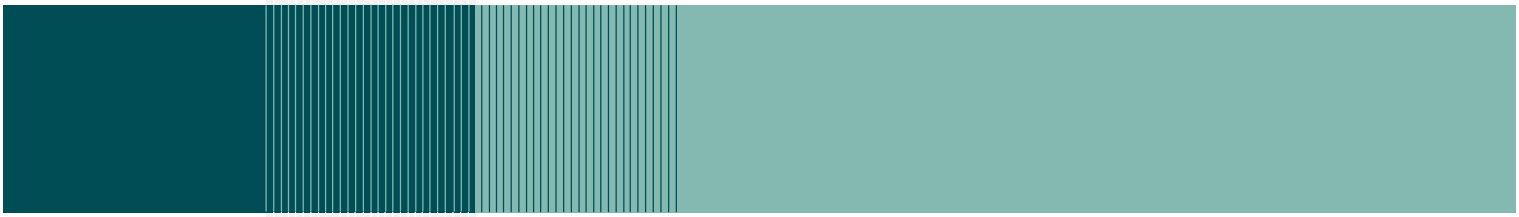
December 2006

Distribution Pricing Rule Framework

Network Policy Working Group



NERA
Economic Consulting

MMC Marsh & McLennan Companies

Project Team

Greg Houston, Director NERA Economic Consulting

Robert McMillan, Analyst NERA Economic Consulting

Peer Review

Jeff Balchin, Director Allen Consulting Group

NERA Economic Consulting
Level 16
33 Exhibition Street
Melbourne 3000
Tel: +61 3 9245 5537
Fax: +61 3 8640 0800
www.nera.com

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1. Introduction

This report has been prepared by NERA Economic Consulting (NERA) and peer-reviewed by Mr Jeff Balchin of the Allen Consulting Group (ACG). Its purpose is to assist the Network Policy Working Group (NPWG) to the Ministerial Council on Energy (MCE) in its development of the initial electricity distribution pricing rules.

Currently, chapter 6 of the National Electricity Rules (the Rules) sets out the pricing principles for the economic regulation of electricity transmission and distribution networks. Part B deals with transmission revenue, Part C deals with transmission pricing, Part D deals with distribution revenue and Part E with distribution pricing.

The economic regulation of electricity transmission was transferred to the national framework on 1 July 2005, and the economic regulation of distribution will be transferred to the national framework from 1 July 2007.

In conjunction with the transfer of electricity transmission regulation, the Australian Energy Market Commission (AEMC) is required by section 35 of the National Electricity Law (NEL) to review the transmission revenue and pricing provisions in the Rules. By contrast, the transfer of distribution regulation to the national framework is taking place at a later time, and the initial distribution Rules (to replace the existing Part D and Part E of Chapter 6) will be made by the South Australian Energy Minister, on the recommendation of the MCE.

In accordance with the Australian Energy Market Agreement (AEMA), the NPWG is therefore currently developing the initial electricity distribution Rules for the economic regulation of distribution service revenues and prices.

This paper has been commissioned to assist the NPWG in developing the pricing rule element of this task. In particular, it seeks to provide a robust and consistent framework within which the electricity distribution pricing Rules may be formulated, having regard to:

- specific distribution pricing policy directions identified in the NPWG policy positions paper;
- aspects of distribution network service provision and pricing that differ from the equivalent (if any) aspects of the AEMC draft transmission pricing Rules; and
- the need for pricing rules and compliance arrangements to motivate efficient pricing outcomes with respect to regulated distribution network services.

In considering the pricing rule framework, it is necessary to distinguish upfront between the scope of influence of pricing rules versus revenue rules. Fundamentally, the potential areas of benefit that can be achieved through pricing rules are narrower than those available under revenue rules. This is because, rather than constraining the total revenues and profits earned by a monopoly distribution network service provider (DNSP), pricing rules will only constrain:

- the shares of revenue (costs) to be recovered from different customers or groups of customers; and
- the structure of the tariffs used to recover those revenues.

Together, these two constraints affect the extent to which allocative efficiency is achieved in the way customers consume electricity and invest in electricity using plant and equipment.

The scope of influence of distribution pricing rules is also affected by the extent to which DNSPs' pricing decisions can influence end use customer behaviour. The decision of whether or not customers are actually presented with the prices charged by DNSPs is made by retailers within the context of their overall commercial and risk management decision making processes. Reference in this report to behavioural change arising from different forms of network pricing should therefore be taken to include behavioural change by retailers, end use customers or both.

1.1. Policy objectives of pricing rules

The NEL sets out the overall objective for the National Electricity Market (the NEM objective), as follows:

> *The national electricity market objective is to promote efficient investment in, and efficient use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system.*[1]

Efficient use of electricity service requires that customers face prices that reflect the efficient cost of supply. This is necessary to ensure allocative efficiency, such that customers' usage reflects the cost of making additional units of the relevant service available, and that suppliers' investment decisions are informed by the cost of electricity service provision.

To give effect to the NEM objective, various elements of the NEM are subject to economic regulation. The reasoning for this was identified by the MCE's Expert Panel as being that:

> *In many essential infrastructure service markets, the type of technology, the diminishing marginal costs of use within capacity constraints and the lumpy and fixed nature of the assets (irreversible or sunk investment) dictate that one supplier rather than two or more can provide the service at least cost. Thus, while supply by one infrastructure operator represents the most efficient market structure, the natural protection available against competitive entry confers substantial market power on the incumbent. In short many of these services are a form of natural monopoly. The owner of these assets has both the capacity and the commercial incentive to take advantage of this market power at the expense of the users of the service. Access regulation aims to capture the efficiency benefits of provision by a single entity, but reduce the risks of the efficiency losses arising from substantial market power.*[2]

Distribution services represent a significant element of the NEM, and are most efficiently provided by a single entity. Each of the various jurisdictions across the NEM involve the

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1 Section 7, of the National Electricity Law (NEL)

2 Expert Panel on Access Pricing (2006), Report to the Ministerial Council on Energy, p.10

regulated provision of distribution by either a licensed or a de facto monopoly service provider.

In the context of the regulation of distribution services, many aspects of the NEM objective including service quality, reliability and security of supply, as well as the total prescribed revenues underpinning regulated prices are captured in the revenue rules for the economic regulation of distribution revenues.

By contrast, the distribution pricing rules focus on the manner in which DNSPs' regulated prices contribute to the efficient use of electricity services, or more particularly, electricity network services. In the context of the objective of regulation identified by the MCE Expert Panel, pricing rules seek to reduce the efficiency losses that may otherwise arise through DNSPs exercising their market power through their pricing decisions. The efficiency losses arise through the effect of pricing distortions on customers' usage and investment decisions (ie, allocative efficiency).

These objectives distil to two practical aspects of tariff setting that the application of pricing rules seeks to motivate. These are:

1. ensuring revenues earned from each customer or group of customers are set by reference to the efficient costs incurred in serving that customer or group of customers; and

2. ensuring the structure of tariffs is consistent with economic efficiency.

1.1.1. Principles of good regulation

A further objective arises from the principles of good regulation. The OECD and the UK Better Regulation Taskforce identify five principles of good regulation that are equally applicable to independent regulators and to government departments.[3] These principles state that regulation should demonstrate:

- Proportionality – Regulators should only intervene when necessary. Remedies should be appropriate to the risk posed. Costs should be identified and minimised.
- Accountability – Regulators must be able to justify decisions and be subject to public scrutiny.
- Consistency – Government rules and standards must be joined up and implemented fairly.
- Transparency – Regulators should be open and keep regulations simple and user-friendly.
- Targeting – Regulation should be focused on the problem and minimise side effects.[4]

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[3] That is, they apply to all forms of regulation, not just the economic regulation of utilities. For example, these principles are equally applicable to workplace safety standards, health regulations and building standards.

[4] See David Arculus "The Better Regulation Task Force" published in OECD, Working Party On Regulatory Management And Reform: designing independent and accountable regulatory authorities for high quality regulation, Proceedings of Expert Meeting in London, United Kingdom, 10-11 January 2005.

Of particular relevance to distribution price regulation is the principle of proportionality in regulatory rule setting. This concept has been captured by the NPWG in its Policy Positions paper through identification that pricing rules should be:

- sufficiently high level as to allow for the various operating contexts of different DNSPS across Australia; and
- not too prescriptive in the rules.[5]

These principles are in turn consistent with the Australian Energy Market Agreement (AEMA) which specifies that the initial rules will 'to the extent possible and where effective regulation is not impeded' minimise the regulatory compliance burden and associated cost.[6]

Together, these principles suggest that the development of distribution pricing rules must recognise the need for pricing regulation to be commensurate to the potential allocative efficiency losses arising through DNSPs taking advantage of their market power. It must also be cognisant of the existing incentive arrangements applied to minimise the potential for these efficiency losses including the widespread use of price cap regulation to deliver efficient pricing incentives by exposing DNSPs to the risks and costs of increased or decreased energy use (see section 2.2.2).

The Rules must recognise the benefits to be gained through regulating prices as well as the costs that various price rules impose on regulators and DNSPs. In so doing, the Rules should seek to balance these costs and benefits in a manner consistent with the long term interest of electricity consumers (as required by the NEL objective).

Balance also needs to be struck between the MCE's stated objectives of ensuring consistency of regulatory approach between gas and electricity, between transmission and distribution and across jurisdictions[7] while taking into account differences in the provision of different network infrastructure services.

To ensure an optimal balance is struck, it is first necessary to identify the benefits that can be achieved through price regulation. In this regard it is useful to examine where and how distribution pricing rules sit within the wider framework for the economic regulation of distribution services.

1.2. Distribution regulatory framework context

Pricing Rules can be thought of as the final step in a hierarchy of regulatory decisions. Preceding decisions specify the scope and form of regulation that applies to various distribution services, determine whether a given service should be regulated, and if so, whether this should be via direct control (cost based) or be means of a negotiation with arbitration applying when such negotiations cannot reach agreement.

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5 NPWG paper *Policy Position on the Pricing of Electricity Distribution Services,* p.3

6 AEMA clause 14.5(e)

7 AEMA sections 13 and 14

Where distribution services are to be regulated via direct control, the method for setting this control must be chosen. This requires a choice of either:

1. the building blocks method, as currently applied to prescribed distribution services in all Australian jurisdictions; or
2. an alternative method such a 'fair and reasonable' test or 'cost plus' approach.

Where a building blocks approach is adopted (as well as under some alternative methods of control) it is necessary to adopt a form of price control mechanism. This may include:

- price cap;
- revenue cap; or
- an alternative (possibly a hybrid of price and revenue caps).

Finally, the pricing Rules govern the setting of prices (tariffs) within the overall constraint imposed by the form of price control adopted. Unlike each of the preceding steps in the regulatory decision-making hierarchy, pricing rules generally involve less scope to affect the amount of revenues earned by a DNSP. This is because revenues are generally determined and monitored via the control setting method and form of price control. Instead pricing rules primarily affect the way permitted revenues are recovered from different customers or customer groups.

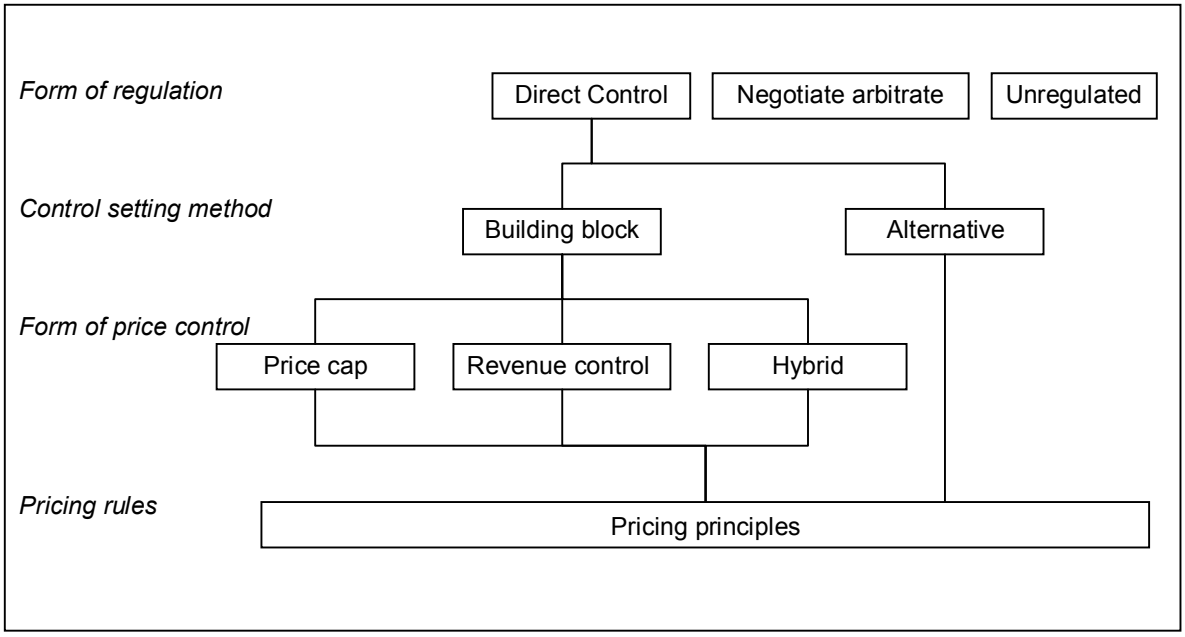
This distinction between the scope of influence of pricing rules versus other regulatory rules is important since it narrows the areas of benefit that can be achieved through a pricing rule. In other words, rather than constraining the total revenues and profits earned by a monopoly DNSP, pricing rules will constrain:

- the shares of revenue (costs) to be recovered from different customers or groups of customers; and
- the structure of the tariffs used to recover those revenues.

