Draft Decision

BENCHMARK UPSTREAM AUGMENTATION CHARGE RATES FOR CITIPOWER'S NETWORK

19 FEBRUARY 2010

AUSTRALIAN ENERGY REGULATOR

Request for submissions

Interested parties are invited to make written submissions to the Australian Energy Regulator (AER) regarding this draft decision by the close of business on **12 March 2010**. In particular the AER is seeking submissions on the proposed benchmark fair and reasonable customer contribution rates for upstream asset augmentation of CitiPower's network as set out in section 7 of this paper.

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

Alternatively, submissions can be sent to:

Mr Chris Pattas
General Manager
Network Regulation South
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 also available on the AER's website.

Enquiries about this paper, or about lodging submissions, should be directed to the Network Regulation South branch of the AER on (03) 9290 1446.

Contents

Shortened forms

AER	Australian Energy Regulator
current regulatory control period	1 January 2006 to 31 December 2010
DNSP	distribution network service provider
EDPR	Electricity Determination Price Review
ESCV	Essential Services Commission of Victoria
Guideline No. 14	Essential Services Commission of Victoria, *Electricity Industry Guideline No. 14 – Provision of Services by Electricity Distributors*,
MCR	marginal cost of reinforcement
MVA	mega Volts-Ampere, a measure of network demand and capacity
NER	National Electricity Rules
next regulatory control period	1 January 2011 to 31 December 2015
NPV	net present value

Summary

All Victorian electricity distribution businesses are required to make an offer to connect new customers to the distribution network. The distribution licence conditions require that such offers, which may include an up-front charge for connection, must include a price and other terms and conditions that are fair and reasonable, and consistent with *Electricity Industry Guideline No. 14 - Provision of Services by Electricity Distributors* (Guideline No. 14).

As part of the transition to national regulation of energy markets, the Australian Energy Regulator (AER) is now responsible for exercising certain powers and functions previously undertaken by the Essential Services Commission of Victoria (ESCV). The new responsibilities are conferred on the AER by the operation of the *National Electricity (Victoria) Act 2005* (NEVA) in accordance with the *Trade Practices Act 1974* and the Australian Energy Market Agreement. The NEVA specifically confers economic regulatory functions, powers and duties on the AER. This includes the ESCV's powers to decide whether the charges by electricity distribution businesses for new customers seeking connection to their networks are "fair and reasonable" under Guideline No. 14.

Guideline No. 14 states that a distributor must calculate the maximum amount of a customer's capital contribution for new works and augmentation, as follows:

Customer Contribution = [Incremental Cost – Incremental Revenue] + Security Fee

Several new customers connecting to or seeking an upgrade to CitiPower's distribution network raised concerns with the ESCV in 2008 about the customer contributions determined by CitiPower pursuant to its distribution licence and Electricity Guideline No. 14. The key element of the complaints related to CitiPower including the cost of future augmentation of CitiPower's shared network assets upstream of the customer connection points (commonly referred to as deep connection charge) as part of the overall project cost, regardless of whether such augmentation takes place immediately or some time in the future.

CitiPower calculates upstream augmentation on a per MVA capacity basis in determining the augmentation component of the incremental cost of connecting a customer to its distribution network. According to CitiPower, the charge rates are based on its long-term average historical unit cost of upstream network augmentation as a proxy for the unit cost of augmentation.

The key stages of this process that preceded the release of this Draft Decision were:

- **ESCV's draft decision:** The ESCV undertook a formal review of the fairness and reasonableness of CitiPower's charges for recovering the cost of augmenting shared assets upstream of the point of connection. It released a draft decision—*CitiPower's Contribution Charge for Marginal Cost of Network Reinforcement*—on 17 December 2008.[1]

[1] Prior to 1 January 2009, the ESCV had the power under the distribution licence conditions to make decisions on whether such charges are fair and reasonable.

- **AER's final decision and further consultation**: After reviewing the submissions to the ESCV's draft decision, the AER released the *Formal decision on CitiPower's current approach to charge new customers capital contributions for upstream network augmentation and further consultation on what should be the fair and reasonable charging rates* (July 2009 decision paper) on 17 July 2009.

  The key finding from the AER's July 2009 decision paper was to confirm the ESCV's finding that CitiPower's approach to calculating the deep connection charge component of the incremental cost based on the full marginal rates of upstream network augmentation cost (referred to by CitiPower as Marginal Cost of Network Reinforcement, or MCR) was inconsistent with Guideline No. 14 as these rates did not take appropriate account of the timing of future augmentations.

  The AER's calculation suggested that the fair and reasonable cost allocation to new customers for augmenting the shared network should be around one-third (33.61 per cent) of CitiPower's rate, at:

  - Zone Substation Bus $86,591
  - HV Feeder $91,958
  - Distribution Substation $139,694
  - LV Street Circuit $227,204

  As the AER received insufficient information through the original consultation process to permit it to make a decision on what could be considered a fair and reasonable amount to charge new customers for future upstream augmentation, it considered that further consultation was required before such amounts could be determined.

