



Consultation Paper

Issues and AER's preliminary positions

**Connection charge guidelines: for accessing
the electricity distribution network**

10 June 2011

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Request for submissions

Interested parties are invited to make written submissions to the Australian Energy Regulator (AER) regarding this paper by the close of business Friday 5 August 2011.

Submissions can be sent electronically to: aer inquiry@ aer.gov.au

Alternatively, submissions can be sent to:

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General Manager
Australian Energy Regulator
GPO Box 520
Melbourne VIC 3001

The AER prefers that all submissions be publicly available to facilitate an informed and transparent consultative process. Submissions will be treated as public documents unless otherwise requested. Parties wishing to submit confidential information are requested to:

- clearly identify the information that is the subject of the confidentiality claim
- provide a non-confidential version of the submission in a form suitable for publication.

All non-confidential submissions will be placed on the AER's website at <http://www.aer.gov.au>. For further information regarding the AER's use and disclosure of information provided to it, see the *ACCC/AER Information Policy*, October 2008 available on the AER's website.

Enquires about this paper, or about lodging submissions, should be directed to the Network Regulation South branch of the AER on (03) 9290 1444.

The AER will be hosting a public forum in July 2011 to explain the issues identified in this paper to facilitate stakeholders' preparation of their submissions to the AER. Details of this forum will be available on the AER's website. It is expected that the forum will take place in Hobart, Brisbane, Sydney, Canberra, Melbourne and Adelaide via video links.

After consideration of stakeholders' submissions, the AER will publish a draft guideline for further consultation in accordance with the distribution consultation process under the National Electricity Rules.

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Shortened forms

AER	Australian Energy Regulator
CPI	Consumer Price Index
DNSP	Electricity Distribution Network Service Provider
ESCOSA	Essential Services Commission of South Australia
ESCV	Essential Services Commission of Victoria
IPART	Independent Pricing and Regulatory Tribunal of NSW
kVA	1000 volt-Ampere (VA): A unit for measuring apparent power in an electrical circuit. The real power (active power) in kilowatts (kW) equals kVA times the power factor of the circuit.
MVA	mega-Volt-Ampere = 1 000 000 VA, or 1000 kVA
MCE	Ministerial Council on Energy
NER	National Electricity Rules
QCA	Queensland Competition Authority
SAC	Standard Asset Customer, a term used by Energex of Queensland
SWER	Single wire earth return line, high voltage distribution line mainly used in rural areas

Summary

The Ministerial Council on Energy (MCE) has endorsed the introduction of a new chapter 5A —*Electricity connection for retail customers*— to the National Electricity Rules (NER).¹ Under chapter 5A, the AER will be required to develop and publish connection charge guidelines to codify how Electricity Distribution Network Service Providers (DNSPs) should charge new electricity customers for connecting to their networks.

The principles of how DNSPs may charge for connection services and the matters that the AER must have regard to in developing the connection charge guidelines are set out in chapter 5A. The key principles include (1) DNSPs may charge reasonable capital contribution towards the cost of the extending the networks to provide the connection services; and (2) for customers with capacity higher than a threshold set by the AER, DNSPs may also charge for specific augmentation cost towards the cost for increasing the capacity of the existing network (upstream cost) because of new customer demand.

The AER has developed a set of design criteria based on the principles and rules set out in chapter 5A at clause 5A.E.3(b). These criteria are:

1. Where possible, the connection charge should be reflective of the actual cost for providing the network extension attributed to the individual customers.
2. Where suitable alternative service providers for construction works are available, the DNSP's charge should be reflective of the market price; where no alternative service providers are available, DNSPs must charge at a reasonable rate, which is reflective of the market price.
3. Any cross subsidies between new and existing customers should be minimised. However, minimising cross subsidies should not be pursued at the expense of undue administrative costs.
4. Customers should not experience a large step change in capital contributions if they fall above or below the threshold for charging for augmentation.

Based on the above design criteria, the AER proposes the following key framework for determining connection charges:

- Connection charges should be based on a cost-revenue-test. If the cost to connect a new customer exceeds the distribution network tariff revenue collected over the pre-determined time period from this customer, the customer should pay for the shortfall.

¹ Chapter 5A is available at:
[http://www.ret.gov.au/Documents/mce/_documents/2010%20Bulletins/No.185-10-National_Electricity_\(Retail_Connection\)_Amendment_Rules_2010.pdf](http://www.ret.gov.au/Documents/mce/_documents/2010%20Bulletins/No.185-10-National_Electricity_(Retail_Connection)_Amendment_Rules_2010.pdf)

- Customers with a peak demand less than 100 Amperes 3-phase low voltage supply should not pay specific shared network augmentation charges.²
- Where a customer’s demand exceeds the above threshold, the customer should only contribute to the augmentation cost of the existing network based on its demand level above the threshold.
- DNSPs should seek to mimic the outcome of a contestable market where possible by using tender price, or setting up a typical charge rate table based on pre-established contract rates with qualified independent suppliers, as their cost base.

The AER seeks stakeholders’ comments on the proposed options and processes for connection charges discussed in this paper.

Structure of this paper

Chapter 1 explains the purpose of this consultation paper and the legislative framework under which the AER is developing this connection charge guideline.

Chapter 2 explains the purpose, scope and application of the connection charge guideline.

Chapter 3 provides a summary of the types of connection works that may be subjected to connection charges.

Chapter 4 explains how the AER established its design criteria for the guideline.

Chapter 5 explains the cost-revenue-test.

Chapters 6 and 7 address issues relating to the calculation of the incremental cost and incremental revenue attributable to a new connection.

Chapter 8 explains how the AER set the thresholds for augmentation charges.

Chapter 9 discusses the treatment of augmentation assets, security deposits and rebate schemes—where earlier customers recover costs from subsequent customers who use the assets already paid for by the earlier customers.

Chapter 10 outlines the AER’s next steps in developing the connection charge guideline.

² The cost of shared network augmentation for general demand growth is already shared amongst all customers, new and existing. The shared network augmentation cost of customers below the threshold will be treated in a similar manner.

1 Introduction

This chapter outlines the purpose of this consultation paper and the related legislative framework.

1.1 Purpose of paper

The AER will be required by new provisions (a new chapter 5A) under the National Electricity Rules (NER) to publish a national connection charge guideline. The guideline will set the method that must be followed by the Electricity Distribution Network Service Providers (DNSPs) in determining the capital contribution for most new customers for connecting to the distribution networks.

In developing this guideline, the AER has identified a number of issues and alternate options for calculating the connection charge. As this guideline will have a significant impact on the community in how new customers are charged for connecting to the electricity grid, the AER considers that it is important to consult on these issues before it proceeds to further develop the guideline.

After considering all the submissions and issues raised in response to this paper, the AER will develop and publish a ‘draft version’ of the guideline for consultation, in accordance with the distribution consultation process specified by the NER.

1.2 Legislation

On 5 November 2010, the Ministerial Council on Energy (MCE) announced that:³

In line with the scheduled National Energy Customer Framework (NECF) Parliamentary introduction timeframe outlined in the Ministerial Council on Energy (MCE) Communiqué of June 2010, the South Australian Minister for Energy, the Hon Patrick Conlon MP, introduced two Bills (the National Energy Retail Law (South Australia) Bill 2010 (NERL) and the Statutes Amendment (National Energy Retail Law) Bill 2010 to the Parliament of South Australia on 27 October 2010...

To assist stakeholders in preparation for implementation of the NECF, the Regulations and Rules that will be made are being released. These Regulations and Rules are not subject to any further consultation and their publication is aimed at informing stakeholders to allow the commencement of implementation planning.

The legislative instruments (to be made by the South Australian Minister) include the *National Electricity (Retail Connection) Amendment Rules 2010* (the Rule).⁴ The Rule

³ Ministerial Council on Energy, Standing Committee of Officials, Bulletin No.185, <http://www.ret.gov.au/Documents/mce/documents/2010%20Bulletins/Bulletin%20No.%20185%20-%20%20National%20Energy%20Customer%20Framework%20Update.pdf>

⁴ This rule is available from [http://www.ret.gov.au/Documents/mce/documents/2010%20Bulletins/No.185-10-National_Electricity_\(Retail_Connection\)_Amendment_Rules_2010.pdf](http://www.ret.gov.au/Documents/mce/documents/2010%20Bulletins/No.185-10-National_Electricity_(Retail_Connection)_Amendment_Rules_2010.pdf)

enables the introduction of a new chapter 5A—*Electricity connection for retail customers*—to the NER.

Under chapter 5A, the AER will be required to develop and publish connection charge guidelines to codify how Electricity Distribution Network Service Providers (DNSPs) should charge new electricity customers for connecting to their networks.

DNSPs will be required to develop their connection policies for approval by the AER based on the guideline. The connection policies must set out the circumstances in which connection charges are payable and the basis for determining the amount of these charges.

While the legislative process is not complete, the MCE has announced that the AER may commence the development and consultation process in time for the NECF implementation by the target date of 1 July 2012.⁵ Activities carried out by the AER in accordance with NECF requirements prior to the NECF start (such as consultation, making instruments and decision-making) will be supported by appropriate transitional provisions enacted by participating jurisdictions to ensure instruments and decisions are validly made under the National Electricity Laws and Rules and take effect on commencement of the NECF.

1.3 Connection charge principles

Chapter 5A sets out the following principles under clause 5A.E.1—Connection charge principles:

- (a) This clause states the *connection charge principles*.
- (b) A *retail customer* (other than a *non-registered embedded generator* or a *real estate developer*) who applies for a *connection service* for which an *augmentation* is required cannot be required to make a capital contribution towards the cost of the *augmentation* (insofar as it involves more than an *extension*) if:
 - (1) the application is for a basic connection service; or
 - (2) a relevant threshold set in the Distribution Network Service Provider's connection policy is not exceeded.

Note In general, the intention is to exclude deep system augmentation charges for retail customers.

- (c) Subject to paragraph (b), in determining connection charges in accordance with its connection policy, a Distribution Network Service Provider must apply the following principles:
 - (1) if an extension to the distribution network is necessary in order to provide a connection service, connection charges for the service may

⁵ MCE Standing Committee of Officials Bulletin No. 190—Implementation of the National Energy Customer Framework, http://www.ret.gov.au/Documents/mce/_documents/2011bulletins/Bulletin-No-190-ImplementationoftheNationalEnergyCustomerFramework.pdf

include a reasonable capital contribution towards the cost of the extension necessary to provide the service;

(2) if augmentation of premises connection assets at the retail customer's connection point is necessary in order to provide a connection service, connection charges for the service may include a reasonable capital contribution towards the cost of the augmentation of premises connection assets at the connection point necessary to provide the service;

(3) if augmentation of the distribution system is necessary in order to provide a standard connection service, connection charges for the service may include a reasonable capital contribution towards the cost of the augmentation necessary to provide the service;

(4) if augmentation of the distribution system is necessary in order to provide a connection service under a negotiated connection contract, connection charges for the service may, subject to any agreement to the contrary, include a reasonable capital contribution towards the cost of augmentation of the distribution system to the extent necessary to provide the service and to any further extent that a prudent service provider would consider necessary to provide efficiently for forecast load growth;

(5) despite subparagraphs (1) to (4) if augmentation of the distribution system is necessary in order to provide, on the application of a real estate developer, connection services for premises comprised in a real estate development, connection charges for the services may, subject to any agreement to the contrary, include a reasonable capital contribution towards the cost of augmentation of the distribution system to the extent necessary to provide the services and to any further extent that a prudent service provider would consider necessary to provide efficiently for forecast load growth;

(6) however, a capital contribution may only be required in the circumstances described in subparagraphs (1) to (5) if provision for the costs has not already been made through existing distribution use of system charges or a tariff applicable to the connection.

(d) If:

(1) a connection asset ceases, within 7 years after its construction or installation, to be dedicated to the exclusive use of the retail customer occupying particular premises; and

(2) the retail customer is entitled, in accordance with the connection charge guidelines, to a refund of connection charges;

the Distribution Network Service Provider must make the refund, and may recover the amount of the refund, by way of a connection charge, from the new users of the asset.

