Guidance Paper

THE AER'S CONCLUSION ON THE BENCHMARK UPSTREAM AUGMENTATION CHARGE RATES FOR CITIPOWER'S NETWORK

25 June 2010

AUSTRALIAN ENERGY REGULATOR

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
forthcoming 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).

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 contribution amount determined by CitiPower pursuant to its distribution licence and Electricity Guideline No. 14. The key element of the complaints related to CitiPower charging 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.

The AER issued its *Draft Decision – Benchmark Upstream Augmentation Charge Rates for CitiPower's Network – 18 February 2010* and subsequently received two submissions. The AER has considered the submissions provided by Utilicor Pty Ltd and CitiPower Pty and does not consider that the information provided requires the AER to change its position, from its February 2010 draft decision, on the appropriate methodology for determining CitiPower's benchmark fair and reasonable rate for recovering upstream augmentation costs under Guideline No. 14.

The AER considers that CitiPower should be able to recover the full marginal cost of reinforcement (MCR)[1] in aggregate, from the customers who connect to its network. The AER considers that if CitiPower includes for each new connecting customer—about 60 per cent of the MCR for business customers and about 84 per cent of the MCR for domestic customers—in its calculation of incremental costs, this approach will allow CitiPower to recover its full MCR in aggregate from all customers who connect to its network. By using the prescribed connection terms in Guideline No. 14, this methodology properly accounts for a degree of asset reuse by new customers when they use the capacity left by customers who have left the network.

The AER notes that this guidance paper only applies to assessing the up-stream augmentation component of incremental costs and CitiPower can continue to recover the direct connection costs from customers.

The AER will use the methodology presented in this guidance paper, to inform any future assessment of whether a connection offer is fair and reasonable and in accordance with Guideline No. 14. While the AER cannot unilaterally set CitiPower's

[1] CitiPower's MCR is calculated on a network wide historical cost per MegaVolt-Ampere (MVA)

connection charges, the AER considers that appropriate benchmark charge rates for upstream augmentation, 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

1 Introduction

All Victorian distributors 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 AER reviewed CitiPower's connection charge methodology. The key stages of this process that preceded the release of this guidance paper have been:

- **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.[2]

- **AER's formal 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*

[2] 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.

the fair and reasonable charging rates (July 2009 decision paper) on 17 July 2009.

A request for further consultation was issued because 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.

- **AER draft decision:**

  The AER released the *Draft Decision – Benchmark Upstream Augmentation Charge Rates for CitiPower's Network – 18 February 2010*. This draft decision took into account submissions made in response to the AER's formal decision and further consultation.

  The AER's draft 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 developed a modified methodology to use as a benchmark to assess whether CitiPower's allocation of upstream augmentation costs to new customers are fair and reasonable.

- **Submissions on the AER's *Draft Decision – Benchmark Upstream Augmentation Charge Rates for CitiPower's Network – 18 February 2010*:**

  The AER received submissions from Utilicor Pty Ltd and CitiPower Pty.

- **AER Guidance paper**

  The AER has not received information that causes it to alter its position in the draft decision. Therefore the AER issues this guidance paper which specifies a methodology that the AER will use to inform any future assessment of whether CitiPower's deep connection charges are fair and reasonable, and compliant with Guideline 14.

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 as to the fairness and reasonableness of a distributor's assessment in respect of those components is to be determined by the AER (clause 7 of Guideline No. 14).

2.1.2 Application of this guidance paper

As discussed in the draft decision, 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 11.4 of CitiPower's licence, the AER will have to make a decision. The methodology outlined in this guidance paper, will inform the assessment process on for determining whether CitiPower's customer contribution charge is, in the AER's view, fair and reasonable.

3 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

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
- 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 incremental capital costs the distributor will incur as a result of the customer being connected
- the present value of the incremental capital 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 the term over which the connection services offered will be provided is:

- 30 years for domestic customers and, unless the distributor fairly and reasonably determines some other term is more appropriate in any particular case
- 15 years for all other customers.

4 Methodology presented in the AER's Draft decision

4.1 CitiPower's current charging methodology

In calculating a customer's connection charge, CitiPower currently includes the full MCR in the calculation of the incremental costs attributable to upstream augmentation. CitiPower calculates the MCR on a network wide historical asset cost per MegaVolt-Ampere (MVA).