Together, these two constraints affect the extent to which allocative efficiency is achieved in the way customers consume electricity and invest in electricity using plant and equipment.

Figure 1.1 illustrates the hierarchy of regulatory decisions, as it is currently specified in the NPWG's proposed rule specification.

Figure 1.1
Distribution Regulatory Hierarchy



2. Role of distribution pricing rules

To capture the (productive efficiency) benefits of monopoly service provision whilst avoiding the inefficiencies of market power, pricing rules are required:

- to encourage efficient pricing disciplines in regulated monopoly markets (ie, so that prices reflect marginal cost); and
- to ensure that, where sustainable provision of the service requires revenues in excess of marginal cost to be recovered, the potential distortion to customer usage decisions is minimised.

In practice, therefore, pricing rules can be viewed as guiding the nature and extent of the compromises that must be made between these principles.

Consistent with this role, our recommended objectives for the pricing rules arising from this review (as discussed in section 1.1) are:

- to ensure that revenues earned from each customer or group of customers are set by reference to the efficient costs incurred in serving that customer or group of customers (objective 1);
- ensure that the structure of individual tariff elements is consistent with economic efficiency (objective 2); and
- provide a regulatory rule and compliance framework that involves incentives and compliance costs that are commensurate with the benefits (costs) of achieving (not achieving) objectives 1 and 2 (objective 3).

This framework and associated objectives provide a reference point from which it is possible to examine areas of the current rules that represent opportunity for improvement. As noted by the NPWG, currently all Australian jurisdictions have derogated away from part E of the Rules, ie, the distribution pricing rules.[8] It is therefore apparent that the existing rules are not achieving the above objectives. Rather, alternate arrangements for the economic regulation of distribution prices have evolved in each jurisdiction. In our view, revisions to the rules must take account of these arrangements in order to preserve the efficacy of any rule revisions by removing (or narrowing) the need for derogation.

The MCE's Expert Panel provided useful guidance for rule developments when it identified that revisions to the rules for economic regulation should achieve one or more of the following principles (which correspond respectively with our suggested objectives 3, 1 and 2 above):

- *reduced administration and compliance costs (for both regulators and service providers), achieved without compromising the effectiveness of regulation in terms of price and service quality outcomes;*

[8] NPWG paper Policy Position on the Pricing of Electricity Distribution Services, p.5

- *a reduction in the extent of distortion to production and consumption decisions by service providers and customers, again achieved without compromising price and service quality outcomes; and/or*

- *price level, structure and service quality outcomes that more closely represent those achieved by a competitive market, but with no greater distortion to efficient production and consumption decisions.*[9]

It is arguable that failure to provide a cost effective framework (the first of the MCE expert panel principles) has been the undoing of the current rules. This is because the current rules seek to impose a highly prescriptive approach to distribution pricing with potentially significant regulatory costs associated with the development and compliance assessment of cost allocation methodologies.

It follows that a key aim of this rule review should be to balance the anticipated regulatory administration and compliance costs against the perceived benefits of price regulation. This matter is considered further in chapter 6 of this report, while the second and third of the MCE Expert Panel principles are considered in chapters 3, 4, 5.

A further failing of the current rules is the time horizon over which they require costs to be allocated. Efficient pricing (discussed in chapter 5) requires a forward looking assessment of costs. In contrast, the current rules prescribe a method for allocating sunk (retrospective) costs. This retrospective allocation may provide a result that falls outside of the efficient pricing bounds, yet which would be within these bounds where appropriately considered on a prospective basis.

2.1. Replicating efficient pricing incentives

In a hypothetically competitive market DNSPs would be constrained (and motivated) to price services at their marginal cost (recognising that this concept may be applied in both short or long run terms). Such pricing can be expected to deliver both allocative and productive efficiency benefits as discussed in section 5.1. In sum, these benefits are expected to maximise the benefits to both DNSPs and their customers by ensuring efficient use of electricity as required by the NEL objective.

However, even in workably competitive markets, the extent to which the efficient pricing incentives are effective is highly dependent upon a number of key assumptions. In utility markets characterised by high sunk costs, large minimum efficient scales and legislative barriers to entry several of these key assumptions no longer hold. In such circumstances, DNSPs may face incentives that run counter to the efficient pricing incentives and outcomes normally found in competitive markets.

By way of example, where a licensed DNSP cannot exclude a customer from its service, it may have a diminished incentive to price above avoidable cost. Likewise where a license grants a DNSP exclusive supply rights, it will face diminished incentive to price below stand alone cost.

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[9] Expert Panel on Access Pricing (2006), Report to the Ministerial Council on Energy, p.98

A further complication arises where the minimum efficient scale of production is so large that, at all levels of customer demand, it will not be financially sustainable for a DNSP to price at marginal cost. Such circumstances give rise to a single, natural monopoly provider of services, often subject to price regulation to ensure both revenue adequacy and the sustained provision of socially desirable services.

2.1.1. Ramsey pricing

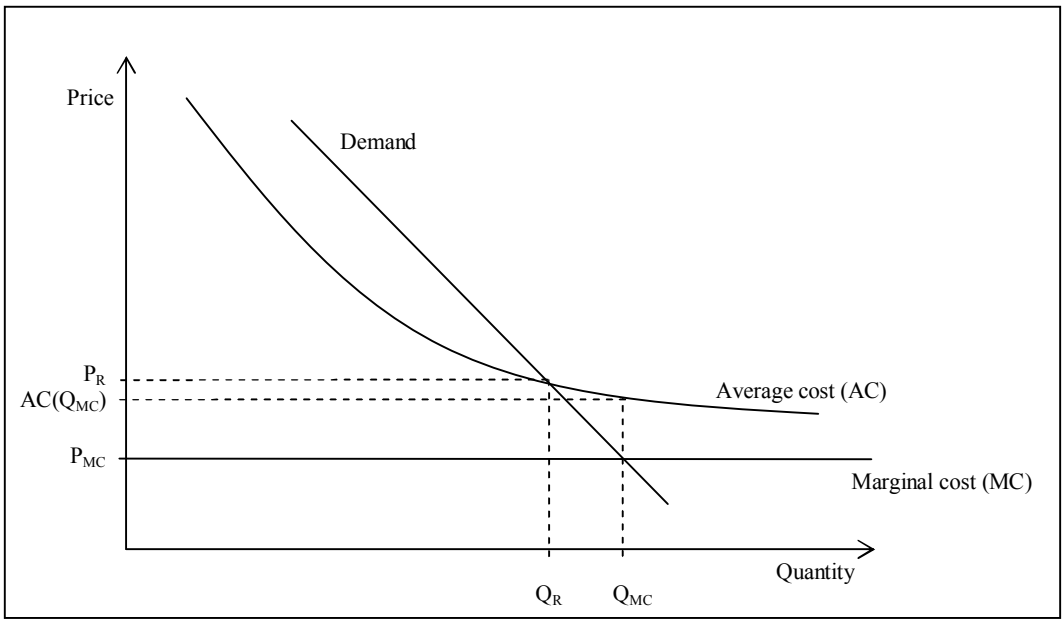
The economies of scale or density applying to many network utilities mean that supplying services at marginal cost may not be financially sustainable. This gives rise to a tension between economic efficiency and revenue adequacy. In such circumstances, efficiency demands the application of Ramsey Pricing[10], where a firm differentiates its prices so as to ensure:

- that the total quantity produced is as close as possible to the quantity that corresponds to the intersection of demand and marginal cost, while maintaining overall financial viability; and
- that any differences between average cost and marginal cost are recovered from those customers who have the least responsive demand (as regards price movements) referred to as price elasticity.

The quantity and price outcomes under Ramsey Pricing are illustrated in Figure 2.1. The figure shows that pricing at the Ramsey efficient price P_R minimises the deadweight loss within the overall constraint of the DNSP breaking even (ie, covering its average costs).

[10] See Ramsey Pricing discussion in Church, J. and Ware, R. (2000), Industrial Organisation a Strategic Approach, McGraw Hill, Singapore, pp.786 - 801

Figure 2.1
Ramsey Pricing



Such pricing arrangements are common among regulated network businesses, since economic regulation typically provides for revenues that include returns on and of sunk investment costs, rather than simply providing for (forward looking) marginal costs. This enables DNSPs to recover their average costs and maintains incentives for them to invest in maintaining and augmenting their networks.

2.2. Incentives under different forms of price control

Having identified the objectives and role that distribution pricing rules seek to achieve, it is useful to consider why this role is necessary and the extent to which it is required under different forms of price control.

Generally speaking, the principles for efficient pricing are the same regardless of the regulatory control setting method (eg, building blocks or alternative) or form of price control (eg, price or revenue cap). This is because these principles attempt to replicate the constraints that would apply in an effectively competitive environment, ie:

- absent a monopoly right to provide the service, a DNSP cannot price above stand alone cost because bypass would occur; and
- absent universal service obligations, a DNSP would not be willing to price below avoidable cost for sustained periods of time because this would threaten its financial viability.

Having established the need for pricing rules, the following sections examine their applicability under the various forms of price control identified in Figure 1.1. In other words, we seek to identify the incentives created under different forms of price control and the implications for pricing rule development rising from the NPWG's decision that price cap,

revenue cap and alternative forms of price control will all be available under the revised rules for the economic regulation of distribution revenues.

In short, the implication is that the form of price control influences the extent to which DNSPs are motivated to price efficiently, but that neither form of control provides perfect incentives. It follows that the rules that give effect to the principles of efficient pricing are applicable and necessary under all forms of price control (see section 6.5).[11]

2.2.1. Revenue cap regulation

Under a revenue cap form of price control, firms have little or no incentive to ensure that their prices are calibrated so as to reflect marginal cost or to avoid distorting customers' usage decisions. In fact the most likely motivation for firms subject to a revenue cap is to collect these revenues in a manner that generates the least amount of customer resistance. This is because revenue caps generally ensure that a DNSP will receive the maximum allowed revenue regardless of changes in customer numbers or consumption.

For example, consider the situation where $DNSP_A$ is regulated under a revenue cap. If a large customer in $DNSP_A$'s network area were to bypass $DNSP_A$'s network, or relocate into another DNSP's network, $DNSP_A$ would not be financially affected (in NPV terms). This is because $DNSP_A$'s regulated revenues in the ensuing year(s) would be permitted to rise to recover the lost revenue from that customer plus compensation for the time value of money on the lost revenue.

In this example (and as subsequently referred to in the paper), the concept of bypass should be read as broadly including physical bypass of the network, substitution with alternative energy sources (including embedded generation, photovoltaic cells or use of gas), relocating to a different network area or creating an embedded network. The common element to each of these forms of customer bypass is that the DNSP faces competitive threat and an associated reduction in revenues.

Bypass of the type described above may not be an efficient outcome if a customer incurs significant costs to install the infrastructure or in relocation to bypass $DNSP_A$'s network. In fact this outcome would only be efficient where bypass costs are:

- less than the price the customer is currently paying to $DNSP_A$; or
- less than the cost that would be avoided by $DNSP_A$ if it ceased servicing the customer.

This means that in order for the customer to make an efficient decision, the revenue generated by the tariff it pays to $DNSP_A$ must at least reflect the avoidable cost but should not be greater than the stand alone cost (see sections 4.1.1 and 4.1.2 for descriptions of these cost bounds).

[11] The efficient pricing principles also applicable to those distribution services regulated under hybrid forms of price control and those regulated under alternative regulatory control setting methods (e.g. excluded services).

