting demand when making consumption and investment decisions. Efficient price signals also provide incentives for optimal investment in the network and its alternatives – demand side responses and distributed generation.

In the short run, when capacity is fixed, marginal costs will be made up of energy losses and the cost of network congestion. At present, congestion costs are incurred by customers in the form of reduced quality of supply and interruptions, rather than through increased prices. In the long run when capacity is variable, the marginal cost is the investment in additional capacity that is required to meet an increase in demand on the network.

In theory, the most efficient tariff structure possible would be a fixed charge to recover residual network costs and a peak charge set at LRMC that applies to network usage only during periods when the network is most likely to be congested. The NSW DNSPs are well placed to provide the AEMC and other stakeholders with an understanding of the economic desirability of this form of congestion given the practical insights gained from undertaking several trials of various forms of dynamic peak tariff.[5]

This research confirmed that residential customers are able to understand complex tariff structures (with effective consultation and education) and were willing to respond to these innovative price signals by reducing their network usage during periods of critical congestion, such as on hot summer days and cold winter evenings. However, the severe revenue risk issues associated with recovering a high proportion of network revenue from a small number of critical peak events and the costs of providing the metering and other infrastructure to support these tariffs suggest that this form of pricing is not appropriate as a network-wide tariff solution.[6] These risks are an inherent shortcoming of this form of congestion pricing and as a consequence cannot be addressed through improvements to tariff design or changes to regulatory arrangements i.e. adoption of a revenue cap. Nevertheless, it was acknowledged at the time that dynamic peak price signals may be a feasible option as part of a limited and localised demand management response where the dynamic peak price can be set to more closely reflect the avoidable costs in a particular network location.

More recently, Ausgrid has begun to research the merits of a dynamic peak rebate as an alternative to dynamic peak pricing. The use of rebates to provide incentives to customers to reduce their demand for capacity during periods of critical network congestion has the potential to achieve network cost savings without the equity concerns associated with dynamic peak price signals. Ausgrid is hopeful that the results of the dynamic peak rebate trial being undertaken as part of the Smart Grid Smart City initiative will shed light on whether customers respond appropriately to rebate incentives and that this response is likely to flow through to the realisation of cost savings, noting the inherent complications of setting the baseline for the dynamic rebate calculation.

It is important to note that while a dynamic rebate may be found to be a feasible alternative to dynamic peak pricing in localised areas of network congestion, it still leaves the issue of how a DNSP should

[5] Including EnergyAustralia 2009, Strategic Pricing Study, August.
[6] It is relevant to note that there is likely to be an economic welfare loss associated with applying the same dynamic peak price signal across all customers in a particular network areas (i.e. postage stamp pricing) given that network congestion patterns are likely to vary across the network.

recover residual network costs from customers in a manner that minimises the distortion to efficient network usage patterns. For DNSPs experiencing minimal network congestion and with the medium term prospect of flat or declining peak demand growth, the recovery of residual costs in an efficient and equitable manner is likely to be a far more important challenge than signalling LRMC to customers.

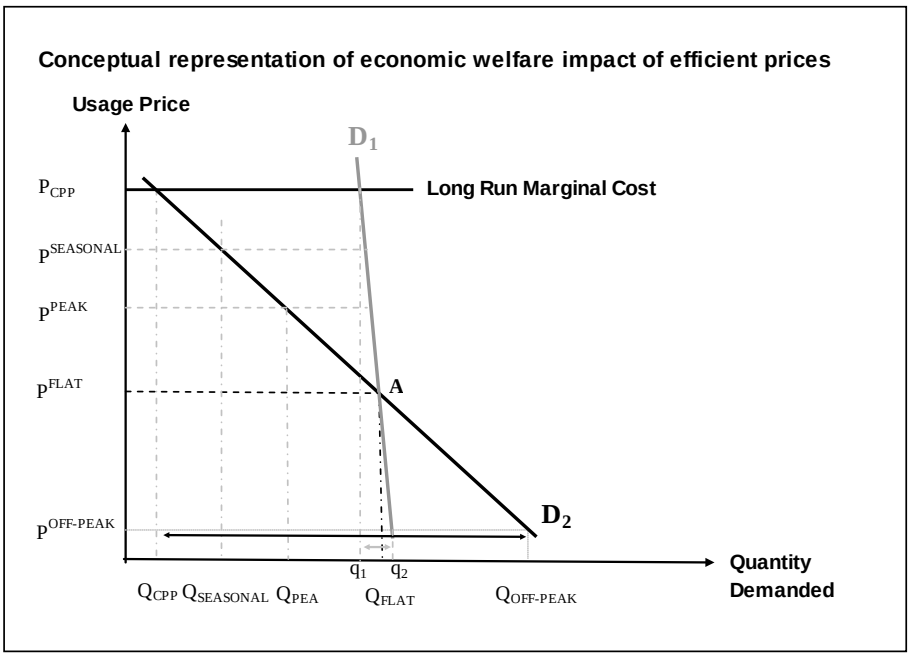
There is a risk that imposing a requirement on DNSPs to set prices on the basis of LRMC will result in a widespread movement away from setting tariffs on a highly averaged basis under a postage stamp approach towards a more localised approach designed to signal local network conditions. While there may be economic benefits to be realised from this fundamental change in network prices, the disaggregation into a large number of location-specific tariffs will not only increase the administrative costs to DNSPs, but will also increase the transaction cost of retailers and customers, particularly given that the variation in economic cost across network area will need to be reflected in the level and structure of the location-specific tariffs. For example, customers in one location may be faced with LRMC-based price signals between 5pm and 8pm on business days only during the winter months, whereas customers in the adjacent region may be faced with LRMC-based prices signals between 1pm and 8pm on business days during the summer months. Customer confusion could also be exacerbated by retailer pricing behaviour.

It is also relevant to point out that while dynamically set localised peak price signals may have theoretical merit from an economic perspective, setting network prices in this manner may be contrary to the key objective of the rule change request of providing customers and retailers with greater price certainty. This is because setting prices on the basis of marginal cost will tend to result in peak prices rising to an exceptionally high level when the network is approaching its constraint and collapsing to a very low level once the network augmentation has occurred due to the existence of spare capacity.

5.2.2 Potential Customer impact of LRMC-based pricing

It is clear that the introduction of a mandatory requirement to set marginal prices on the basis of LRMC has the potential to have a significant (positive/negative) impact on network use of system (NUoS) bill outcomes for many customers. [7]

The NSW DNSPs believe that it is important to have a clear understanding of economic welfare implications associated with imposing efficient prices, as distinct from the equity considerations. To assist the AEMC and other stakeholders understand this distinction, the following conceptual framework has been developed to illustrate the economic welfare implications of different marginal price signals and price elasticity of demand assumptions in the situation of network congestion.



[7] It is relevant to note that an alternative to LRMC-based marginal price signals is to offer targeted rebates to customers for reductions in peak demand for network capacity in congested areas of the electricity distribution network. Ausgrid is currently investigating a dynamic peak rebate as part of its Smart Grid Smart City Initiative.

The above figure shows the extent that network usage changes in response to different price signals under different demand conditions. It is clear from this simple conceptual framework that improvements in the efficiency of the price signal enhance economic welfare (i.e. contribute to the achievement of the NEO) by reducing network usage during time periods when the network is likely to be congested and increasing network usage during time periods when the network is idle i.e. presence of excess capacity. However, the extent of the improvement in economic welfare is dependent upon the following factors:

- The extent of network congestion in the network, which is represented in the above figure as a vertical movement in the LRMC curve.[8]
- The extent that customers respond to the introduction of efficient price signals, which is represented in the above figure as a change in the slope of the demand curve.

Interestingly, there are a range of factors that influence the ability of customers to respond optimally to a change in the level and structure of network tariffs, such as the extent that retailers pass through network tariff structures to end-customers and the extent that end-customers are able to:

- Understand their tariff structure. This could relate to the complexity of the tariff design and the effectiveness of the customer engagement undertaken by the DNSP and retailers.
- Respond to efficient price signals by changing the level and pattern of their network usage in both a short-run and long-run context. This could relate to the customer's circumstance (e.g. tenant Vs owner occupier) or to the availability of well-priced substitutes such as gas and solar PV.[9]
- Avoid the efficient price signal by transferring to a voluntary tariff with a different tariff structure.

The NSW DNSPs believe that there is an economic rationale for amending the distribution pricing principles to include a requirement for DNSPs to engage with retailers and other key external stakeholders on proposed network tariff reforms and to consider the feedback from these stakeholders on the economic merit of the various implementation approaches. This approach recognises that Retailers and end-customers need to have sufficient advance notice to decide how best to respond to the DNSP's long-term tariff reform intentions. The NSW DNSPs believe that the proposed obligation on DNSP to consult on network tariffs should be seen as an additional requirement in the distribution pricing framework. It should not replace the existing principle set out in Section 6.18.5 (2)(ii) of the NER that requires the DNSP to have regard to whether customers are or likely to respond to price signals, which relates to the legitimate economic need to recover residual network costs in a manner that minimises the distortion to efficient network usage patterns.

The NSW DNSPs do not agree with the SCER that there is a risk that the introduction of a requirement for DNSPs to set prices on a LRMC basis will harm economic welfare by encouraging DNSP to recover a higher share of their residual network costs from customers on the flat network tariffs because these customers are less likely to respond and adjust their consumption.[10] This is because it is not in the interests of DNSP to recover sunk costs in this manner in the current environment where these customers have clearly become more responsive to the perverse incentives under flat tariffs to reduce their energy consumption (as opposed to peak demand for network capacity) by investing in efficient appliances, solar PV systems and switching to gas. The only appropriate economic solution in this circumstance is to the recover of residual network costs is through the fixed charge or charging parameters with similar properties.