- **Submissions to AER's further consultation:**

  The Victorian Department of Industry, Innovation and Regional Development (DIIRD) and Lend Lease Development recommended increased transparency in the cost model associated with installing new electricity infrastructure and improvement to new customer connection charge methodology.

  CitiPower did not provide specific comments on the AER's calculation methodology. However, it contended that:

  1. For each unit of new customer demand, CitiPower needs to install 2.755 units of new capacity in order to maintain a level of network utilisation of 49 per cent of the "N-1 capacity"[2] after augmentation. By applying the 2.755 multiplication factor to AER's proposed adjustment factor of 0.3361 per unit, CitiPower contended that the "fair and reasonable" deep connection charge rates should be 93 per cent of the full MCR rates.

  2. In addition, the AER does not have the power to unilaterally prescribe fair and reasonable charges for CitiPower to include in its connection offers. Rather,

[2] N-1 planning standard means that no supply interruption would result if one major component of the network is unavailable.

the AER is confined to assessing whether any proposed charges are fair and reasonable, and in compliance with Guideline No. 14.

AER's analysis

The AER's analysis of the submissions received in response to its July 2009 decision found that:

- CitiPower's proposed approach does not adequately account for the connection life of new customers as specified in Guideline No. 14 when calculating the upstream augmentation component of incremental cost

- the AER's original proposed calculation method in the July 2009 decision is subject to a number of assumptions, including forecasts on future network capacity usage and growth, as well as future network augmentation criteria. There is uncertainty in these assumptions and the AER considers that a methodology which removes the sensitivity to these assumptions is more appropriate.

The AER acknowledges CitiPower's argument that Guideline No. 14 does not enable the AER to prescribe specific prices or terms and conditions for connection offers. The AER also accepts that its powers are limited to determining whether the terms and conditions in CitiPower's offers are fair and reasonable, and compliant with Guideline No. 14. However, as CitiPower applied its MCR rates uniformly to new customers, the AER considers it appropriate to inform the relevant stakeholders, including prospective new customers, of the benchmark charge rates that could be considered as fair and reasonable.

The AER has now developed a modified methodology to use as a benchmark to assess whether CitiPower's allocation of upstream augmentation costs to new customers is fair and reasonable. This methodology has regard to the prescribed connection lives of domestic[3] and all other customers—30 and 15 years respectively—under Guideline No. 14, and results in the calculation of incremental costs being:

- 84.4 per cent of the MCR, for domestic customers; and

- 60.6 per cent of the MCR, for all other customers.

Based on CitiPower's 2008 MCR rates, and applying the AER's calculation methodology, the AER assesses benchmark fair and reasonable cost allocation to new customers for upstream network augmentation to be:

Domestic customers

▪ Zone Substation Bus	$ 217,443	per MVA capacity usage
▪ HV Feeder	$ 230,921	per MVA capacity usage
▪ Distribution Substation	$ 350,793	per MVA capacity usage
▪ LV Street Circuit	$ 570,546	per MVA capacity usage

[3] The term used by Guideline No. 14 to describe residential customers.

All other customers

- Zone Substation Bus $ 156,126 per MVA capacity usage
- HV Feeder $ 165,803 per MVA capacity usage
- Distribution Substation $ 251,873 per MVA capacity usage
- LV Street Circuit $ 409,657 per MVA capacity usage

Following this consultation process the AER will release a final decision on the benchmark fair and reasonable upstream augmentation charge rates for CitiPower's network.

1 Introduction

All Victorian electricity distribution businesses are required to make an offer to connect new customers to the distribution network. The distribution licence conditions require that such offers, which may include an up-front charge for connection, must include a price and other terms and conditions that are fair and reasonable, and consistent with *Electricity Industry Guideline No. 14 - Provision of Services by Electricity Distributors* (Guideline No. 14).

Guideline No. 14 specifies that a customer is not to contribute towards the capital cost of new works and augmentation unless the incremental cost in relation to the connection offer is greater than the incremental revenue. Additionally, the amount of any such customer capital contribution is not to be greater than the amount of the excess of the incremental cost in relation to the connection offer over the incremental revenue.

A network provider may charge, as part of a new connection offer, for new works (shallow connection) and augmentation (deep connection). Typically, shallow connection is the direct cost of extending a distribution network to a customer's connection point. The costs are customer specific and significantly vary depending on factors such as a customer's location.

Deep connection charges are levied to address augmentation to the shared network required due to a new customer connecting to the distribution network. CitiPower's deep connection charges are calculated on a network wide historical cost per MegaVolt-Ampere (MVA) and therefore the rate is consistent for all customers connecting to the CitiPower network.

Customer contribution charges, where incremental costs include both the shallow and deep connection costs, are determined as follows:

Customer Contribution = [Incremental Cost – Incremental Revenue] + Security Fee

Following customers' complaints regarding CitiPower charging deep connection charges for new connections, the ESCV undertook a review and published a draft decision on 17 December 2008—concluding that CitiPower's approach to calculating customer connection charges for upstream augmentation ('deep connection' charges) was not consistent with Guideline No. 14. The ESCV also sought submissions on what should be the fair and reasonable rates.