As we have seen, DNSPs regulated by means of revenue caps do not have strong incentives to ensure that their tariffs efficiently reflect these pricing constraints. This gives rise to a risk that a customer may either:

- inefficiently bypass the network or relocate; or
- may not bypass the network or relocate even though it would be efficient to do so.

The potential for such inefficiencies has led many regulators to attempt to motivate or require DNSPs to price in accordance with efficient pricing principles. This has tended to involve administering pricing principles or guiding the allocation of costs.

This is also true of the cost allocation requirements adopted for the pricing regulation of TNSPs by the AEMC, and reflects the fact that the AEMC's revenue rules[12] mandate the use of a revenue cap form of price control (see Figure 2.2).

2.2.2. Price cap regulation

Under a price cap form of price control, regulated firms face greater incentive to price efficiently because they are exposed to revenue sufficiency risk. The DNSP will need to ensure its prices are reflective of the marginal cost of service because where demand is less than forecast, the firm will not be able to recover the foregone revenue.

For example, where a price cap regulated DNSP loses a customer to bypass or relocation, it foregoes all revenues associated with that customer, at least in any given year. It follows that a DNSP will seek to price at a level that discourages inefficient bypass or relocation. Equally, however, the DNSP will seek to price at a level that ensures its revenues recover its costs of serving that customer or group of customers.

The pricing outcome that satisfies these aims is marginal cost pricing. Put differently, the revenue sufficiency risk motivates DNSPs to charge tariffs that reflect marginal cost because:

- charging prices above marginal cost will lead to loss of revenue (through loss of customers) without any commensurate reduction in cost; and
- charging prices below marginal cost will reduce DNSPs' profitability (and over time their financial viability, other things being equal).

In additional to marginal cost pricing incentive, tariff baskets also provide an incentive to set Ramsey optimal prices (section 2.1.1). This is because additional revenue can be earned by rebalancing prices under the price cap (subject to any side constraints) to shift the recovery of common costs (ie, the size of the mark-up above avoidable cost) from price-responsive customers to non-price responsive customers.

However, the interaction of the overall regulatory framework with pricing decisions in any given year may reduce the strength of the above motivations. Specifically, the fact that a

[12] See AEMC, Proposed National Electricity Amendment (Pricing of Prescribed Transmission Services) Rule 2006

DNSP may expect its costs to be captured in the revenues allowed through ensuing regulatory reviews may distort the DNSP's pricing motivations and behaviour.

In recognition of this potentially diminished motivation under price caps, regulators have chosen at least to monitor or to prescribe price setting principles, even under price cap forms of control.

2.2.3. Alternative forms of regulation

The extent to which the monitoring described above is required will differ under alternative control setting methods. For example, where the control setting method de-emphasises the link between prices and costs over time (as may be the case with index-type regulatory approaches such as total factor productivity) the DNSP may be exposed to greater revenue sufficiency risk and will therefore be better motivated to price efficiently.

Notwithstanding variances in the strength of incentives arising under different control-setting methods and forms of regulation, the pricing principles presented in this paper are equally applicable under the full spectrum of regulatory and service delivery arrangements– from revenue cap regulated service provision through to competitive service provision. The variable element across this spectrum is be the extent to which the pricing principles reinforce existing incentives as compared to requiring or motivating behaviour that is not otherwise achieved by the service delivery arrangements.

The incentives already achieved by the regulatory and service delivery arrangements will be influenced by a number of factors including the control setting method (eg, building blocks or total factor productivity) and the frequency of regulatory resets.

2.3. Regulatory enforcement

The preceding sections have discussed the residual need for pricing principles under the range of regulatory control methods currently applied by the jurisdiction regulators. This need arises where DNSPs are afforded discretion in their pricing decisions, and, as a consequence of the interaction of various aspects of the regulatory regime, may be motivated to make pricing decisions that are inconsistent with the efficient pricing incentives that would arise in a workably competitive market.

By requiring DNSPs to follow efficient pricing principles, the regulatory arrangements limit the potential for service providers to pursue inefficient pricing outcomes. However, the extent to which such action is effective in changing DNSPs' pricing behaviour will also depend upon the rigour of the monitoring and compliance arrangements. This issue is considered in chapter 6, but the logic may be briefly considered by reference to the analogy of legal systems.

Much literature supports the proposition that it is the credible threat of punishment that makes laws effective in dissuading socially undesirable behaviour. The rational decision of whether to obey the law is a function of the probability of getting caught and the severity of the ensuing remedy. Arguably, the same logic is true of compliance with pricing regulation. It follows that while one can design a well crafted pricing rule, the incentive powers of this rule will ultimately be derived from the compliance arrangements implemented to give effect to it.

2.4. Differences between transmission and distribution contexts

The role of distribution pricing rules is also informed by the key difference between distribution and transmission network services. The MCE has adopted a policy of applying a consistent approach to economic regulation across the NEM. Notwithstanding this policy, the NPWG has identified that a number of differences between the technology and market characteristics affect the practicability of applying the same approach to distribution pricing rules as has been applied in the draft transmission pricing rules proposed by the AEMC.[13]

While remaining cognisant of the desirability of maintaining consistency of approach across both transmission and distribution pricing rules, the framework developed in this paper seeks to customise the distribution rules for the distinct characteristics of distribution services, and the forms of price control applied to regulated DNSPs.

The following sections examine the key differences between distribution and transmission networks, and the regulatory frameworks applying to each.

2.4.1. Network and market characteristics

There are a number of ways in which distribution and transmission network and market characteristics vary. Most notable among these is the great difference in the number of customers.

2.4.1.1. Customer numbers

TNSPs generally have a few large customers - these being the DNSPs, generators and a small number of end users that connect directly to the transmission network. In contrast, DNSPs have a large number (some greater than a million) of smaller customers. Specifically, almost every end user (apart from a small handful of direct connected large users) connects to the distribution network in order to take supply of electricity.

This difference has been noted by the NPWG which stated that:

> *Transmission service providers have relatively few customers (up to five distributors and a small number of direct-connected customers e.g. aluminium smelters) and fewer connection points (transmission node interfaces – TNIs) than distribution service providers. Distributors have many customers and many connection points. There are approximately 7 million national metering identifiers (NMIs) across the NEM.*[14]

The greater interconnectedness of distribution systems is consistent with their role in facilitating competition in the retail sector while the limited interconnectedness of the transmission network is consistent with the requirements of competition facilitation in the generation sector.[15]

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[13] NPWG paper Policy Position on the Pricing of Electricity Distribution Services, pp.1-2

[14] NPWG paper Policy Position on the Pricing of Electricity Distribution Services, p.2

[15] NPWG paper Policy Position on the Pricing of Electricity Distribution Services, p.1

The transmission network typically has many end use customers who use the same set of infrastructure, and so all are charged the same price. This reduces the relevance of customer classes at the transmission level because large numbers of end use customers make use of the same infrastructure and face the same transmission price. In contrast, at the distribution level, different customer classes use different types of infrastructure (ie, different sizes of customers connect at different voltage levels). As these customer connections occur at different levels down the layers of infrastructure (ie, with successively lower voltage levels), the infrastructure components become increasingly dedicated to individual customers or customer groups.

For this reason, there is greater disparity of the costs that a particular customer causes on the distribution system than they do on transmission, and different classes of end use customers (and potentially also different individual customers) face different prices.

2.4.1.2. Share of end use customer bills

In addition to differences in the number of customers, transmission and distribution charges also represent very different shares of most end use customer bills and so affect customer usage decisions differently. At the residential level, distribution charges are a significant share of end use charges, and represent approximately 40-45% of an average bill, while transmission charges account for only around 5%. The ability to affect demand through price signalling is therefore likely to be stronger at the distribution level.

It follows that price structure adjustments at the distribution network level (including when this incorporates the transmission element of charges) are more likely to affect residential customers than would be the case with the same proportionate adjustment in transmission prices. This places different emphasis on the form, level and importance of side constraints at the distribution level than may be the case at the transmission level.

Further, while DNSPs (as customers of TNSPs) are constrained as to which transmission networks they can take supply from, some large customers may well take distribution charges into account in their location decisions. Consequently, distribution charges can have a potentially greater affect on economic decisions in downstream markets.

2.4.1.3. Range of pricing parameters

There is a much larger range of possible charging parameters for distribution services between DNSPs and their customers than there are between TNSPs and their customers. This stems from the fact that DNSPs levy charges based on various fixed, variable and capacity charging parameters. In contrast TNSPs charge based on fees for entry, exit, common and usage services.

2.4.1.4. Network investments

Transmission capital asset investments tend to be larger and less smooth over time relative to those of distribution. This reflects the more interconnected nature of distribution systems, which allows for more ‘incremental’ network augmentation than is the case in transmission network augmentation.

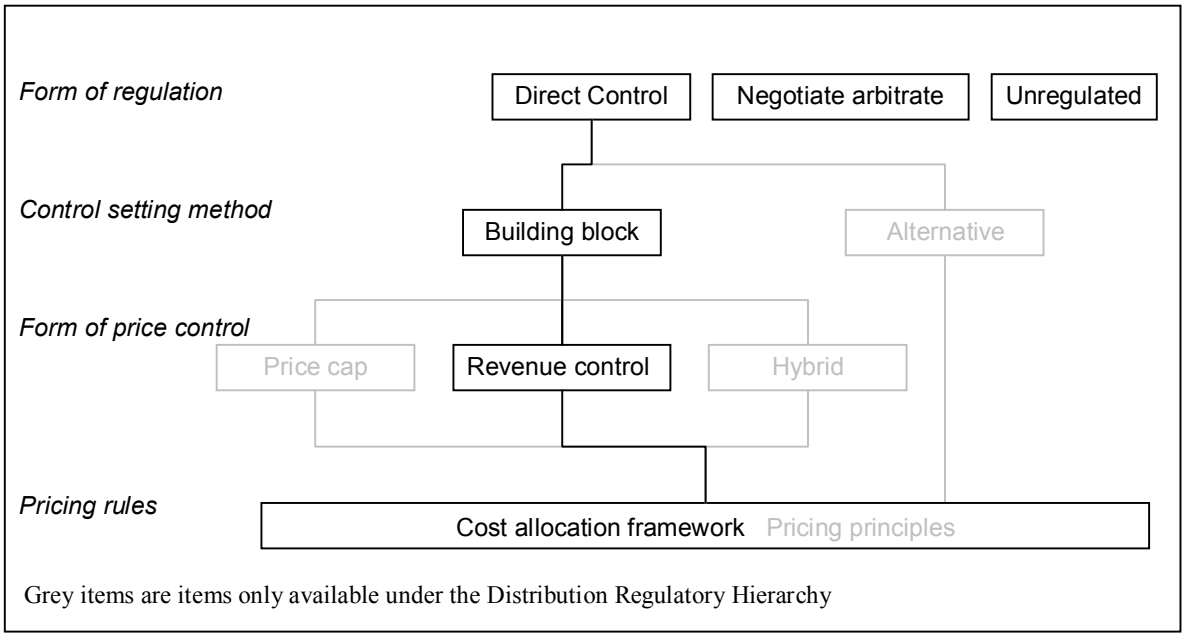
2.4.2. Regulatory frameworks

The regulatory frameworks applied to distribution and transmission services also vary in several ways. For example the revenue regulation of transmission services specifies the control setting method to be applied to prescribed transmission services as being a building block method. This is not the case for distribution services.

In addition, the AEMC's transmission revenue rule requires the use of the revenue cap form of price control whereas the equivalent distribution rules (will) allow the use of price caps, revenue caps or other alternative forms of price control.

Figure 2.2 illustrates these differences by reference to a version of the distribution regulatory hierarchy that has been modified to show the (proposed) transmission regulatory hierarchy.

Figure 2.2
Transmission Regulatory Hierarchy



A further area of regulatory differentiation is the extent of prescription that underpins tariff decisions for transmission. The AEMC's transmission pricing rule, while less so than its predecessor, includes specific requirements regarding cost allocations for transmission pricing. Its draft Rule prescribes the approach to the allocation of the annual service revenue requirement to various categories of transmission services including use of a 50/50 location versus non-location based allocation for usage charges (or an alternative based on anticipated future utilisation and the need for investment). The approach also requires TNSPs to submit pricing methodologies to the AER for approval and permits the AER to publish guidelines on the development of such methodologies.

Such prescription, and in particular the requirement for detailed cost allocations is made practicable by the relatively small number of transmission customers (as opposed to the many

end use customers of DNSPs). This means the information and compliance costs are much lower than would be the case where TNSPs have more customers. In other words, while prescriptive, the aggregated nature of the costs attributable to the relatively small number of customers means the cost and administrative complexity associated with reporting and assessing compliance is more likely to be in balance with the benefits to be derived.