5.2.3 Residual Cost Recovery

A significant proportion of a DNSP's revenue requirement is made up of the fixed capital costs of previous investments in network assets – so-called sunk costs. Sunk costs are not affected by current

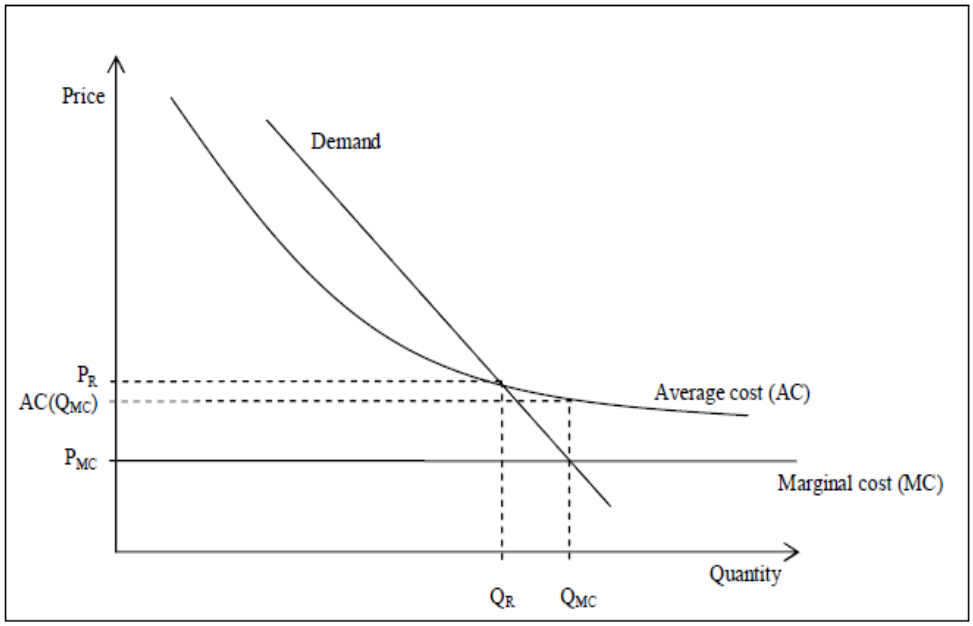
[8] It is important to note that in the situation where there is excess capacity in the network, setting prices efficiently is likely to result in the application of a relatively low peak charge and the recovery of a large proportion of the revenue requirement from the fixed charge (or similar charging parameters). This has the potential to impose material adjustment on low energy users.

[9] It is important to note that some stakeholders believe that offering a plethora of network tariffs is in the long-term interests of all electricity users in spite of the likely impact such an approach has on transaction costs. Refer to Gavin Dufty presentation at AEMC public forum held on 27 November 2013.

[10] AEMC 2013, Information – Proposed Rule Amendment to Distribution Pricing Framework, section 3.3.1, p.15

and future consumption decisions. Therefore, from an economic perspective, sunk costs do not provide a basis for signalling the costs of network use. The relevant costs for this purpose are marginal (forward looking) costs. Interestingly, when there is spare capacity, network marginal costs, and hence efficient usage prices, will be low. Alternatively, as capacity is more fully used efficient usage prices will increase towards LRMC. However, only in rare cases will these fully recover allowed (or required) revenues. This leaves a residual revenue requirement that must be recovered by other means.

The following conceptual representation provides an understanding of the inherent tension between the need for a DNSP to provide efficient price signals by setting prices on the basis of LRMC and the need for a DNSP to recover sufficient revenue to earn a normal return and to fund the efficient provision of distribution network services. Economic welfare is maximised by setting prices on the basis of Marginal Cost (denoted by P_{MC}). At this level of price, customers will consume an efficient level of distribution network service (denoted by Q_{MC}). Unfortunately, the DNSP will not earn sufficient revenue by setting prices in this manner given that at the efficient level of distribution network service supplied (denoted by Q_{MC}) , the DNSP earns a level of revenue (P_{MC} multiplied by Q_{MC}) that is below its efficient cost to supply (AC multiplied by Q_{MC}).



From an economic perspective the DNSP should recover residual revenues in a manner that has the least impact on the current and future level of network use. Thus, residual revenues should be recovered in a manner that, as far as possible, does not influence consumption decisions made by end-customers.

The first option for recovering residual revenues while minimising the effect on network use is the application of Ramsey pricing principles. This is a pricing approach that weights the allocation of residual (non-marginal) costs to customers inversely to their price responsiveness (demand elasticity). The NSW DNSPs do not support this approach because it is based on price discrimination between customers based on the nature of their demand rather than the costs they impose.

The second economic approach[11] is to recover residual costs through charging parameters that have little if any influence on the network usage decisions made by customers. Fixed charges clearly meet this requirement, but tend to be unpopular and are considered by some consumers to be inequitable. It is also possible to design charging parameters to be difficult for customers to avoid. An example of this type of tariff innovation is the use of historical energy consumption by Transmission Network Service Providers (TNSP) as the basis of the non-location and common service charges to DNSPs. This approach is referred to by the AEMC as postage stamp pricing and is prescribed under the transmission pricing principles set out in clause 6A.23.4 (j) of the National Electricity Rules. The NSW DNSPs believe

[11] The capital contribution policy of a DNSP could also be seen as an approach to recovering sunk network costs.

that this is not an appropriate approach to the recovery of residual costs of DNSPs for both economic and equity reasons, as discussed below:

- This approach will result in relatively large energy users bearing a higher share of sunk cost recovery, irrespective of their contribution to network congestion. This is inequitable.
- This approach will convey perverse incentives to customers to minimise their share of sunk cost recovery by reducing their total energy consumption. This is inefficient.

The NSW DNSPs note that traditionally residual costs have been recovered from retailers using complex cost allocation models, similar to the T-Price model used by TNSPs. The objective of these types of models is to equitably allocate the annual revenue requirement to each network tariff using historical network usage patterns and accounting cost concepts. As a consequence, this approach has no basis in economic theory and is likely to result in pricing outcomes contrary to the long-term interests of electricity users. Therefore the AEMC should disregard this approach.

Given that the use of Ramsey pricing and the reliance on fixed charges to recover residual network costs is likely to raise equity concerns, it is clear that DNSPs will have to develop innovative pricing solutions to recover these costs in a manner that achieves an appropriate balance between economic and equity objectives. The NSW DNSPs believe that the achievement of balanced outcomes of this kind is not possible if a heavy handed and prescriptive approach was adopted in the NER. This is because imposing a requirement on DNSPs to price efficiently will inevitably raise equity concerns and stifle, rather than encourage innovation in network pricing. The end-result will be poor outcomes for customers and DNSPs.

5.2.4 Economic Relevance of Transmission Price Signals

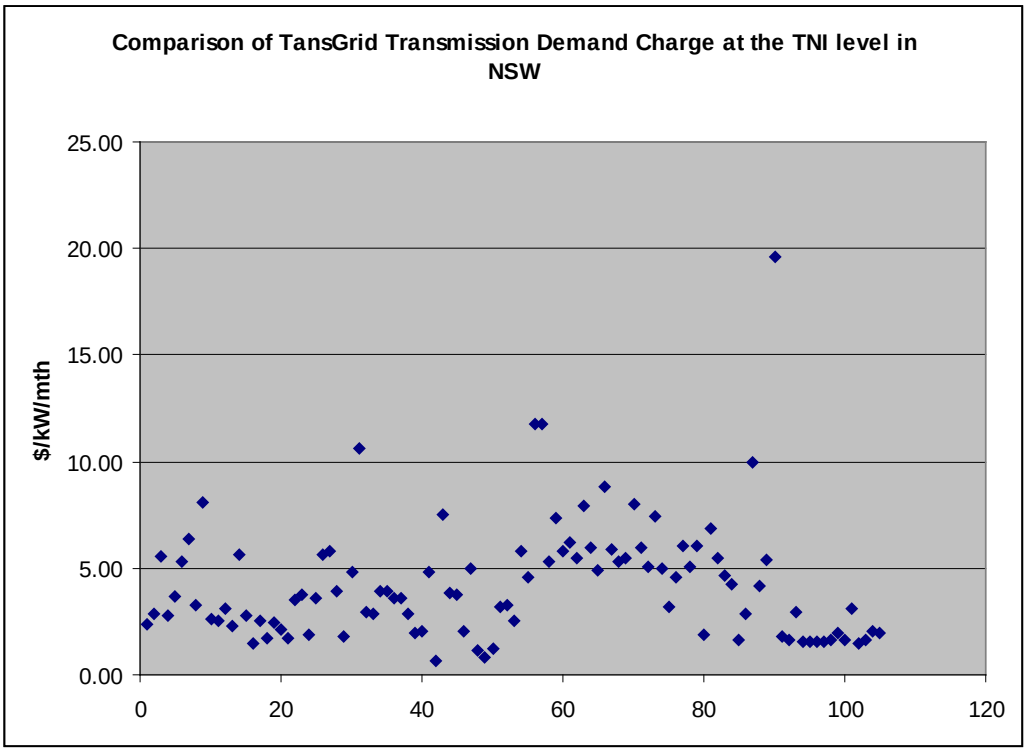
The AEMC noted in their consultation paper that there is no requirement under the current distribution pricing arrangements for DNSPs to set Transmission Use of System (TUoS) prices[12] in an efficient and cost reflective manner. The NSW DNSPs believe that a light handed approach in relation to the setting of TUoS prices is not necessarily a problem from an economic perspective if the economic costs associated with setting TUoS prices more efficiently are reasonably likely to outweigh the economic benefits of doing so.

The NSW DNSPs believe that the economic costs associated with conveying the transmission pricing signal to retailers is likely to be prohibitive for the following key reasons.

