AusNet Electricity Services Pty Ltd

Electricity Distribution Price Review 2022-26

Reset Regulatory Information Notice

Basis of Preparation - LRMC

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PUBLIC

1 LRMC

1.1 Overview

Rule 6.18.5 (f) prescribes the marginal cost concept that must be utilised when developing network tariffs, by stating that "each tariff must be based on the long run marginal cost of providing the service".

The requirement to take into account the LRMC reflects a fundamental economic concept - namely allocative efficiency. Allocative efficient outcomes will be promoted if customers consume electricity up to the point where the marginal benefit to them of consuming an additional unit of energy (kWh, kW or kVa, depending on the cost driver being priced) equals the marginal cost of providing that extra unit of energy to that customer.

The three key questions that stem from the discussion of LRMC are:

- What methodology should be used to calculate the LRMC?
- What 'service attributes' should be costed and therefore subject to a variable price based on the LRMC of supply? and
- What cost information should be included in the LRMC calculation?

1.2 LRMC methodology

Consistent with the requirements of Rule 6.18.5 (f), AusNet Services will adopt the Average Incremental Cost (AIC) approach, which is underpinned by a business' forecast of the change it expects to incur in its future costs (numerator) as a result of its forecast change in demand for its service/s (denominator), with both the numerator and denominator discounted back to create a Net Present Value (NPV).

$$LRMC = \frac{\sum NPV(Forecast\ Augmentation\ Capex + Forecast\ Augmentation - related\ Opex)}{\sum NPV\ (Forecast\ Cumulative^{1}\ Growth\ in\ MW)}$$

The AIC approach ensures that if AusNet Services' underlying demand and cost forecasts eventuate, the NPV of revenue generated over the evaluation period from the implementation of a cost-reflective price based on the calculated LRMC will exactly equal the NPV of the costs that it incurs – that is, growth is 'self-funding'. It is commonly used by distribution networks, as it is generally considered to be well suited to situations where there is a fairly consistent profile of investment over time to service growth in demand.

[1] Cumulative demand is used as this creates a value that if charged to all of that future demand growth, would lead to the NPV of revenue being exactly equal to the NPV of the cost of those augmentation projects. This is not the case if we estimate the LRMC based on year-on-year demand (instead of total cumulative incremental demand), unless the resultant amount was applied as a one-off up front cost (e.g., only in the year that the increment in growth occurs). However, this is inconsistent with the development of an on-going price signal.

1.3 Service attribute/s reflected in LRMC model

The issue of what 'service attributes' should be costed and therefore subject to a variable price based on the LRMC of supply is sometimes raised in the context of electricity network pricing. For example, should a network business price demand, or throughput (or both)?

In developing the LRMC, it should:

- reflect the specific cost drivers faced by an individual network business, and
- should address those cost drivers that can be affected by the behaviour of end customers.

In the case of AusNet Services, the future capital expenditure that it will incur that can be affected by the behaviour of end customers is that which is driven by peak demand.

Peak demand, measured in MW, is therefore the service attribute that has been reflected in AusNet Services' LRMC calculation (i.e., growth in spatial peak demand, as measured in MW, is the denominator in the LRMC calculation, and the consequential costs it creates is the numerator).

1.4 What cost information should be included in the calculation

AusNet Services will face cost drivers that cannot be influenced by (or are not driven by) a customers' future consumption behaviour. These include asset condition (which will predominately drive replacement capital expenditure), safety requirements and other licence requirements (both of which may drive both capital and operating expenditure), and corporate costs (which may drive operating expenditure in areas such as finance, HR and legal).

There is little if any economic benefit from AusNet Services signalling these costs via a variable price signal, therefore, these costs have not been included in its LRMC calculation.

Having regard to the above, AusNet Services has included the following types of costs in its LRMC model:

- **Forecast augmentation capital expenditure:** As future changes in customer demand (MW) can affect the timing and size (and therefore cost) of any expenditure in this cost category, and
- **Incremental forecast operating expenditure related to changes in demand or energy consumption:** As future changes in customer demand and consumption are likely to drive a small amount of its future operating expenditure (e.g., short run operational and maintenance costs).

