09.02.01

Unit Rates for Capital Contributions

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1. Introduction

1.1 Overview

The Australian Energy Regulator (AER) has developed and published the *Connection charge guidelines for electricity retail customers June 2012* (the Guidelines), pursuant to clause 5A.E.3 of the National Electricity Rules.

Under the Guidelines, the AER requires capital contributions to be calculated in line with the cost revenue test, whereby the capital contribution is equal to the sum of customer specific incremental costs (ICCS) and shared network incremental costs (ICSN), less the incremental revenue (IR) expected to be received from a new connection.

The ICSN is calculated as the unit rate multiplied by the demand estimate. The unit rate should equal the average cost of augmentation (insofar as it involves more than an extension), per unit of added capacity.

1.2 Requirements

The Guidelines stipulate that the unit rate must be calculated in accordance with clauses 5.2.7 to 5.2.11 of the Guidelines. Specifically, it requires that the unit rate:

- Must be calculated as the average cost of adding a unit of capacity to the shared network
- May be different for different areas of the networks
- May be based on the local area's recent shared network augmentation costs for sub-transmission lines, zone substations, high voltage feeders, distribution substations and low voltage mains
- Must not include components that have been included as a customer specific cost
- Must not include components that will not be used by the connection applicant paying the capital contribution
- Must take account of the proportion of each network component used by the connection applicant
- Must give reference to the useful life of the network component
- Must give reference to the assumed period for which the connection applicant will be using the network.

1.3 Scope

This attachment sets out the calculation of the unit rates for capital contributions made towards the cost of an augmentation (insofar as it involves more than an extension).

Further information about the calculation of capital contributions is provided in supporting document 09.01.01 –Ergon Energy Connection Policy.

2. Unit Rate Calculation

2.1 Overview

In accordance with the Guidelines, we have calculated the unit rate using Ergon Energy's Benchmark Cost of Supply (BCS) based on the Average Capital Cost of Capacity (ACCC). The detailed forecast methodology is described below.

We have based the unit rates on capital expenditure forecast data for the current regulatory control period as the expenditure profile in this period is considered to be more representative of the long run marginal cost of network augmentation. The reduced capital expenditure program proposed for the regulatory control period 2015-20 has not been used as it may overstate the long run unit rates. This is because network investment is known for being quite "lumpy" as a consequence of investing large blocks of capacity at a time and the reduction to Ergon Energy's capital program as a consequence of recent changes in security criteria, means that there would be an increased risk that investments assessed are not able to be appropriately averaged if the data for the regulatory control period 2015-2020 was used. . The unit rates have been escalated for the regulatory control period 2015-20 using the actual consumer price index (CPI) from the Australian Bureau of Statistics and the inflation forecast provided by SKM.[1]

Table 1: Proposed unit rates for the ICSN, 2015-20 ($/KVA)

	2015-16	2016-17	2017-18	2018-19	2019-20
Unit rates	1,486.49	1,524.70	1,563.88	1,604.07	1,645.30

2.2 Methodology

Ergon Energy has calculated the unit rate for the next regulatory control period by:

1. Calculating the ACCC using the Forward Looking Incremental Cost Approach in 2011
2. Calculating the BCS by applying the standard building block methodology to the ACCC, and taking the Net Present Value (NPV) of the annual BCS to determine the unit rate
3. Inflating the unit rate forecast from 2011 to 2015 to 2020.

We discuss each step of the methodology in detail below.

2.2.1 Calculating the ACCC

We define the ACCC as the total network augmentation expenditure within a given period of time divided by the total capacity installed during this time. There are various ways to define both the timeframe (historic cost and future cost) and the network augmentation expenditure (average cost, stand-alone cost and incremental cost).

Ergon Energy has calculated the ACCC using the Forward Looking Incremental Cost Approach (FLIC). This is considered an appropriate methodology as it:

- Measures the cost of an additional unit of capacity on the distribution network
- Reflects future construction, labour and materials costs of network augmentation.