CitiPower, includes either 15 or 30 years of revenue, depending on the connection type, in the calculation of the incremental revenue.

4.2 Equitable allocation between customers and CitiPower

The AER's draft decision found that setting a reference price for new customers to pay for future upstream augmentation involves finding a fair and reasonable cost allocation between new and existing customers to fund future augmentation costs. As the relevant augmentations occur to the shared network, the AER considers that it is a reasonable assumption that capacity left when one customer leaves the network is available to be used by subsequent customers.

Guideline No. 14 prescribes an assumption of a limited connection life in the calculation of the connection charge for all new customers. Currently, CitiPower only applies the limited connection life in the calculation of incremental revenue and not incremental costs. The result of this is that only a fixed period of revenue is used to offset the total life cost of the connection. This could be viewed as being logically equivalent to one of the following assumptions:

- the customer will remain connected to the network indefinitely (whilst only paying Distribution Use of System charges for either 15 or 30 years); or
- there is zero use (by existing or subsequent new customers) of any portion of the spare capacity left in the augmented up-stream network and there is zero salvage value of the augmented assets once the customer leaves the network.

The AER considers that the first assumption would be internally inconsistent and that the second assumption is incorrect, as it is unlikely that there is zero re-use of assets once a customer leaves the network.

Where there is zero possibility for reuse of an asset once a customer leaves the network, then it would be appropriate for the connecting customer to meet the full cost of installing those assets. However, where there is a reasonable likelihood that a distributor can reuse the asset or recover some of the cost of the assets once a customer leaves the network, it would receive a windfall gain if it charges the connecting customer the full cost of these assets.

Additionally, 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.

The AER considers that, by charging each new connecting customer the full MCR without reference to the portion of augmentation costs that are met by past or future customers, CitiPower's current methodology leads to an over recovery of costs from its connecting customers. The AER considers that the full cost of the required augmentation should be shared by all the connecting customers, such that CitiPower receives the full MCR in total and that each current and future new connecting customer contributes equally towards the cost of required augmentations.

4.3 Consideration of the connection duration and time value of money

Under Guideline No. 14, new domestic and business customers are assumed to have 30 and 15 years of connection life respectively. Guideline No.14 specifies an assumed connection life to ensure that neither the customer nor the distributor can influence the assumed connection period for financial gain. As upstream assets can be used by multiple customers and the same asset could be used by future new customers once the earlier customers stop using such assets at the end of their connection life, it is not equitable for the first new customer to fund the full cost of upstream augmentation. In such a case, CitiPower will charge future users for the same assets again.

The net present value of all connection charges received by CitiPower in respect to the augmentation of a particular asset should equal the MCR of that asset. A methodology that does not take this into account would result in CitiPower either over or under recovering its costs.

The charges paid (in respect of the augmentation of a given asset) by previous, current and future new customers should be equal in real terms. A methodology that does not take this into account would result in an inter-temporal transfer of wealth and would be inequitable for some customers.

4.4 Calculation methodology

The AER considers that in calculating the component of incremental costs attributable to upstream augmentations, CitiPower must take into consideration the prescribed connection life of the connecting customer. That is, CitiPower should only charge new connecting customers for the costs attributable to their connection life, Guideline No. 14 assumes this to be either 15 or 30 years.

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 4.3 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.[3] Using domestic customers as an example, the second domestic customer to connect to the network, in 30 year time, would pay 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 the NPV equal to 1 and solving for X leads to:

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

Solving this equation shows that for the costs of adding capacity to CitiPower's network, new connecting domestic customers should pay 84.4 per cent of the MCR and all other customers should pay 60.6 per cent of the MCR. An alternative derivation of this formula can be found at appendix B.

The AER considers that this 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 network augmentation and

[3] 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 appear to have been adjusted by CPI.

provides a fair cost allocation among new customers that avoids the situation of where new customers pay more than the full cost of upstream augmentation in aggregate.

5 Submissions on the draft decision

The AER received two submissions on its draft decision.