After reviewing the submissions to the ESCV's draft decision, the AER released its *Formal decision on CitiPower's current approach to charge new customers capital contributions for upstream network augmentation and further consultation on what should be the fair and reasonable charging rates* (July 2009 decision) confirming the ESCV's draft decision that CitiPower's approach for charging new customers the full marginal rates of upstream network augmentation cost (referred to by CitiPower as Marginal Cost of Network Reinforcement, or MCR) was inconsistent with Guideline No. 14 as the rates do not take appropriate account of the timing of future augmentations.

This paper outlines the submissions received by the AER and the AER's assessment of the submissions, as well as a revised model, which the AER intends to use in determining the benchmark fair and reasonable charge rates for upstream augmentation of CitiPower's network.

As shallow connection costs vary between customers, the AER reviews such costs on an individual basis and are not the subject of this review.

2 Regulatory framework

2.1.1 Regulatory requirements

Pursuant to 2.2 (h) of the Victorian *Electricity Supply Industry Tariff Order 2005*, the terms and charges for a Distributor's Excluded Services—including connection of new customers—will be set in accordance with the provisions of the distributor's distribution licences issued under Division 3 of Part 2 of the *Electricity Industry Act 2000* and any applicable guidelines published by the ESCV, and subject to oversight under the *Essential Services Commission Act 2001*.

In addition, CitiPower's electricity distribution licence requires that the terms in an offer made by CitiPower for connection services must be fair and reasonable (clause 11.3). Any question of the fairness and reasonableness of a term is to be determined by the AER (clause 11.4 of CitiPower's licence).

CitiPower must also comply with Guideline No. 14 (according to clause 22.1 of the licence). Guideline No. 14 provides for components of connection offers and, like CitiPower's licence, provides that questions of fairness and reasonableness must be determined by the AER (clause 7 of Guideline No. 14).

As outlined in Section 5, the AER does not have a general power to determine the methodology used by CitiPower or to set the dollar amount of the customer contribution charged by CitiPower. However, in the event a question as to the fairness or reasonableness of a cost, term or condition is brought to the AER for a decision under clause 7 of Guideline No. 14 or clause 11.3 of CitiPower's licence, the AER will have to make a decision. The methodology outlined in this paper provides a benchmark for determining whether a DNSP's customer contribution charge is, in the AER's view, fair and reasonable.

2.1.2 Application of decision

This draft decision sets out what the AER considers to be a fair and reasonable benchmark rates for assessing the deep connection component of the incremental cost. While the AER is not bound to apply these rates in future, the AER intends to use these rates as a benchmark in assessing the fairness and reasonableness of customer contributions relating to deep connection charges currently under review, and in assessing any future disputes.

3 AER July 2009 decision

In its July 2009 decision, the AER noted that CitiPower's distribution licence requires it to make offers to connect new customers to its distribution network. The connection offers must:

- include a price, and other terms and conditions, which are fair and reasonable
- be consistent with the ESCV's Electricity Distribution Price Review (EDPR) or any other applicable price determination made by the ESCV, and any applicable approved statement.

The AER undertook an analysis of the fair and reasonable charge rates that should apply to CitiPower customers for funding future upstream augmentation. This analysis found that:[4]

- 62 per cent of CitiPower's zone substations and 78 per cent of its high voltage feeders were operating at less than 100 per cent capacity.
- On average, CitiPower's network components will need to be augmented in 16.7 years based on the forecast demand growth rate of new and existing customers.
- In the absence of new customers, CitiPower's network components would not need to be augmented, on average, for 63.5 years based on the estimated average consumption growth rate of existing customers.

The analysis also found that not all new customers' energy demand required immediate upstream network augmentation.

Guideline No. 14 specifies that the incremental cost should reflect the difference between (1) the present value of the augmentation costs the distributor will incur as a result of the customer being connected; and (2) the present value of the costs the distributor would have otherwise incurred in undertaking the augmentation at a later date due to increase in demand by existing customers, assuming no new customers were connected.

The AER concluded that CitiPower's methodology for determining the brought forward costs of augmentation for new customers seeking to connect to its network was not fair, reasonable nor consistent with Guideline No. 14. Specifically, it considered that CitiPower's methodology did not reflect the incremental capital costs that would otherwise have been incurred at a later date had the customer not connected to the network.

In relation to CitiPower's existing connection charge rates, the AER concluded that CitiPower did not comply with Guideline No. 14 on the basis they did not take into account the timing of future augmentations.[5]

---

4 AER, *Formal decision on CitiPower's current approach to charge new customers capital contributions for upstream network augmentation and further consultation on what should be the fair and reasonable charging rates, July 2009*, pp. 23–30.