Appendix A provides an overview of the advantages and disadvantages of the alternative costing approaches.

[1] See Attachment 06.02.02 – Cost Escalation Factors 2015-20 SKM

The FLIC of the ACCC is equal to the sum of the forecast expenditure associated with the instillation of additional capacity in real terms (financial data) divided by the amount of additional capacity (capacity data) expected to be installed over the same period of time for both distribution and sub-transmission capital expenditure, as follows:

$$ACCC = \frac{Forecast\ Capital\ Expenditure_{(1\ or\ more\ years)}}{Forecast\ Additional\ Capacity_{(1\ or\ more\ years)}}$$

Where:

Forecast capital expenditure – is the forecast total capital expenditure for 2011-12 to 2014-15 directly associated with the forecast additional network capacity; the expenditure for capacity improvement falls in the same year of the capacity increase.

Forecast Additional Capacity – reflects the forecast additional network capacity installed during 2011-12 to 2014-15. The data was obtained from the Sub-transmission Network Asset Plans (SNAPs) and the Distribution Network Asset Plans (DNAPs). The SNAPs and DNAPs describe the capital works that are needed to meet the augmentation requirements of the sub-transmission network to accommodate normal load forecasts for the next 10 years.

The output yields the average capital cost of capacity ($/kVA).

2.2.2 Calculating the annual BCS and unit rate

The next step is to calculate the annual BCS using a standard building block approach. The annualised cost of supply is represented by the building block revenue that needs to be recovered directly as a consequence of that network augmentation. Consistent with the approach used in determining the Annual Revenue Requirement for Standard Control Services (for the current regulatory control period) we calculate the return on capital, the return of capital and the operating expenditure of the ACCC over a 40 year period. The calculation assumes:

- Weighted average of cost of capital (WACC) of 9.72%[2]
- Standard asset lives of 40 years
- Operating expenditure equal to 2.5% of capital expenditure.[3]

We then calculate the net present value of the annualised BCS over the life of the assets (40 years) to determine the 2011-12 unit rate. The unit rate represents the net present value of the revenue recovered from customers as a result of the network augmentation over a period of 40 years.

2.2.3 Inflating the BCS

We have used the NPV of the BCS for the current regulatory control period to determine our unit rate forecast for the regulatory control period 2015-20. Consistent with our Regulatory Proposal, we have used the inflation forecasts provided by SKM for forecast inflation and used the Australian Bureau of Statistics data to calculate actual CPI adjustment. The CPI adjustments (actual and forecast) and the resulting unit rates are shown in Table 2 below.

[2] This is the AER-approved WACC for the current regulatory control period, from which the forecasts are taken.

[3] The capital expenditure is reduced to reflect the proportion that is typical treated as operating expenditure.

Table 2: Proposed unit rates for the ICSN, 2015-20 ($ / KVA)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
CPI		2.50%	3.00%	2.25%	2.57%	2.57%	2.57%	2.57%	2.57%
Unit rates	1,343.95	1,376.08	1,417.36	1,449.25	1,486.49	1,524.70	1,563.88	1,604.07	1,645.30

2.3 Meeting the requirements

We believe the unit rate calculation meets the requirements set out in the Guidelines. Specifically, we have:

- Calculated the unit rate as the average cost of adding a unit of capacity to the shared network
- Not included components that have been included as a customer specific cost, as the capital expenditure included in the calculation relates only to the shared network
- Not included components that are not used by the connection applicant paying the capital contribution, as it is assumed that all customers benefit from the shared network
- Taken into account the proportion of each network component used by the connection applicant, as the unit rate reflects the applicant's share of the cost of providing the additional unit of capacity

Appendix A – Costing approaches

In establishing a benchmark cost of supply, consideration must first be given to the overarching methodology for establishing the benchmark value. There are a number of potential approaches, based on the following options:

- Average cost, stand alone cost or incremental cost
- Backward or forward looking costs.