- TNSPs set transmission prices at the individual transmission connection point, whereas DNSPs generally set TUoS prices on a “postage stamp” basis at the National Metering Identifier (NMI) level.[13]
- DSNPs cannot convey a demand price signal to the majority of the residential and small business customers as the majority of these sites only have a basic (accumulation) metering installed in their premise.

It is clear both of these factors would result in significant transaction costs being imposed on the DNSP, retailers and end-customers. The economic benefits of preserving the TNSP price signal are not likely to be significant, particularly given that the TUoS component accounts for a relatively minor share of the overall NUOS level for the majority of residential and small business customers. It is also reasonable to believe that the potential economic benefit from reforming TUoS tariffs in this manner will be immaterial given that only a few transmission connection points have a maximum demand charge in excess of $10 per kW per month, see figure below:

[12] Please note that TUoS prices are referred in clause 6.18.7 in Chapter 6 of the NER as designated pricing proposal charges.
[13] The only exception are the site-specific individually calculated network tariffs for sites with consumption above 40 GWh pa or maximum demand above 10MW.



5.2.5 Economic Relevance of Tariff Class Concept

The concept of a tariff class plays an important role under the current distribution pricing arrangements in the following respects:

- Demonstrating the extent that the DNSP proposed prices are fee of economic cross subsidy i.e. lie between avoidable and standalone cost;
- Demonstrating that the DNSP's proposed prices comply the side constraint;
- Calculation of Long Run Marginal Cost; and
- The procedures for assigning customers to one or more tariff classes and the transaction costs associated with the annual review process.

There is no evidence to suggest that the current approach to tariff classes in the NER has resulted in outcomes that are contrary to the long-term interests of electricity users. Currently DNSPs have given DNSPs the discretion to assigned customers to tariff classes using a variety of criteria, such as voltage level, customer type and tariff structure. The absence of a need to amend the pricing principles in this regard is highlighted by the AEMC indicating that current practice could be considered to be economic efficient because they all represent groups of customers that generally impose similar costs on the network on average across the tariff class.[14]

5.2.6 Economic Relevance of the Side Constraint Mechanism

The side constraint mechanism set out in the NER plays an important role in the price setting function by placing a limit on the extent that the DNSP can re-balance its DUOS tariffs across tariff classes in a single year. The NSW DNSPs believe that this tariff re-balancing constraint on the pricing is justified on economic grounds given that large step changes in network tariffs are not in the long-term interest of electricity users because they undermine the confidence of customers in the regulatory arrangements and undermine the realisation of efficient outcomes by not providing customers with sufficient notice to optimally respond to these price changes.

It is important that the AEMC consider economic relationships between side constraints, tariff reform and customer impact. Imposing more restrictive the side constraints, particularly under a heavy handed and

[14] AEMC 2013, Information – Proposed Rule Amendment to Distribution Pricing Framework, p.70.

prescriptive regulatory framework has the potential to undermine the long-term interests of consumers by stifling tariff reform and innovation. A lack of tariff reform, particularly in the current uncertain energy consumption environment is likely to expose customers to an unacceptable level of price volatility in the case of DNSPs subject to a revenue cap and unfairly constrain the ability of DNSPs under a Weighted Average Price Cap (WAPC) from mitigating their exposure to volume risk.

6.0 Proposed Amendments to the Distribution Pricing Framework

6.1 Overview

The SCER rule change request proposes a number of changes to the distribution pricing principles in the NER in relation to how the DNSP should set their network prices from an economic perspective. These changes have been proposed because of concerns that the significant discretion that DNSPs currently have in setting their network tariffs, and insufficient guidance that the NER provide about the interpretation and application of the economic principles, have resulted in DNSPs not setting network tariffs in accordance with economic theory.

The NSW DNSPs urge the AEMC to adopt a cautious approach to assessing the various elements to the rule change request. There is a considerable risk that amending the distribution pricing arrangements that are fundamentally sound from an economic perspective to cater for current concerns may undermine the long-term interests of all stakeholders. To mitigate this risk, the AEMC should only amend the NER where there is conclusive evidence that an existing provision has caused material economic harm and where it can be demonstrated that the proposed solution is likely to address this issue in an economically desirable manner and at minimal risk of unintended consequences.

6.2 The Underlying Rationale for the Current Pricing Principles

The current distribution pricing arrangements in the NER were developed with a clear recognition that the pricing principles contribute to the achievement of the NEO by reducing the loss of economic welfare associated with DNSPs exercising their market power through their pricing decisions. It was also recognised that these arrangements should seek to balance the costs imposed on the Regulators and DNSPs with benefits to be gained from limiting the potential allocative efficiency losses arising through DNSPs taking advantage of their market power. Given that prices are set within the overall constraint imposed by the form of control mechanism, it is clear that the DNSP has little scope to exploit their market power through the setting of prices. This is the economic rationale for providing DNSPs with some discretion over the extent that economic objectives influence the setting of network prices.

It is also important that the AEMC recognises that this discretion also enables DNSPs to set their network prices to achieve an appropriate balance between economic and non-economic objectives. This is a critically important point given that DNSPs provide an essential service to the community. It is also relevant to the AEMC assessment of the rule change request to note that the essential nature of distribution services means that government plays an important role in ensuring that improvements to the efficiency of network tariffs does not undermine social welfare objectives through their decisions on the level and scope of Community Service Obligations(CSO) rebates.

The current distribution pricing framework enables DNSPs to achieve a balanced pricing outcome by providing DNSPs with the discretion to:

- Improve the economic efficiency of price signals where interval metering exists in a manner that does not unduly undermine the achievement of the DNSP's non-economic pricing objectives; and
- Recover residual network costs in a manner that minimises the distortion to customer usage decisions without compromising the achievement of the DNSP's non-economic pricing objectives.

The NSW DNSPs are concerned that there is a risk that changing the distribution pricing principles to restrict the ability of DNSPs to balance potentially conflicting objectives will have unintended consequences and potentially undermine the achievement of the NEO. It is evident from the consultation paper that the AEMC is also concerned that jurisdictional instruments and requirements could imposing conflicting obligations on DNSPs.[15]

[15] AEMC 2013, Information – Proposed Rule Amendment to Distribution Pricing Framework, December, p.66

6.3 PROPOSAL TO REQUIRE PRICES TO BE SET ON BASIS OF LRMC

SCER has proposed to amend the pricing principles in the NER to require that DNSPs develop their network tariffs on the basis of LRMC, rather than just being required to take LRMC into account. Specifically, SCER have proposed that DNSPs set network prices with regard to the following principles:

- Additional costs associated with demand at times of greatest network utilisation;
- The extent to which the LRMC of providing network services can vary by location; and
- Network price should be based on drivers of network costs to the maximum extent possible.

SCER believe that the discretion provided to DNSPs in this regard and the lack of guidance that the NER provides about the interpretation and application of the economic principles, have resulted in DNSPs not setting network tariffs in a way that reflects LRMC.[16] SCER believe that the current light handed approach in the NER has failed to produce pricing behaviour consistent with the NEO. The AEMC in its consultation paper has indicated that the current approach was based on a misconceived assumption that DNSPs under a WAPC are incentivised to set prices efficiently. The NSW DNSPs do not support this assertion[17] and are concerned that this rule change request has not been based on a sound empirical analysis of the economic welfare implications of current network pricing practices and in the absence of a clear understanding of the counter-factual i.e. what pricing practices should have been pursued by DNSPs given the pricing environment that they face. The rule change also does not address the important issue of how best to provide incentives to DNSPs to pursue innovative pricing solutions or at a more fundamental level how best to address the well documented perverse pricing incentives under a revenue cap.

The NSW DNSPs agree with SCER and the AEMC that setting prices to reflect LRMC has strong appeal from a theoretical economic perspective, but are concerned that this concept is not being considered appropriately from a practical perspective. LRMC is more easily estimated and applied to the setting of prices for natural monopolists with exceptionally lumpy capital investment profiles, such as in bulk water provision. In the case of electricity distribution sector, the localised pattern of network congestion makes it more difficult to reliably estimate and apply LRMC concepts. As a consequence there is a tendency for DNSPs to favour calculation methodologies that more closely resemble average cost, rather than marginal cost. The NSW DNSPs believe that it is appropriate in this situation to continue to provide DNSPs with the discretion to choose the LRMC methodology that is appropriate given their individual circumstances.

It is important that the AEMC considers this aspect to the rule change request with the following points in mind:

- The rules should recognise that the pricing function of DNSPs is broader than economic principles in the NER;
- The concept of LRMC is only relevant from a distribution pricing perspective where interval meters exist and the network expects peak demand to grow over the medium to long term;
- It is important to consider the LRMC-based pricing and localised demand side management initiatives as complements, rather than substitutes;
- The adoption of an efficient peak period definition is just as important as set the peak price on the basis of a reliable estimate of LRMC; and
- A requirement to set prices on the basis of LRMC is likely to increase uncertainty and complexity for customers.

In summary, the NSW DNSPs believe that the current discretion provided to DNSPs in regard to setting prices reflective of LRMC is appropriate given that it is in the broader interests of the community to continue to provide DNSPs with the discretion to set the prices for an essential service in a manner that

[16] The NSW DNSPs note that SCER have not provided any evidence that current pricing practices are economically inefficient in light of the practical, regulatory and political constraints imposed on DNSP.
[17] Please refer to NSW DNSP Response to AER Framework and Approach- NSW DNSPs – 2014-19 Regulatory Control Period Stage 1 Consultation Paper, November, 2013.

appropriately balances economic and non-economic objectives to meet the needs and expectations of the community. There are also sound economic reasons for DNSPs to continue to have a considerable degree of discretion as to how they estimate and apply LRMC in their pricing decisions given that the optimal approach is likely to vary according to the circumstances of the DNSP. Nevertheless the NSW DNSPs believe that the AER can play a more proactive approach under the existing pricing framework to assist DNSPs to exercise this discretion in the most efficient manner possible.