5 AER, July 2009 decision, p. 20.

The AER was also of the view that:[6]

- the cost of CitiPower's existing network was being recovered by CitiPower through its network charges to existing and future customers
- CitiPower's approach was to recover costs from not just those new customers who cause an augmentation to be brought forward immediately, but all new customers connecting to the network, including those whose marginal impact did not cause an augmentation to be brought forward in the near future, which was inconsistent with Guideline No. 14.

The AER proposed a model to determine the adjustment factor to CitiPower's MCR rates for charging deep connection cost. It calculated that:

> the fair and reasonable rates for recovering the cost impact due to new customers' on additional augmentation requirements on the shared upstream network of CitiPower's network to be at 33.61 per cent of CitiPower's full MCR rates.

The AER sought input from stakeholders on the manner in which CitiPower's current approach could be modified to be consistent with Guideline No. 14 as well as any alternative approaches which may satisfactorily address this issue.

A copy of the July 2009 decision is available on the AER's website at www.aer.gov.au.

6 AER, July 2009 decision, p. 20.

4 Submissions to the July 2009 decision

The AER received submissions regarding the July 2009 decision from:

- Lend Lease Development
- the Victorian Department of Industry, Innovation and Regional Development (DIIRD)
- CitiPower.

The submissions are available on the AER's website. Below is a summary of these submissions.

Lend Lease Development stated that:[7]

- Over the past seven years of development, it found considerable increases in customer contributions for buildings of similar type and electrical demand. In a number of cases, these contributions have trebled between 2006 and 2008 on a like for like basis.
- It considered that increased transparency in the cost model associated with installing new electricity infrastructure would deliver benefits to all stakeholders. It recommended that a schedule of electrical infrastructure charges, based on a total precinct servicing cost model, should be established as part of an overall approach to major urban development.

DIIRD stated that:[8]

- Guideline No. 14 had not been interpreted consistently by the five Victorian DNSPs, and that it was unclear whether any of the DNSPs had correctly interpreted Guideline No. 14 when providing estimates for connection services to customers.
- Customers have found it difficult to understand the costs associated with upstream network augmentation and in particular, the method for calculating capital contribution charges.
- The calculations contained in the AER's July 2009 decision did not take into account a diversity factor for individual connections.

DIIRD considered that it would be appropriate if there was greater transparency in negotiating connection offers, to enable customers to better understand the various costs that make up a connection or upgrade estimate. It also considered that using an averaging approach for calculating incremental costs of augmentation at the lower levels of the distribution network would be appropriate.[9]

---

7 Lend Lease Development, *AER Formal decision on CitiPower's current approach to charge new customers capital contribution for upstream network augmentation and Consultation on fair and reasonable charging rates*, 13 August 2009.

8 DIIRD, *Submission to AER Formal decision on CitiPower's current approach to charge new customers capital contribution for upstream network augmentation*, August 2009, pp. 1–2.

9 DIIRD, *Submission to AER Formal decision*, August 2009, p. 2.

The AER considers that Lend Lease Development's and DIIR's suggestions have merit. It will be consider this matter in developing the national "connection charge guidelines" under the proposed new chapter 5A of the NER by the Ministerial Council on Energy.[10]

CitiPower considered that the methodology and the resultant deep connection charge rates in the AER's July 2009 decision were not fair, reasonable nor consistent with Guideline No. 14. It stated that the AER's methodology:

- used out of date values rather than the current MCR rates
- calculated new customers' deep connection charge rates that:
  - represented the cost of bringing forward only the portion of augmentation capacity to be utilised by the new customer
  - did not present the cost of bringing forward the *entire* augmentation (which would also include the capacity to service existing customer's demand growth and to maintain average utilisation levels).

CitiPower argued that, on average, the augmentation of a network component would result in the utilisation of that component being 49 per cent immediately after the augmentation. This was based on the assumption of (1) constant average growth over time; (2) the current average N-1 network utilisation level of 82 per cent, as estimated by the AER; and (3) the trigger level for augmentation of 115 per cent, also estimated by the AER,

The above assumptions are equivalent to a network development model based on a 33.4 year augmentation cycle,[11] CitiPower's network N-1 utilisation is expected to increase from 49 per cent just after each augmentation to 115 per cent when the next augmentation is due. It estimated that, on average, for each 0.49 unit of new customer demand, its network would need to install 1.35 units (2.755 times) of additional capacity at the next augmentation trigger point. By applying the 2.755 multiplication factor to AER's proposed NPV adjustment factor of 0.3361 per unit[12], CitiPower contended that the fair and reasonable deep connection charge rates should be those shown in Table 4.1, which are 93 per cent of the full MCR rates.