The relative advantages and disadvantages of these approached are discussed in the following sections.

Average cost

An average cost methodology is undertaken by dividing the total allocated cost for the network by a demand-based (i.e. kVA) denominator. In practice, this involves a detailed cost allocation methodology and is ordinarily backward looking – it takes the costs per kW of the existing supply of the network and uses this as an indicator for what a future saving might be from avoiding a kW in the future.

The average cost is not considered appropriate for the purposes of calculating a unit rate for capital contributions because it reflects the average cost of the total capacity of the network, not the cost of network augmentation (i.e. an additional unit of capacity) across Ergon Energy's distribution network.

Stand-alone cost

The stand-alone cost is the "upper bound" cost in servicing a customer or group of customers and is forward looking. It is based on an assumption that no customer or group of customers should be charged more than the price of replicating or bypassing infrastructure. This method assumes that the customers or group of customers being assessed are the only customers within the network, and therefore that the cost attributable to a customer or group of customers should never exceed this upper-bound cost.

In practice, the stand-alone cost is an esoteric concept and often bears little relationship to the shared network within which a particular customer exists. For example, a stand-alone cost optimises the network used to supply a customer - in the event of a by-pass opportunity the stand-alone cost might be very small even though the actual costs of supplying a customer might be very large.

For this reason, the stand-alone cost is not considered appropriate for determining the unit rates.

Incremental cost

The incremental cost is the "lower bound" cost of servicing a customer or group of customers assuming that other customers or customer groups continue to be served at the same time. It can be either forward or backward looking. Where the cost of servicing a customer is less than avoidable cost, it necessarily follows that the particular customer or group of customers is being acceptably subsidised by another customer or group of customers. In practice, the cost attributable to a customer or group of customers should never be less than this lower-bound cost.

Incremental cost is considered appropriate for determining the unit rates for network augmentation as it represents the cost of providing an additional unit of capacity on the distribution network.

Backward Looking approach

A backward looking methodology involves using historical costs and capacity growth (over a period of one or more years) as the basis for developing the benchmark.

A backward looking methodology offers the following advantages over a forward looking approach:

- The use of historical rather than forecast costs means that expenditure on growth related projects is known with greater certainty
- Similarly, the use of historical rather than forecast capacity growth (in kVA) means that capacity growth is known with greater certainty.

However, a backward looking methodology has the following disadvantages:

- Historical cost data provides a point in time snapshot of the costs associated with augmenting the network, and as such may not accurately reflect future variances in construction, labour and materials costs
- Historical growth data provides a point in time snapshot of the additional capacity required at that time, and as such may not accurately reflect future growth trends.

Forward Looking approach

A forward looking methodology involves using forecast costs and capacity growth (over a period of one or more years) as the basis for developing the benchmark. It involves a bottom up assessment not of the costs already expended in the supply of a customer, but those costs not yet expended and possibly avoidable. This methodology is most often used by distribution companies to assess the specific costs of avoiding a particular network investment.

A forward looking methodology offers the following advantages over a backward looking approach:

- Forecast cost data better reflects future variances in construction, labour and materials costs than historical data
- Forecast cost data better reflects the forward growth-related capital work plan than historical data
- Forecast capacity growth better reflects the forward growth in network capacity than historical data

However, the forward looking methodology has the following disadvantages:

- The use of forecast rather than historical costs means that expenditure on growth related projects is known with less certainty (due to projects not proceeding or changing in scope at a later time)
- For similar reasons, the use of forecast rather than historical capacity growth (in kVA) means that capacity growth is known with lesser certainty

While an approach based on historical costs has the key advantage of using costs that are known with greater certainty, historical costs do not necessarily reflect the future costs. Therefore, a forward looking approach is considered more appropriate for the purposes of determining a unit rate for capital contributions.