In contrast the much larger number of distribution network customers makes cost allocation a significantly more complex task and one for which compliance assessment is likely to be more cumbersome and expensive. This has been suggested as one of the reasons why all jurisdictions have derogated from the current distribution pricing rules which contain prescriptive cost allocation requirements (see clause 6.13 of the Rules).

The above variations in the network, market and regulatory characteristics of distribution relative to those of transmission highlight the need for distribution pricing rules to be tailored to the specific circumstances of distribution service provision.

2.5. Interaction of transmission, distribution and retail pricing

The final bills faced by most end use customers contain charges for transmission and distribution services (ie, network charges for energy transportation) and retail charges (ie, energy consumption and customer service charges). For most customers these charges are bundled together in a single retail bill, while in some jurisdictions and for some customers there are requirements for the network charge element to be separately identified on retail bills.

The distribution pricing rules considered in this report apply only to the specification of distribution prices and the manner in which DNSPs pass transmission charges through to customers. However it is instructive to consider the interaction of these network charges with bundled retail charges and specifically, the extent to which end use customers face the prices actually levied on them by DNSPs.

Retailers in the various jurisdictions across Australia are not compelled to pass network charges on to end use customers in the same form in which they are levied by DNSPs. Instead the manner in which retailers either absorb, pass on or inflate these charges forms part of the commercial and risk management decisions of retailers, and contributes to their differentiation within contestable retail markets.

In all jurisdictions the prices levied by incumbent retailers that inherited retail franchise customers are subject to ongoing regulation. Such regulation takes varying forms ranging from regulation of the retail components of total prices through to direct regulation of bundled retail and network charges. The latter form of regulation may therefore limit retailers' ability to pass changes in network charges through to end use customers. Such limits raise the question of whether the distribution pricing rules should take into account the extent to which end use customers actually face the prices levied by DNSPs.

For the purpose of developing distribution pricing rules, we consider it preferable to presume that end use customers do face the prices levied by DNSPs. I our view, this presumption is consistent with the fact that retailers are effectively the DNSPs' customers and, over time, it is reasonable to assume that retailers will pass changes in their network costs through to end

users. It follows that the prices levied by DNSPs should be calibrated so as to reflect DNSPs' costs and should not pre-empt the extent to which retailers may pass these costs through to end use customers.

The potential for transitory disconnect between network prices and bundled retail prices should not inform the specification of distribution prices. Rather in order to comply with the NEM objective, we believe that regulatory arrangements should seek to ensure that each component of the electricity supply chain is efficiently priced by reference to the usage and charging dimension of that component of service provision. This is consistent with the approach to transmission pricing whereby TNSPs are required to price efficiently to each terminal station (distribution connection point). This pricing requirement is directed to ensuring that transmission services are efficiently priced despite the fact that most end use customers face transmission charges (generally bundled) that often average transmission charges across multiple terminal stations.

The balance of this report therefore proceeds on the presumption that the prices levied by DNSPs are levied as though they are passed through to end use customers. Similarly, many of the references to changes in customer behaviour may be read as including changes in retailer behaviour, eg, where a retailer reacts to a DNSP's prices by increasing the extent to which it passes those price signals through to end use customers in an unmodified form.

3. Pricing rule framework

The preceding chapters conclude that the distribution pricing rule framework should aim:

- to ensure that revenues earned from each customer or group of customers are set by reference to the efficient costs incurred in serving that customer or group of customers (objective 1);
- to ensure the structure of tariffs is consistent with economic efficiency (objective 2); and
- to provide a regulatory rule and compliance framework that involves incentives and compliance costs that are commensurate with the benefits (costs) of achieving (not achieving) objectives 1 and 2 (objective 3).

The third objective is consistent with the NPWG's stated requirements for the development of distribution pricing rules that

> *...the pricing principles must be sufficiently high level that they can be applied in the wide range of operating environments experienced by DNSPs.* [and] *pricing methodologies cannot be too prescriptive in the Rules...*[16]

3.1. NPWG's proposed pricing rule

In its 17 October 2006 paper *Policy Positions on the Pricing of Electricity Distribution Services*, the NPWG proposed a distribution pricing rule approach that largely replicated the key aspects of the AEMC's transmission pricing rules. This approach would require DNSPs to submit cost allocation methodologies to the AER for approval and permit the AER to develop guidelines regarding these methodologies. As currently specified, the AER would be required to approve these methodologies prior to approving a DNSP's proposed tariffs for a given year.

In addition the NPWG proposed the following high level pricing principles prepared by the Utility Regulators' Forum (URF). [17]

(a) that distribution prices should lie on or between the upper boundary of stand alone cost and the lower boundary of avoidable cost for economically efficient prices; and
(b) that distribution prices should signal efficient economic costs of service provision by:
    (i) having regard to the level of available network capacity; and
    (ii) signalling the impact of additional usage on future investment costs.

While this proposed pricing rule provides a useful staring point for discussion, in our view it is capable of significant improvement. In particular, it may not adequately accommodate the major difference between distribution and transmission, ie, the number of customers and consequent complexity and costliness of cost allocation compliance and assessment (and, in this context, its doubtful benefits).

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[16] NPWG paper Policy Position on the Pricing of Electricity Distribution Services, p.3

[17] Utility Regulators Forum, *Review of Nationally Consistent Pricing Principles*, Discussion Paper, 2005.

Moreover, the formal approval of cost allocation methodologies by the AER and development of guidelines is arguably much more prescriptive and intrusive than the regulatory approach adopted for distribution pricing under the various jurisdictional derogations.

Indeed, in their current form the proposed pricing principles may require immediate derogation for South Australia, Queensland and Tasmania in order to facilitate the continued application of the geographic tariff averaging practices required in these jurisdictions. Given the scope for the initial distribution pricing rules that apply to all jurisdictions, and the non-trivial costs associated with a subsequent rule change proposal and AEMC review, the NPWG has made a policy decision that this review will develop a rule framework capable of accommodating existing jurisdictional arrangements whilst also achieving our proposed objectives.

More generally, we believe it highly desirable that the distribution pricing rules address the basic dichotomy of, on one hand, ensuring efficient revenue recovery per customer or group of customers and, on the other, the choice and level of individual charging parameters.

While the URF pricing principles go some way towards the first issue, they do not address the second. This paper therefore proposes a framework that seeks to guide the extent and manner of compromise between both these aspects of efficient distribution pricing.

3.2. Proposed pricing rule

Our proposed framework involves a two tiered pricing rule that draws on the work undertaken by the URF (as do the NPWG's proposed pricing principles) whilst more clearly incorporating the general principle of long run marginal cost (LRMC) pricing. The two tiers correspond to the dichotomy identified above and apply respectively to:

- the revenue to be recovered per tariff class; and
- the choice and level of individual charging parameters that together determine the tariff structure applicable for each tariff class.

The rule adopts the concept of a 'tariff class' that refers to the collection of charging parameters and associated tariffs charged to a given customer or group of customers.[18] For example, a tariff class might be 'residential time of use' which comprises a standing charge, peak tariff, shoulder tariff and off-peak tariff.

The approach draws on a number of options available to facilitate allocative efficiency as identified by the MCE Expert Panel which noted that:

> *options may include the use of two part tariffs, the desirability of setting charges between incremental and standalone costs, and that tariffs take account of the circumstances of the customer classes to which they apply. Such arrangements should facilitate efficient forms of price discrimination, so*

[18] In this regard a tariff class may apply to a single customer, a group of similar customers, a geographic area, or in the case of those jurisdictions with geographic tariff averaging, an entire state.

that prices to different classes of customer may be adjusted downward (or upward) to reflect different demand circumstances, subject to revenue adequacy criteria and competition in upstream or downstream markets not being compromised.[19]

The proposed pricing rule is specified in Box 3.1, below.

Box 3.1
Proposed pricing rule

1) for each tariff class established by a DNSP, the revenue expected to be recovered from that tariff class should lie on or between an upper bound determined by the stand alone cost of serving the customers to whom that tariff class applies, and a lower bound determined by the avoidable cost of not serving the customers to whom that class applies.

2) having satisfied condition 1), a DNSP must:

a) select one or more charging parameters and set the associated tariff level for each charging parameter so as to reflect the LRMC for each relevant dimension of service, having regard to:

i) the transaction costs associated with each charging parameter; and

ii) the scope for customers to alter their consumption of each relevant dimension of service by reference to the corresponding charging parameter.

b) having satisfied condition 2) a), to adjust the tariff levels for each charging parameter so as to ensure that the revenue expected to be recovered from that tariff class (as specified under condition 1)) minimises the extent of distortion to the pattern of usage implied by the tariff levels set according to clause 2) a).

The two tiers respectively provide:

1. a framework for the assessment of efficient revenue recovery per customer or customer group based on the relevant cost of service; and

2. a tariff setting framework.

These frameworks and their benefits are considered in the following chapters.

[19] Expert Panel on Access Pricing (2006), Report to the Ministerial Council on Energy, pp.111-112

4. Efficient revenue recovery framework

4.1. Upper and Lower Bounds

Part one of this proposed pricing rule achieves the economic objectives of ensuring that the revenue expected to be recovered from each tariff class is calibrated so as to discourage inefficient bypass and to avoid customer subsidies. In other words, a customer or group of customers should not be charged:

- more than the price of replicating or bypassing the infrastructure (standalone cost); or
- less than the costs that would be avoided by the DNSP if that customer was not served (avoidable cost).

The need to apply these efficient pricing bounds arise respectively from the market power of monopoly DNSPs and the obligation placed upon them to supply any customer seeking connection (ie, the inability to exclude - see section 2.2). The following sections detail these bounds and their role in ensuring efficient pricing.

Importantly, it is first useful to observe that as the number of customers in a given tariff class increases, stand alone cost and avoidable cost will tend to converge due to scale economies of serving larger groups of customers or higher levels of demand. Consequently, the efficient pricing bounds test (part one of the proposed rule) becomes more stringent as the size of a customer class increases. This becomes important when considering the appropriate level of discretion that DNSPs are provided in specifying their tariff classes.

It is also important to note that the extent to which costs are avoidable will differ depending upon the time horizon over which avoidability is being considered.

4.1.1. Stand alone cost

Where a customer (or group of customers) is paying more than the stand alone cost of providing the service, it necessarily follows that those customers are paying more than it would have to pay to take supply from another source. In such cases, these customers could stop paying the DNSP, produce the service themselves, and incur lower costs. Prices above standalone cost could not be sustained in a competitive market, because another DNSP would enter the market to serve the customer (or group of customers) at a lower price.

4.1.2. Avoidable cost

Where a customer (or group of customers) is charged below avoidable cost and yet the regulated business continues to cover its total costs, it necessarily follows that the particular customer (or group of customers) is being subsidised by another customer or group of customers.

Such circumstances are inefficient because a DNSP would save money by not serving this customer (or group of customers). Such pricing outcomes cannot be sustained in a competitive market, since a service provider would need to protect its financial sustainability

by choosing not to serve such customers. Even in a regulated context, such conduct is only sustainable where there is some form of universal service obligation placed upon a DNSP.

4.2. Method of rule application

Assessment of these upper and lower bounds on efficient pricing requires examination of the aggregate revenues forecast to be earned through each tariff class against the identified stand alone and avoidable costs of service for that tariff class.

The bounds between standalone and avoidable costs are likely to vary significantly. For example, the marginal cost of serving a customer or group of customers is likely to be close to zero, whereas, the stand alone costs of serving that customer is likely to be extremely high.

4.2.1. Use of aggregate tariff revenues by tariff class

The use of aggregate revenues for each tariff class in the application of the part one efficient pricing bounds test (as distinct from revenue per individual customer within a tariff class) reflects the cost benefit trade-off between sending customised cost and price signals to individual customers and the impracticability of developing a tariff for each individual customer, particularly where individual customers have relatively small levels of demand.

The development of tariffs that apply to certain groups of customers – even when some of the costs of supplying individual customers will vary from one to another - is efficient in light of the significant proportion of distribution network services that are common, and the doubtful benefit of developing and communicating customised prices to every customer (recalling that there are over seven million DNSP customers in Australia).

By allowing DNSPs the discretion to determine their tariff classes and assign customers to these classes, the proposed approach facilitates this efficiency trade-off and assists in achieving two of the key requirements identified in the NPWG's Policy Positions paper. Under this approach DNSPs can specify tariff classes as applying to a group that may be:

- as small as a single customer - perhaps a large industrial plant with specialised needs or, in the case of South Australia, a large customer that may gain from having its allocated transmission charges smeared across all distribution network users rather than connecting directly to the transmission network; or

- as large as its entire set of residential customers – such as where geographic tariff averaging is required.