Table 4.1: CitiPower's proposed deep connection charge rates for 2009 ($ per MVA)

▪ Zone substation	$ 245,792	per MVA capacity
▪ HV feeder	$ 261,027	per MVA capacity
▪ Distribution substation	$ 396,526	per MVA capacity
▪ LV street circuit	$ 644,928	per MVA capacity

In addition, CitiPower considered that:

---

10 Ministerial Council on Energy *National Energy Customer Framework - Second Exposure Draft*: *NECF Package - Draft Electricity and Gas Connection Rules*, November 2009 (www.ret.gov.au/Documents/mce/_documents/NECF%20Package%20-%20Draft%20Connection%20Rules.pdf)

11 Page 12 of CitiPower's submission.

12 Based on the expected average augmentation timing established by the AER.

- the AER's July 2009 decision did not preclude CitiPower from making a connection offer which included deep connection charges calculated using a different methodology
- there was a range of methodologies and deep connection charge rates that could be deemed fair and reasonable under Guideline No. 14 and that there was no single 'correct or appropriate approach' or set of deep connection charges
- the AER does not have the power to unilaterally prescribe fair and reasonable charges for CitiPower to include in its connection offers. Rather, the AER is confined to assessing whether any proposed charges are fair and reasonable, and in compliance with Guideline No. 14.

5 AER's analysis

The following section sets out the AER's considerations of submission received to its July 2009 decision.

5.1 AER's role in relation to deep connection charge rates

5.1.1 Submissions

CitiPower stated that the AER only has the power to make a decision on connection charges with respect to a specific individual offer. It also stated that the AER's decision regarding CitiPower's methodology and the resultant charges for network augmentations did not preclude CitiPower from using an alternative approach to that proposed by the AER.

CitiPower considered that the AER is confined to assessing whether its charges are:

- fair and reasonable
- compliant with Guideline No. 14.

CitiPower also considered that, provided its customer contribution charges satisfy those requirements, the AER is not permitted to reject the charges that a DNSP imposes on customers seeking to connect to a distribution network.

5.1.2 AER's considerations

The AER recognises that neither Guideline No. 14, CitiPower's distribution licence nor any relevant legislation provide the AER with the ability to prescribe connection prices or other terms and conditions. However, the AER notes that clause 11.4 of CitiPower's distribution licence provides that any question as to the fairness and reasonableness of a term or condition is to be decided by the AER on the basis of the AER's opinion of the fairness and reasonableness of the term or condition.

The AER notes that:

- it is not able to prescribe a specific price, or other terms and conditions, that a DNSP must use when determining the charges that the DNSP seeks to impose on customers seeking to connect to its distribution network

- its regulatory role under Guideline No. 14 in this case is limited to determining whether the terms and conditions in CitiPower's offer to connect customers to its distribution network are fair and reasonable, and consistent with Guideline No. 14

- where there is a range of charging methodologies and resultant charges for upstream network augmentation that are also fair and reasonable, and consistent with Guideline No. 14, it cannot reject a DNSP's charges on the basis that the AER prefers different charges.

However, as CitiPower applies its MCR rates uniformly to new customers, the AER will use this process to inform relevant stakeholders, including prospective new

customers, what it considers as benchmark fair and reasonable charges which are consistent with Guideline No. 14.

5.2 Diversity factor

5.2.1 Submissions

DIIRD supported the outcome of the AER's July 2009 decision. However, it questioned the calculations for capital contributions, in particular whether a diversity factor for individual connections had been taken into account when determining a charge rate.[13]

5.2.2 AER's considerations

In response, the AER requested further information from CitiPower on whether its MCR rates took into account the diversity factors upstream from the customer's connection point.

On 25 September 2009 CitiPower advised that it applied the following diversity factor to its MCR rates:[14]

- at sub-transmission level a diversity factor of 90 per cent is allowed
- at zone substation level a diversity factor of 70 per cent is allowed
- at high voltage level a diversity factor of 80 per cent is allowed
- at distribution substation level a diversity factor of 90 per cent is allowed
- no diversity is allowed at low voltage street mains network level.

By way of example, the AER notes this means a new customer connection to the low voltage street mains will pay 0.9x0.8x.0.7x0.9 (or 45 per cent) the unit rate of the sub-transmission marginal augmentation cost.

The AER considers that the diversification factors applied by CitiPower do not appear inconsistent with industry practice. Hence, the AER is satisfied that CitiPower has taken into account the reasonable diversity factor for upstream network usage when determining the MCR rates.

5.3 CitiPower's 2009 MCR rates

CitiPower advised that its new rates in 2009 are higher than those presented in the AER's July 2009 decision.

The AER acknowledges this change. However, and as discussed above, the AER does not have the power to prescribe fair and reasonable charge rates for capital contribution for future upstream augmentation. Accordingly, the AER has not assessed whether the increase from the 2008 MCR rates to the 2009 rates is reasonable. Instead, the AER will be publishing what it considers to be a benchmark for the fair and reasonable allocation of the incremental costs associated with future

---

13 DIIRD, *Submission to AER Formal decision*, August 2009, pp. 1–2.

14 CitiPower letter, *Formal decision on CitiPower's current approach for charging upstream network augmentation*, 25 September 2009, pp. 4–5.

upstream network augmentation. This benchmark calculation is based on CitiPower's 2008 MCR.