(e) For the purposes of paragraph (d), a person is taken to be a new user of a connection asset if the asset comes to be used to provide a connection to that person's premises

(f) For the purposes of this clause capital contribution includes a prepayment or financial guarantee.

2 Purpose and requirements of the connection charge guideline

2.1 Purpose of the connection charge guideline

Chapter 5A requires that the purpose of the guideline is to ensure that connection charges:

- are reasonable, taking into account the efficient costs of providing the connection services arising from the new connection or connection alteration and the revenue a prudent operator in the circumstances of the relevant Distribution Network Service Provider would require to provide those connection services
- provide, without undue administrative cost, a user-pays signal to reflect the efficient cost of providing the connection services
- limit cross-subsidisation of connection costs between different classes (or subclasses) of retail customer
- are competitively neutral, if the connection services are contestable.

2.2 Scope of the guideline

Under chapter 5A, the guidelines must:

- describe the method for determining charges for premises connection assets⁶
- describe the circumstances (or how to determine the circumstances) under which a Distribution Network Service Provider may receive a capital contribution, prepayment or financial guarantee from a retail customer or real estate developer for the provision of a connection service
- describe how the amount of any such capital contribution, prepayment or financial guarantee is to be determined
- establish principles for fixing a threshold (based on capacity or any other measure the AER thinks fit) below which retail customers (not being a non-registered embedded generator or a real estate developer) are exempt from any requirement to pay connection charges (or to give consideration in the form of a capital contribution, prepayment or financial guarantee) for an augmentation (other than an extension) to the distribution network necessary to make the connection
- describe the methods for calculating the augmentation component for the connection assets and, if the augmentation consists of or includes an extension, the extension component of a connection charge

⁶ Under chapter 5A, premises connection assets means the components of a distribution system used to provide connection services; and connection service means either or both of (a) a service relating to a new connection for premises; (b) a service relating to a connection alteration for premises.

- describe the method for calculating:
 - the amount of a refund of connection charges for a connection asset when an extension asset originally installed to connect the premises of a single retail customer is used, within 7 years of its installation, to connect other premises and thus comes to be used for the benefit of 2 or more retail customers
 - the threshold below which the refund is not payable
- describe the treatment of augmentation assets.

In developing the guidelines, the AER must have regard to: (1) historical and geographical differences between networks; and (2) inter-jurisdictional differences related to regulatory control mechanisms, classification of services and other relevant matters; and (3) the circumstances in which connection services may be provided by persons other than Distribution Network Service Providers (and are therefore contestable).

2.3 Application of the guideline

Based on the connection charge principles set under chapter 5A and the AER's connection charge guideline; each DNSP must submit its proposed connection policy for approval by the AER. The connection policy must set out the circumstances under which the DNSP may require a retail customer or real estate developer to pay a connection charge for the provision of a connection service.

DNSPs must charge new customers in accordance with the guideline for the following classes of connection services:

- basic connection service—connection service related to a connection (or a proposed connection) between a distribution system and a retail customer's premises (excluding a non registered embedded generator's premises), where the retail customer is typical of a significant class of retail customers or the retail customer is, or proposes to become, a micro-embedded generator⁷
- standard connection service—a connection service (other than a basic connection service) for a particular class (or sub-class) of connection applicant and for which a model standing offer has been approved by the AER.

⁷ Micro embedded generator means an embedded generating unit contemplated by Australian Standard AS 4777 (Grid connection of energy systems via inverters).

3 Typical connection works

The AER considers that a typical connection can be separated into three separate components and to reduce confusion the AER seeks to settle on a robust definition of each component. In this paper the AER applies the definitions in appendix A, including the following:

- Direct Connection Assets - These are the premise's connection assets which run from the connection point to the point of supply and where applicable also include the consumer mains.
- Extensions - An augmentation that requires the connection of a power line or facility outside the present boundaries of the transmission or distribution network owned, controlled or operated by a Network Service Provider.⁸
- Augmentation - Augmentation of a transmission or distribution system means work to enlarge the system or to increase its capacity to transmit or distribute electricity, caused by the need to connect a customer.⁹ Only new customers with capacity level above the threshold level set by the AER are required to pay for their augmentation cost.

As network extensions are a subset of an augmentation, the AER considers that an additional definition is needed to distinguish capacity augmentations from extensions:

- Shared Network Augmentation—Augmentation of a transmission or distribution system to increase its capacity to transmit or distribute electricity. This is all augmentations other than extensions to the transmission or distribution system to extend the area of coverage.

The AER seeks comments on the above proposed definitions and those in appendix A for use in the connection guideline.

⁸ National Electricity Rules, glossary.

⁹ National Electricity Law, definitions.

4 AER's design criteria and considerations

The AER considers that, subject to, and in addition to the conditions of chapter 5A, it is important to establish a policy framework to enable it to design the connection charge guideline. Based on the purpose of the connection charge guideline outlined in chapter 5A clause 5A.E.3(b), the AER has adopted the following design criteria in developing the connection charge guideline:

1. Where possible, the connection charge should be reflective of the actual cost for providing the network extension attributed to the individual customers.
2. Where suitable alternative service providers for construction works are available, the DNSP's charge should be reflective of the market price; where no alternative service providers are available, DNSPs must charge at a reasonable rate, which is reflective of the market price.
3. Any cross subsidies between new and existing customers should be minimised. However, minimising cross subsidies should not be pursued at the expense of undue administrative costs.
4. Customers should not experience a large step change in capital contributions if they fall above or below the threshold for charging for shared network augmentation.

The rationale of the AER design criteria is explained in the following sections.

The AER seeks comments on its design criteria for the connection charge guideline.

4.1 Connection charge should be reflective of actual attributable cost

Under clause 5A.E.3(b)(2), one of the purposes of the guideline is to 'provide, without undue administrative cost, a user-pays signal to reflect the efficient cost of providing the connection services'. The AER therefore considers that, unless the administrative cost out-weights the need to provide a user-pays signal, connection charge should be reflective of the actual cost attributed to the individual customers.

4.2 DNSP's charge should be reflective of the market price where possible

Under clause 5A.E.3(b)(1) another purpose of the guideline is to ensure that the connection charges are 'reasonable, taking into account the efficient costs of providing the connection services arising from the new connection or connection alteration and the revenue a prudent operator in the circumstances of the relevant Distribution Network Service Provider would require to provide those connection services'.

The AER considers that a prudent operator subject to competitive pressure would attempt to improve efficiency and charge customers competitive market rates. The AER also considers that a competitive market price would be reflective of efficient cost. Hence, where suitable independent service providers (contractors) are available,

a DNSP should either price its connection service at the market price, or engage independent service providers to provide the service to customers. Where no alternative service providers are available, DNSPs must charge at a reasonable rate, which is reflective of the market price.

4.3 Any cross subsidies between new and existing customers should be minimised

Clause 5A.E.3(b)(3) requires that the connection charge should 'limit cross-subsidisation of connection costs between different classes (or subclasses) of retail customer'. The AER considers that the guideline should seek to charge new connecting customers a subsidy-free price. The AER considers this approach would not cause increases in network charges to existing customers due to new connections.

4.4 Customers should not experience a large step change in capital contributions if they fall above or below the threshold for shared network augmentation charges

The AER notes that shared network augmentations typically occur in discreet steps. The size of the steps depends on the voltage level. For example, a distribution feeder typically has a capacity of 4 to 10 MVA, a zone substation's capacity typically ranges between 20-60 MVA and transmission connection point transformers are typically larger than 100 MVA.

Most parts of the networks will have some level of spare capacity. As new customers are connected, the level of spare capacity diminishes. At some point in time, the next new customer would trigger shared network augmentation. In consideration of the requirement that the connection charges should be:

'reasonable, taking into account the efficient costs of providing the connection services arising from the new connection or connection alteration and the revenue a prudent operator in the circumstances of the relevant Distribution Network Service Provider would require to provide those connection services',¹⁰

the AER considers that it would be unreasonable that the customer who happens to trigger the shared network augmentation should pay the full cost of this augmentation. Rather each customer who connects to the network should contribute an amount towards the cost of shared network augmentation reflective of the load they place on the network. Hence, the AER considers the shared network augmentation charge should be based on the per unit usage of each new customer, above the shared network augmentation threshold.¹¹

¹⁰ National Electricity (Retail Connection) Amendment Rules 2010, clause 5A.E.3(b)(1).

¹¹ The cost of network augmentation for general demand growth is already shared amongst all customers, new and existing. The augmentation cost of customers below the threshold will be treated in a similar manner.

4.5 Existing jurisdictional connection charge frameworks

In developing this consultation paper, the AER has also considered the current jurisdictional connection charge framework and the specific requirements of chapter 5A.

The applicable jurisdictional codes, guidelines and DNSP pricing principles which have been taken into account in developing the AER's views include:

Australian Capital Territory

Utilities (Electricity Network Capital Contributions Code) Approval 2007

Available at;

<http://www.legislation.act.gov.au/di/2007-204/default.asp>

New South Wales

Capital Contributions and Repayments for Connections to Electricity
Distribution Networks in New South Wales

Available at;

http://www.ipart.nsw.gov.au/investigation_content.asp?industry=2§or=4&inquiry=16&doctype=1&doccategory=1&docgroup=1

South Australia

Electricity Distribution Code, and

Electricity Industry Guideline No. 13

Available at;

<http://www.aer.gov.au/content/index.phtml/itemId/738041>

Victoria

Guideline no. 14: Electricity Industry - Provision of Services by Electricity
Distributors

Available at;

<http://www.esc.vic.gov.au/public/Energy/Regulation+and+Compliance/Codes+and+Guidelines/Guideline+no+14+electricity+industry+-+provision+of+services+by+electricity+distributors/Guideline+no+14+electricity+industry+-+provision+of+services+by+electricity+distributors.htm>

Queensland

Ergon Energy Policy, Capital Contributions (Associated with Network
Connections)

Available at;

http://www.ergon.com.au/_data/assets/pdf_file/0010/6310/Ergon-Capital-Contribution-Methodology-April-05.pdf

Energex Limited, Capital Contributions Policy

Available at;

http://www.energex.com.au/network/network_prices/pdf/capital_contributions_policy_2009-10.pdf

Tasmania

not published.

5 Method of determining capital Contributions (cost-revenue-test)

Under clause 5A.E.3(c)(2), the AER's guideline must describe the circumstances (or how to determine the circumstances) under which a Distribution Network Service Provider may receive a capital contribution, prepayment or financial guarantee from a retail customer or real estate developer for the provision of a connection service. As discussed in this section the AER considers that the primary determinate of the circumstances where a DNSP may receive a capital contribution for the provision of connection services is whether or not the customer's incremental cost of connection exceeds its incremental revenue provided from the connection.

5.1 Current jurisdictional shared network augmentation arrangements

5.1.1 Victoria

In Victoria, Guideline No. 14 implements an explicit test of incremental cost versus incremental revenue. In implementing this test, the Essential Services Commission of Victoria (ESCV) stated that the purpose of customer contributions was to ensure that customers expect to pay at least the net incremental cost of providing their service.¹²

This test applies to both the operating and maintenance costs associated with the new connection. It takes the form of:

$$CC = [IC - IR] + SF$$

Where:

CC is the maximum amount of the customer's capital contribution;

IC is the amount of incremental cost in relation to the connection offer;

IR is the amount of incremental revenue in relation to the connection offer; and

SF is the amount of any security fee under the connection offer

5.1.2 New South Wales

In New South Wales, IPART decided on a general rule which was that:

The general rule is that a customer will pay for the direct costs of establishing the connection up to a defined point of connection to the network. These direct costs are those involved in providing and installing the lines and equipment that are dedicated to that customer. The distribution network service provider (DNSP) will pay for all other costs.¹³

¹² ESCV decision on Guideline 14. pg. 9.

¹³ IPART, Final Report - Capital Contributions And Repayments For Connections To Electricity Distribution Networks In New South Wales, April 2002, p.1

In deciding on this general rule, IPART rejected the findings of the connections working group which recommended that a cost-revenue-test be applied.