By assessing tariff class revenue on an aggregate basis DNSPs have some flexibility to set tariffs based on potential differences in the willingness to pay of different customers or groups of customers, ie, to make use of efficient Ramsey pricing methods – see section 2.1.1. It also provides for the use of practices such as geographic tariff averaging (or 'postage stamping') as required in South Australia, Queensland and Tasmania.

This approach also affords DNSPs the flexibility to provide prudent discounts to customers where it is efficient to do so, ie, where a reduced tariff may prevent bypass yet remain above the avoidable costs of supply.

In our opinion, by focusing on aggregate revenue per tariff class rather than revenue per individual customer within a tariff class, two of the key challenges facing the NPWG (as identified in the Policy Positions paper) can be overcome. These challenges and their resolution within the proposed rule framework are considered in more detail in the following sections.

4.2.1.1. Geographic tariff averaging

The proposed rule allows for geographic tariff averaging or other forms of customer tariff averaging, based on customer characteristics determined by the DNSP. This is because a degree of tariff averaging will always be efficient, depending on the relative costs and benefits of providing separate prices to each individual customer connected to a DNSP's network. The question then becomes 'over what range of customers will such averaging remain efficient?' The further question of who will determine this efficient range and what guidance they are provided is considered in section 4.4.

The answer is that it will not be efficient to continue to average all customers or locations together where:

- there is a significantly large customer or group of customers or sub-location paying prices that are above stand alone or below avoidable cost; *and*
- the administrative and transactions costs of levying a distinct tariff for this customer group or location are sufficiently low as to provide a net benefit to doing so.

The presumption is that DNSPs will take these efficiency considerations into account when specifying their tariff classes. This presumption is supported by the principles discussed in section 4.4 and is more reasonably held for DNSPs operating under a price cap form of price control where customer bypass directly affects the commercial fortunes of the DNSP. The extent to which this presumption holds for those DNSPs operating under a revenue cap may be less clear, and should be addressed within the compliance assessment framework considered in chapter 6.

Taking this presumption as given, allowing DNSPs flexibility as to how they choose to define their tariff classes can be expected to result in efficient choices as to the extent of customer aggregation, as distinct from disaggregation. For example, tariff classes may be based on one or more of the following factors:

- size of the connection;
- type of use;
- maximum demand;
- location;
- meter type (type of connection); or
- the DNSP's need/desire to implement a prudent discount.

DNSPs can also be expected to take into account any applicable tariff equalisation schemes in their jurisdictions such as those applying to distribution tariffs in South Australia, Queensland

and Tasmania. For example, under the proposed rule, ETSA utilities in South Australia would be expected to define a single residential tariff class that included all residential customers in all geographic locations across the state.[20] The situation in Queensland would also operate in line with the different application of geographic tariff averaging mandated in that jurisdiction.

The question of whether or not specifying large geographic tariff classes across entire jurisdictions in order comply with geographic tariff averaging requirements would be an efficient outcome is largely an empirical one, and would in any case not prevent the application of the proposed rule.

That said, while the proposed rule allows DNSPs to apply geographic tariff averaging via their tariff class specification decisions, it does not compel them to do so. This compulsion remains the responsibility of individual jurisdictions under clause 14.7(b) of the Australian Energy Markets Agreement (AEMA). It is therefore likely that South Australia, Queensland and Tasmania would need to implement specific derogations to require their respective DNSPs to specify their tariff classes (under part one of the rule) in a manner that facilitates or achieves geographic averaging of residential tariffs.

To achieve what we understand to be the current outcome in each of those jurisdictions, in our view such derogations would only need to replace that part of the proposed rule that provides guidance on the efficiency principles that DNSPs are to apply when specifying their tariff classes (see section 4.4). In other words, we do not see it as necessary for those jurisdictions to derogate from both tiers of proposed rule in order to maintain this aspect of the status quo. Rather the derogations would impose additional constraints on the application of part one of the proposed rule by over-riding the associated tariff class specification principles.

It should be noted that the proposed rule framework would also accommodate Victoria's transmission tariff equalisation scheme. However the mechanism for doing so would differ. Specifically, the costs of the Victorian scheme which is implemented via a system of equalisation payments and receipts administered by VENCorp, would continue be incorporated into the LRMC cost structure of the DNSPs' transmission costs. This is because it is levied (received) as a separate cost (revenue) item within the DNSPs' transmission cost calculation (maximum transmission revenue allowance).[21]

4.2.2. Prudent discounts

In some circumstances it may be efficient for a DNSP to offer a given customer or group of customers a discount on their distribution charges. This is often referred to as 'prudent discount' arrangement and occurs where a customer's (or group of customers') costs do not reflect those of the rest of its tariff class such that the customer may credibly be able to threaten to bypass the DNSP's network or relocate. Where the avoidable cost of the customer

[20] Consistent with part d of schedule 5 of ESCOSA's 2005-2010 Electricity Distribution Price Determination: Part B - Price Determination

[21] See clause 3.3 of the ESC's Electricity Distribution Price Review 2006-10, Final Decision Volume 2 Price Determination

leaving the DNSP is less than the costs that the customer would incur in doing so, it will be efficient for the DNSP to offer a discount.

Under a price cap form of price control, DNSPs are motivated to provide efficient discounts where appropriate because otherwise they risk losing the affected customer(s) without any means to recoup foregone revenues. Indeed the large number of tariff class offerings and sometimes small number or single customers assigned to them suggest that price differentiation is already common practice among DNSPs.

This differentiation may however also be affected by the interaction of regulatory revenue resets with DNSPs' pricing behaviours. In particular, it should be recognised that under a price cap, the DNSP would only lose the revenue associated with a customer who bypasses the network until the next reset when forecast prices are increased based on lower demand projections as a result of that customer's bypass. While the price path would be realigned at the reset, the DNSP would have permanently foregone those revenues not recovered within the period.

It should also be noted that the proposed revenue rules for distribution provide for no asset stranding risk which may distort DNSPs' discounting incentives relative to the situation where there was asset stranding risk.

The proposed rule provides for DNSPs to offer discounts by establishing new tariff classes where these assist in delineating a different class of customers for whom a discount is appropriate. Importantly, the rule also allows DNSPS to recover the associated cost from other tariff classes, within the constraints of the efficient pricing bounds test and any applicable side constraints.

The recovery of such 'discounts' is made possible by the approaches used to give effect to both price cap and revenue cap forms of price controls. That is, where a given tariff class is discounted, the weighted average tariff basket will permit another tariff class (or multiple tariff classes) to increase by a commensurate amount. Therefore, the flexibility to offer prudent discounts is already a feature of current distribution pricing behaviour under the various derogations to jurisdictional regulators and the arrangements applied by those regulators.

The widespread use of differential pricing among DNSPs may be attributed to the distinguishing characteristics of distribution networks relative to transmission networks. The large number of distribution customers makes price differentiation a relatively easier task. This arises because the variation in customers' cost impost and willingness to pay will be greater and also because any 'discounts' may be recovered across a much larger number of customers or tariff classes.

In this way, discounting provisions in the distribution pricing rules need not be as explicit or prescriptive as those applying to transmission. Differences between the two sets of rules (the AEMC's revised transmission rules and the existing distribution rules) are set out in Table 4.1.

Table 4.1
Prudent discounting rules provisions

Transmission		Distribution		Comment
6A.26.1 (a)	Principle that prices are maximum prices for services at defined standards.	6.6.6 (a)	Same as transmission	
6A.26.1 (b)	Lower prices can be by agreement	6.6.6 (b)	Same as for transmission	
6A.26.1 (d)	Allowance to recover discount from other customers *if* discount complies with AER guidelines		No equivalent in distribution rules	This recovery is facilitated through weighted average tariff basket approach and only on a prospective basis where the DNSP is regulated via price cap
6A.26.1 (g)	Discount not recovered in one year can be recovered in a subsequent year.		No equivalent in distribution rules.	This recovery is permitted where the DNSP is regulated via revenue cap
6A.9.1 (4)	Agreement for higher and lower prices to apply where higher or lower service standards relative to the prescribed services standard have been negotiated but limitation of discounts for lower standard services to avoided costs of providing services at a lower standard.	6.6.6 (c)	Same as transmission, but currently specified for prescribed distribution services.	

The means to discount tariffs will continue to be available to DNSPs under the proposed rule. However the additional discipline of pricing on or between stand alone and avoidable cost will further ensure such discounting is consistent with efficient pricing. DNSPs will continue to be able to implement discounts via the choice of tariff classes (and potentially through their cost allocation methodologies underpinning the assessment of the efficient pricing bounds test).

As identified in Table 4.1, the incentives for discounting will vary depending upon whether the DNSP is regulated via a price cap or revenue cap. This is due to the revenue risk faced by DNSPs under a price cap, and not faced by DNSPs under a revenue cap.

Under a revenue cap a DNSP is assured to recover the costs of discounts from other customers via the revenue 'overs and unders' correction mechanism. Such recovery will be limited by any applicable tariff rebalancing constraints (side constraints) in any given year, but over time will be captured by the correction mechanism such that the DNSP would not be out-of-pocket for the cost of the discount in NPV terms.

In contrast, under a price cap a DNSP is exposed to greater revenue risk and so, at the risk of losing a customer, it faces an incentive to implement prudent discount arrangements by means of a revised tariff class specification, with a commensurately lower tariff. This in turn allows headroom in the price control from which to recover the revenue from other customers. This recovery will be constrained by the fact that it must be achieved in the same year (ie, on prospective basis when tariffs are approved annually) and that the tariff movements required to implement the recovery may be impacted by any applicable side constraints.

A further potential difference of incentive as regards discounting and the form of price control is the fact that approved prices are classified as maximum prices in the rules (clause 6.14.6 (a) of the Rules). This means that DNSPs may choose to price below their approved prices for a particular customer or group of customers. While the above considerations have focussed on the implementation of prudent discounts within the approved tariffs, the absence of any specified minimum tariff allows for discounts in addition to those inherent in approved tariffs.

4.3. Cost allocation

The need for and the administrative complexity of cost allocation in distribution services is very different from that in transmission services, as discussed in section 2.4.2. This arises from:

- the incentives that price cap regulation provides for DNSPs to set efficient prices; and
- the more interconnected nature of distribution networks and associated existence of large numbers of distribution customers and tariff classes, giving rise to significant 'common costs'.

As discussed above, the revenue risk faced by DNSPs under price cap regulation motivates them to price in a manner that reflects marginal cost. This is because to do otherwise would lead to either loss of customers or reduced revenue sufficiency. It follows that DNSPs regulated by means of price caps will necessarily be motivated to apply the upper and lower bound tests for revenue adequacy across different customers or customer groups.

The interconnected networks with significant common costs and the large number of distribution customers makes cost allocation a complex task with potentially significant administration and compliance costs for both DNSPs and the AER as the regulator.

These factors limit the extent to which it will be efficient to prescribe cost allocation arrangements and compliance requirements in the distribution pricing rules. This is because the likely net benefit of such prescriptive rules will be low or possibly negative. That said, some form of assessment that links costs to different tariff classes is necessary to give effect to part one of the proposed pricing rule framework.

Ensuring tariff class revenues are between stand alone and avoidable costs (ie, to apply the efficient pricing bounds test) requires that forward-looking costs be identified for each tariff class. In practice, this is likely to require a DNSP to 'allocate' its existing costs across its various tariff classes.

The NPWG Policy Positions paper states that the rules will require the AER to prepare and publish cost allocation guidelines. However, the use of cost allocation methodology requirements is highly prescriptive relative to the arrangements currently applied by the various jurisdictional regulators. This has been identified as one of the reasons for all jurisdictions having derogated away from the current distribution pricing rules.

In our view it is unlikely to be desirable for cost allocation guidelines to be applied prescriptively by the AER. For example, many of the benefits discussed above regarding prudent discounting or postage stamp pricing are unlikely to be realised were the AER to impose a highly prescriptive cost allocation methodology.

Furthermore, leaving cost allocation methodologies to the discretion of DNSPs is consistent with the use of high level pricing principles in that it acknowledges the significant information asymmetry between regulators and regulated DNSPs. This was recognised by the URF which stated that:

> *The adoption of high level principles acknowledges that distributors' will have a greater understanding than regulators of their cost structures, users' needs as reflected in demand patterns and the sensitivity of those demands to price signals, as well as network utilisation and the likelihood of the emergence of congestion.*[22]

Finally, the decision of the degree of prescription to apply to cost allocation arrangements in the rules is best considered in the context of how the pricing rule arrangements will be implemented through compliance assessment. This is discussed in more detail in chapter 6.