This means that AusNet Services has explicitly excluded the following costs from its LRMC model:

- **Forecast replacement capital expenditure**: As the timing and scale of these costs is not expected to be materially affected by AusNet Services' forecast change in demand or energy consumption, rather, these costs are predominately driven by condition and risk factors unrelated to the loads placed on the asset[2].
- **Forecast DER integration capital expenditure:** As the timing and scale of these costs is predominately driven by voltage-related issues caused by significant amounts of PV being exporting back into the grid at times coincident with when native demands on the grid are low or moderate;

[2] For example, if demand remained the same – i.e., there was neither an increase or decrease from current levels – AusNet Services' replacement expenditure would remain almost identical to that which it proposes under its existing program of works (which reflects its current forecast of peak demand).

- **Forecast corporate, safety related and IT capital expenditure costs:** As the timing and scale of these costs will not be affected by changes in future customer demand or energy consumption.
- **Sunk costs:** As this expenditure will not be influenced by future changes in demand or consumption.
- **Non-incremental forecast operating expenditure:** As this expenditure will not be influenced by future changes in demand or consumption.

1.4.1 Demand forecast

ASD – Appendix 7B – Demand Forecasting Methodology describes the methodology used to forecast demand.

The demand forecasts applied in the LRMC calculation reflect the weather corrected P50 demand forecasts (non-coincident, MW) reported in template 5.4 of Workbook 1.

1.4.2 Augmentation capital expenditure inputs

For projects identified in 2019-20, 2020-21 and the 2022-26 EDPR period, a detailed assessment of network limitations and options is undertaken using AusNet Services' risk-cost model. The risk-cost model quantifies the benefits of potential investment options by comparing the service level risk of the Do Nothing (Counterfactual) option with the reduced service level risk assuming the credible option is place.

The investment cost to implement the credible option is then subtracted from the monetised benefit to compare credible options and identify the option that maximises the net economic benefit (the proposed preferred option).

The areas of service level risk costs, and risk cost reduction benefits, that AusNet Services considers include:

- Supply risk;
- Safety risk;
- Collateral damage risk;
- Reactive replacement risk;
- Environment risk;
- Operations and maintenance costs; and
- Losses.

The key inputs to the risk-cost model include:

- Current and forecast asset condition, used to determine the expected unavailability of assets and the likelihood of safety, collateral damage, reactive replacement and environmental risk impacts;
- Current and forecast demand, used to determine the expected load on assets;
- Asset ratings, including committed rating changes from retirement, replacement and/or augmentation, used conjunction with asset fail likelihood, unavailability rates and forecast loading to determine the service level risk under system normal (with all assets in service) and network outage conditions; and
- Value of customer reliability (VCR), personal safety and damage/replacement, used to monetise the service level risk.

We incorporate both 10% probability of exceedance (POE) and 50% POE demand forecasts in our risk-cost assessments, and these are weighted 30% and 70% respectively.

Beyond 2026 a higher level approach was taken. This approach still considers the current and forecast condition of assets and the current and forecast load on assets to determine retirement, replacement and augmentation needs. However, it does not include a detailed cost-benefit assessment to determine the optimal timing and proposed preferred solution. Instead, the timing and proposed preferred solution for projects proposed beyond 2026 is indicative based on engineering judgement and the service level risk typically experienced before a risk mitigation solution is economically justified.

The augmentation expenditure included in the LRMC calculation relates to specific demand related augmentation projects provided in the 'LRMC and Avoidable Cost Model'. This is included in the augmentation expenditure reported in Tables 2.1.1 and 2.1.7 of the RIN . Note that other parts of augmentation expenditure, such as DER- driven or safety-driven augmentation, is not included in the LRMC calculation.

1.4.3 Opex Input

The opex input into the LRMC calculation represents the incremental opex required to operate and maintain the demand-related augmentation assets. A high level assumption has been made that annual incremental opex is 1% of the capital cost of these assets.

This opex is part of output growth opex forecast in Workbook 1 – Table 2.16.1, and part of maintenance opex included in Workbook 1 – Table 2.16.2.