5.1.3 Queensland

In Queensland, the Queensland Competition Authority has not issued guidelines on an appropriate capital contribution policy, however, it has approved the capital contributions policies of Ergon and Energex.

5.1.3.1 Energex

Energex has implemented a cost-revenue-test of the form:

$$CC = ICCS + ICSN - [IR(n=20) - SNC(10\%)]$$

Where:

CC = Capital Contribution

ICCS = Customer specific incremental costs

ICSN = Incremental costs in the upstream (shared) network directly attributable to the new connection

IR(n=20) = Present value of a 20 year revenue stream directly attributable to the new connection

SNC(10%) = A 10% attribution of Incremental revenue (IR(n=20)) to the costs of the existing shared network.

Energex stated that:

The level of a particular capital contribution is determined by reference to the following objectives:

- To meet the economic efficiency objective, capital contributions should only cover any shortfall between the present value of distribution charges expected to be paid by the new customer over the life of the assets and the incremental cost of connecting that customer. This approach ensures that existing customers are no worse off following the connection of a new user because the expected network revenue from the new customer (in the form of additional charges and/or capital contributions) will cover the incremental cost of supply; and
- To meet the equity objective, it is reasonable to expect each customer, in addition to their incremental costs of connection to make some contribution to shared assets.¹⁴

¹⁴ Energex, 2009-10 Pricing Principles Statement, p. 35

5.1.3.2 Ergon

Ergon reached similar conclusions to Energex and also implemented a cost-revenue-test of the form:

$$CC = ICCS - [IR(n=20) - SNC(X\%)]$$

Where:

CC = Capital Contribution

ICCS = Incremental Costs - Customer Specific portion of the Project Cost

IR(n=20) = Incremental Revenue (present value of a 20 year revenue stream directly attributable to the new connection – calculated on the annual Network Price Book rates)

SNC(X%)= Shared Network Cost (a 25, 80 or 2% attribution of Incremental Revenue (IR(n=20)) to the costs of the existing shared network)

East Zone 25%

West Zone 80%

Mt Isa Zone 2%

5.1.4 South Australia

There is no explicit cost-revenue-test.

5.1.5 ACT

There is no explicit cost-revenue-test.

5.1.6 Tasmania

There is no explicit cost-revenue-test.

5.2 Issues under chapter 5A

The connection charge principles state that the AER should provide user-pays signals to reflect the efficient cost of providing the connection services and seek to limit the cross subsidisation of connection costs between different classes of retail customers. The economic theory of cross-subsidy is based on the work of Gerald Faulhaber.¹⁵ Faulhaber explicitly defined subsidy-free pricing and presented two tests for the existence of cross-subsidisation:

- A service is the recipient of a cross-subsidy if the revenue generated by producing the service is less than the incremental cost of providing the service.
- A service is a potential source of subsidy if the revenue generated by providing the service is greater than the stand-alone cost of providing it. The stand-alone cost of a service is the cost of producing that service in isolation.

¹⁵ Cross-Subsidization: *Pricing in Public Enterprises*, Gerald R. Faulhaber, The American Economic Review, Vol. 65, No.5 (Dec., 1975), 966-977.

The AER considers that these two tests generally set the upper and lower bounds for the connection charges that a customer should pay for connection to the electricity distribution networks to limit cross subsidies. The AER's initial position is that it is appropriate to implement a cost-revenue-test, whereby a customer will only be charged a capital contribution if its incremental cost exceeds the incremental revenue that the connection will provide over its life.

This may result in a new connecting customer contributing to its incremental costs as a combination of an upfront capital contribution and ongoing network tariff (distribution use of system charges (DUoS)) charges. The AER's guideline does not indicate a preference for either charging an upfront capital contribution or through network tariffs but rather, it seeks to limit cross-subsidies between new and exiting customers.¹⁶ The AER considers that appropriate user pays signals will be provided by the cost-revenue-test, regardless of whether the revenue is received upfront or through ongoing charges, if a subsidy free price is charged to each customer.

5.3 AER considerations

To ensure that a customer pays at least the incremental cost it imposes on the network, it is necessary to test the incremental revenue that a customer will provide against the incremental cost of connecting that customer. Implementing a cost-revenue-test requires estimates of all the costs that a DNSP will incur by connecting the customer and all the revenue that a DNSP will receive from that customer. The AER's preliminary position is that all costs incurred by the DNSP, including direct connection, extension, shared network augmentation¹⁷ and an allowance for the additional operating and maintenance costs¹⁸ should be compared against the anticipated DUoS revenue from the customer. An upfront capital contribution would only be required to the extent that the customer's DUoS payment is less than their incremental cost.

A connecting customer's costs will be recovered as a combination of ongoing DUoS payments and upfront capital contribution, if required. Each jurisdiction currently has its own method of apportioning a customer's connection costs as either upfront capital contributions or ongoing DUoS payments. Changing the jurisdictional balance between DUoS and capital contributions would create equity issues between new and existing customers. Additionally, the AER considers that it generally does not matter if connecting customers' costs are recovered upfront or as ongoing payments, so long as a mechanism is in place to ensure that a subsidy-free price is recovered by the DNSP.¹⁹ As such, the AER is not seeking to adjust the historical split between capital

¹⁶ However, the AER notes that a DNSP's DUoS charges must be in accordance with the Distribution Pricing Rules contained in the NER.

¹⁷ This is subject to the discussion in section 8, which outlines the threshold beneath which customers do not explicitly pay for shared network augmentation.

¹⁸ While ongoing operational and maintenance costs are not strictly covered by the requirements of Chapter 5A, the AER proposes to include it in the calculation of incremental cost. The AER considers that this is necessary because the AER proposes to use DUoS in the calculation of incremental revenue and DUoS includes a component related to operational and maintenance costs. Section 7.4 discuss this issue in more detail.

¹⁹ DNSPs have suggested that upfront payment of costs provides a stronger locational signal to connecting parties. Therefore, a customer should generally pay upfront for its direct connection costs. Whilst this may be the case, the AER considers that for most small customer, direct

contributions and DUoS in each jurisdiction. Applying the cost-revenue-test will ensure new connecting customers pay a subsidy free price but not necessarily alter the historical split between DUoS and capital contributions.²⁰

In a non contestable environment, all costs are incurred by a DNSP and all the revenue is received by the DNSP, therefore, all costs and revenues would be included in the cost-revenue-test. However, where some costs are paid by a customer directly to a third party service provider, or where the customer performs some of the work (i.e. in the case of some developers), the application of a cost-revenue-test is less clear. The AER's preliminary view is that the cost-revenue-test should be applied only on the costs incurred, and revenue received, by the DNSP. Where the costs are borne by a third party, they should not feature in the cost-revenue-test. Otherwise, the AER considers a customer would always seek the DNSP to perform the works given that the DUoS payment would offset the cost of the project, whereas if an accredited service provider undertook the works, the customer would pay the full cost to that provider in addition to DUoS payment to the DNSP. The AER considers that not including competitive services in the cost-revenue-test is more likely to facilitate competitive neutrality of contestable services in accordance with the purposes of the guideline.

Where there is a revenue shortfall from an individual customer, then the DNSP will levy a capital contribution. Alternatively, where the incremental revenue is in excess of the incremental cost, then the customer would not be required to make a capital contribution to the network. The AER is not proposing that any excess incremental revenue be returned to the customer. The AER considers this would still be consistent with the limit cross-subsidisation purpose of the guideline because it is unlikely these customers will be paying in excess of their stand alone cost.

Where the incremental connection cost is less than the incremental revenue, it does not mean that the particular customer should be paying less than the DUoS for the same class of customers. This is because the DUoS charges also includes cost recovery of the upstream assets for supplying the customer. All customers of the same connection and load characteristic should pay the same DUoS rate because this network charge represents the average real cost of providing the network service.

While the AER considers that the cost-revenue-test is required to ensure customers are contributing at least their incremental costs, for many classes of customer, a set capital contribution may be the most administratively efficient manner to charge for connections. For basic and some standard connection offers, the AER would allow the amount of a capital contribution to be pre-calculated for all customers within a class.

connection costs will not vary substantially and hence a locational signal is not necessary. The AER has provided strong locational signals on, the more substantial, extension and augmentation costs. Also, where a customer's direct connection costs are higher than usual, for example when a customer requires a pole on private property, the cost will be included in a customer's revenue test possibly resulting in a capital contribution, thus providing a locational signal.

²⁰ DUoS charges in each jurisdiction should reflect the average connection costs not currently covered by an upfront capital contribution. In jurisdictions where customers have not historically paid capital contributions, DUoS charges would tend to be higher and as such customers will generally contribute more incremental revenue to the DNSP, this would result in lower capital contributions under the AER's scheme.

Where this amount was pre-recalculated it would be done using a cost-revenue-test based on an average or typical customer within the class. As such, large groups of roughly homogenous customers would be able to access connections on consistent terms at a consistent price.

The AER considers that:

- For larger customers, or customers with specific requirements in addition to standard connection services, the cost-revenue-test would need to be applied individually. As DNSPs can determine what standard connection offers to provide, the AER considers that DNSPs will be able to balance the administrative costs against ensuring that customers are meeting at least their incremental cost.
- Implementing a cost-revenue-test is in accordance with the AER's design criteria 3 and 4 as it seeks to minimise cross-subsidies in a manner which is not administratively burdensome for DNSPs.

The AER notes that Queensland's implementation of the cost-revenue-test includes an explicit allowance towards the cost of the existing shared network and that this was adopted to maintain equity between new and existing customers. The Victorian approach to the cost-revenue-test does not include an explicit allowance towards the costs of the shared network. The AER's initial view is that the connection charge principles under Chapter 5A (clause 5A.E.1, see section 1.3) do not specifically allow for the inclusion of an allowance towards the costs of the existing shared network and so the AER is not proposing to include this specific allowance in the cost-revenue-test at this time.

AER's preliminary position is that a cost-revenue-test will be applied in the form of:

$$CC = ICCS + ICSN - IR(n=X)$$

Where:

CC = Capital Contribution

ICCS = Customer specific incremental costs incurred by the DNSP

ICSN = Incremental costs in the upstream (shared) network directly attributable to the new connection, where applicable

IR(n=X) = Present value of a X year revenue stream directly attributable to the new connection

The AER considers it appropriate that an additional constraint be placed on this formula that $CC \geq 0$.

The AER seeks comments on its preliminary position to apply a cost-revenue-test of the form $CC = ICCS + ICSN - IR(n=X)$.

6 Incremental revenue

The cost-revenue-test relies upon an estimation of the incremental revenue that a DNSP will receive from the connecting customer. The AER considers that the four primary issues to consider in determining the appropriate estimate of total revenue to use in the cost-revenue-test are: the appropriate measure of revenue; the appropriate time period over which to assume revenue for a particular connection is earned by the DNSP; the price path to assume beyond the current distribution determination and; the appropriate discount rate to use for calculating the net present value of the future revenue stream.

6.1 Appropriate measure of revenue

The AER considers that the measure of revenue used in the cost-revenue-test should be consistent with the costs which it will offset. The AER proposes that its cost-revenue-test will apply to all capital and operational and maintenance costs borne by the DNSP due to the connection of the new customer. As such the AER considers that DUoS is the appropriate measure of revenue to use because it compensates DNSPs for these costs.

The AER requests comments regarding whether DUoS is the appropriate measure of revenue to use in the cost-revenue-test.

6.2 Appropriate time period

The AER considers that the cost-revenue-test should include an assumption about future revenue that reasonably reflects the period over which a DNSP will receive revenue from the connection. In many cases it may be appropriate to use an assumption which corresponds to the useful life of the assets being installed. However, in some cases it may be apparent, to either or both parties, that the connection may be needed for a shorter/longer period of time. In these cases, the AER considers that a shorter/longer time period, corresponding with reasonable expectations of the required connection period, would be reasonable. Where a connection is assumed to be used for a period less than the useful life of the asset, the AER considers that a reasonable assumption should also be made for the salvage value of the assets (taking into account the costs involved in recovering the assets).