4.4. Specifying tariff classes

As discussed in section 4.2.1, it is proposed that the Rule provide principles regarding the mechanism for DNSPs to divide their customers into tariff classes. Such principles should

[22] Utility Regulators' Forum (July 2005), Review of Nationally Consistent Pricing Principles, Discussion Paper, p.4

identify that when determining how many tariff classes to have and on what basis to differentiate between classes DNSPs should have regard to:

- the extent to which the application of the efficient pricing bounds test provides different outcomes for a given customer, group of customers or sub-location and the materiality of any difference in these outcomes, ie, are they paying prices that are above stand alone or below avoidable cost of servicing those customers?; and
- the transactions costs of recognising these differences by differentiating the pricing to this customer, group or location, taking into account the likely scope for behavioural change, ie, the costs and benefits of presenting tariffs to individual customers that reflect the forward-looking costs that they impose on the DNSP.

These principles reflect the two tiers of the proposed pricing rule.

As noted above, providing tariff class specification principles will have consequences for the need for jurisdictional derogation. Where the above principles are prescribed in the rules, it is likely to be necessary for South Australia, Queensland and Tasmania to derogate in order to retain their geographic tariff averaging practices. However it should be noted that these jurisdictions would only need to derogate so as to impose an additional constraint on the manner in which their DNSPs apply the first tier (ie, part one) of the proposed rule framework.

In other words, the relevant jurisdictions would need to derogate away from the tariff class specification principles and guidance contained in the Rule and implemented by the AER, and substitute this with a requirement for geographic tariff averaging. The AER would then be responsible for ensuring compliance with the geographic tariff averaging requirement when it applies tier one of the pricing rule to DNSPs' operating in these jurisdictions.

The second tier (ie, the part two tariff setting framework) would remain applicable to all jurisdictions in its proposed form regardless of the approach to geographic tariff averaging. This tariff setting framework is examined in the following chapter.

An alternative to the above derogation arrangements would be to add an additional clause to the tariff class specification principles in the Rule. Such as clause would require DNSPs to have regard to any applicable tariff class specification constraints sanctioned by the AER. This would in turn be supported by a provision in the rules for the AER to sanction individual tariff class specification requirements submitted to it by relevant jurisdictional Ministers.

In this way, for example, the SA Minister for Energy could submit tariff class specifications for residential users to the AER that would facilitate geographic tariff averaging. The AER would then be responsible for administering these requirements when assessing ETSA Utilities' tariff classes and applying the proposed pricing rule.

The benefit of this approach is that no jurisdiction would need to derogate from the Rule. Further, the compliance and accountability framework would clearly and consistently remain the responsibility of the AER even where additional jurisdictional requirements apply.

5. Tariff setting framework

Part two of the pricing rule sets out a framework within which DNSPs must determine the individual charging parameters applying to each tariff class (ie, price structure). This framework:

- imposes a long run marginal cost (LRMC) pricing standard on DNSPs' pricing structure decisions;
- causes DNSPs to give consideration to the basis on which they set charges (ie, the various dimensions of use and the associated measurement options or requirements, and tariff elements); and
- causes DNSPs to give consideration to cost and clarity of any usage signal provided to customers, and the potential for customers to change their consumption decisions in response to those signals.

These objectives reflect the fact that efficient price structures require that prices reflect marginal cost, the cost of administering prices and the ability to give rise to behavioural change. These objectives and their importance to the tariff setting framework are considered in the following sections.

5.1. LRMC pricing standard

Economic principles require that efficient prices be structured and set at levels that reflect the associated marginal costs of supply. This allows prices to provide the link between the cost of service provision and the amount customers pay, thereby balancing the benefits obtained by consuming electricity network services with the costs of providing them.

In the absence of such link, customers may consume either more or less electricity network service than is efficient. In such circumstances allocative efficiency is reduced ie, some consumers miss out when they should not, and some production does not take place, when it should.

For the electricity distribution services industry, pricing above (below) the cost of service provision may lead customers to make inefficient decisions about installing their own generators (eg, photovoltaic cells), bypassing the DNSP's network, relocating, or increasing (decreasing) their consumption of other substitute fuels such as gas. Such distortions in relation to end use decisions will, in turn, distort investment decisions in upstream generation and transmission markets.

Consistency with the NEL objective therefore requires DNSPs to be motivated or required to reflect marginal cost pricing principles when setting their tariffs.

5.1.1. What is marginal cost?

Marginal cost is a forward-looking concept that relies as much on probability and expectation as on fact. Estimates of marginal costs therefore represent the probability weighted cost of various expectations of demand and supply cost scenarios.

Marginal costs will vary based on a number of factors including between customers, times of use, types of use and location. It is therefore inaccurate to talk about 'the' marginal cost. For marginal cost pricing to present customers with relevant signals as to the costs incurred as a result of their consumption decisions, the relevant marginal cost needs to be carefully defined in terms of the service, location and time of use, and available parameters for charging customers.

For example the marginal cost of serving a residential customer in metropolitan Sydney will vary from that of serving a residential customer in far north Queensland. Equally, the marginal costs of serving an industrial customer during business hours on Monday to Friday will vary from that of serving the same customer at 4:00 am on a Sunday morning.

In addition to varying across different customers, locations, types of use, volumes and times of use, marginal cost will also vary depending upon the time horizon over which costs are being assessed. More particularly, the marginal cost will vary depending upon whether a time horizon is assumed that:

- allows only variable costs of production to vary; or
- allows all costs of production to vary, ie, including fixed costs.

These two time horizons correspond to the concepts of short run and long run marginal cost respectively. The fundamental difference between short run marginal cost (SRMC) and long run marginal cost (LRMC) is the time frame under consideration and the implications of this for a DNSP's ability to vary its capacity.

5.1.2. What marginal cost horizon should the rules contain?

The appropriate choice of marginal cost time horizon will depend largely upon the characteristics of the market for electricity service provision.

SRMC, which involves a time frame over which capacity constraints apply, is more relevant if the emphasis is to be on curtailing demand at the precise time when capacity constraints are encountered. By contrast, if management of short term capacity constraints is less relevant than long term capacity and consumption decisions, LRMC provides a more useful price signalling mechanism. Examples of such decisions in an electricity context might involve both the demand side (ie, purchases of electricity efficient appliances) and the supply side (ie, network augmentations) of the market.

Given the long term nature of network investment and consumption decisions, LRMC is likely to be the more appropriate time horizon for use in the pricing rules. This is because SRMC price signals fluctuate and so are more difficult to measure and to communicate to customers, and so to affect short term consumption decisions. Even if short term consumption decisions can be adjusted easily, measurement and the communication to relevant customers of short term network constraints is difficult (as compared say to the measurement of electricity generation capacity constraints).

Having determined that LRMC is the more appropriate time horizon for distribution pricing, there remain a number of factors that will influence the estimation of LRMC. This will depend on the basis of charging (ie, the charging parameters) for various customers (ie, the

LRMC of what?) as well as the administrative costs of charging by reference to these parameters. This will be determined by the transaction and information costs of presenting marginal cost signals to the relevant customers and on the available charging parameters, as discussed in section 5.2 below.

In addition the efficiency of marginal cost pricing will also be affected by the ability for the DNSP to achieve revenue sufficiency. This arises where marginal costs are less than average costs as discussed in section 2.1.1. The implications of this for the tariff setting framework are discussed in section 5.3 below.

5.2. Basis of charging

When setting distribution tariffs it is first necessary to identify the basis of charging for each tariff class. This involves the identification and consideration of all available usage bases and associated charging parameters, which may include one or more of those identified in Table 5.1.

Table 5.1
Potential charging parameters

Basis of charge	Charging parameter example
Standing or connection charge	Customer numbers
Time of use consumption charge	Peak, shoulder, off-peak consumption (where these are defined by times of day, or days of the week)
Accumulative consumption charge	Flat rate, inclining block
Demand charge	Peak demand, agreed capacity
KVA charge	KVA
Seasonal charge	Summer consumption premium

As identified above, the choice of charging parameters for a given tariff class will also influence the way in which marginal costs are estimated for that tariff class. It is likely that different charging components and their associated tariffs within a given tariff class will have different marginal costs. For example the marginal cost of a connection charge will differ from that of a peak time of use charge.

While the charging parameters will inform the marginal cost estimation, the choice of charging parameters also involves consideration of how various charging parameters align with the accurate measurement and reflection of costs for different types of usage. For example:

- standing charges reflect connection to the network for potential supply;
- time of use charges reflect the different marginal costs (or contributions thereto) at different times of day or week;

- capacity charges reflect the DNSP making certain minimum/maximum amounts of capacity available to the customer; and
- summer peak charges reflect the additional augmentation expense incurred through the incidence of system-wide peaks and network capacity constraints.

The final consideration as to which charging parameters to apply in setting tariffs will be informed by the more practical issue of the cost effectiveness of charging be reference to the various available parameters. There will be a trade-off between the cost of measurement and the benefits of charging on a given parameter basis.

For example, a DNSP may determine that a particular customer group contributes significantly to the incidence and cost of system peaks, and so it would be desirable to shift some of their load by differentiated time of use prices. However such a pricing strategy requires metering capacity capable of measuring consumption at different times of the day (ie, an interval meter).

It follows that the DNSP must make a judgement as to whether the cost of interval meter installation and data management is justified by the expected behavioural change and associated savings. Put differently, it needs to be considered whether there will be a net benefit to levying a tariff using this charging parameter.

This judgement requires detailed knowledge and understanding of the following factors:

- the DNSP's cost structures;
- the DNSP's likely level of network utilisation and congestion under different levels of customer price responsiveness;
- customers' needs as demonstrated through in their demand patterns; and
- the sensitivity of customers' demand to price signals.

The large volume of information required for these judgements supports the view that DNSP's will be better informed to make these decisions than regulators. This being the case, it will be preferable to provide DNSPs discretion to apply the efficient pricing principles in determining their charging parameters rather than prescribe the basis of charging in the rules.

5.3. Usage cost signalling and behavioural change

As noted above, the cost benefit assessment of various charging parameters requires consideration of the scope for these to affect behavioural change. This is because efficiency gains will therefore only be achieved where there is behavioural change (relative to some counterfactual). When setting tariffs, it is desirable to require DNSPs not to simply provide cost signals, but to also consider customers' capacity to understand and respond to those signals.

The identification of behavioural change requires DNSPs to examine the customers' willingness to pay for distribution services. This is commonly referred to as customers'

demand elasticities. These elasticities will vary for different customers, charging parameters and tariff rates.

Different customers will have different levels of responsiveness to changes in their distribution tariffs. This responsiveness may reflect a number of factors including the customer's income level, the share of their total consumption dedicated to purchasing electricity and the availability of and cost effectiveness of other energy substitutes.

In principles, different charging parameters will each have their individual levels of demand elasticity. For example changes in the connection cost may be expected to have less impact on a customer's consumption decisions (whether or not to connect) than changes in their consumption charges (whether or not to use more electricity once connected). Also, changes in contracted capacity prices may have less impact on consumption than peak time of use consumption charges because of the lag between adjustment in customers' contract demand threshold and their actual capacity usage.

Finally, different tariff rates will result in different levels of demand elasticity. This is because different tariff rates and increases therein will reflect differing levels of relative price change. Thus the level of response will also vary.

Ideally each of these forms of elasticity should be taken into account under parts 2 (a)(ii) and 2 (b) of the proposed rule. Such issues should also inform DNSPs' decisions about the level of customer aggregation versus disaggregation in the specification of tariff classes. Part 2 (b) of the proposed rule encourages the use of Ramsey pricing principles where there is a need for compromise between LRMC pricing principles and revenue sufficiency.

More specifically, part 2 (b) of the proposed rule requires that where marginal cost pricing is insufficient to recover the allocated revenues, the under recovered revenues should be levied on those charging components that have the least price responsive demand. This is consistent with the Ramsey pricing principles discussed in section 2.1.1

The desirability of such a pricing strategy was acknowledged by the Utility Regulators Forum which noted that:

> *Where prices based on 'economic' incremental costs under-recover fixed and common costs provided for in the allowed revenues, the shortfall should be made up in a manner that minimises the effect on consumption and investment while having regard to the impact on users. As noted in footnote 2 Ramsey prices have the effect of minimising the distortion of demand.*[23]
>
> [2] In markets subject to scale economies and declining average costs of supply to sustain the suppliers financial viability fixed and common costs including a profit margin have to be recovered in addition to direct or marginal costs of supply. Recovery of these costs by means of Ramsey pricing which seeks to minimise the distortion of demand is considered to give the most efficient price signals in these circumstances.