6.4 PROPOSAL TO AMEND THE REQUIREMENT TO HAVE REGARD TO CUSTOMER PRICE RESPONSIVENESS

The existing pricing principles require that DNSPs are to have regard to whether consumers are able or likely to respond to network price signals. In spite of the rigorous economic relevance of this principle (see chapter 5), SCER is concerned that this principle may result in DNSPs pursuing inappropriate pricing strategies such as the shifting of cost recovery onto customers with flat network tariffs as these customers are less likely to respond and adjust their behaviour.[18] The NSW DNSPs no not agree with SCER on this point. DNSPs do not have the incentive to increase the share of residual network costs recovered from customers on flat network tariffs in an environment where the DNSP's ability to increase fixed charges is constrained by factors that lie outside the regulatory framework. In this circumstance, the DNSP would be required to recover these additional costs through the energy charge parameters of the flat tariff structure. This is an undesirable strategy for a DNSP because the perverse incentives conveyed to customers under these tariff structures expose the DNSP to a significant economic profit risk, as explained in more detail below:

- *Significant marginal revenue effect*: The risk of under-recovering revenues as a consequence of customers responding to the perverse incentives provided under these tariffs by reducing their energy consumption, such as through the uptake of solar PV systems and more efficient appliances; and

- *No appreciable impact on marginal cost:* The risk that the reduction in energy consumption will not result in a commensurate reduction in network costs as customers on these blunt energy-based tariffs have no incentive to limit their use of air conditioners during periods of critical network congestion.

SCER has required the AEMC to consider two economic approaches to the recovery of residual network costs. The NSW DNSPs have equity concerns about the first approach (Ramsey pricing) because it is based on price discrimination between customers based on the nature of their demand, rather than the costs that they impose. As discussed in Chapter 5, the NSW DNSPs have interpreted the second approach (postage stamp pricing) to mean that the DNSP recovers residual network costs through charging parameters that have little if any influence on the network usage decisions of customers. It is important to note that as with Ramsey pricing, this approach has the potential to raise equity concerns given that fixed charges tend to be unpopular and are considered by some customers to be inequitable because they are difficult to avoid.

It is important for the AEMC to understand that there are a broad range of additional pricing strategies that a DNSP could pursue in practice to recover residual network costs in an economically efficient manner. The unprecedented uncertainty in the energy consumption has forced many DNSPs under a WAPC to explore innovative ways to recover these costs without having to rely on fixed charges. [19] To assist the AEMC and other stakeholders to broaden their understanding of this issue from a practical perspective, please consider the following examples:

- Reforming the basis of a charging parameter to reduce the responsiveness of customers to changes in the price level;
- Transferring customers from a blunt tariff to a more cost reflective tariff, where residual cost is recovered more appropriately; and

[18] AEMC 2013. Information – Proposed Rule Amendment to Distribution Pricing Framework, section 3.3.1, p.15

[19] Please note that TNSPs under a revenue cap typically allocate residual network costs to charging parameters based on network usage. There are serious flaws with this mechanistic approach from an economic perspective.

- Reforming the structure of network tariffs to enable residual network costs to be recovered from charging parameters with stable and inelastic network usage patterns.

It is clear that the DNSPs pursuing innovative pricing strategies to recover residual network costs at least distortion to network usage patterns makes an important contribution to the NEO and should be encouraged under the distribution pricing framework given that the alternative approaches are likely to raise considerable equity concerns in the community.

In summary, the NSW DNSPs believe that there is no economic rationale for amending this pricing principle. Given that there are a number of approaches available to DNSPs to recoup these costs in a manner consistent with economic principles, the NSW DNSPs believe that it is not the long-term interest of electricity users for the rules to limit the discretion of the DNSP in regard to how these costs should be recouped from customers. This is a critically important point given the current uncertainty in the volume environment. While a heavy handed and prescriptive approach in this regard could severely limit the ability of DNSPs to manage their exposure to volume risk. The party that bears the consequence of a failure to mitigate volume risk will depend on the control mechanism applying to the DNSP. In the case of DSNPs subject to a revenue cap, it is clearly in the long-term interests of electricity users to adopt a light handed approach in this area of the NER. To do otherwise in the current uncertain volume environment will expose customers to the risk that unanticipated movements in volumes will result in unacceptable price path uncertainty. A key challenge for the AEMC is how to encourage DNSPs to explore innovative tariff reforms in this area.

6.5 THE PROPOSAL TO ADD A NEW PRINCIPLE THAT REQUIRES DNSPS TO TAKE ACCOUNT OF CUSTOMER IMPACTS

The NSW DNSPs agree in principle to this aspect of the rule change request given that there is a clear economic rationale for DNSPs to engage with customers, retailers and other stakeholders on their network tariff structures. The NSW DNSPs support the notion that this engagement should be based on a document that provides information on the DNSP's proposed tariff strategy for the next regulatory control period. The NSW DNSP also support the notion of the annual pricing process being brought forward to provide retailers and other stakeholders with earlier notification of approved network tariffs. However, the NSW DNSPs do not agree with SCER that the existing pricing principle be removed from the NER, as discussed in the above section.

The NSW DNSPs note that the Pricing Structures Statement (PSS) will play a key role in the pricing framework proposed by SCER and the intent of this document is to:

- Assist consumers and other stakeholders to respond effectively to changing network tariff structures and pricing levels over the coming determination period by providing information on tariff classes, tariff structures and charging parameters;
- Support the development of flexible network tariffs that can be passes through to consumers in retail tariffs;
- Provide transparency and allow scrutiny (in particular by the AER) that pricing principles
- Inform the subsequent annual network tariff publication processes.[20]

The NSW DNSPs believe that there is a considerable risk that the PSS will not meet its objectives under the SCER proposal. This is because the PSS is trying to achieve two conflicting objectives. To be effective from a consultation perspective, it is important the PSS provide relevant and easy to understand information to retailers and other stakeholders. To be effective from a regulatory compliance perspective, the PSS would need to discuss complex economic concepts and provide technical analysis to demonstrate compliance with the NER. It is difficult to see how a single document can deliver both of these outcomes. If the key purpose of the PSS is to facilitate effective consultation between DNSPs and their stakeholders on network tariff strategy, the requirements on DNSP in relation to the PSS in the new pricing framework should reflect this purpose. The complex economic and regulatory information should be confined to the annual pricing proposal.

[20] AEMC 2013, Information – Proposed Rule Amendment to Distribution Pricing Framework, December, p.12

A number of important issues are raised in the AEMC consultation paper in the relation to the content of the PSS and the role that the PSS should play in the distribution pricing framework. The key issues relating to the PSS are summarised below:

- What level of information should be provided in the PSS i.e. tariff structure or price levels?
- Whether the DNSP should be allowed to vary the PSS. Should it be varied outside the annual pricing process?
- The extent that DNSP should be bound to the information in the PSS during the regulatory control period. Should the PSS be indicative?
- Should the DNSPs be required to consult with stakeholders before submitting their PSS to the AER for approval through the regulatory determination process?
- What role should the AER play in the consultation process?
- What happens if the AER finds a PSS non-compliant with the NER?
- How should DNSPs be incentivised to comply with their approved PSS in their annual pricing proposals?

The NSW DNSPs position of each of these issues is discussed below:

(i) Information requirements of the PSS

SCER have indicated that to achieve its intent the PSS could include, for example, the following detailed information:

- How DNSPs have met the pricing principles;
- A breakdown of the network tariff structures that the DNSP proposes to apply;
- Expected take up of network tariff structures and allocation of revenue across network tariff structures (which may be based on historical usage);
- Changes in network tariff structures over the course of the regulatory control period including;
    - the introduction of new network tariffs, retirement of old network tariffs; and
    - an indication as to whether each individual network tariff component would increase by more, less, or about the same as the average change over the regulatory control period;
- Expected changes in network charges over the course of the regulatory period[21];
- Expected customer impacts by class;
- How customer consultation, jurisdictional policies and practical constraints (or other relevant provisions in the NER) have shaped proposed network structures;
- How residual costs will be recovered; and
- Expected risks and volatility.[22]

The SCER proposal is based on the notion that the PSS can effectively achieve two purposes – stakeholder engagement on the development of network tariffs and to enable the AER to have more scrutiny over the network pricing decisions of DNSPs. The NSW DNSPs believe that a single document cannot achieve these two objectives. If the key objective of the PSS is to facilitate stakeholder engagement, DNSPs should be required to provide information in the PSS that is relevant and easy to understand for Retailers and other key stakeholders. Complex discussions and analysis concerning whether the DNSP's proposed pricing approaches comply with the economic principles under the NER play no meaningful role in a consultation document and may undermine this process.

(ii) Scope to vary the PSS during the course of the regulatory control period

[21] Note that under SCER's proposals, the statement of expected price trends would also be required to be included in the PSS.
[22] SCER, 2013, Rule Change Request, Reform to Distribution Pricing Arrangements under the NER, December, p.8

There is considerable discussion in the AEMC consultation paper on the extent that it is in the long-term interests of electricity users to allow DNSPs to vary the PSS during the course of regulatory control period. The AEMC notes that the effectiveness of the PSS to achieve its stated objectives will depend on the frequency with it can be updated and the extent that DNSPs are bound by the PSS in the regulatory control period.