The AER has noted the connection periods currently assumed in Victoria and Queensland. The AER's initial view is that a default assumption for residential customers connecting for 30 years and business customers connecting for 15 years may be appropriate. The AER considers that it is appropriate for the assumption for residential customers to be set rigidly because there is unlikely to be substantial variance in the expected life of a dwelling. However, due to the greater variance in the nature of business connections, the AER considers that DNSPs and business customers, should have the flexibility to vary the assumed connection period taking into account the circumstances of the new connection. For example, a high rise office building in the CBD would typically exist for much longer than 15 years.

The AER requests comments on the appropriate assumptions regarding the connection period for new connections.

The AER requests comments on how much flexibility DNSPs, or new business customers, should have to alter these default assumptions.

6.3 Discount rate

To calculate the incremental revenue, an appropriate discount rate is required to discount the future revenue stream into present value. The AER considers that the DNSPs' real weighted average cost of capital (WACC) as determined in the respective DNSPs' price determinations is the appropriate discount rate to use.

The AER requests comments regarding whether the WACC is the appropriate discount rate to use in performing the net present value calculation.

The AER requests comment regarding whether it is appropriate to use a pre-tax WACC, or a post tax WACC with a separate adjustment for taxation.

6.4 Appropriate price path

The calculation of incremental revenue requires an assumption to be made regarding the price path of DUoS. For the period until the end of the current distribution determination this price path is reasonably clear. However, it becomes more difficult to accurately estimate the revenue the customer will be contributing after the active distribution determination. The four most obvious price paths to follow in subsequent periods are:

1. Continue the current price path indefinitely
2. A historical average growth rate
3. Trend prices in line with CPI
4. Flat price path

The AER's preliminary view is that continuing the current price path indefinitely, as currently assumed in Victoria, is likely to be inappropriate because the price path can differ markedly from historical or anticipated future price growth rate. Due to the inherent difficulty in estimating the future price path, the AER's preliminary position is that it is appropriate to assume prices will remain flat for the period of the connection.²¹

The AER requests comments regarding the appropriate assumption of future price path to use in the cost-revenue-test.

²¹ The AER is proposing to use a real WACC in the NPV calculation and as such it is not necessary to escalate the current price path in line with CPI. If a nominal WACC is adopted then it will be necessary to inflate DUoS revenue using CPI.

7 Incremental cost

Under chapter 5A, the purposes of the AER's guideline include ensuring connection charges are reasonable taking account of efficient costs of providing the connection service, provide a user pays signal and limiting cross subsidisation. The AER must also have regard to historic and geographical differences between networks.

The cost-revenue-test relies upon an estimation of the incremental cost that a new connection imposes on the DNSP. Therefore, to determine the capital contribution for a new connecting customer, it is necessary to quantify all the costs that that customer imposes upon the DNSP. Generally, a connection can be broken into three separate components being, the direct connection assets, the extension and the shared network augmentation. Also, a new connection will also impose some additional operational and maintenance costs onto the DNSP.

Under clause 5A.E.3(c)(5) of the NECF, the AER's guideline must “describe the methods for calculating the augmentation component for the connection assets and, if the augmentation consists of, or includes an extension, the extension component of a connection charge”. While there is no specific reference to operational and maintenance costs in the new chapter 5A, as discussed in section 7.4 of this paper, the AER proposes to include these costs in the cost-revenue-test. This would ensure the costs are offset against the component of DUoS related to operational and maintenance costs.

7.1 Direct connection assets cost

Generally the costs associated with direct connection assets are easily identifiable and attributable to an individual customer. Hence, this cost element should be included in setting the connection charge. Where the service is classified as standard control,²² the charges for direct connection assets should be based on the efficient costs of providing the required service in accordance with the form of control applied by the AER in a distribution determination.

7.2 Extensions cost

Consistent with most current arrangements, the AER's initial view is that the full cost of an extension should be funded by the customer which requires the extension, subject to a cost-revenue-test and rebate scheme. This pricing will also provide a strong locational signal. The rebate scheme will provide a rebate to the initial customer, if subsequent customers join the extension. This scheme is discussed further in section 9.4.

The AER considers that a competitive market price would be reflective of efficient costs. Hence, where suitable independent service providers (contractors) are available, a DNSP should either price its connection service at the market price, or engage independent service providers to provide the service to customers. In a non

²² Standard control services are typically provided to all customers, or to a broad class of customers, and are generally available only from the incumbent service provider (i.e. they have a monopoly over the provision of those services). Costs for these services are recovered through regulated tariffs.

contestable environment, the AER regulates DNSPs to price alternative control services at cost reflective prices.²³ One option, which could be applied to a connection service, is a schedule of fixed prices.

Another option to ensure efficient prices is to require a DNSP to call for tenders subject to customer agreement before performing works over a certain dollar threshold (where the administrative cost of calling for tenders would not be significant relative to the total project cost). The AER considers that the threshold could be set at \$3000 which should not create a substantial administrative burden.²⁴ For works below the threshold, the AER's preliminary view is to require DNSPs to use pre-established period (standing) contract prices from qualified third party contractors as the cost calculation basis.

The AER seeks comments on its preliminary view that an extension should be funded by the customer requiring the extension, subject to the cost-revenue-test.

The AER seeks comments on its preliminary view that:

- Subject to customer agreement, DNSPs should call tenders for connection works over \$3000.
- For works below this threshold, DNSPs should use pre-established period (standing) contract prices from qualified third party contractors as the basis for cost calculation.

7.3 Shared network augmentation cost

Under chapter 5A, only new customers with demand above the threshold level set by the AER are required to pay for specific shared network augmentation costs.

However, this does not mean that other new customers do not fund shared network augmentation costs. DNSPs will be recovering the portion of the overall shared network augmentation cost due to new customer growth through network tariffs, which apply to all existing customers and new customers.

7.3.1 Current jurisdictional shared network augmentation charge arrangements

This section provides an overview of the augmentation charge arrangements in the relevant jurisdictions. It does not, in all cases, discuss the actual charge methodologies adopted by each DNSP.

²³ Alternative control services are generally provided at the request of, or for the benefit of, specific customers. They are subject to less onerous regulation and they can often be provided by third parties (other than the DNSP). They are "excluded" in the sense that they are not covered by the price cap or revenue cap applicable to direct control services. A fee is usually charged for these services.

²⁴ Based on the assumption that the total cost of tendering should not exceed 10 per cent of the overall cost and the cost for tendering is about four hours of an electrician's rate of about \$80 per hour. This hourly rate is based on the average electrician charge-out rates of Adelaide, Brisbane, Melbourne and Sydney published by *Rawlinsons Australian Construction Handbook, 2011*.

7.3.1.1 New South Wales

Under IPART's capital contributions determination, the network augmentation works, which a new customer must fund, must be the economic optimum size required given the customer's connection capacity, other loads and expected growth in other loads.²⁵

7.3.1.2 South Australia (SA)

Under clause 3.3 to 3.11 of ESCOSA's Electricity Distribution Code and the SA Guideline No. 13, the appropriate augmentation charge was based on either a published standard unit charge or local costs determined by an individual assessment of the augmentation impacts.

The unit charge was based the aggregate average unit cost of; sub-transmission lines, the costs of substations, high voltage feeder exit and high voltage feeders using recent cost data for the metropolitan area.²⁶ The AER now performs and exercises functions and powers of ESCOSA under the Electricity Distribution Code Provisions. Under SA derogation 9.28.3 of the NER, the standard unit charge is \$135 adjusted for CPI. The charge applies to each kVA above 90 kVA except where the customer is supplied by a 19kV SWER line [single wire earth return line], in which case the allowance is 25kVA.²⁷

For individual assessment customers, a similar component based approach is used to develop the standard unit charge, however, the components are limited to those requiring augmentation within 10 years.²⁸

7.3.1.3 Queensland

Ergon requires new customers to contribute to the costs of the existing shared network. This amount is a 25%, 80% or 2% (depending on the area) attribution of the incremental revenue. In addition, Ergon applies the following general principles:

- If the shared network works were previously outside the Planning Horizon (5 years for distribution networks and 10 years for zone substations and sub-transmission networks), then the customer/developer is required to fully fund the cost of the works.
- If the shared network works were already within the Planning Horizon, then the customer/developer will be required to pay the cost of advancement of the works.
- If the shared network works, or advancement costs, result in a benefit to other customers, then the new customer/developer will be required to pay only its share of the costs. Where costs are to be shared, Ergon will determine at its absolute discretion, the cost shares proportional to the benefit derived by each party.

Energex requires a 10 per cent reduction in DUoS be applied when determining capital contributions as a contribution to shared network costs. In addition, where

²⁵ IPART, *Capital Contributions and Repayments for Connections to Electricity Distribution Networks in New South Wales Determination*, clause 5.

²⁶ ESCOSA, *Electricity Industry Guideline No. 13*, July 2005 GL 13 p. 7, 8.

²⁷ ESCOSA, *Electricity Industry Guideline No. 13*, p. 5. *Electricity Distribution Code 2007*, p. A-33.

²⁸ ESCOSA, *Electricity Industry Guideline No. 13*, July 2005 GL 13 p. 8, 9.

upstream network costs can be clearly identified and are material, they are included in the calculation of total costs.²⁹

7.3.1.4 The Australian Capital Territory (ACT)

In the ACT, ActewAGL charges customers who trigger an augmentation and whose connection is uneconomic relative to the cost of the upgrade, the total cost of works associated with the augmentation.³⁰

7.3.1.5 Victoria

Guideline No. 14 requires that augmentation charges should be calculated as the difference between the present value of undertaking augmentation at an earlier date as the result of the customer having connected to the network and the present value of the cost the DNSP would otherwise incur.³¹

7.3.1.6 Tasmania

There is no published policy in this regard.

7.3.2 Issues under chapter 5A

As noted, the purposes of the AER's guideline include ensuring connection charges are reasonable taking account of efficient costs of providing the connection service, providing a user pays signal and limiting cross subsidisation. In addition, the AER must have regard to historic and geographical differences between networks.

In order to account for cost efficiency (charges reflective of actual cost), the AER considers that some locational signal would be appropriate when charging for shared network augmentation. This will ensure customers face, and take account of the actual costs of providing connection services. A shared network augmentation charge limits cross subsidisation because the costs to the shared network resulting from a new customer will be paid by that customer and not other users.

The AER proposes the guideline should allow for flexibility in DNSPs' shared network augmentation charges to take account of network differences in actual costs.

7.3.3 Alternative approaches

Under chapter 5A, the AER must set a threshold below which customers will not pay for specific shared network augmentation. In addition, to have regard to the guideline's purposes under chapter 5A,³² the AER considers that shared network augmentation costs should be met by the connecting customers where relevant. For these reasons, the AER has not listed—as an option—that no specific shared network augmentation charge be levied. The AER has classified the current approaches adopted into the following broad categories:

²⁹ Energex, *2009-10 Pricing Principles Statement*, p. 36

³⁰ ActewAGL, *response to AER information request*, 15 April 2011.

³¹ ESCV, *Electricity Industry Guideline No. 14*, April 2004, p. 5, 6.

³² The purposes of the guideline include providing user pay signal and to limit cross subsidisation of connection cost.

1. Shared network augmentation charges, for all customers connecting to the network above the shared network augmentation charge threshold, could be set as a unit rate (e.g. \$ per kVA rate).
2. Shared network augmentation charges, for all customers connecting to the network above the shared network augmentation charge threshold, could be based on the brought forward costs. This is the cost of undertaking the shared network augmentation sooner as a result of the new customer.
3. Shared network augmentation charges could be the actual cost of the shared network augmentation which is triggered by a customer (and those customers that do not immediately trigger an upgrade are not required to pay).

7.3.4 AER considerations

The AER's preliminary view is that option one, a unit rate charge, should be adopted to calculate shared network augmentation charges. As discussed further in section 8, the shared network augmentation charges should only be applied to a customer's peak demand in excess of the shared network augmentation threshold level and the demand measure should be consistent with the threshold—and thus the charge should be levied on peak demand. Approach one will promote customers above the shared network augmentation threshold paying for the cost of the shared network augmentation which can be attributed to them and will limit any step change concerns. Therefore, the method would be in accordance with the AER's guideline design criteria 3 and 4. The AER considers this approach to also provide a user pays signal in that, a customer will pay for the shared network augmentation it requires, but not that which will be taken up by subsequent customers.