[23] Utility Regulators' Forum (July 2005), Review of Nationally Consistent Pricing Principles, Discussion Paper, p.3

5.4. Application of price setting framework to both TUOS and DUOS

The proposed pricing rule would be applied both to DNSPs' distribution tariffs as well as to the way in which DNSPs pass transmission charges through to end use customers. This is consistent with the approach currently applied by the Victorian ESC in its regulation of transmission cost recovery by DNSPs.[24]

In the context of transmission cost recovery, a DNSP's LRMC would be taken to be the forward-looking transmission costs expected to be incurred by the DNSP, as they relate to each tariff class and charging parameter.

This application of the pricing rule to the way DNSPs pass transmission charges through to end use customers ensures DNSPs apply the same pricing principles in their transmission charging as they do for distribution charging. The effect of this rule is the requirement for the DNSP to pass on to end use customers as closely as possible the price signals that are created by the TNSP. That is, the DNSP would not be examining again what price signals should apply to the use of the transmission network, but would merely be required to pass though what the TNSP decided was appropriate.

This assists in promoting the NEM objective by encouraging all network tariffs (both distribution and transmission) to be set in a manner that is consistent with economic efficiency.

In combination, these disciplines can also be expected to support better transmission price signalling to end users and to current and potential embedded generators who are/might be eligible for avoided transmission cost payments.

We note that those jurisdictions that apply geographic tariff averaging to transmission charges should not need to derogate from this section of the Rule. This is because DNSPs could be expected to continue to apply an efficient level of averaging across their customers in line with the current practice even in those jurisdiction that do not require geographic tariff averaging. For example, in Victoria SPAusnet applies the same Small Residential Single Rate transmission tariff to residential customers located in the Latrobe Valley (ie, next to the base load generators) as it applies to customers located in Mallacoota on the coast near the NSW border.

Applying the pricing rule to both the transmission and distribution charges levied by DNSPs is also consistent with current arrangements under chapter 6 of the Rules whereby DNSPs are required to publish annual information disclosing the separate transmission use of system charges and distribution use of system charges levied on each class of customer.[25] Those jurisdictions that include transmission charges as quasi-distribution costs within bundled distribution charges would already be operating under derogation and would continue to need to do so.

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[24] See ESC, Electricity Distribution Price Review 2006-10, Final Decision Volume 2 Price Determination clauses 2.3.16 (distribution) and 3.3.6 (transmission)

[25] The Rules clause 6.18A(f)

6. Process and compliance

Process and compliance arrangements are a fundamental component of the pricing rule since they are the means by which incentives and motivations are aligned with the efficiency principles contained in the Rule. When considering the appropriate procedural and compliance arrangements to give effect to the proposed rule, it is important to have regard to our third rule review objective. That is, the rules should provide a price setting and compliance framework that provides incentives and compliance costs that are commensurate with the benefits (costs) of achieving (not achieving) the objectives of:

- efficiency in the relative revenue contributions of different tariff classes; and
- efficiency in the manner in which tariff classes are specified, charged and priced.

Consideration must also be given to the practicability of compliance arrangements and the need for such arrangements given the incentives created through other components of the regulatory framework (eg, price caps). In this regard, the procedural and compliance arrangements should complement (rather than duplicate) existing constraints and incentives that affect the extent to which DNSP's price in accordance with efficiency principles.

6.1. Existing constraints on efficient pricing

An important existing constraint to efficient pricing is the side constraints or 'tariff rebalancing constraints' applied in various jurisdictions. These constraints limit the allowed annual movement in a given tariff class and apply in addition to the applicable revenue or price cap.[26]

The nature of these constraints (eg, expressed net or inclusive of consumer price inflation), the extent of their application (eg, to tariff components to tariff classes) and the level of restrictiveness (rate of allowed movement) vary significantly across current jurisdictional arrangements. For example, in Victoria a tariff rebalancing constraint of CPI+2% is placed on both the distribution and transmission tariffs levied by DNSPs.[27] This is consistent with the CPI+2% constraint included in the AEMC's final transmission pricing rule determination for the locational component of transmission charges.[28]

Other jurisdictions apply side constraints that include both real constraints in a 'CPI+' form, and nominal constraints in a 'no greater than $X' annual average customer price rise form. For example, South Australia applies a real side constraint of CPI+3.5% on individual tariff components across all tariff classes. In addition, a further nominal constraint is placed on the fixed component of residential tariffs to the effect that these may not increases by more than

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[26] As allowed for under clause 6.14.4 of the Rules

[27] See clauses 2.4.2 and 3.4.2 respectively for distribution and transmission in the Electricity Distribution Price Review 2006-10, Final Decision Volume 2 Price Determination. Note that additional factors are also included in the side constraint to accommodate additional annual tariff movement arising from the service incentive scheme (S factor), licence fee pass though (L factor) and variation in transmission costs (Z factor).

[28] See clause 6A.23.4(f).

$5 per annum.[29] [30] In contrast the Victorian tariff rebalancing constraint is applied as a single constraint of CPI+2% on the aggregate weighted average tariff revenues for each tariff class.

A further area of distinction in the application of side constraints in different jurisdiction is the extent to which these apply to tariff movements between regulatory periods. For example, where Victoria and NSW apply their respective side constraints between the final year of a given regulatory period, and the first year of the ensuing regulatory period, this is not the case in some other jurisdictions.

The above constraints limit the magnitude of annual price changes experienced by customers. However, in doing so, they also place a constraint on the speed with which TNSPs or DNSPs can move historic price levels or structures towards those within the efficient pricing bounds. Such constraints may therefore make the application of the efficient pricing bounds test (part one of the proposed rule) a largely hypothetical exercise.

In the extreme case, strict compliance assessment against efficient pricing principles in the context of restrictions on tariff rebalancing may create a regulatory 'stalemate.' This presents two key considerations that must be accounted for in developing the pricing rules:

1. side constraints must be specified in a manner that facilitates a smooth transitioning from current pricing arrangements to prices that satisfy the efficient pricing bounds test; and

2. the existence of tariff rebalancing constraints must inform the choice of compliance assessment adopted in the rules.

The NPWG has provided guidance to the effect that a provision for rebalancing constraints should be retained in the pricing rules and that a uniform approach is to be adopted. In this way customers in any given jurisdiction will not be exposed to greater rates of change in distribution prices than those in any other.

Side constraints logically apply within but not between individual tariff classes. The exception to this is where a DNSP introduces a new tariff for which it would be required to identify an existing 'parent' or 'origin' tariff and estimate the sales that would have occurred under that tariff had it existed at the time of the relevant sales quantities being used (see section 6.4.1 below). In such instances the side constraint would be applied between the parent tariff and the new tariff. This limits the extent to which the introduction of new tariffs provides a means of circumventing the side constraint. This is consistent with the approach currently applied in NSW and Victoria.

In our opinion, side constraints should be applied to the aggregated weighted average tariff revenue for each tariff class. This approach retains the price smoothing features associated with large increases in the revenue earned from a given tariff while also affording the DNSPs

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[29] See clause 3.2 of the Essential Service Commission of South Australia, 2005-2010 Electricity Distribution Price Determination: Part B - Price Determination, June 2005.

[30] IPART applies a similar nominal constraint on the fixed component of residential prices constraining annual movements to no greater than $30. A price limit factor of 4.5% is also applied to other tariff components. See IPART, NSW Electricity Distribution Pricing 2004/05 to 2008/09 Final Determination, June 2004.

flexibility to alter the structure of individual tariff components in line with the principles set out in part two of the proposed rule.

This tariff class level application of side constraints is consistent with the approach adopted for part one of the proposed rule. It also reflects the fact that end use customers are generally unlikely to be affected immediately by changes in the component structure of tariffs because of the limited extent to which retailers are likely rapidly to restructure retail tariffs so as to pass on changes in the structure (as opposed to level) of network charges levied by DNSPs.

In light of the MCE's stated objective of applying consistency in the rules that apply across the NEM, we propose that the common side constraint be set at 2% consistent with the approach for transmission pricing adopted in the AEMC's final pricing rule determination.

An important variation to this 2% real side constraint may arise where the initial price adjustment (referred to as P_0 adjustment) required following a regulatory reset necessitates increases in all tariffs in excess of the rebalancing constraint applied to annual price movements within regulatory periods. In NSW this issue was overcome via application of a specific (higher) price limit factor of 7% for the first year of the regulatory period.[31]

To maintain consistent treatment of all DNSPs and preserve the certainty of the rule application between regulatory periods, we suggest that the side constraint apply to all years within and between regulatory periods and be specified as being the greater of:

- CPI+2%; or
- CPI-X+2%.[32]

Under this approach the real effective rebalancing limit of 2% is maintained regardless of whether the regulatory reset requires price reduction or price increases.

Where the AER applies annual service incentive rewards or penalties in the applicable price control formula, it may also be appropriate to include an adjustment factor for such payment in the side constraint formula in order to preserve the real 2% effective rebalancing limit. Precedent for this is provided in the Victorian approach.[33]

In addition to side constraints, a further constraint to DNSPs' levying inefficient tariffs arises from the revenue risk that exists under price cap regulation. This risk and its motivation of efficient pricing was discussed in section 2.2.2.

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[31] IPART, NSW Electricity Distribution Pricing 2004/05 to 2008/09 Final Determination, June 2004. Annexure 9.

[32] Note, the actual rule will specify this constraint in a manner consistent with the current formulaic specification adopted by jurisdictional regulators. That is:

- (1+CPI)(1+2%); or
- (1+CPI)(1-X)(1+2%)

[33] See Footnote 27.

6.2. Procedural and compliance arrangements

Currently, different jurisdictions (under their respective derogations) apply slightly different procedural and compliance arrangements for approving DNSPs' network tariffs. The common element to these arrangements is the annual application of a price control or revenue control formula via a tariff basket approach. In addition, those jurisdictions that apply a side constraint do so via a rebalancing constraint formula. Thus, annual tariff approval procedures are highly formulaic and thereby have a significant degree of certainty regarding compliance assessment. This provides a high level of regulatory certainty and transparency and assists in minimising the cost burden of regulation.

When considering the specification of the procedural and compliance arrangements for the pricing rule, it should be noted that, in practice, there will be many approaches that will potentially show that a DNSP is setting prices that earn revenues within the efficient bounds of stand alone and avoidable cost. This means there is likely to be little benefit in protracted exercises to establish pricing and cost allocation guidelines and methodologies. This contrasts with the case in transmission where the small number of customers and less interconnected network infrastructure simplify this task.

It follows that, in the case of distribution, rather than attempting to establish what the 'best' pricing method is, the rules should seek simply to require DNSPs to provide sufficient information to demonstrate that they are pricing within the specified efficient pricing bounds.

It is true that approval based on annual assessment of cost allocations is likely to be administratively burdensome, and potentially to exceed the benefits of cost allocation. Moreover the existence of side constraints (rebalancing constraints) on individual annual tariff movements is likely to constrain the extent to which any particular cost allocation framework is capable of being fully applied (or varied) in any given year.[34]

The choice of compliance assessment must therefore be cognisant of existing efficient pricing incentives and constraints within the overall regulatory framework and ensure that the imposition of additional regulatory controls on pricing are applied in a manner that balances the benefits with the associated administrative costs.

6.3. Procedural and compliance options

Given the issues affecting the balance of costs and benefits associated with development and application of pricing methodologies for the distribution sector, it is prudent to consider the range of compliance and procedural arrangements that may potentially be adopted for use in the distribution pricing rules.

The following sections examine the potential pros and cons of three procedural and compliance approaches currently applied in different Australian jurisdictions before

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[34] The exception to this side constraint effect occurs during regulatory resets, at which times DNSPs may be required to apply initial price adjustments (Po adjustments) that could potentially provide significant scope for tariff rebalancing (where the price adjustment is negative) even within a relatively high side constraint. As noted above our proposed side constraint rule will overcome this issue by including the X factor in the side constraint formula to apply between regulatory periods.

concluding by identifying the preferred method given the current stage of development of the NEM. The approaches considered are:

- ESC (Victoria) – requires DNSPs to show that they *have had regard* to the prescribed pricing principles. This is done annually and is a requirement of the annual tariff report template.[35] These tariff reports are then published to provide a level of transparency to customers regarding the application of efficient pricing principles.