5.4 CitiPower's contention that new customers will trigger 2.755 times their consumption capacity at the next upstream augmentation

5.4.1 AER's concerns

The AER identified several areas of concern in CitiPower's submission:

- CitiPower proposed that, at the next augmentation trigger point, it will install new network capacity that would bring the N-1, or equivalent, utilisation factor to 49 per cent on average. The AER considers that this network investment approach would represent a very high level of spare capacity lasting for about 33 years, based on the current demand growth rate. The AER questions whether this low level of network utilisation is an efficient investment strategy and would deliver a net benefit to CitiPower's customers.
- CitiPower's argument would result in almost 100 per cent upfront deep connection charge (93 per cent) of current marginal costs being levied up-front even though the next augmentation is expected to be 16.7 years away on average. This result does not appear logical, considering the depreciation factor over the time period.

The AER requested further clarification from CitiPower regarding these concerns. On 25 September 2009, in response CitiPower advised that:

- The post augmentation N-1 utilisation level of zone substation and sub-transmission lines, derived by symmetry, are 67 and 69 per cent respectively.[15]
- The post augmentation utilisation of HV feeders, also derived by symmetry, is 31 per cent.
- In addition, CitiPower has reviewed the growth in demand, which is driving the network augmentation, and found the trend line growth in total demand over the period 2004 to 2008 to be 2.94 per cent. Using the trend line growth in customer numbers over the same period of 2.01 per cent as a surrogate for new customer demand growth means that the growth in demand attributable to existing customers is assessed as 0.93 per cent. This growth rate is higher than the AER's model in its July 2009 decision.
- The expected time for next augmentation due to new and existing customers would be 9.5 and 14.3 years for zone substations and HV feeders respectively.

---

[15] CitiPower advised that the post augmentation utilisation level is derived based on a simplifying assumption that allows the derivation of the post augmentation utilisation from the average and top quartile (augmentation imminent) utilisation rates. That is the post augmentation utilisation is calculated as the average utilisation level minus the difference between the average and the top quartile utilisation levels. For example:
  - if top quartile utilisation is 123% + 28% variance from average, and
  - the average utilisation is 95%; then
  - the post augmentation utilisation = 95-28, or 67%.

- Based on this higher growth rate and CitiPower's post augmentation utilisation level, the multiplication factor for each unit of new customers' capacity would be 2.21 and 4.75 for zone substations and HV feeders respectively. This would represent an upfront deep connection charge rate of 87 per cent for zone substation marginal cost rate and 166 per cent for HV feeder marginal cost rate.

CitiPower's response to the AER's request for further information is available on the AER's website.

5.4.2 AER's considerations

Given that CitiPower is required by the *Electricity Distribution Code* to invest in a way that would minimises costs to customers, taking into account distribution losses, the AER is not convinced that, especially for HV feeders, an average of 31 per cent post augmentation utilisation is purely driven by new customer demand growth. As indicated in CitiPower's *2009 Distribution System Planning Report*,[16] the key tool for CitiPower to mitigate the impact of zone substations and sub-transmission network equipment failures is to transfer customer load between zone substations and sub-transmission lines through its high voltage network. It appears to the AER that some HV feeders are purposely designed to operate at a low utilisation level in order to provide the spare capacity required to transfer load between zone substations.

In addition, CitiPower's contention is based on a 33.4 year network augmentation cycle. Therefore, on average, augmentation due to a new customer's additional capacity demand is not required within 16.7 years of connection. Based on CitiPower's modelling, one could argue that new business customers should not be required to pay for any upstream augmentation, as they are deemed to have a connection life of 15 years under Guideline No. 14. However, the AER considers that this approach would not achieve an equitable share of costs between business and domestic customers, as business customers also utilise upstream assets.

CitiPower's argument raises the issue that the AER's calculation method proposed in the July 2009 decision is subject to a number of assumptions, including various forecasts on future network capacity usage and growth, as well as future network augmentation criteria. In recognition of uncertainties regarding the accuracy of these forecasts, the AER considers that a more direct and equitable method should be established for calculating the benchmark fair and reasonable rates for upstream augmentation for all new customers.

[16] Available from http://210.247.188.33/docs/pdf/Electricity%20Networks/CitiPower%20Network/CP%202009%20DSPR.pdf

6 The AER's modified approach

Setting a reference price for new customers to pay for future upstream augmentation involves a fair and reasonable cost allocation between new and existing customers to fund future costs. CitiPower should be cost neutral in this regard irrespective of which group of customers fund the augmentation—given it is provided with a regulated return based on its weighted average cost of capital (WACC) on actual investment.

Guideline No. 14 prescribes a limited connection life for all new customers. This assumption will have the effect that, after network augmentation, the same upstream (shared) asset will be used again by subsequent connecting customers. CitiPower currently calculates new customers' incremental revenue based on the prescribed connection life, however, it calculates the incremental cost as though new customers were connected indefinitely.