Option two is the approach currently adopted in Victoria and in some cases Queensland. The AER has previously found, during the AER's review of the benchmark upstream augmentation charge rates for CitiPower's network, that:

...there is almost no theoretical difference in the incremental cost of continuously augmenting a distribution network or augmenting it in large steps. As such, the brought forward concept has little practical value. As fewer large augmentations are almost equivalent to continuously augmenting the network, the brought forward cost of augmentation would be approximately the same as the cost of undertaking the augmentation immediately.³³

...not all new customers connecting to the network trigger upstream augmentation. Some new customers use network capacity that has already been paid in part by previous customers. The existence of spare capacity in the network does not imply that no connection charges should be paid by the particular new customer who will use this excess capacity. The AER considers that each customer should contribute towards the cost of adding their required capacity, regardless of the timing of previous or future augmentations.³⁴

³³ AER, *Benchmark Upstream Augmentation Charge Rates For CitiPower's Network*, Draft Decision, 19 February 2010

³⁴ AER, *The AER's Conclusion on the Benchmark Upstream Augmentation Charge Rates for CitiPower's Network*, Guidance Paper, 25 June 2010.

Option two, the brought forward cost approach is not the AER's preferred preliminary option because there is considerable complexity in determining the costs accurately. There is also a lack of transparency to customers. As a result some of the Victorian DNSPs are using method one as a proxy for the brought forward cost.

The AER considers that method three—requiring the customer who triggers shared network augmentation to pay for the full cost—is not equitable. All customers connected to the network contribute to the costs of shared network augmentation and so it is not appropriate to only charge the customer who triggers it. The AER came to this same conclusion in its final decision on the benchmark upstream augmentation charge rates for CitiPower's network review. Further, the AER considers that such an approach would lead to large impediments to investment where the utilisation of the network is reaching capacity. The approach would not be consistent with the AER's criteria 4, and may also be inconsistent with criteria 3 and the purpose of the AER's guideline to limit cross subsidisation.

Under approach one, there are different methods to calculate a per unit charge rate. It is the AER's preliminary view that the rate should be based on average recent project shared network augmentation costs for an area. In South Australia, Guideline No. 13 outlined:

The standard unit cost will be determined through consideration of the augmentation costs associated with four components:

- sub-transmission lines,
- substation,
- high voltage feeder exit, and
- high voltage feeder.

In the case of sub-transmission lines, the meshed nature of the network makes it difficult to assess the incremental network capacity attributable to specific augmentation works. Consequently, the incremental cost of augmentation capacity will be assumed to be equal to the average cost, at current prices, of the 66 kV metropolitan network capacity needed to meet customer demand. This average value will be determined by calculating the total cost of the metropolitan 66 kV network at current prices, subtracting the proportion of that cost attributable to spare capacity, and dividing the remaining cost by the aggregate peak demand in the metropolitan area.

Augmentation expenditures related to each of the other components and the corresponding capacity increases provided will be determined using recent cost data for the metropolitan area. The total expenditures will then be divided by the total capacities to give a unit cost in \$/kVA for each component.

The four component unit costs will then be added to give an aggregate average unit cost for all augmentation in the metropolitan area. The standard unit augmentation charge is then determined by discounting this average value in current dollar terms for the average period before future augmentation expenditures will be required. The discount rate to be used in

this calculation will be as specified by the Commission from time to time.
From 1 July 2005 the value will be 8.5% per annum.³⁵

The AER proposes adopting a similar methodology to calculate the per unit shared network augmentation charge rate. The AER considers that the rate would result in charges reflective of the efficient costs.

The AER seeks comments on its preliminary view to charge for shared network augmentation on a per unit rate based on the calculation method outlined in the South Australia Guideline No. 13.

7.3.4.1 Locational signals

The AER considers that DNSPs may propose to segment their network into different areas where different shared network augmentation charge rates will be applied. In some parts of a DNSP's network, the cost per unit of shared network augmentation will be higher than in other parts. By allowing different rates in different areas, the shared network augmentation charge will be reflective of the actual shared network augmentation unit rate cost, which should provide an efficient locational signal to the market. This is in accordance with the purposes of the AER's guideline under chapter 5A to take account of the efficient costs of providing a service.

The AER seeks comments on its preliminary view to allow DNSPs to segment their network into areas where different shared network augmentation charge rates would apply.

7.4 Operation and Maintenance (O&M) cost

A new connecting customer imposes not only the immediate cost of connecting to the distribution network, but also ongoing costs in the form of additional operation and maintenance expenses. However, the AER notes that the connection charge principles under clause 5A.E.1 do not explicitly indicate that DNSPs should charge O&M cost as part of the upfront connection charge.

As the AER is proposing to use DUoS to calculate the incremental revenue and DUoS is used to recover both capital and O&M costs, the AER considers it necessary to include an O&M component to the calculation of incremental cost to ensure that O&M cost is netted-off from the cost-revenue-test. Otherwise, the future O&M contributions from the new customer would be used to subsidise their connection cost.

The AER's preliminary view is that the operations and maintenance cost should be based on the current network average for each class of customers.

The AER requests comments on

- what is the most appropriate manner to calculate the operation and maintenance costs imposed by a new customer

³⁵ ESCOSA, Electricity Industry Guideline No. 13, p. 7, 8.

- should the O&M cost be excluded from the incremental cost calculation; and instead the incremental revenue calculation be adjusted, based on the equivalent network tariff with the O&M component removed?

8 Capacity threshold for shared network augmentation charge

Under clause 5A.E.3(c)(4), the AER's guideline must establish principles for fixing a threshold (based on capacity or any other measure the AER thinks fit) below which retail customers (not being a non-registered embedded generator or a real estate developer) are exempt from any requirement to pay connection charges (or to give consideration in the form of a capital contribution, prepayment or financial guarantee) for an augmentation (other than an extension) to the distribution network necessary to make the connection.

8.1 Current jurisdictional augmentation threshold arrangements

A substantial body of work has been produced by various jurisdictions and jurisdictional regulators on augmentation charge thresholds. Different charge thresholds and methods for setting charge thresholds have been adopted in jurisdictions. The AER has provided a summary of the thresholds and in some cases a brief statement on the justifications, as appears in the relevant Codes, Guidelines and pricing principles.

8.1.1 New South Wales (NSW)

In NSW, a customer pays for augmentation if the customer is:

1. A rural customer—where average demand per kilometre of high voltage line is less than 300 kVA or where council has zoned the area as rural.
2. A large load customer—where the expected demand for electricity is such that the customer would require more than 50 per cent of the capacity of the existing assets to be augmented.

In 2001, the NSW Independent Pricing and Regulatory Tribunal (IPART) commissioned a report from Meritec to assist with the development of a capital contributions policy.³⁶ The report found that the net present value (NPV) of all connections in NSW were profitable except for some rural ones. The report noted that this raised the question of whether connection charges should be levied, except for rural and large load customer.³⁷

In IPART's final report on capital contributions, it adopted the above definition of rural and large load customers, noting that the definition of large load customer was the same as in the draft determination.³⁸

8.1.2 South Australia

In South Australia, a customer's demand subject to an augmentation charge is the customer's estimated maximum demand at times corresponding to network design

³⁶ Meritec, *Report on Capital Contributions in the NSW Electricity Market*, September 2001, p. 1.

³⁷ Meritec, *Report on Capital Contributions in the NSW Electricity Market*, September 2001, p. 11, 16.

³⁸ IPART, *Capital Contributions and Repayments for Connections to electricity Distribution Networks in New South Wales*, Final Report, p. 8, 9.

conditions less a specified augmentation allowance. The allowance is 90 kVA except on 19kV SWER lines where the allowance is 25 kVA.³⁹ It is the customer's responsibility to specify the maximum demand, however, the customer must satisfy ETSA Utilities that it is reasonable. If the customer does not have information, ETSA will estimate the demand. When agreement cannot be reached, a provisional value will be used with a true up after three years.⁴⁰

The Essential Services Commission of South Australia (ESCOSA) indicated in the draft Supplementary Determination that 90 kVA is slightly in excess of a 100 Amperes 3-phase low voltage service. ETSA Utilities commented that more than 95 per cent of its connections are less than 100A.⁴¹

8.1.3 Queensland

In Queensland, the DNSPs have developed a charging methodology which was approved by the Queensland Competition Authority (QCA).

Energex only charges Standard Asset Customers (SACs) for augmentation where the augmentation costs can be clearly identified and are considered material.⁴² However, all customers have a 10 per cent reduction in their incremental revenue as a contribution to the shared network when calculating a customer's capital contribution.

Ergon Energy charges for augmentation when a customer triggers an augmentation or brings one forward to within the planning horizon (5 years for distribution networks and 10 years for zone substations and sub-transmission networks) then the customer must fund all or a share of the cost.

8.1.4 The Australian Capital Territory (ACT)

In the ACT DNSPs may charge a capital contribution for augmentation of its network undertaken at the request of a customer.⁴³ ActewAGL informed the AER that it charges for augmentation when the customer triggers a need to augment non dedicated connection assets and the load is determined to be uneconomical relative to the cost of the upgrade.⁴⁴

8.1.5 Victoria

Guideline No. 14 in Victoria does not specify an augmentation charge threshold.

8.1.6 Tasmania

There is no published policy in this regard.

³⁹ ESCOSA, *Electricity Industry Guideline No. 13*, p. 5. Electricity Distribution Code 2007, p. A-33.

⁴⁰ ESCOSA, *Electricity Industry Guideline No. 13*, p. 6.

⁴¹ ESCOSA, *Amendments to Chapter 3 of the Electricity Distribution Code: Final decision*, March 2005, p. 10.

⁴² Energex, *2009-10 Pricing Principles Statement*, p. 36.

⁴³ ICRC, *Electricity Network Capital Contribution Code*, August 2007, p.1.

⁴⁴ ActewAGL, *response to AER information request*, 15 April 2011.

8.2 Issues under chapter 5A

Under chapter 5A, the purposes of the AER's guideline include ensuring connection charges are reasonable taking account of efficient costs of providing the connection service, provide a user pays signal and limiting cross subsidisation. The AER must also have regard to historic and geographical differences between networks.

Taking account of efficient costs may indicate that applying a locational signal to the shared network augmentation threshold would be appropriate. In some circumstances, a single threshold may not be appropriate. There would be situations where a new customer could be considered small in comparison to the infrastructure available in a highly developed area but would be considered large (and would normally require shared network augmentation to the local network) if it connected to a SWER line in a rural area. In such a case, it could be argued that the customer should pay for shared network augmentation charges because they would (or would normally) trigger a shared network augmentation expense. The AER considers that DNSPs could have some flexibility under the new guideline to take account of the historical and geographical differences in networks, in setting shared network augmentation charge thresholds. The AER considers that a locational signal may provide customers with incentives to connect to the network where their load would result in a lesser need to augment the network, which will reduce pressure on network costs. The AER recognises that once a load is connected, such a locational signal will not provide an incentive to use the network efficiently by, for example, reducing demand or shifting load to off peak times.

To a degree, the requirement for the AER to set a threshold will somewhat undermines user pay signals for certain classes of customers. Some customers who are not required to pay for shared network augmentation will not take account of their full impact on the shared network to which they connect. However, the AER notes that some users should not be charged for shared network augmentation for both administrative simplicity and the materiality of the charge on individual small users.

A shared network augmentation threshold could be set on consumption or on demand. The AER considers that the threshold could further be set on peak coincident demand (demand when the network is operating at peak times). This demand may provide the strongest user pays signal as the AER understands it is peak coincident demand that drives the need for shared network augmentation, however, this may be difficult to administer. Further, after connecting to the network, a DNSP cannot impose restrictions on a customer's usage pattern.