5.1 UTILICOR Pty Ltd (Utilicor)

Utilicor submitted on issues relating to the calculation of the MCR and diversity factors, in particular it stated that:

> *In previous submissions a common thread has been the need for more information and greater transparency. The new proposed model does provide more transparency in some areas of the calculations. An area where further transparency should be provided is in the calculation of the MCR rates that have been used by CitiPower (and likely to be used by all other distributors).*
>
> *For customers (in all distribution areas) to be confident with the proposed model, transparency regarding how MCR rates are calculated is essential. Load diversification, load growth and how historical numbers are used in calculating the forward MCR rates should be provided to ensure that it results in a consistent & transparent model across all distribution businesses. Is there any allowance for re-balancing between one year and the next to account for possible over/under collection?*
>
> *It is possible that this is already the case - but the draft determination provides little information on this and appears to accept this MCR number as correct without any detailed explanation.*

With respect to new customers' incremental network capacity demand and the use of appropriate diversity factors for estimating this aggregated demand, Utilicor submitted that:

> *Generally, distributors require load limiting devices to be installed to ensure that customers do not exceed the maximum supply capacity. As a result, it is common for customers to request (and for distributors to recommend) that the maximum supply capacity be set higher than a customer will actually achieve or indeed require. Based on our experience in the field, we find that it is not uncommon for a customer's maximum supply capacity to be 200% higher than the values that they actually achieve or require in their actual operations.*
>
> *In our experience and in the examples provided, this diversification factor varies from 38% up to 50%. If our examples are representative of average values across all new connections, than we submit that this has a significant impact on the calculation of the MCR.*
>
> *The net effect of diversification is a significant component of the calculations. As a result, a more transparent process on how this is calculated will be beneficial, and, we submit fair. It should be feasible for the distribution business to demonstrate the actual diversification by using historical data.*

5.2 CitiPower

CitiPower submitted that:

> *…the AER misconstrues the conditions of CitiPower's licence that require CitiPower to impose capital contribution charges for new augmentations that are 'fair and reasonable' and compliant with Guideline 14. This is because in construing CitiPowers Licence conditions the AER has disregarded the Essential Services Commission's purpose in imposing those conditions. In particular, in construing CitiPower's Licence conditions, the AER applies clause 3 of Guideline 14, including in particular clause 3.3.3 concerning connection terms without having regard to the purpose of those provisions of Guideline 14.*

In regards to the ESCV's purpose in setting Guideline No. 14, Citpower contended that:

> *The ESCV's purpose in setting guideline No. 14 was to prescribe the compensation that distributors would receive for the risks associated with the uncertain life of customers', particularly business customers', usage and asset stranding.*
>
> *The ESC's selection of connection terms of 30 and 15 years for domestic and other (i.e.) customers respectively as the terms that would appropriately compensate distributors for the risk associated with uncertain life of customers usage and asset stranding was premised on:*
>
> - *Their use in calculating the revenue expected from a new customer (i.e. incremental revenue) from payments for networked services; and*
> - *An assumption that no new customer will connect after an earlier new customer stops using the capacity in respect of which they are making a capital contribution, with the result that those terms are not used in the calculation of incremental cost.*
>
> *This latter assumption is implicit in the extracts from the Issues Paper*[4]
>
> *In addition it is evident from the ESC final decision that, in prescribing connection terms of 30 and 15 years for domestic and other (i.e. business customers) the ESC envisaged that:*
>
> - *these connection terms would be used in the calculation of incremental revenue and not incremental cost; and*
> - *It is revenue and costs that are due to the connecting customer that are the relevant revenue and costs (and so revenues or costs from subsequent customers or connections should not be considered.*

[4] ESCV, *Issues Paper Review of Connection and Augmentation Guidelines Volume 2 Customer Contributions for connections and Augmentations,* October 2008, p. 12.

In regards to the risks associated with uncertain asset life and asset stranding, CitiPower contended that:

> *The AER, Methodology will not compensate CitiPower for the risk associated with the uncertain life of customers' usage and asset stranding at all. The AER Modified Methodology assumes that at the end of a new customers assumed connection term set out in clause 3.3.3(a)(1) of Guideline 14 another new customer will immediately connect and use the capacity left by the first-mentioned new customer. That is the AER Modified Methodology assumes away the very issue the ESCV sought to address through clause 3.3 of Guideline 14, that of the risk of uncertain customers' usage and stranded assets.*
>
> *The ESC intended that the calculation under clause 3.3 of Guideline 14, including in particular the application of the connection terms set out in clause 3.3.3(a)(1), would result in significantly higher charges for other (i.e. business) customers relative to those for domestic customers. The AER's use of the connection terms set out in clauses 3.3.3(a)(1) of guideline 14 has the result that the shorter connection term for business customers results in significantly lower charges because of the assumed greater sharing of the MCR costs of connecting demand with future new customers associated with that shorter connection terms.*