The AER does not consider it equitable that augmentations are paid for in full by the first customer because CitiPower can charge subsequent new connecting customers for the same asset once the first customer disconnects from the network. CitiPower's current methodology leads to an over recovery of costs from subsequent customers. The AER considers that the full cost of augmentation should be shared among connecting customers, such that each customer pays for only the portion of augmentation attributable to their assumed connection life.

6.1 NPV of future upstream augmentation cost

The AER's understanding of industry practice is that augmentation to the distribution network is undertaken in discrete steps of varying capacity depending on current and forecast utilisation. Augmentations typically add spare capacity to the network which reduces the required frequency of augmentation. Where augmentation occurs in large capacity steps, an additional customer's demand will result in bringing forward the next augmentation and all subsequent augmentations.

If augmentations were to occur in very small steps, just sufficient to meet the additional demand of each new customer connecting to the network, the cost of each augmentation will reduce but the number, or frequency, of augmentations required will increase.

The AER has modelled the effect of a new customer connecting to the network assuming augmentations occur in both large steps—where the customer brings forward all subsequent augmentations— and where augmentations occurs continuously each time a new customer connects. The AER found 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,[17] the brought forward cost of augmentation would be approximately the same as the cost of undertaking the augmentation immediately.[18]

As such CitiPower is able to recover the full MCR[19] from its customers which is largely in line with CitiPower's current practices. However, the AER considers that CitiPower is not applying Guideline No. 14 correctly in relation to the prescribed connection life of customers.

Under Guideline No. 14, new domestic and business customers are assumed to have 30 and 15 years of connection life respectively. However, CitiPower calculates new customers' incremental revenue based on the prescribed connection life but it calculates the incremental cost as though new customers were connected indefinitely.

As upstream assets can be used by any customer, the same asset could be used by future new customers once the earlier customers stop using such assets at the end of their assumed connection life. It would not be equitable for the first new customer to fund the full cost of upstream augmentation as CitiPower will charge future users for the same asset. The AER considers that the full cost of augmentation should be shared among connecting customers, such that each customer pays for only the portion of augmentation attributable to their assumed connection life.

6.2 Guideline No. 14

The AER's role in relation to connection charges in Victoria is governed by the ESCV's Guideline No. 14. It states that a distributor must calculate the maximum amount of a customer's capital contribution for new works and augmentation in determining the price to include in its connection offer, as follows:

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

---

[17] The AER's calculation was based on Guideline No.14's definition that the incremental cost with respect to deep connection should be calculated as:

the difference between "the present value of the augmentation costs the distributor will incur as a result of the customer being connected"; and "the present value of the costs the distributor would otherwise incur in undertaking the augmentation at a later date due to the increase in demand from existing customers".

On this basis, the AER included the values of all future brought forward augmentations in the NPV calculation.

[18] In undertaking this model, the AER did not take full consideration of the effect of various economies of scale for different approaches of augmentation.

[19] CitiPower's MCR is based on the historical average cost. The AER considers that the use of the historical average cost is a reasonable proxy for the marginal cost of performing the augmentation. However, the AER notes that as CitiPower may benefit from economies of scale the MCR as calculated by CitiPower may actually be higher than the marginal cost of performing the augmentation.

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.

The incremental cost (IC) of upstream augmentation of the distribution network must reflect the difference between:

- the present value of the augmentation costs the distributor will incur as a result of the customer being connected; and
- the present value of the costs the distributor would otherwise incur in undertaking the augmentation at a later date due to the increase in demand from existing customers.

Guideline No. 14 also stipulates that when calculating the customer contribution charge, the life of a customer is assumed to be 30 years for domestic customers and 15 years for all other customers.

6.3 Calculation methodology

The AER considers that a fair and reasonable calculation of the incremental cost is one where all new customers share the full cost of adding a unit of capacity equally.

Not all new customers' connection to the network triggers upstream augmentation. Some new customers use network capacity that has already been paid in part by previous customers. However, the AER considers that each customer should pay for its capacity over the period for which they are connected regardless of the timing of previous or future augmentations.

Guideline No. 14 assumes that a domestic customer's connection life is 30 years. This assumption implies that a domestic customer will physically disconnect from the network after 30 years and another customer will be able to connect and use the capacity left by this customer.

The AER considers that the Net Present Value of the aggregated amount paid for upstream asset augmentation by all customers should equal the MCR, as discussed in section 6.1 above. Additionally, all customers should pay the same real amount for upstream augmentation.

If the first customer to connect to the network pays X per cent of the MCR to add a unit of upstream capacity, then in real terms the second (and all subsequent customers) should pay the same real amount for the same capacity.

Each year the MCR increases by an amount assumed to equal CPI.[20] Therefore, the second customer to connect to the network, in 30 year time as prescribed by Guideline No. 14, pays X × MCR × ((1+CPI)^30). This can be discounted back to the present value as follows:

X × MCR (1+CPI)^30 ÷ ((1+WACC)^30 × (1+CPI)^30)).

The CPI terms cancel and so the present value of the payment made by the second customer is equal to:

X × MCR ÷ (1+WACC)^30.