When setting a shared network augmentation threshold, clause 5A.E.3 stipulates that:

(d) The principles for establishing an exemption under paragraph (c)(4) must ensure that the exemption only operates in the following circumstances:

- (1) the connection is a low voltage connection; and
- (2) the connection would not normally require augmentation of the network beyond the extension to the distribution network necessary to make the connection; and
- (3) the connection is not expected to increase the load on the distribution network beyond a level the Distribution Network

Service Provider could reasonably be expected to cope with in the ordinary course of managing the distribution network.

8.3 Alternative approaches

The AER has characterised the different jurisdictional approaches, and other approaches it has identified, into two high level possible approaches. The methods for setting a shared network augmentation threshold that have been identified are:

1. A fixed electricity demand threshold. The threshold may be set as a fixed demand amount for each jurisdiction, region (e.g. CBD, urban and rural) or DNSP. This could be determined via a variety of methods, including, to capture a certain number of a DNSP's customers, being calculated as a percentage of a standard design (or typical) feeder capacity or based on historical jurisdictional definitions.
2. A threshold based on a percentage of existing local feeder or substation capacity may be established. For example if a customer uses less than 10 percent of the local substation capacity they may not be required to pay for shared network augmentation.

8.4 AER considerations

8.4.1 Setting the threshold for shared network augmentation charges

The AER must establish principles for establishing a shared network augmentation threshold. The AER's preliminary position is that it is appropriate to provide some locational signal to potential new connections to encourage efficient use of the network. This is because different parts of DNSPs' networks are substantially different in terms of customer size, load capability and network development.

Method one above provides some locational signal, although not as strong as that which could be provided under method two. Under method two, a customer would only pay for shared network augmentation based on its relative size to the local network to which it connects. However, given the interconnectedness of many parts of the network, this method may not provide an appropriate locational signal. In a highly integrated network, a locational signal may not be appropriate as the size of a new customer may not substantially necessitate the need for a shared network augmentation at the shared network connection point, but it may trigger a shared network augmentation in another section of the network. However, there is still scope for locational signals to a lesser degree to differentiate between highly different network characteristics. Method two may also result in a higher administrative burden (having to calculate and publish the local substation capacity to provide investment certainty) although the AER notes that some of the required information would be reported in DNSPs' planning reports.⁴⁵ The AER also considers it would provide more certainty to the market if a shared network augmentation threshold was set at a fixed amount. Method two may also make the requirement for DNSPs to make standing offers under chapter 5A more difficult to administer. Therefore, method two is not the AER's proposed option. In addition to being more administratively simple, method

⁴⁵ This type of approach is adopted in South Australia to determine if the customer is an Individually Calculated Customers.

one can have regard to the size of existing customers in a given section of a network—as a proxy for the network's development—in its application.

Table 1 provides a summary of data provided by DNSPs regarding the average demand and consumption levels of new residential and non-residential customers.

The information collected indicates that for some DNSPs, the top 10 per cent of all new residential customers' demand and annual consumption are less than 15 kVA and 25 MWh respectively across all jurisdictions. Similarly, the lower limits of the top 10 and 15 percentile of all business customers' annual consumption are just below 100 and 60 MWh respectively.⁴⁶

The AER proposes to set the demand threshold at the higher of either:

- the level of customer demand in each DNSP's network that would result in approximately 10 per cent of new customers paying for specific shared network augmentation (based on existing customer demand information); or
- 70 kVA (equivalent to 100 Ampere 3-phase low voltage supply);

These threshold levels of demand are substantially less than the typical network capacity of a DNSP's network. Hence, the AER considers that these thresholds meet the chapter 5A requirements of:

- the connection is a low voltage connection
- the connection would not normally require shared network augmentation of the network beyond the extension to the distribution network necessary to make the connection
- the connection is not expected to increase the load on the distribution network beyond a level the Distribution Network Service Provider could reasonably be expected to cope with in the ordinary course of managing the distribution network.

The AER's preliminary position is based on:

- the South Australian precedent (where only customers above 100 A 3-phase low voltage supply pay for augmentation);⁴⁷
- the average demand figures provided by the DNSPs; and

⁴⁶ The top 10 and 15 percentile business customers in Ausgrid's area consume 110 and 70 MWh or more respectively per annum, in Endeavour Energy's area they use above 120 and 72 MWh respectively, Energex's area 76 and 47 MWh respectively, Ergon's area 64 and 43 MWh respectively, ETSA Utilities area 55 and 40 MWh respectively and Aurora Energy's area 52 and 33 MWh (Aurora's data excludes sites with daily consumption less than 1kWh).

⁴⁷ ESCOSA's amendments to Chapter 3 of the Electricity Code final decision noted that it considered a 100 Ampere 3-phase supply a practical augmentation charge boundary. In 2004, ETSA Utilities commented that over 95 per cent of its annual connections were less than 100 Ampere 3-phase supply. However, ESCOSA ultimately adopted 90kVA as the threshold.

- the AER’s understanding that in general, a 100 Ampere 3-phase supply connection is the largest connection possible without the need of current transformer metering—it is a requirement in the various jurisdictional service and installation rules that where a connection exceeds 100 Amperes 3-phase low voltage supply that a current transformer is required.⁴⁸ Hence, the AER considers that 100 Amperes 3-phase low voltage supply is a clear natural break point to define this threshold.

Table 1 Average demand and consumption of new customers, all jurisdictions

Jurisdiction	DNSP	Residential		Non residential		Remarks
		demand, kVA	consumption, MWh	demand, kVA	consumption, MWh	
ACT	ActewAGL	2.5-5	5.6	na	na	Planned demand diversity not actual
NSW	Ausgrid	3 to 5	6.85	na	214	
NSW	Endeavour Energy	4.5 to 9	na	na	na	Demand level depends on whether gas is also available
NSW	Essential energy	generally 5-10	na	-majority of these customers uses less than 75 kVA - medium size 75-200 kVA - large 200+ kVA	na	
QLD	Energex		5.13		45.27	
QLD	Ergon		5.09		44.88	
SA (a)	ETSA	0.72	6.3	11.4	100	All customers 4 MWh a – based on customers connected in 2008
Tas	Aurora	2.04	10.78	na	80.1 (b)	b - excluding the single largest new customer
Vic	CitiPower	4.5	6.3	na	na	
Vic	Jemena	3	na	na	na	based on customers with gas hot water
Vic	Powercor	2.5 (c) 6.3 (d)	5.5 (c) 10.7 (d)	na	na	c- urban with gas d- rural without gas
Vic	SP AusNet	generally 3 to 10(e) 12 (f)	5.2 (g)			e- prestige house without gas f- snow area with slab heating g- average consumption all customers
Vic	United Energy	3	na	na	na	based on customer with gas supply

na: information not available

Source: DNSPs

⁴⁸ Except the Queensland Service and Installation Rules note; 9.3. Current Transformers - When required The customer shall make provision for the installation of current transformer metering where the calculated maximum demand of the load to be metered exceeds 120A per phase as determined in accordance with the guidelines given in AS/NZS 3000 (Wiring Rules). Current transformer metering shall be used for actual loads greater than 90A or motors larger than 50kW (65hp). Unless otherwise advised by the metering provider, direct connected meters rated up to 100A will be supplied for loads less than these values.

Having regard to differences in networks, the AER notes that if a DNSP has higher proportion of larger customers, then a threshold of 90 per cent of customers not paying for shared network augmentation could be a higher threshold than the 100 Ampere 3-phase low voltage supply limit proposed. In such a case the AER considers this threshold should be adopted because it should also ensure most retail customers do not pay for shared network augmentation whilst balancing the need to limit cross subsidisation.

The AER proposes that in order to calculate the 90 per cent threshold, the DNSP should use its network's existing customer demand information. Where this information is not available, or the DNSP cannot estimate it, or 100 Ampere 3-phase low voltage supply is a higher threshold—the 100 Ampere 3-phase low voltage supply threshold should be adopted.

The AER also considers that there is merit in allowing DNSPs to nominate less developed parts of the network where different thresholds would be more appropriate. For example, in a less developed area, if the DNSP charged shared network augmentation to customers with demand over 100 Ampere 3-phase low voltage supply, then a new connection which may substantially affect the need for argumentation, may not be large enough to trigger the shared network augmentation threshold. The DNSPs will need to justify to the AER why these areas should be subject to a different shared network augmentation charge threshold during the process of approving a DNSP's connection policies. The AER considers that such areas will generally be rural areas where the network is less interconnected and less developed. This approach is similar to that adopted by most jurisdictions in that it allows some variability in thresholds to suit the network differences. The approach would also result in a locational signal that is reflective of customers' impacts on the network and will therefore provide efficient investment decision signals.

Additionally, the AER proposes a default threshold on SWER lines of 25kVA as adopted in South Australia. This threshold may not suit all networks and so the AER proposes to allow DNSPs to vary from this default value, if they can satisfy the AER that a different value is more appropriate.

In conclusion, in accordance with clause 5A.E.3 the initial view the AER has outlined for setting a DNSP's thresholds will ensure that the exemption only operates for low voltage connections. In addition, the AER considers allowing some flexibility in the thresholds will ensure that the DNSPs can set a threshold so that shared network augmentation charges will not be levied on connections that would not normally require shared network augmentation for a given section of the network, while balancing the need to limit cross subsidisation. The flexibility also means the DNSPs should be able to nominate (subject to AER approval) different thresholds. This would ensure that connections, which are expected to increase the load beyond that the DNSP could be expected to cope with, are not exempt from shared network augmentation charges.

The AER seeks comments on its preliminary view to set a fixed demand threshold rather than a threshold dependant on local capacity.

The AER seeks comments on its preliminary view to set a threshold for most areas of networks on the greater of:

- the level of customer demand in each DNSP's network that would result in approximately 10 per cent of new customers paying for specific shared network augmentation (based on existing customer demand information);

or

- 70 kVA (equivalent to 100 Ampere 3-phase low voltage supply).

The AER seeks comments on its preliminary view to allow DNSPs to nominate less developed areas of the network where a different threshold would be more appropriate.

The AER seeks comments on its preliminary view that customers connected on SWER lines should pay for shared network augmentation on demand above 25kVA as the default level unless a different threshold is nominated by a DNSP and deemed appropriate by the AER.

The AER has also considered basing the shared network augmentation thresholds on coincident peak demand. This measure appears to most closely align with the trigger for shared network augmentation and is therefore most likely to provide efficient price signals. For example, if a customer connects to a summer peaking section of the network but its load is winter peaking, then the customer may not contribute materially to the need for shared network augmentation based on its summer peak demand. However, the AER considers that coincident peak demand may be difficult for DNSPs to verify and enforce. At this stage, the AER does not propose to adopt coincident peak demand in setting the shared network augmentation charge threshold.

The AER seeks comments on its preliminary view that it will be difficult to verify and enforce a customer's peak coincident demand and therefore the threshold should be a set based on peak demand.

In South Australia, it is the customer's responsibility to specify its maximum demand, however, the customer must satisfy ETSA Utilities that its estimate is reasonable. If the customer does not have the necessary data, ETSA Utilities will estimate the demand based on its experience of existing customers with similar characteristics. When agreement cannot be reached, a provisional value will be used. After three years the appropriate demand value will be reconsidered and there is a corresponding refund or additional charge based on it and the actual DUoS charges.⁴⁹

The AER's initial view is that the South Australian approach seems to be a reasonable approach to estimating peak demand. The AER also considers that the approach may also reduce the number of customer disputes. If the customer was to become insolvent within the first three years, then the AER considers that reconsidering the provisional value would not be practicable and need not occur.

⁴⁹ ESCOSA, *Electricity Industry Guideline No. 13*, July 2005 GL 13 p. 5, 6.

The AER seeks comments on its preliminary view that the approach outlined in ESCOSA's Guideline No. 13 is a fair and practicable approach for estimating peak demand that should be adopted.