Finally, CitiPower stated that:

> *the AER nonetheless continues to use the 2008 MCR costs in determining the AER Proposed Benchmark Charges because the AER has not assessed whether the increase form the 2008 MCR rates to the 2009 rates is reasonable. Such an approach is inconsistent with the AER's stated objective in determining benchmark fair and reasonable charges.*

6 AER's analysis of submissions

The following section sets out the AER's considerations of submissions received to its draft decision.

6.1 UTILICOR

In regards to the calculation of the MCR, CitiPower uses a network wide historical average to calculate the MCR. The inputs to this calculation are not publically available and as such the AER accepts that this calculation is not 100 per cent transparent. However, CitiPower's MCR rates were previously checked by the ESCV and found not to be inconsistent with the historical cost (adjusted for inflation) of CitiPower's network assets.[5] The AER considers that the historical cost of installing upstream network infrastructure is an acceptable proxy, on a per MVA basis, for actual cost of augmentation required due to a new customer joining the network.

Regarding the estimation of new customers' incremental network capacity demand and the use of appropriate diversity factors for estimating such aggregated demand, the AER considers that this is a relevant consideration when assessing whether a connection offer is fair and reasonable. However, for the purpose of this guidance paper, the AER's objective is establish the benchmark rates for using the upstream network on a per MVA capacity basis, rather than the assessment of the aggregated demand of a specific connecting customer.

Hence, the AER considers that, while these matters are important when assessing all connection offers by the distributors, it will estimate the benchmark rates based on per unit network capacity basis. Nevertheless, the AER notes that, through information previously provided by CitiPower in response to connection disputes, CitiPower typically:

- estimates new customers' maximum demand based on historical information of the class of customers in its network
- applies a diversity factor between 50 to 70 per cent depending on the class of the customers.

6.2 CitiPower

The AER considers that its methodology is consistent with the wording of Guideline No. 14. The AER does not consider that the express wording of Guideline No. 14 indicates that the assumed connection terms should not be used in the calculation of incremental costs.

With respect to the ESCV's purpose in setting Guideline No. 14, the AER does not consider that the ESCV's purpose in this regard is clearly discernable nor is CitiPower's interpretation of the ESCV's purpose necessarily correct, in that the ESCV does not specifically say that the assumed connection terms should not be used in the calculation of incremental costs.

[5] ESCV, *CitiPower's capital contribution charge for marginal cost of network reinforcement, draft decision*, 17 December 2007. p. 6.

Furthermore , the AER considers that its methodology is not inconsistent with CitiPower's interpretation of the ESCV's purpose in setting Guideline No. 14, since:

- CitiPower's risks are managed through the assumed limited connection life for the purposes of calculating incremental revenue, the possibility of reusing spare capacity left by customers and through charging an upfront security fee. As such, the AER considers that its methodology appropriately shares the costs and risks of uncertain customer life between CitiPower and all its customers (this is explained in greater detail below).

- In regards to CitiPower's contention that it was the ESCV's intention that business customers pay greater connection charges than domestic customers and that the AER's methodology results in business customers paying less than domestic customers. The AER considers that CitiPower's argument does not account for the different connection terms used in calculating the incremental revenue and that domestic customers are assumed to contribute to incremental revenue for a greater period of time. The AER's methodology will reduce the connection charges for business customers by a greater amount than domestic customers, due to their shorter assumed connection term. However, this will ensure that domestic and business customers are treated in a consistent manner and does not necessarily result in business customers paying less than domestic customers—domestic customers pay the costs for a longer assumed period of connection, but correspondingly offset this against a longer assumed period of revenue.

Risk of stranding CitiPower's network assets

A key aspect of CitiPower's opposition to the AER's methodology is that CitiPower considers the AER's methodology does not appropriately account for the risks associated with asset stranding. However, the AER considers that its methodology does properly account for these risks and that it appropriately shares the costs of upstream augmentations between CitiPower's customers.

The AER's methodology only changes CitiPower's calculation of the connection charge with respect to the upstream augmentation component of the incremental cost. The AER's methodology does not alter the calculation of incremental revenue or the calculation of the costs for assets used exclusively by individual customers (shallow connection). As such the treatment of the assets that are most at risk of stranding (those used solely by an individual customer) is not altered by the AER's methodology.