The NSW DNSPs believe that this issue is best resolved by considering the PSS in the context of its primary purpose as a consultation document. On this basis it would appear reasonable for DNSP to provide stakeholders at the beginning of the regulatory control period with the DNSP's long-term vision and a clear understanding of the strategies and tactics that the DNSP expects to pursue to realise this vision. It also appears reasonable to require DNSPs to undertake additional consultation during the regulatory control period if unanticipated developments forced a material change in strategic direction. The NSW DNSPs are strongly opposed to the notion that the forecast information on the level of prices in PSS should be binding on DNSPs during the regulatory control period. This information should be indicative.

(iii) Approval of the PSS

The AEMC suggest the approval process for the PSS would involve the AER assessing whether the PSS complies with the pricing principles in the NER. This would in effect link the PSS and the annual pricing proposal given that both documents must comply with the pricing principles. The AEMC claims that this will result in more efficient network tariffs and simplify the annual network pricing process. The NSW DNSPs do not agree with the AEMC on this point. There is no conceivable reason to believe that linking the PSS and the annual pricing proposal will result in DNSPs undertaking more tariff reform than otherwise. On the contrary there is a considerable risk that these proposed changes to the pricing framework may stifle tariff reform by increasing the complexity and transactions costs associated with the pricing process. The NSW DNSPs are also concerned that the changes to the pricing arrangements proposed by SCER appear not to address the lack of incentives for DNSPs under a revenue cap to set prices efficiently, which may reflect a misguided view that the revenue cap does not inherent shortcomings in the area.

Furthermore, the option of having the AER assess whether the PSS complies with the NER has the potential to create confusion for DNSPs and their customers and expose the AER to the considerable risk of playing a highly intrusive role in the pricing function in the event of non-compliance. These concerns were highlighted by the AEMC in their discussion on the issues associated with the situation where the AER found the PSS to not be compliant with the pricing principles.[23]

The NSW DNSPs believe that these concerns are most appropriately addressed by not requiring the AER to approve the PSS. By removing the requirement to approve the PSS, the focus of AEMC should be on encouraging and fostering the current consultation efforts by DNSPs, such as Ergon, the NSW DNSPs and SA Power. It would be beneficial to provide DNSPs with a clear understanding of what is expected of them in this area. This issue would be most efficiently and effectively addressed through a guideline, rather than unnecessary prescription in the NER.

(iv) The default arrangements

SCER have proposed a process for dealing with the situation where the AER finds the PSS to be non-compliant with the NER. This proposed process is similar to the current process for the regulatory proposal in the revenue determination process. The NSW DNSPs note that it is critical that appropriate default arrangements are in place to address the situation where the AER does not approve the PSS at the final decision stage. The solution to this issue is to provide positive incentives for DNSPs to submit a compliant PSS on a timely basis and for the AER to support the DNSPs to achieve this outcome by providing clear guidance on what is expected from a compliance perspective. The imposition of financial penalties is a last resort and be commensurate with the economic harm caused by non-compliance.

[23] AEMC 2013, Information – Proposed Rule Amendment to Distribution Pricing Framework, December, p.42

6.6 THE PROPOSAL TO AMEND THE RESIDUAL NETWORK COST REVOVERY PRINCIPLE IN THE NER

The AEMC recognise the economic rationale underlying the existing principle relating to the need for DNSPs to recover residual network costs in a manner that causes the least distortion possible to efficient network usage patterns, as discussed in detail in Chapter 5. The NSW DNSPs are concerned that the SCER proposal will lead to the adoption of a prescriptive approach under the NER to the recovery of these costs, as per the transmission pricing framework. While it is clear that the two approaches indentified by SCER have merit from an economic perspective, the reliance on these approaches to recover residual network costs is likely to raise considerable objections from customers on equity grounds. The NSW DNSPs believe that there is considerable merit in the AEMC exploring some of the innovative tariff strategies pursued by DNSPs subject to a WAPC to recover these costs in a manner that balances their commercial, economic and equity objectives.

The NSW DNSPs believe that it is not in the long-term interests of electricity users to amend the distribution pricing framework in relation to this issue. It is critical that DNSPs continue to have the discretion under the NER to recover residual network costs in a manner that strikes an appropriate balance between the economic and equity objectives. It would also be beneficial for the DNSPs subject to a revenue cap to be given the incentive to pursue innovative tariff strategies in this area, particularly given the long-term prospect of declining energy consumption.

6.7 THE PROPOSAL TO REQUIRE DNSPS TO CONSTITUTE TARIFF CLASSES ON AN ECONOMIC BASIS

The current distribution pricing framework provides DNSPs with considerable discretion over how they constitute tariff classes. SCER believes that it is in the long-term interests of electricity users to provide DNSPs with greater clarity and certainty on how DNSPs should constitute their tariff classes on an economic basis. The AEMC should adopt a considered approach to assessing this aspect to the SCER rule change request given that a poorly conceived change in this area of the NER will have broader consequences for the operation of the side constraint mechanism and the reliable estimation of LRMC, avoidable cost, standalone cost, as discussed in chapter 5 and below.

The NSW DNSPs believe that there is no evidence that the current provision in the NER has resulted in outcomes that are contrary to the long-term interests of electricity users. This is confirmed by the observation made by the AEMC that current practice could be considered to be economic efficient because they all represent groups of customers that generally impose similar costs on the network on average across the tariff class.[24] In light of the broader implications of a change in this area of the NER and the absence of economic harm to date, the NSW DNSPs believe that the AEMC should not amend the existing provisions in the NER relating to tariff classes.

6.8 THE PROPOSAL TO AMEND THE SIDE CONSTRAINT PROVISIONS IN THE NER

The SCER rule change request also raises several concerns relating to the current side constraint provision in the NER, as summarised below:

- Extending the application of existing side constraints so they apply across regulatory control periods; and
- Removing the clause that states that the side constraints provisions do not limit tariff variations referable to time or other circumstances of a customer's usage for customers with remotely read time-based interval metering technology.

The NSW DNSPs believe that it is important that the AEMC consider these amendments with a clear understanding of economic rationale of the side constraint provisions in the NER, as discussed in Chapter 5. It is unclear that imposing more restrictive side constraint provisions will deliver superior economic outcomes for customers. However, it is certain to have detrimental impacts of the long-term interests of consumers by stifling tariff reform and innovation. In the case of DNSPs subject to a revenue cap, restrictive side constraints may undermine the long-term interest of users by preventing DNSPs

[24] AEMC 2013, Information – Proposed Rule Amendment to Distribution Pricing Framework, p.70.

from re-balancing their tariffs to extent necessary to deliver stable revenue outcomes in a declining energy consumption environment.

The NSW DNSP's believe that it is not necessary to amend the side constraint provisions in the NER, particularly given the likelihood that DNSPs will be required to undertake more customer engagement on their network pricing intentions.

6.9 OTHER PROPOSED AMENDMENTS TO PRICING PRINCIPLES

SCER has also proposed three additional pricing principles relating to a requirement to comply with jurisdictional requirements, taking into account the impact of (cost reflective) network tariffs on consumers and a minor amendment regarding the need to take into account transaction costs. The NSW DNSPs position on each of these additional pricing principles is provided below.

The proposed requirement to take into account the impact of cost reflective network tariffs on consumers is an important change to the distribution pricing framework. While it is clear that the introduction of a mandatory requirement to set marginal prices on the basis of LRMC has the potential to have a significant (positive/negative) impact on the NUoS bill outcomes for many customers. The NSW DNSPs believe that it is important that this aspect of the SCER rule change request is considered within a robust economic framework, as required by the NEO. To assist the AEMC and other stakeholders in this regard the NSW DNSPs have provided an explanation of the economic welfare implications associated with imposing efficient prices in Chapter 5. While there is some economic merit in adding this principle to the NER, it is important that any changes in this area do not have the unintended consequence of stifling tariff reform and innovation, which would clearly not be consistent with the long-term interest of electricity users.

The NSW DNSPs believe that the adoption of a heavy handed and prescriptive approach to distribution pricing under the NER has the potential to raise equity concerns. It is important that the DNSPs are provided with regulatory certainty and compliance risks are minimised under the proposed distribution pricing arrangements in situations where conflicts are likely to exist between economic and jurisdictional obligations.

The NSW DNSPs have no major concerns with the proposal to recognise in the pricing principles the economic role played by transaction costs associated with implementing more cost reflective network tariffs.

7.0 Glossary

AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AIC	Average Incremental Cost
CPI	Consumer Price Index
CPP	Critical Peak Price
DNSPs	Distribution Network Service Providers
DPP	Dynamic Peak Pricing (see CPP)
IPART	Independent Pricing and Regulatory Tribunal
kVA	Kilovolt-ampere
KW	Kilowatt
KWh	Kilowatt hour
LRMC	Long Run Marginal Cost
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Energy Rules
PSS	Pricing Structures Statement
PV	Photovoltaic
rules	See NER
SCER	Standing Council on Energy and Resources
TUOS	Transmission Use of System
TNSPs	Transmission Network Service Providers