8.4.2 How to charge for shared network augmentation

The AER notes that in some jurisdictions, such as South Australia, customers receive a shared network augmentation allowance of the threshold size. In other words, customers only pay shared network augmentation charges on their demand which is above the shared network augmentation threshold. This approach would reduce step changes in connection charges for customers near the threshold. The approach, however, may not limit cross subsidies to the extent possible (depending on a customer's consumption, demand and connection cost characteristics) as these larger customers may pay below their incremental cost. In this case, the AER has given more weight to its design criterion 4—to remove customers experiencing large step changes depending on whether they fall below or above the shared network augmentation charge threshold—than criterion 3 of limiting cross subsidies.

The AER seeks comments on its preliminary view that a customer who is required to pay for shared network augmentation, would pay for shared network augmentation on the amount of their peak demand above the shared network augmentation threshold.

8.4.3 Shared network augmentation charges to embedded generators

The AER considers that it is generally appropriate to calculate any capital contribution for an embedded generator to connect to the network using a cost-revenue-test in the same manner as a load customer. However, the AER notes that there are some specific issues related to the calculation of costs and revenue from these customers.

The AER notes that some generators are also load customers. In this case, the AER considers that all costs associated with the load portion as well as all costs associated with generated load need to be considered separately, for example if a load customer also has integral embedded generation, the peak consumption demand capacity specifically requested by this customer, or the expected overall peak demand of this customer, should be used to determine the shared network augmentation charge of this customer. This is because the network would need to be able to support this peak demand should the customer's generating unit become unavailable for any reason.

Customers who are only generators do not consume energy and their output can be represented as negative load. For example, a 20 kW generator could be considered as a negative 20 kW (-20 kW) load. The AER's threshold (below which specific shared network augmentation should not be charged) does not readably transfer to embedded generators. For example, there may be situations where the existing network does not have the capacity to provide the power transfer capability to accept the entire proposed output of a new embedded generator or upgrades to an existing generation system. If a specific generator wants to avoid this constraint, parts of the existing network need to be augmented. The AER considers that—similar to transmission connected generators and other registered participant generators—embedded

generators should pay for this user specific cost for removing output constraints, unless there is a demonstrable net benefit to other network users.

Under the current national electricity market structure, generators do not pay for the usage of the network to deliver their output to electricity users. As such, when connecting a generator to the network, the generation component does not provide any revenue to the DNSP in the form of DUoS charges for the generated electricity. Hence, the incremental revenue, from generated electricity, should be zero for the purposes of the cost-revenue-test.

The AER seeks comments on its proposal that embedded generators should fund specific network shared network augmentation to remove constraints on their outputs due to limits of the existing network.

9 Other Issues

9.1 Treatment of augmentation assets

Under clause 5A.E.3(c)(7), the AER's guideline must describe the treatment of augmentation assets.

9.1.1 AER considerations

Consistent with the broader regulatory framework the AER considers that augmentation assets should be treated in the manner by which they are paid for. A DNSP funded augmentation asset will be included by the DNSP in its regulatory asset base (RAB) and a customer funded augmentation asset should be netted off the RAB.

9.2 Prepayments

Under chapter 5A clause 5A.E.3(c)(2), the AER's guideline must describe the circumstances (or how to determine the circumstances) under which a Distribution Network Service Provider may receive prepayment from a retail customer or real estate developer for the provision of a connection service.

9.2.1 Issues under chapter 5A

There may be substantial costs involved in a DNSP connecting a new customer (particularly larger customers) and some of these costs may be incurred a long time before the connection occurs. This is often the case on larger connections where there is considerable design work or specific components need to be ordered and delivered before the connection can occur. As such, some DNSPs currently require all or a substantial portion of the capital contribution to be paid upfront.

9.2.2 AER considerations

The AER considers that any prepayment is largely a commercial matter for agreement between the two parties. As such, the AER proposes that its connection charge guideline will provide DNSPs with a degree of discretion in deciding whether to require the prepayment of a capital contribution and the amount of any prepayment. For transparency, the AER will require DNSPs to include a policy regarding the calculation and charging of prepayments in their connections policies.

However, the AER may seek to limit the maximum amount that a DNSP can require to be prepaid by a customer. The AER considers that requiring the full capital contribution upfront may not be reasonable and that generally the amount of any prepayment should not exceed the upfront costs incurred by the DNSP when, or immediately after, the connection offer is accepted. The AER's initial position is that it appears reasonable that a DNSP receive prepayment for costs that they will incur before construction works begin, such as design cost, and equipment that must be ordered in advance. For administrative simplicity the AER may consider setting the maximum amount of any prepayment to a defined percentage of the capital contribution.

The AER seeks comments on:

Should the AER place limits on the maximum amount of prepayment that a DNSP can charge the connecting customer?

If so, should the AER specifically limit the amount of a prepayment to the actual upfront costs incurred by the DNSP, or should it set a maximum percentage?

9.3 Security fee (financial guarantee) scheme

Under clause 5A.E.3(c)(2), the AER's guideline must describe the circumstances (or how to determine the circumstances) under which a Distribution Network Service Provider may receive a financial guarantee from a retail customer or real estate developer for the provision of a connection service.

9.3.1 Issues under chapter 5A

Financial guarantees or security fee schemes insure DNSPs against the risk of failing to collect the total incremental revenue estimated with regard to a connection offer. In the absence of a security fee scheme, if the DNSP does not collect the total estimated incremental revenue, then the shortfall would eventually be recovered through higher network tariffs to all other network users. Thus, the security fee reduces the risks that existing customers will be required to bear inefficient connection costs attributable to certain new connecting customers.

A security fee is usually an up front payment to a DNSP, which is held for a period of time, to cover any shortfall of the expected incremental revenue or otherwise refunded to the customer. The AER is considering the option for DNSPs to implement a security fee scheme.

The AER seeks comments on whether its connection guideline should have an option for DNSPs to implement security fee schemes.

9.3.2 AER considerations

The AER is considering security fee principles similar to those set out in the ESCV's Guideline No. 14 which states that:

3.5 Distributors may require customers to pay a security fees

3.5.1 If a distributor fairly and reasonably assesses that there is a risk that, if the customer accepts the distributor's connection offer, the distributor may not earn the incremental revenue in relation to the connection offer as estimated by the distributor under clause 3.3.2(c), the distributor may under the connection offer require a security fee.

3.5.2 The amount of the security fee must not be greater than so much of that estimated incremental revenue for which the distributor fairly and reasonably assesses that risk as high and in no case may exceed the present value of the incremental costs the distributor will incur in undertaking any relevant new works and augmentation.

3.5.3 The distributor must pay to a customer interest on the amount of a security fee at a rate and on terms and conditions as approved by the Commission.

3.5.4 A connection offer must require the distributor to rebate to the customer the amount of any security fee, together with interest earned on the amount of the security fee, as the distributor earns the incremental revenue in relation to the connection offer. A rebate must be allowed at least once each calendar year beginning after the calendar year in which the connection services are provided.

The AER considers that the principles could be modified to include requirements that:

- The interest rate paid to the customer on the security fee should be commensurate to the manner in which the security fee is treated by the DNSP. That is, if the security fee is invested in the business then interest should be paid at the weighted average cost of capital. However, if it is held in trust then it may be appropriate to pay at an interest rate similar to commercial deposit rates.
- Over the entire security fee period, a DNSP should not receive—through DUoS and security fee—an amount more than the original estimated revenue, unless above estimated incremental revenue was realised in total over the period. In such a case, the amount should not be more than the estimated revenue plus the actual above estimated revenue.
- The customer should not receive an amount greater than the security fee deposit plus interest from the DNSP in total over the security fee period.

The AER seeks comments on its proposed principles for a security fee scheme.

9.4 Refund of connection charges for extension assets

Under clause 5A.E.3(c)(6) of chapter 5A the AER's guideline must describe the method for calculating:

- i. the amount of a refund of connection charges for a connection asset when an extension asset originally installed to connect the premises of a single retail customer is used, within seven years of its installation, to connect other premises and thus comes to be used for the benefit of 2 or more retail customers; and
- ii. the threshold below which the refund is not payable.

9.4.1 Issues under chapter 5A

The AER also notes that in accordance with clause 5A.E.3:

(f) In developing guidelines dealing with the method for calculating the amount of a refund of connection charges paid before a connection asset becomes a shared asset, the AER must have regard to:

- (1) the Distribution Network Service Provider's obligation to make the refund; and

(2) future projections of distribution network expansion and usage and any consequent effect on the Distribution Network Service Provider's capacity to finance the acquisition of augmentation assets out of increased revenue; and

(3) the fact that the Distribution Network Service Provider's obligation to make the refund will expire after 7 years.

The AER notes that the most efficient method to build a network may, in some cases, be in excess of the minimum requirements to meet the needs of the connecting customer (or group of customers), depending on forecast load growth. For example, a customer may request an extension to the network which would require a SWER line, however, the DNSP may forecast that a 33 kVA line may be more appropriate given forecast growth. As such, the AER considers that the cost to the customer should not in all cases be the total cost of the assets, regardless of the existence of a rebate scheme.

9.4.2 AER considerations

In accordance with chapter 5A a rebate scheme will only apply when an extension asset is used by subsequent customers within seven years of installation. The AER's preliminary position is that the DNSPs should have a high degree of flexibility in developing their own rebate scheme having regard to equity, the extent (physical amount) of any extension required by subsequent customers and the capacity used by subsequent customers. Weightings may need to apply to the extent and capacity of an extension used by subsequent customers.

The amount of a rebate to be paid under the rebate scheme should be calculated on the depreciated value of the assets to which it applies. Although, for the purpose of the rebate scheme, depreciating the asset over seven years (the period which the rebate scheme operates across) would reduce the step change in the cost borne between customers connecting in year seven or in year eight, the assumed depreciation would not be reflective of the true value of the assets after seven years. Depreciating the asset over a period of seven years would also result in the first connecting customer receiving substantially less value than the original cost. However, depreciating the asset over its useful life—typically 40 to 60 years—may create a different impediment to investment, where a subsequent connecting customer would have a greater incentive to not connect to an extension until year eight when the rebate scheme is no longer operational. Therefore, the AER's preliminary view is that, for the purposes of calculating the amount of a rebate, the extension assets could be depreciated over 20 years. This may better balance the incentives and possible investment impediments between the original customer requiring an extension and subsequent customers.

The AER must also set a threshold value below which a refund is not payable. The AER considers that the threshold should balance the DNSPs' administrative costs against the materiality of the refund to the customers. The AER's preliminary view is that a \$500 threshold may strike an appropriate balance.

The AER considers the above described method of treating extensions will be in accordance with the AER's design criteria 1 whereby the charge for extensions will reflect the cost attributed to the individual customer. If no new customers connect to an extension, then the full cost of the extensions is attributed to the customer who

required the extensions. Whereas, when new customers connect, the original customer will only fund the portion of the extension used by, and attributable to that customer.

If a DNSP can reasonably foresee that substantial network expansion (in terms of reach or capacity) is likely to occur and therefore builds the network, upon request of a single customer (or a group of customers), to a greater standard than is required by that customer, then it may be equitable for that customer to only pay what the connection cost would otherwise be to service that customer. However, the customer would also be entitled to a rebate scheme on the amount of its payment to the DNSP when new customers connect. The AER considers that such a scheme would be difficult to accurately calculate because the original customer would need to be rebated, to the extent new customers used the assets which were paid for by the original customer. This would require an assumption that the actual assets built were the only assets required by the original customer's connection. The AER seeks comments on how to best address such a situation.

The AER seeks comments on its preliminary view that the assets subject to a rebate scheme should be depreciated over a 20 year term.

The AER seeks comments on its preliminary view that a rebate scheme should have regard to the length of an extension and the capacity of the assets used by subsequent customers.

The AER seeks comments on its preliminary view that a \$500 refund threshold strikes an appropriate balance between a DNSPs' administrative costs and the materiality of a refund.

The AER seeks comments on its preliminary view on customer payments when the network is built to a greater standard than a customer or group of customers would otherwise require, if the DNSP did not consider it more efficient to build the network to a greater standard based on forecast load growth.

The AER seeks comments and alternative approaches to deal with the costs allocation issues where a DNSP provides a network extension on request of a single customer, to a standard greater than that customer requires due to the DNSP's network planning process.