This calculation can be performed for all subsequent new customers which results in each customer paying the same amount for augmentation in real terms. The value of X is calculated by setting the sum of the present value of all payments received to 1 – which is the price of one unit of the MCR. A more detailed example of this approach is set out in Appendix A.

This approach can more accurately be represented by the following formula:

$NPV = X \times MCR + X \times MCR / i_n$

Where:

X = a percentage of MCR paid by each customer

i_n = (1+WACC)^n -1

n = number of years between payments - 30 for domestic customers and 15 for all other customers

Setting this equal to 1 and solving for X leads to:

$X \times MCR = i_n \div (i_n + 1)$

Solving this equation shows that the incremental cost calculation for, domestic customers is 84.4 per cent of the MCR and 60.6 per cent of the MCR for all other customers. Derivation of this formula can be found at Appendix B.

The AER believes that this modified approach to calculating the incremental cost aligns the cost/revenue symmetry with respect to new customers' connection life, provides a fair cost allocation between new and existing customers for future network augmentation and provides a fair cost allocation among new customers that avoids the situation of where the last customer pays for the full cost of the next augmentation.

[20] CitiPower's submission to the AER's July 2009 decision outlined that the MCR rates which appeared in the paper were expressed in 2008 dollars and thus were the charges which applied in 2008. The 2009 MCR charges outlined by CitiPower are 2.6 per cent higher than its 2008 MCR charges.

7 Further consultation

The AER seeks feedback on the proposed benchmark fair and reasonable incremental costs which are attributable to a customer for upstream augmentation in CitiPower's network.

The AER consider that the incremental cost should be 84.4 per cent of the MCR for domestic customers and 60.6 per cent of the MCR for all other customers.

Based on the adjustment factors, the AER calculated that the fair and reasonable rates for recovering the cost impact due to new customers' impact on CitiPower's shared upstream network of network, in 2008 dollars, are:

Domestic customers

- Zone Substation Bus $ 217,443 per MVA capacity usage
- HV Feeder $ 230,921 per MVA capacity usage
- Distribution Substation $ 350,793 per MVA capacity usage
- LV Street Circuit $ 570,546 per MVA capacity usage

All other customers

- Zone Substation Bus $ 156,126 per MVA capacity usage
- HV Feeder $ 165,803 per MVA capacity usage
- Distribution Substation $ 251,873 per MVA capacity usage
- LV Street Circuit $ 409,657 per MVA capacity usage

The AER seeks comments on its proposed fair and reasonable charges from stakeholders, particularly from CitiPower by 12 March 2010.

Appendix A: Calculation methodology

Domestic (30 year connection life) example

Year	0	30	60	90	120	150	180	210
MCR (real)	1	1	1	1	1	1	1	1
Payment (X × MCR)	0.844493	0.844493	0.844493	0.844493	0.844493	0.844493	0.844493	0.844493
Present Value of Payments	0.844493	0.131325	0.020422	0.003176	0.000494	7.68E-05	1.19E-05	1.86E-06
Net Present Value	1							

The first customer is assumed to make an upfront payment of X × MCR (following this example through to completion, indicates that the value of X for domestic customers is 84.4 percent).

Each customer is assumed to disconnect after a period of 30 years and is replaced by a new customer, who is charged a customer connection fee by CitiPower. Therefore in 30 years this initial customer disconnects from the network and is replaced by a new customer.

Each year the MCR increases by an amount assumed to be equal to CPI. In order for the payments from each customer to be equal in real terms, the MCR must be inflated by CPI. Therefore the second customer to connect to the network (in 30 years time) should pay X × MCR × ((1+CPI)^30). This would be discounted back to the present value as follows:

X × MCR (1+CPI)^30 ÷ ((1+WACC)^30 × (1+CPI)^30)).

As the CPI terms cancel the MCR is constant in real terms and the present value of the payment made by the second customer is equal to:

X × MCR ÷ (1+WACC)^30.

This calculation can be performed for all subsequent new customers which results in each customer paying the same amount in real terms. The value of the X is then calculated by finding the value that makes the sum of the 'Present Value of Payments' figures equal to one (the full MCR).

The methodology results in each customer paying the same real amount and CitiPower recovering the full MCR over time.

Appendix B: Derivation of formula

The Net Present Value of the contribution made by all customers, for the addition of a unit of capacity, can be written as:

$NPV = X \times MCR + X \times MCR / i_n$

Where:

X = a percentage of MCR paid by each customer

WACC = 0.064

$i_n = (1+WACC)^{\wedge}n -1$

n = number of years between connections. i.e. 15 for business users and 30 for domestic.

This formula represents the discounting of periodic payments received from customers (in perpetuity) back to the present value.

To allow CitiPower to recover the full cost of augmentation the net present value of the contributions received from all customers should be equal to one. Therefore:

$X \times MCR + X \times MCR / i_n = 1$

Solving for X:

$X \times MCR = i_n \div (i_n + 1)$

As a result, domestic customers pay 84.4 per cent of the MCR and all other customers pay 60.6 per cent of the MCR.