8.0 Attachment

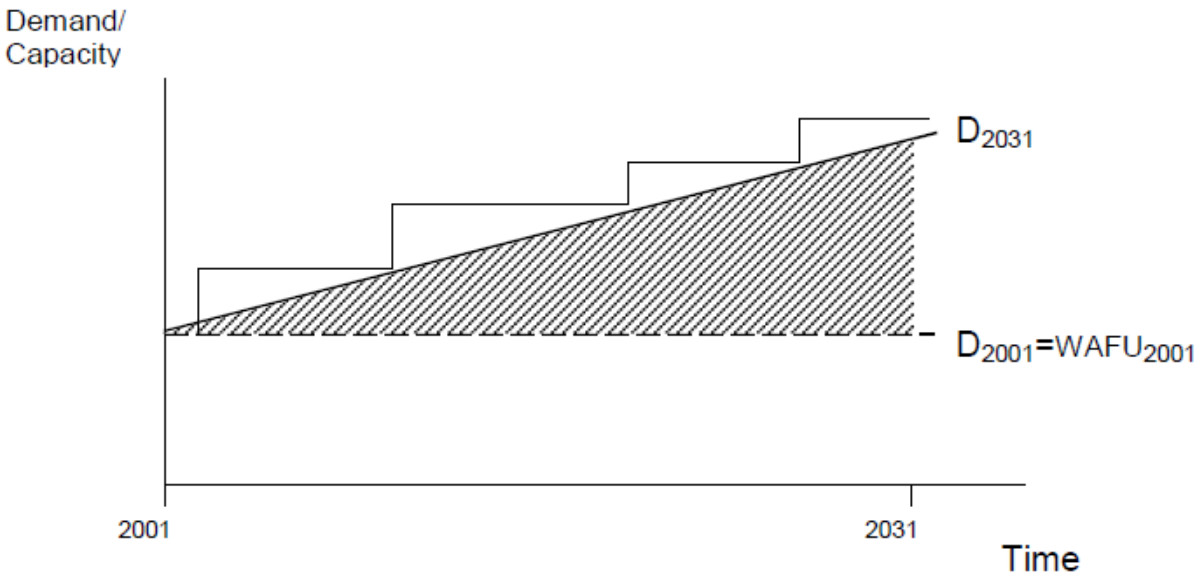
To assist the AEMC, the NSW DNSPs undertook a brief review of the methodologies used to estimate marginal cost estimation in the context of a natural monopolist. The key results of this review are summarised below.

8.1 Long Run Average Incremental Cost Method (LRAIC)

The long run average incremental cost approach considers the following issues:

- assesses the resource position over a suitable long-term period;
- forecasts 'unconstrained' demand over the same period;
- optimises the various strategies available to generate the least cost solution to addressing supply/demand imbalances; and
- estimates LRMC as the present value (PV) of the expected extra costs of the optimal strategy divided by the PV of the changes in the supply/demand balance in terms of additional quantity supplied and/or saved through additional demand management options.

The following figure illustrates the LRAIC approach.



8.2 Turvey Approach

This approach has been associated with the work of Professor Ralph Turvey.[25] Turvey recommends that an appropriate estimate of LRMC may be derived by considering the impact on future costs of both an increment and a decrement on the central demand forecast and taking the mean of the two results. This approach considers the change in forecast future system costs arising from a permanent increment or decrement in the forecast pattern of future demand. This approach is therefore more explicitly concerned with decision making at the 'margin'.

This approach may also be difficult to use when demand is forecast to be flat. In these circumstances the unit costs of the last block of leakage reduction may provide a good indicator of LRMC. The other important feature of this approach is that there is no requirement to categorise future costs . Under this approach the calculation is based on consideration of forecast changes in expected total system costs

[25] Turvey, R. (2000), *What are marginal costs and how to estimate them,* Technical Paper 13, Centre for the Study of Regulated Industries, University of Bath.

(such as including future costs associated with implementing known legal obligations, for example quality improvements or the free meter option). However, estimates may be sensitive to the size of increments or decrements modelled, and in using this approach it is important to analyse this degree of sensitivity.

8.3 Other calculation methodologies)

A selection of alternative marginal cost methodologies commonly used by utility companies is discussed below.

8.3.1 Discounted Total Investment Method (DTIM)

The DTIM method computes a marginal cost for new capital investment by dividing the net present value of the total investment over the planning period under review by the present value of the load growth. The resulting unit marginal cost ratio is annualised using a Real Economic Carrying Cost Factor (RECC) factor.

The rationale for discounting both the numerator and denominator is to normalise all investments and loads to a single time period. The intuitive reason for this is that the discounted load accurately represents a constant price that, if paid for the increased load as it occurs, would exactly match the present value of the investment stream.

The formula is outlined below:

$$MC_{DTIM} = RECC \times \frac{\sum_{t=1}^{N} \frac{I_t}{(1+r)^t}}{\sum_{t=1}^{N} \frac{L_t}{(1+r)^t}}$$

where

It = capital investment in year *t*

Lt = additional load in year *t*

r = discount rate or WACC

N = number of years in the planning horizon

RECC = real economic carrying cost

8.3.2 RECC

A RECC factor, when applied to a capital investment, produces the first year revenue requirement of a series of annual capital charges that remains constant in real terms over the life of the asset. The RECC factor is a function of the authorised rate of return (WACC), inflation, salvage value, book life, and tax rates. The RECC factor could take into account tax rates through incorporating post-tax WACC rates.
Some distribution businesses develop a standard set of RECC factors for various investment categories.[26]

8.3.3 Capital Recovery Factor

A concept closely tied to the RECC is the capital recovery factor (CRF). The CRF is another method of levelising a stream of future payments to an annualised real cost.
In general, the CRF is calculated by the following formulae:

[26] Commission for Energy Regulation (CER) and NERA, (July 2004), *Marginal Cost of Electricity Service Study*, CER www.nera.co.uk

CRF = $\frac{r(1+r)^N}{(1+r)^N - 1}$ or $\frac{r}{\left(1-(1+r)^{-N}\right)}$

Where

R = the discount rate (i.e. the WACC)

N = the useful life of the investment

The CRF is equal to the standard annuity formulae in finance. Capital investment is converted to a constant annual stream sufficient to recover the initial investment over the useful life of the project in NPV terms.

The RECC is approximately equal to the CRF in which the real discount rate (r – i) is substituted for the nominal discount rate of the CRF formulae.

Where there is a stream of capital investments over a period of time in the planning horizon, it is a reasonable approximation feasible to apply CRF factors to the cumulative capital investment in each year in order to annualise the impact of incremental capital expenditure. Technically, the formulae will need to be adjusted where the number of periods in the planning horizon under study is greater than the assumed asset life of the initial period's investment (as the capital costs will have been fully recovered in NPV terms). However, in electricity distribution marginal cost studies, the average asset lives are longer than planning information on investments. Furthermore, where the planning horizon is long and the discount rate is high, out-year values have minimal impact on results.

8.4 Total Investment Method

Another variant of the DTIM method is the Total Investment method (TIM), which is computed by the following formula.

$$MC_{DTIM} = RECC \times \frac{\sum_{t=1}^{N} I_t}{\sum_{t=1}^{N} L_t}$$

It is essentially the same as the DTIM method without discounting total investment and load growth. This method is not useful over a long planning horizon and should not be used by EnergyAustralia Network.

8.5 Present Worth Method (PW)

The PW method estimates marginal costs as the opportunity costs of planned capital expenditures from a permanent increase in load. This cost is reflected in the savings associated with the deferral value of shifting the system expansion plan cost stream into the future. The PW method yields an MC estimate that varies over time, reflecting greater marginal costs when investment is imminent.

The PW formulae is:

$$MC_{PW} = CRF \times \frac{\sum_{t=1}^{N} \frac{I_t}{(1+r)^t} - \sum_{t=1}^{N} \frac{I_t}{(1+r)^{t+\Delta t}}}{\Delta L} = \frac{\sum_{t=1}^{N} \frac{I_t}{(1+r)^t}\left[1-\left(\frac{1}{1+r}\right)^{\Delta t}\right]}{\Delta L}$$

where

It = capital investment in year *t*

Δt = incremental change in peak load divided by the estimated annual change in peak load

ΔL = incremental change in peak load

r = discount rate

N = number of years in the planning horizon

CRF = capital recovery factor

The PW numerator is sometimes presented with a distribution cost inflation index DCI and the actual cost of capital or interest rate such that

$$MC_{PW} = CRF \times \frac{\sum_{t=1}^{N} \frac{I_t}{(1+r_{cc})^t} \left[1 - \left(\frac{1+DCI}{1+r_{cc}} \right)^{\Delta t} \right]}{\Delta L}$$

The PM method reflects the savings associated with an investment of deferral, but assumes that the existing plan differs only in timing. There are some conceptual advantages to using this method as it produces different marginal cost estimates over time and should signal higher marginal costs during periods of increased network congestion. The PW method yields an avoided cost estimate that varies by planning year, reflecting the greater marginal costs when investment is imminent.

An alternative expression of the PW formula is:

$$MC[PW] = \sum \frac{\left[\frac{I}{(1+r)^y} - \frac{I*(1+i)^{\Delta y}}{(1+r)^{y+\Lambda y}} \right]}{LoadChange} * AnnualisationFactor$$

where:

I = annual demand-related investments in capacity by area ($);

i = escalation rate for the investments;

r = discount rate;

y= year;

LoadChange = estimated average change in peak load by area for the planning period;

⊿y = deferral caused by load change (annual peak load growth divided by *LoadChange*); and

Annualization Factor = real economic carrying charge for the planning period, grossed up by a variable expense factor.

The present worth method has been used by transmission companies in the US to assess avoided costs.[27]

8.6 Regression Method

The National Economics Research Associates (NERA) has suggested the use of a linear regression technique that has been adopted by utilities and jurisdictions in the US for marginal cost studies. The regression methodology obtains a marginal unit capital cost by regressing the cumulative changes in investment on cumulative changes in load. The analysis usually uses a combination of historical and

[27] Expansion of BPA Transmission Planning Capabilities, Tom Foley and Eric Hirst, San Francisco.

forecast period data. The marginal unit cost is estimated from the "b" coefficient for the regression. The marginal unit cost is then annualised by multiplying the coefficient by the RECC factor.