As the AER's methodology only alters the charges for the shared component of the network, which is already shared by existing customers. When a customer leaves the network, the shared component of network would generally continue to be used by other customers. This is particularly the case due to the highly inter-connected nature of CitiPower's network. In its submission to the ESCV's December 2008 draft decision, CitiPower contended that its MCR rates need not be location specific because:

- …there are substantial practical difficulties in identifying the extent to which all planned augmentations benefit a specific area and so which customers

- Many high voltage feeders in CitiPower's network are interconnected with high voltage feeders from other zone substations. Due to the customer and load density of CitiPower's area, and CitiPower's planning criteria, high voltage feeders from one zone substation can be interconnected to feeders from several adjacent zone substations. This deliberate strategy is designed to provide a highly reliable network for the benefit of customers generally, but also results in substantial practical difficulties defining the cost of augmentation by location for a specific customer.[6]

There are also several scenarios in which the connection assets will be reused, or where CitiPower can realise some value from those assets. The ESCV issues paper[7], which CitiPower quotes in support of its argument, stated that:

> *for warehouses, office blocks, shops and similar types of electricity users, if the original new customer goes out of business or leaves, another customer with similar demand could be expected to take over the site[The AER notes that this would include the shallow connection assets]. In contrast highly specialised usage may well imply that it would be unlikely that there would be a replacement customer with similar demand requirements; and*
>
> *some assets that may be installed to serve a new customer may be transportable to another site if the customer leaves the premises (such as transformers). Accordingly the sunk costs associated with these assets (and so losses incurred) would be small. In contrast it is generally not feasible to remove conductor [sic] and transport it to another site, and so the proportion of sunk costs associated with these assets could be large.*

As such, the AER does not accept that its methodology creates material risk that CitiPower will bear significant costs due to asset stranding. This is due to the following reasons:

1. CitiPower can incorporate the cost of dedicated connection assets into the calculation of incremental cost. These are the assets with the highest risk of asset stranding and are in effect paid for by the specific connecting customer.

2. Where a customer leaves the network, it is possible that another new customer with similar demand could take over the site. Where there is a reasonable expectation that this could occur (warehouses, office blocks and shops) there is little risk of asset stranding.

3. Given the highly inter-connected nature of CitiPower's network, it should also be able to use the spare capacity in the shared network, to service customers in the surrounding area or for load transferring during outage events.

---

6 CitiPower, *Submission to the Essential Services Commission on the Draft Decision regarding CitiPower's Capital Contribution Charge for Marginal Cost of Network Reinforcement*, 23 January 2009. p. 5

7 ESCV, *Issues Paper Review of Connection and Augmentation Guidelines Volume 2 Customer Contributions for connections and Augmentations*, October 2008, p. 12.

The AER also considers that the payment of an upfront security fee, as allowed by Guideline No. 14 is another important mechanism that CitiPower can use to mitigate the risks associated with uncertain customer life and asset stranding.

While not part of this assessment, the AER notes that, in addition to the shared network, some portion of the dedicated connection assets may also be reused by subsequent customers.

Appropriate MCR rate

The AER notes CitiPower's contention that the AER should update its decision to use a historical MCR expressed in 2009 dollars. The AER considers that as the original complaints related to connection offers made in 2008, it is appropriate to use a MCR expressed in 2008 dollars. However, the AER intends to use a MCR corresponding to the relevant year in assessing any complaints brought to it by a customer.

6.3 Summary of AER's analysis

The AER has not received information that causes it to alter its position from the draft decision. The AER will apply the methodology outlined in section 4.4, which is the same as the methodology outlined in its draft decision, to inform any future assessment of whether CitiPower's connection charges are fair and reasonable and in accordance with Guideline No. 14.

7 Conclusion

The AER consider that the incremental cost in respect to the upstream augmentation component should be about 84.4 per cent of the MCR for domestic customers and about 60.6 per cent of the MCR for all other customers.

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

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 above benchmark rates are based on CitiPower's current weighted average cost of capital (WACC). The AER will use the same principles to re-calculate the benchmark rates should CitiPower's WACC change in the forthcoming regulatory control period, which starts on 1 January 2011.

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.