- AER (under the AEMC's draft pricing rules) – requires TNSPs to submit a pricing methodology along with their revenue *proposal for approval* by the AER. The AER is required to publish guidelines on pricing methodologies which TNSPs must comply with.[36]

- ESCOSA – requires ESCOSA to be satisfied that the DNSP's proposed tariffs and accompanying statement *demonstrate compliance* with the prescribed pricing principles.[37]

6.3.1. Submit a pricing methodology for approval

This approach was adopted by the AEMC in its recent transmission rule review and is consistent with existing practices in the transmission sector. It would require that the rules consist of:

1. General rules for pricing methodologies;
2. Pricing principles;
3. A requirement for the AER to develop and publish pricing methodology guidelines;
4. A requirement for the service provider to submit a proposed pricing methodology to the AER for approval and to require the AER to approve that methodology if it is consistent with the pricing principles in the rules and the guidelines published by the AER; and
5. A requirement for the service provider to apply the approved methodology.

Applying such an approach to distribution would amount to a substantial change from the current approaches applied to distribution pricing regulation by jurisdictional regulators (see for example 6.3.2 and 6.3.3 below) when conducting annual tariff approval processes. Although it would satisfy the desire for consistency between the pricing rule approaches for distribution and transmission, it does not take account of the significant differences between these services in terms of compliance arrangements. In our opinion, it would be likely to impose greater costs than the consistency benefits to which it would give rise.

The AEMC's approach to transmission is consistent with the nature of transmission services in that they are:

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[35] See ESC, Electricity Distribution Price Review 2006-10, Final Decision Volume 2 Price Determination, attachment 10

[36] See AEMC, Proposed National Electricity Amendment (Pricing of Prescribed Transmission Services) Rule 2006, 6A.25

[37] See ESCOSA, 2005-2010 Electricity Distribution Price Determination: Part B - Price Determination, clause 3.4.1(a) and schedule 5

- provided via relatively unconnected networks with very few customers; and
- most investment is of relatively large scale and is generally subject to individual scrutiny on a project by project basis (ie, the regulatory test)

These characteristics make cost allocations relatively easier to administer, because the costs are highly aggregated and the existence of far fewer customers makes the application of locational cost and asset allocations a more straight forward task. Furthermore, it is probable that many of the costs associated with conducting these allocations would have already been incurred when applying the regulatory test.

In contrast, distribution networks are highly interconnected, with millions of customers. Moreover, distribution network investment is generally not of sufficient size to be required to undergo the regulatory test.[38] These characteristics of the distribution network make cost allocations a cumbersome task, and one that jurisdictional regulators have not required to date. In any case, the incremental and integrated nature of capital investment makes individual allocations a more difficult and potentially arbitrary process. This is also reflected in the manner in which jurisdictional regulators tend to determine capital expenditure allowances based on a 'pooled' capital funding and investment program, rather than assessing individual capital projects as is more often the case in transmission.

In sum, these factor support the view that it is not appropriate to apply the same compliance arrangements to distribution pricing as those applied to transmission pricing. The following sections therefore consider examples of the distribution pricing compliance frameworks currently applied by jurisdictional regulators.

6.3.2. Have regard to prescribed pricing principles

An alternate set of compliance arrangements for a distribution pricing rule is the approach adopted by the Victorian ESC. This approach requires that when setting their distribution (and transmission[39]) tariffs, DNSPS 'must have regard to' the specified pricing principles.[40]

To comply with this requirement, DNSPs are required to submit annual tariff reports. Among other things, the template for these reports requires that DNSPs provide the following:

> *1.5 details as to how each proposed distribution tariff meets the upper and lower bounds*
>
> *1.6 a demonstration as to how prices have taken into account future investment requirements*[41]

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[38] Note DNSPS are however required to apply the regulatory test when developing their network planning (clause 5.6.2(g) of the Rules.)

[39] Victorian DNSPs are required to levy separate transmission tariffs on end use customers. These transmission tariffs are governed by a revenue control which ensures the DNSPs are not financially advantaged or disadvantaged by the manner in which transmission costs are recovered. This also allows for separate cost allocations to be applied for transmission and distribution costs to a given tariff class.

[40] Clause 2.3.16, ESC, Electricity Distribution Price Review 2006-10, Final Decision Volume 2 Price Determination

[41] See ESC, Electricity Distribution Price Review 2006-10, Final Decision Volume 2 Price Determination, attachment 10

These arrangements provide DNSPs the ability to apply the efficient pricing principles in the most practical manner for their individual circumstances, ie, taking into account the DNSPs' detailed knowledge of:

- their own cost structures;
- the likely level of network utilisation and congestion under different probability weighted expectations of customers' needs, as demonstrated and informed through in their historic demand patterns;
- customer's responsiveness to price changes; and
- costs and benefits of various levels of tariff class aggregation versus disaggregation.

Under these arrangements DNSPs are permitted to determine tariff classes, charging parameters and tariff rates, and are afforded significant discretion to offer discounts and/or to impose geographic tariff averaging as they see fit. For example Powercor applies a common Residential Single Rate tariff to all residential customers who have accumulation meters regardless of whether they are located on the south coast of Victoria in Lorne or near the NSW border in Mildura.

The decision of whether or not to approve proposed annual tariff changes is based solely on the application of the price control formula and side constraint formula. Such approach has very low compliance and administration costs. However one potential shortcoming is that because tariff approval is not dependent upon the regulator being satisfied that the DNSP has complied with the efficient pricing principles, the incentive to comply with these principles may be weakened. Moreover if the regulator believes a DNSP is not complying with these principles, it is not clear that it has the power not to approve the submitted tariffs.

In practice, therefore, there is little or no scope for the regulator to intervene where it considers that the pricing strategy of a DNSP is inefficient or non-compliant with the principles. One factor mitigating this potential disadvantage is the fact that Victoria applies a price cap form of price control. As discussed in section 2.2.2 this form of price control involves revenue risk incentives that can be expected to motivate pricing within the efficient pricing bounds (ie, compliance with the principles).

On the other hand, the case for retaining regulatory power to intervene is stronger where revenue caps (whether overall or average per customer/unit) are used. This is the case for example in South Australia, which has consequently specified greater intervention powers as discussed below.

6.3.3. Demonstrate compliance with prescribed pricing principles

The framework applied by South Australia includes the application of an average revenue control as well as specified pricing principles. However, unlike the Victorian approach, in

order to approve tariffs each year the ESCOSA must be 'satisfied' that the DNSP has demonstrated compliance both with this control and with the specified pricing principles. [42]

If the regulator is not satisfied of compliance with the principles it can allow the DNSP to resubmit. However it is not clear that the regulator has the power to determine an alternative schedule of tariffs where it still considers that the DNSP's proposed tariff schedule does not comply with the principles.

Setting aside difference in pricing principles, this approach achieves the same benefits as those identified for the Victorian '*have regard to'* approach. Further, it overcomes the lesser incentive for efficient pricing under revenue cap forms of price control as well as the common issue of retaining residual regulatory discretion to intervene where the regulator is not satisfied that compliance has been demonstrated.

Finally the requirement for the DNSP to demonstrate compliance rather than the regulator to prescribe pricing methodologies via guidelines is likely to reduce significantly the administrative and compliance costs relative to the transmission approach of submitting a pricing and cost allocation methodology for approval. As discussed above, this is because, in practice, there will be many approaches capable of demonstrating that a DNSP's pricing complies with the principles. Consequently there is little benefit in seeking to establish what the most preferred pricing method is. Rather, it is likely to be more beneficial to require the DNSP to show that it is pricing within the specified efficient pricing bounds while retaining some discretion for intervention where this has not been demonstrated.

6.4. Recommended compliance approach

In light of the above considerations it is our opinion that a *demonstrate compliance* approach should be adopted for the initial distribution pricing Rules. Such an approach provides a compliance framework that is commensurate with the benefits (costs) of achieving (not achieving) compliance with the efficient pricing principles. The approach also takes into account the differing incentives that exist under both revenue and price cap forms of price control by providing the AER with residual discretion to reject prices where it is not satisfied that they comply with the pricing rule.

Consistent with the approach adopted by the AEMC in its transmission rule review, where this residual discretion is provided to the regulator, it should be guided by principles or criteria in the rules. This increases the predictability and accountability of the regulatory framework by affording regulated firms certainty that where a regulator does not approve their proposed tariffs, the regulatory remedy will be applied in line with transparent requirements which are set out on an *ex ante* basis and which ensure consistent regulatory treatment over time and across different DNSPs.

Under our proposed compliance approach DNSPs would submit their proposed prices for approval by the AER each year and would also submit supporting material demonstrating that the revenues to be earned through their proposed prices are within the efficient pricing bounds of stand alone and avoidable cost. Such supporting material need not require a

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[42] See ESCOSA, 2005-2010 Electricity Distribution Price Determination: Part B - Price Determination, clause 3.4.1(a)

detailed methodology to allocate historic costs. Instead, it may more appropriately make use of forward looking cost data and perform hypothetical cost calculations of stand alone and avoidable cost.

The AER would assess compliance against the applicable price or revenue control and the CPI+2% side constraint, and would seek to satisfy itself that the efficient pricing bounds have been complied with. Where such satisfaction is not achieved, the DNSP would be advised and provided opportunity to resubmit compliant tariffs. However, where the AER and DNSP cannot reach agreement on a satisfactory set of compliant tariffs, the AER would apply the CPI-X price movement evenly to all tariff classes and tariff components.

6.4.1. Aggregate tariff class revenue assessment

Assessment of the upper and lower bounds on efficient pricing under each of the above compliance options requires examination of the aggregate revenues forecast to be earned through each tariff class against the identified stand alone and avoidable costs of service for that tariff class.

This means that the weighted average tariff revenue for a tariff class (ie, the same revenue measure currently used to apply side constraints in some jurisdictions) would need to be calculated for each tariff. The weights to be applied in calculating the tariff class revenues would need to be those quantities expected to be sold under each tariff charging parameter. Hence to calculate these revenues, regulators will be faced with a choice of using either forecast quantities, or some proxy based on historic quantities. The options available and their key advantages and disadvantages include use of:

- historic charging parameter quantities which are audited (and therefore free from possible manipulation) but are also lagged - e.g. the year t-2 quantities used in Victoria's distribution price control and side constraint;
- forecast charging parameter quantities which are not audited (and therefore may be susceptible to potential manipulation) – e.g. the year t quantities used in South Australia's retail tariff price control; or
- historic charging parameter quantities which are audited (and therefore free from possible manipulation) but which have been escalated by a determined growth factor.

In our opinion the distribution pricing rules should use audited historic charging parameter quantities as a proxy for current charging parameter quantities. The requirement for use of audited quantities provides several key benefits in that it:

- offers simplicity of application;
- limits the scope for manipulation of pricing outcomes within the price control and side constraint;
- reduces the compliance costs for DNSPs by removing the need to generate and substantiate sales forecasts; and

- reduces the compliance assessment costs for the AER by removing the need to obtain verification of the reasonableness of forecast methods and estimates.

6.5. Application under alternative regulatory control methods

The application of pricing rules to all services provided under direct control regulation is necessary because the direct regulation removes the constraints that would otherwise ensure these services are priced efficiently (see section 2.1). Thus, while alternative forms of regulation (ie, other than building block – see Figure 1.1) may be applied for example to excluded services, it is still necessary that these services are priced in accordance with efficient pricing principles. Indeed the proposed pricing principles give effect to the economic concepts inherent in a 'fair and reasonable' test and thereby enhance regulatory certainty by elaborating on the meaning of such a test.

These considerations have led the NPWG to form the view that if a distribution service is to be regulated through a direct control form of regulation, then the same pricing principles should apply to the alternative control setting methods as are to apply under the building block control setting method. Thus the pricing principles, including the demonstrate compliance approach should apply to all services that fall under direct control (including the alternative control setting methods). This provides a consistent approach to regulating direct control services and overcomes issues associated with introducing different pricing principles and compliance regimes where alternative control setting methods are used.

It is evident that the level and quality of historic cost data on excluded services is relatively poor (compared to prescribed distribution services). It is therefore reasonable to anticipate that compliance with the pricing principles for distribution services regulated via alternative control setting methods will involve a relatively high level of hypothetical forward looking cost assessment rather than historic cost allocation.

6.5.1. Negotiated services

This paper has only examined the application of distribution pricing rules to distribution services regulated by direct control. However, there may be a residual need to include pricing rules that guide pricing of negotiated distribution services. That is, while such services are priced via commercial negotiation, it may be desirable to provide guiding principles in the Rules to inform such negotiations. The Rules should also include arrangements for dispute resolution where negotiated outcomes cannot be agreed upon.

In this regard, it is proposed that the current Rule provisions relating to the pricing negotiated transmission services be considered for consistent application to the pricing of negotiated distribution services.

NERA
Economic Consulting

Tel: +61 3 9245 5537
Fax: +61 3 8640 0800
www.nera.com