10 Next steps

The AER will be hosting a public forum in July 2011 to explain the issues identified in this paper in order to facilitate stakeholders in preparing their submissions to the AER. Details of this forum will be available on the AER's website. It is expected that the forum will take place in Hobart, Brisbane, Sydney, Canberra, Melbourne and Adelaide via video links.

After consideration of stakeholders' submissions, the AER will publish a draft guideline for further consultation in accordance with the distribution consultation process under the NER.

A Appendix – Proposed definitions

The AER notes that aspects of a connection are currently referred to in a different manner in each jurisdiction. The connection charge guideline will require a single definition to be applied in all participating jurisdictions.

Chapter 5A defines a ‘connection’ as a physical link between a distribution system and a retail customer’s premise to allow the flow of electricity, and ‘premises connection assets’ as the components of a distribution system used to provide connection services. These definitions appear to cover all components of the distribution network.

The AER considers that a premises connection asset can be separated into three separate components and to reduce confusion the AER seeks to settle on a robust definition of each component. The AER has largely taken the following definitions from the NEL, the NER and existing jurisdictional guidelines (particularly NSW). In this paper the AER has adopted the following definitions:

- Direct Connection Assets - The premises connection assets which run from the connection point to the point of supply and where applicable also include the consumer mains.
- Augmentation - Augmentation of a transmission or distribution system means work to enlarge the system or to increase its capacity to transmit or distribute electricity.⁵⁰
- Augmentation Assets - assets installed to perform the augmentation.
- Extensions - An augmentation that requires the connection of a power line or facility outside the present boundaries of the transmission or distribution network owned, controlled or operated by a Network Service Provider.⁵¹
- Extension Assets - assets installed to perform the extension.

The AER notes that an extension is a specific subset of an augmentation. As such, the AER generally considers that an additional definition is needed which refers to augmentations other than an extension

- Shared Network Augmentation (in some jurisdictions this was historically referred to as deep connection) - Augmentation of a transmission or distribution system to increase its capacity to transmit or distribute electricity. This is all augmentations other than extensions to the transmission or distribution system.
- Shared Network Augmentation Assets - assets installed to perform the shared network augmentation.

⁵⁰ National Electricity Law, definitions.

⁵¹ National Electricity Rules, glossary.

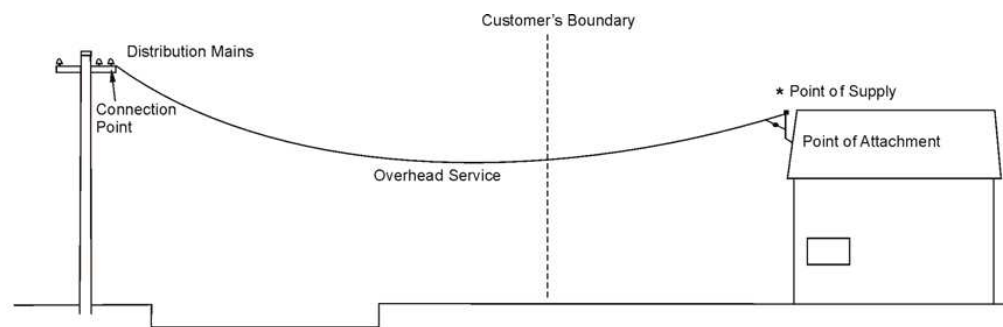
- Connection Point - the agreed point of supply established between Network Service Provider(s) and another Registered Participant, Non-Registered Customer or franchise customer.⁵² The AER considers that this would generally refer to the point at which the service connects to the distribution system. Refer to Figures 1.1 and 1.2.
- Point of Supply - means the junction of an electricity distributor's conductors with consumer's mains. Refer to Figures 1.1 and 1.2.
- Point of Attachment - means the point or points, at which aerial conductors of an overhead service or aerial consumer's mains are terminated on a customer's building, pole or structure. Refer to Figure 1.1 and 1.2.
- Consumers Mains - consumers' mains are the conductors between the point of supply and the main switchboard and form part of an electrical installation. Consumers' mains may be overhead, underground or within a structure. Refer Figures 1.1 and 1.2.
- Dedicated Connection Asset - premises connection assets used solely by one customer. This would generally comprise the direct connection assets and extension assets.

The AER requests feedback on the completeness, consistency and adequacy of the proposed definitions.

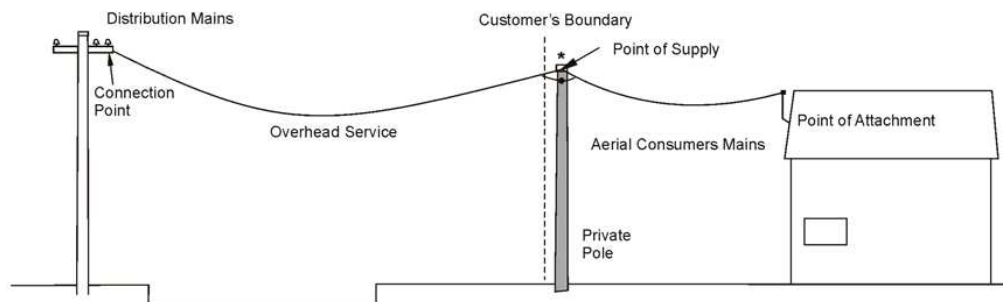
The AER seeks comment on whether stakeholders require clarification of any additional terms.

⁵² NER, glossary

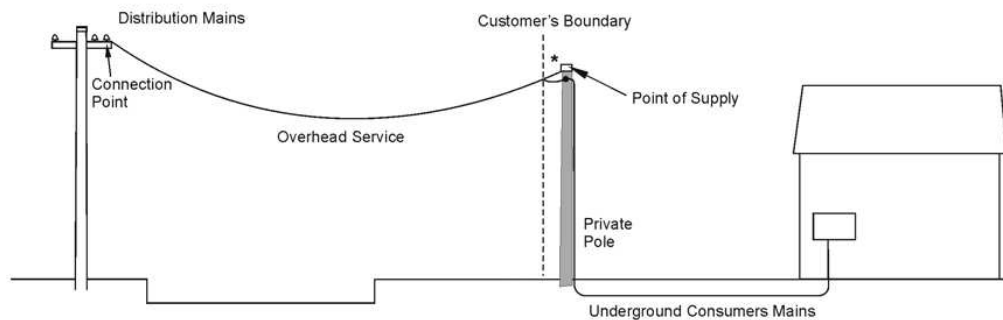
Figure 1.1 Definitions - Supply from Overhead Distribution Mains



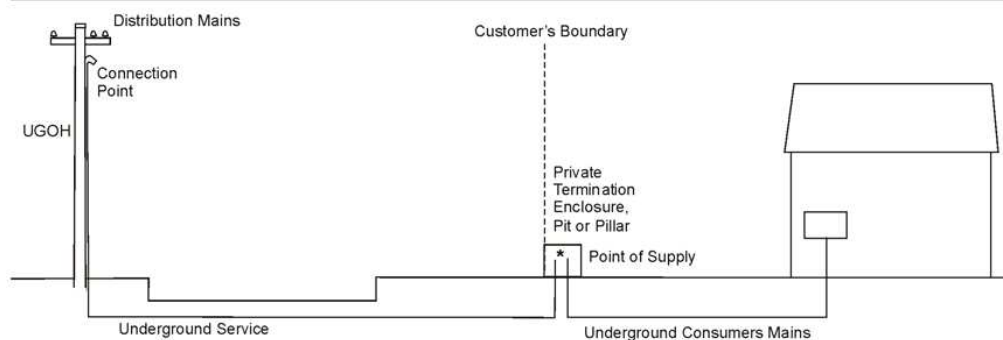
(a) Overhead Service



(b) Overhead Service and Aerial Consumers Mains



(c) Overhead Service and Underground Consumers Mains



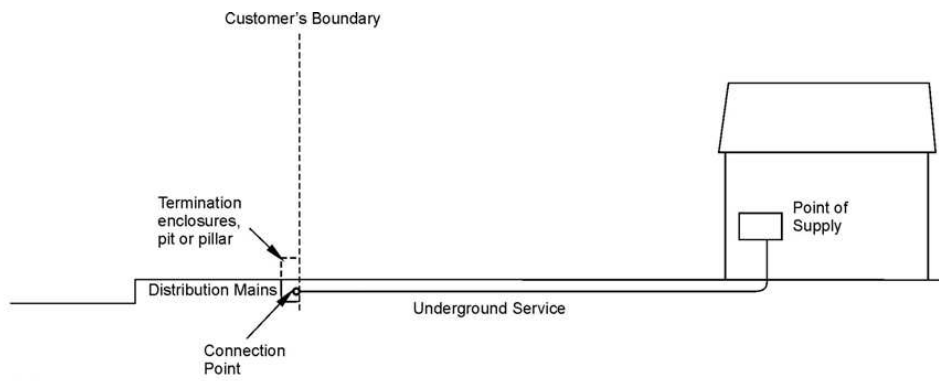
(d) Underground Service and Consumers Mains from Overhead Mains on Electricity Distributor's Pole

* A connection must be able to be made at the Point of Supply

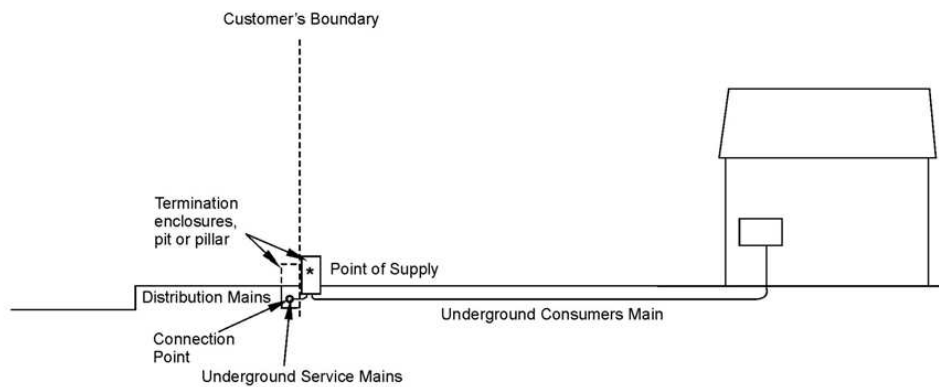
NOTE: Terminal enclosure, pit or pillar is required if service exceeds 50 metres. Refer to clause 2.7.3 in Section 2.

Sourced: *Service and Installation Rules of New South Wales*, Amendment 3: January 2010, available from www.industry.nsw.gov.au/energy/electricity/network-connections/rules

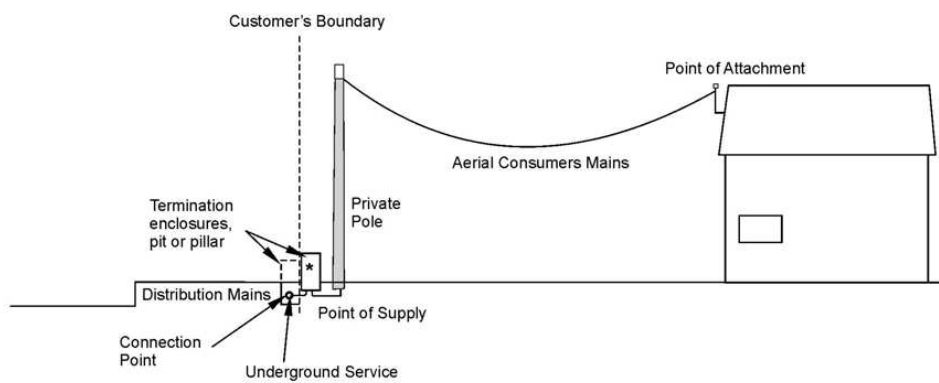
Figure 1.2 Definitions - Supply from Underground Distribution Mains



(a) Underground Service



(b) Underground Service and Underground Consumers Mains



(c) Underground Service and Aerial Consumers Mains

* A connection must be able to be made at the Point of Supply

Sourced: *Service and Installation Rules of New South Wales, Amendment 3: January 2010*