This method was adopted by the Southern California Gas Company to estimate marginal capital costs for its medium pressure and high pressure gas distribution systems.[28]

The basic regression equation is:

$$I_t = \alpha + \beta L_t$$

where:

alpha = cumulative capital investment in year t (the dependent variable)

beta = cumulative load in year t (the independent variable)

and the resulting marginal cost estimate is

$$MC_{RM} = RECC \times \beta$$

The regression method can provide an accurate historical account of marginal cost, but the forward-looking component is not so useful. Furthermore, in a business such as EnergyAustralia, marginal costs tend to display a sawtooth approach, ramping up significantly when capacity constraints are reached and then falling significantly once a facility has been augmented. This is particular true of individual projects. Econometric based marginal costs studies usually adopt polynomial functional forms in order to capture the non-linear curved relationship between the dependent and independent variables.

Replacement Cost New Method (RCN)

RCN reflects the estimated cost to reproduce the existing facilities at prevailing prices. The total RCN cost of the system is usually estimated by collecting historical asset value data (differentiated by location and component type), and then converting to current values. The RCN per unit of load served (measured as non-coincident peak, coincident peak, diversified peak, or equivalent demand) estimates the average cost of meeting demand - the rationale being that it reflects the appropriate opportunity cost. This part of the calculation is based only on historical data. The average cost is then converted to a marginal cost by multiplying by an elasticity of capital cost with respect to demand. This elasticity is usually derived using a forward-looking load and project projection. Due to computational complexity, this method is not preferred.

[28] see Smith, Allison (2003), *Prepared Direct Testimony of Allison F. Smith*, Southern California Gas Company, California, www.socalgas.com

NSW DNSPs response to the questions raised in the AEMC Consultation paper		
AEMC Question		**NSW DNSP's response**
Question 1	What other considerations should be included in the assessment framework?	The proposed criteria are appropriate. It is important that the proposed rule change is assessed against each criterion only to the extent relevant from an economic perspective. This approach will ensure that the distribution pricing arrangements under the NER will only be amended if there is a reasonable expectation that the resultant outcomes are in the long-term interest of all electricity users.
Question 2	Does Figure 6.1 reflect the key components of how network tariff structures and pricing levels are determined by DNSPs?	No. The AEMC have not properly represented the process used by DNSPs to set network prices because no recognition has been made of the role of non-economic considerations (i.e. outside the rules) in this process. Once a decision on tariff structure has been made, the next step is to decide which charging parameter (if any) is to be used to signal economic cost. The level of this charging parameter is set at economic cost (or transitioned to economic cost levels due to non-economic reasons). The final step is to decide how best to recover residual network costs from customers. This decision is driven by both economic and non-economic considerations (e.g. equity, reputation, political factors).
Question 3	How often are network tariffs likely to change during a regulatory period and what are some of the reasons for that change?	DNSPs typically set network prices in accordance with their tariff strategy and the obligations under the NER and Determination as well as on the basis of a range of expectations e.g. future level and pattern of volumes. DNSPs would be motivated to change their network tariffs in response to changes in all three of these drivers. For example, if the maximum allowed revenue in a given year was increased due to AER approving a network pass-through event. Alternatively network tariffs could change in response to a change in strategy or a change in expectations in relation to volume risk exposure.
Question 4	What level of information on network tariff structures and network tariff pricing levels should be included in a network tariff structures document to assist retailers and consumers to understand and respond effectively to changing prices and structures over the regulatory period?	The PSS document should provide retailers and other stakeholders with sufficient information to understand the DNSP's long-term vision for pricing and their proposed network tariff strategy to make progress towards realising this vision (e.g. transitional strategy). It is also important for this document to provide stakeholders with an understanding of the factors outside the DNSP's control that could result in a change in tariff strategy.

Question 5	Should DNSPs be able to vary their network tariff structures during the regulatory period? Why or Why not?	It is in the long-term interests of all stakeholders that DNSPs have sufficient flexibility under the NER to respond to unanticipated developments or events outside the DNSP's control in a manner that safeguards the long-term interests of electricity users. This should not unduly undermine certainty in an economic sense if the PSS document provides stakeholders with an understanding in advance of the potential drivers of change.
Question 6	If a document on network tariff structures is put in place, should this be an indicative document or should the DNSPs be required to apply it in their annual pricing proposals?	The PSS should be indicative in relation to any price and customer impact analysis provided in light of the uncertainties associated with the network price setting process e.g. volume movements. It should, however, require that the DNSP make a commitment to the long-term vision. The DNSPs should be required to explain any material departures from the PSS in the annual pricing proposals, particularly in respect to strategies relating to transitioning towards cost reflective price and a change in long-term vision.
Question 7	If a document on network tariff structures is binding on the DNSP, should it be able to be varied and under what circumstances? If so, should it be varied outside or within their annual network pricing process?	As per the response to Question 5, it is in the long-term interests of all stakeholders to provide DNSPs with pricing flexibility. It would be appropriate to allow minor variations to be addressed in the annual pricing proposal process, but for a major change (such as proposed to introduce tariff structures not included in the PSS) there may be merit to addressing this issue outside the annual price setting process, subject to a materiality threshold.
Question 8	Should DNSPs be required to consult with stakeholders before submitting their proposed pricing structures statement to the AER for approval through the regulatory determination process?	It is important that the AER assesses whether the pricing structures proposed by the DNSP satisfy the requirements under the National Electricity Rules before the DNSP consults retailers and other stakeholders. This will provide stakeholders with the confidence that the proposed structures are consistent with economic principles, which enables the consultation process to focus more on non-economic issues, such as providing feedback on the transitional pricing options.
Question 9	Is consultation necessary if DNSPs seek to amend their approved pricing structures statement during the regulatory period, as opposed to at the time of the regulatory determination? Are there any circumstances where amendments to the network tariff structures in the annual pricing process should be exempt from consultation on	This depends on the materiality of the amendments. Consultation should not be required in respect to immaterial changes. Immateriality in this situation could be defined to mean that the change only impacts a small percentage (e.g. 20%) of customers or is expected to have a minor financial impact (e.g. NUoS bill increase of 2% or $20 per annum) on a large number of customers. Or some combination of two.

	amendments to the previously approved pricing structure statement?	
Question 10	Is it necessary for the AER (as opposed to the DNSP) to consult with stakeholders before approving any proposed amendments to the pricing structure statement sought by the DNSP?	Yes. See response to Question 8.
Question 11	Should the AER be required to provide guidance on the consultation process for DNSPs? Should the guidelines be binding on DNSPs?	The AER's Customer Engagement Guideline already addresses customer consultation processes.
Question 12	Does the PSS need to be approved?	The AER could be required to approve the PSS submitted in the regulatory determination process, against the criteria that it has met the information requirements and the requirements for stakeholder engagement.
Question 13	Should the AER be able to amend a DNSP's PSS? If the AER does not approve a DNSP's proposed pricing structure statement, what arrangements would be suitable for default network tariff structures?	It is not appropriate for the AER to have a role in designing individual network tariffs or structures. Its role must be constrained to ensuring that the PSS meets the approval criteria (information requirements and stakeholder engagement).
Question 14	What are the risks to the annual pricing process if DNSP's do not comply with their approved pricing structures statement or are late submitting a full pricing proposal?	The PSS should not be binding on the annual pricing process. In this situation the compliance risk does not arise. However, the DNSP should be required to explain any departures from the PSS during the regulatory control period. In the case of a material departure, it would be in the interest of stakeholders for the DNSP to be required to undertake consultation.
Question 15	How should DNSPs be incentivised to comply with their approved pricing structures statement in their annual pricing proposals? How should compliance incentives be balanced against the financial risks for DNSPs and certainty for stakeholders?	As per Question 14, the PSS should be non-binding on the annual pricing proposals. The NSW DNSPs do **not** support a compliance incentive mechanism in relation to the PSS.
Question 16	Should DNSPs include forecasts of their expected changes in network tariff pricing levels in the pricing structures statement?	DNSPs could potentially include forecasts of expected changes in network tariff levels in the PSS. However, these prices would be indicative only and should be non-binding in light of the uncertainties associated with the network price setting process e.g. volume movements, changes to jurisdictional amounts, transmission charges and other external influences.

Question 17	Should any changes to the network tariff pricing levels included in the pricing structures statement be subject to consultation? If so, what level of materiality should apply to the change?	It is generally appropriate for DNSPs to consult on major departures in tariff strategy from the approved PSS during the course of a regulatory control period, where these changes are expected to have a material impact on customers. NSW DNSPs believe that material changes in volume forecasts and other inputs to the price-setting process should not need to be consulted on. This is because the PSS should explain how changes to these inputs influence the price-setting process.
Question 18	Should a pricing structures statement process be introduced as soon as possible? If so, what risks are there from having it in place before the next regulatory period?	The NSW DNSPs do not support the imposition of the PSS process within a regulatory control period that was already commenced. To avoid unnecessary duplication, confusion and unnecessary costs from being occurred, the PSS process should be optional in this situation. This reflects that the DNSP may have already undertaken effective engagement with stakeholders.
Question 19	Does the AER consultation guideline need to be in place before a PSS can be implemented?	See answer to Question 11. Such a guideline is already in place. An AER Consumer Engagement Guideline which was designed in consultation with consumers, retailers and networks, and which explicitly is designed to facilitate network and consumer engagement on tariff issues.
Question 20	If a PSS framework were implemented, would this reduce the timing pressures for the DNSPs, the AER and the retailers that have arisen from the first year and subsequent year annual pricing process?	The NSW DNSPs believe that the PSS will not result in a material time savings during the annual pricing approval process. While the PSS would provide reasonable certainty to retailers about future tariff structures, the NSW DNSPs believe that the PSS should be a non-binding document in respect to price levels. This is a critical requirement for the PSS as DNSPs should continue to have the flexibility to adjust their tariffs in response to unanticipated changes in our pricing environment. Therefore, there is reason to believe the PSS framework will reduce the timing pressure in the annual pricing process.
Question 21	What would be the likely impacts on customers of making an LRMC approach mandatory?	It is difficult to provide the AEMC with an understanding of the practical implications of adopting a mandatory approach to LRMC-based pricing because it is unclear in the consultation paper how the AER will enforce this requirement in practice. It may be irrelevant for a DNSP with a high penetration of accumulation meters given that it is not possible to introduce time-varying price signals in this situation.

		In contrast, it may be highly relevant for DNSPs faced with widespread network congestion with a high penetration of interval metering in the residential and small business customer segment. In this situation, it is reasonable to believe that the impacts of imposing LRMC-based price signals could have a severe impact on customer bills in the absence of a transitional strategy.
Question 22	What would be the impacts on DNSPs of making an LRMC approach mandatory? Does it result in increased compliance risk?	As discussed above it is difficult to provide the AEMC with an understanding of the practical implications because it is unclear on how this aspect of the proposed rule change will be applied in practice. In the extreme case, it has the potential to create risks around compliance because forcing DNSPs to pursue this form of congestion pricing may undermine the DNSP's ability to meet community expectations that the prices for essential service are fair and reasonable.
Question 23	How limited will DNSPs be in basing prices at LRMC if they must first comply with jurisdictional instruments?	It is reasonable to expect that potential conflicts could arise between the requirement to set prices on the basis of LRMC and jurisdictional instruments that aim to deliver non-economic outcomes.
Question 24	Should LRMC be defined? If so, what level of detail would be appropriate?	The definition of LRMC is generally well understood and accepted by the industry. The complexity and concerns relates to the estimation and application of LRMC in the context of setting distribution prices.
Question25	Should one methodology apply to calculating LRMC or should multiple methodologies be allowed? Which is/are the most appropriate methodology (ies)?	Given that there are a number of approaches to estimating LRMC that have theoretical appeal, it is appropriate for DNSPs to have the discretion to choose which approach is appropriate to their circumstances.
Question 26	Should the AER be required through a guideline to specify the methodology or methodologies of calculating and applying LRMC?	An AER guideline on LRMC would be beneficial to the DNSPs if it was designed to "guide" DNSPs in their choice of estimation approach and how best to apply LRMC in practice. The DNSP must have the discretion over their pricing decisions.
Question 27	What is the impact of coincident peak demand on network costs and how are these additional costs currently recovered in network tariffs?	Growth in peak demand will only flow to increase network costs if this change in network utilisation leads to network congestion. For tariffs based on interval metering, most DNSP recover these costs through either a peak energy consumption charge or a maximum demand charge. For tariffs based on accumulation metering, these costs must be smeared across energy consumption charges as to recoup these costs through the fixed charges has

		the potential to lead to unacceptable price shocks on small energy users.
Question 28	How should LRMC pricing reflect additional costs associated with coincident peak demand and what are the practical impediments to DNSPs adopting tariffs that reflect coincident peak demand?	There are a number of decisions that must be made to appropriately reflect LRMC in the tariff. The first decision relates to the choice of charging parameter to signal LRMC. The second decision relates to the peak period definition to ensure that the peak period appropriate covers only periods of critical network congestion. The third decision relates to developing an estimate of LRMC to use as the basis for setting the level of the peak period price.
Question29	How important are locational pricing signals for distribution networks? Are locational pricing signals for some types of customers more important than others?	Most DNSPs currently apply site-specific network pricing solutions to large industrial users. Providing these signals is important from an economic perspective because they influence the investment decisions of these customers. The provision of locational price signals for residential and small business customers is typically less important from an economic perspective because the DNSP can rely on well targeted demand management initiatives to efficiently alleviate network congestion in localised areas. Locational price signals may result in the removal of cross subsidies across regions within a network, but this is more on an equity issue, rather than an economic issue.
Question 30	What are the practical impediments to DNSPs adopting tariffs that reflect locational pricing signals?	There is a range of practical impediments to a DNSP conveying locational price signals. Firstly, a clear definition of the locational boundaries is required. Secondly, customer acceptance of this form of pricing is at risk of being undermined if the driver of network congestion is a deliberate decision to delay network augmentation, as opposed to unanticipated growth in peak demand. DNSP support for this form of pricing could be undermined by the volume forecasting risks associated with introducing this type of pricing signal. While this is a more significant problem for DNSPs subject to a price cap, it still exposes the DNSP to a risk of potential under/over recovery of revenue and hence increased price volatility.
Question 31	Is an additional principle required to encourage network prices which are based on the drivers of network costs to the maximum extent possible?	The NSW DNSPs believe that a mandatory approach to LRMC is a second-best approach in the current uncertain volume environment. A more appropriate approach is to provide DNSPs with appropriate incentives under the control mechanism in this regard.

Question 32	What are the pros and cons of using a Ramsey pricing approach or a postage stamp pricing approach?	Ramsey pricing is an efficient way to recover residual network costs but is very information-intensive and is controversial because it promotes price discrimination on basis of demand, rather than costs to service. The NSW DNSPs believe that the postage stamp approach identified by the AEMC (as applied by TNSPs) is essentially about the difficulty of a customer to respond to the incentives associated with an individual charging parameter. For example, a fixed charge is difficult for a customer to avoid unless they are willing to relocate to another network area. A less obvious example is the general service charge applied by TransGrid in NSW, which has the appearance of a normal energy charge in the sense that it is expressed on a cents per kWh basis. The point of difference is that NSW DNSPs cannot avoid this charge because this charging parameter is based on historical energy consumption at the individual transmission connection point. The key point here is that this approach satisfies economic principles because of it design attributes as opposed to its application on a postage stamp basis. While recovering residual costs through fixed charges minimises transactions cost and reflects underlying cost structures, as with Ramsey pricing it may be controversial because of the equity concerns raised. The NSW DNSPs believe that, where the metrology allows, there are innovative alternatives to rely on fixed charge increases or Ramsey pricing strategies to recover residual costs in the most equitable and efficient manner possible. These approaches do not lend themselves to prescription in the NER, as they are complex and information-intensive, The key issue raised by the AEMC is to provide DNSPs with stronger incentives to pursue innovative tariff strategies in this area.
Question 33	Are there any other pricing approaches that should be considered to recover residual network costs?	There are alternative approaches, such as the use of management accounting “cost allocation” models. These approaches are not relevant from an economic perspective, but they will provide some basis for an equitable recovery of network costs from customers.
Question 34	Should an approach or approaches be specified in the NER or an AER guideline?	The NSW DNSPs strongly believe that an approach or approaches to recovering residual costs from customers should not be prescribed in the rules. It is important that DNSPs continue to have the discretion over how these costs should be recovered, particularly in the current uncertain energy consumption environment. It is also

		important that the new framework addresses the weak incentives faced by DNSPs under a revenue cap to pursue innovative tariff strategies to recoup these costs in the most efficient and equitable manner possible.
Question 35	What jurisdictional instruments or requirements could limit the ability of a DNSP to comply with any requirement to base tariffs on LRMC(including where that LRMC may vary with customer location or with different local peak demands?)	No comment
Question 36	What are the potential impacts of a NER requirement for DNSPs to comply with jurisdictional instruments?	No comment
Question 37	Should a requirement for DNSPs to take into account the impact of tariffs on consumers be included in the principles?	The existing requirement for a DNSP take account of the price responsiveness of customers to changes in the level and structure of network tariffs has a strong economic rationale and should remain in the NER.
Question 38	If requirement is included, does the proposed principle provide enough guidance on how it is to be complied with, or would an AER guideline be useful?	It would be beneficial for the AER to provide a guideline as to what approaches are compliant with this requirement.
Question 39	If a requirement is included, does the proposed principle conflict with other principles in the NER?	There is no conflict as long as this new provision is purely economic in nature. The NSW DNSPs believe that there would be a fundamental conflict with the NEO if this requirement was broadened to require that the DNSP take into account equity considerations associated with bill impacts on particular groups of customers.
Question 40	Should network tariffs reflect transmission pricing signals? If so, what would the most appropriate way to achieve this for different types of network customers?	The NSW DNSPs believe that the current distribution pricing framework is working to ensure that DNSPs reflect transmission price signals in network tariff where appropriate to do so from an economic perspective, such as for large customers on site-specific tariff. The NSW DNSPs believe that it is not economically feasible to pass on transmission price signals to residential and small business customers given the magnitude of the transaction costs and metrology constraints associated with this approach and the considerable equity issues that arise from localised price signals.

Question 41	Is the change to a mandatory requirement to group customers into tariff classes likely to achieve the desired outcomes?	It is difficult to assess the practical implications of this proposed change given the lack of detail provided in the consultation paper. The AEMC has provided no evidence that the existing tariff classes used by DNSPs are not consistent with economic principles. In theory this proposed requirement could result in a large change in the number of tariff classes. If there is a large increase in tariff classes, the side constraint mechanism would place severe constraints on the ability of the DNSP to re-balance tariffs, which is likely to undermine economic welfare. Alternatively if there is a large decrease in the tariff classes, the standalone cost constraint may under some circumstance severely constrain the ability of the DNSP to pursue tariff re-balancing
Question 42	Is the change to a mandatory requirement to group customers into tariff classes likely to result in inconsistencies within the NER or with any jurisdictional instruments or requirements?	No comment
Question 43	Is the proposal to apply side constraints across regulatory periods likely to materially benefit consumers by protecting them from price shocks?	No comment
Question 44	Is the proposal to apply side constraints across regulatory periods likely to lead to inconsistencies with other requirements in the NER?	No comment
Question 45	Are there likely to be implementation issues in applying side constraints across regulatory periods?	No comment
Question 46	Should network tariffs of customers with interval meters or other types of time-based meters be subject to side constraints?	No comment