

# **Submission to QCA regarding "Draft Determination Regulation of Electricity Distribution"**

From:

**Prof Gerard Ledwich Chair in Electrical Asset Management QUT  
Keith Hoffman Adjunct Professor Electrical Asset Management QUT, CEO Prodim**

## **Introduction**

The structure of the proposed policy follows similar regulatory bodies in Australia and contains the same aspects which can send the wrong investment signals to the distribution companies. There are three main areas that are of importance to the delivery of electricity, which would be open to improvement.

- **Incentives for minimum and average quality of supply**
- **Incentives for reduction of energy loss by distribution companies**
- **Correct valuation for Refurbishment of plant and Residual value at end of nominal life**

## **Supply Quality**

The major concern of customers is that supply continues without interruption to the operation of equipment. Once this aspect has reached a satisfactory level, the next aspect is price. Satisfactory supply includes voltage dips and short outages which can trip vital equipment. The draft determination indicates the desirability of moving in this direction but does not make any specific suggestions of reporting average or minimum performance. It should be noted that distribution utilities typically quote average SAIDI and SAIFI. This does not give a true picture of customer service since for example the worst case SAIDI might be eight times or more greater than the best case. The latter is of course in city areas and especially in the case of Energex, the large city base can mask poor performance in towns and country areas.

Without specific incentives, the investment to meet the rising expectations and demands for reliability of supply will not be met. As noted in the draft determination in both SAIDI and SAIFI both Queensland distributors are behind the average of comparable US companies.

Significant improvements in SAIDI and SAIFI cannot be made quickly. Because of the size of the Queensland distributors' networks, major investment over a number of years is required to bring performance to world class standards. The sooner a significant start is made on targeted areas for improvement the better.

## **Energy Loss**

Energy loss reduction is an important issue for community benefit including greenhouse gas impacts. An important principle is that the costs or incentives are given to the party able to make the difference. In this circumstance the distribution losses are best addressed by the distribution companies but there is no reflection of this impact and no incentive to make investments to address this aspect. The industry tradition for the purchase of transformers amortizes the energy loss and includes it in the capital cost for tender comparison. With no responsibility for losses this consideration would have no rational basis for distribution companies.

In distribution networks, energy losses are normally of the order of 5-6% of total energy passed through the networks. Losses then are a very significant component of "system inefficiency" and operating costs. Without the reported measurement of losses and costs and the creation of incentives to reduce losses, no significant capital investment is likely to be made (including new system design approaches) by a utility.

## Valuation of Capital

A valuation of assets based on purchase costs and straight line depreciation makes sense when dealing with taxation issues. When the income for the company is based on the value of approved assets, there is no reason to retain an asset once it has reached the end of its declared life. This approach encourages increased expenditure on capital and fails to make appropriate use of refurbishment opportunities. Thus equipment which had been lightly loaded throughout its life may have significant residual value as a means of delivering energy but the company gains no benefit from retaining the item.

The estimation of asset lives (particularly sub-transmission (i.e. 33 kV to 132 kV) sub-stations (mainly transformers and lines), varies significantly across utilities in Australia. It is understood that this is as wide as 35 to 70 years for steel tower lines and 35 to 50 years for power transformers. Also, sub-transmission assets in particular and distribution systems generally deteriorate little in the first ten years of life. Straight line depreciation in determining the economic life of assets produces a misleading asset valuation. An exponential depreciation rate to an effective residual amount, while ever that asset is producing revenue is a more realistic approach.

High cost assets (e.g. power transformers and sub-transmission lines) are capable of significant life extension through refurbishment costs of about 20% of replacement value at about 35-40 years - leading to potentially very significant life extension of these assets, e.g. possibly 70 years for power transformers and even more for lines. There is little encouragement for utilities to undertake such refurbishment rather than replacement, unless the impact of the refurbishment to increased asset valuation is allowed by the Regulator. Without such refurbishment encouragement, utilities are likely to replace major assets too early in order to maintain valuation for regulatory revenue purposes - rather than as determined by economic/engineering/reliability considerations. Shareholder value (e.g. economic value added, EVA) considerations currently do not receive the utility attention capital investment decisions in private enterprise might, because of the currently applied regulatory approach.

In summary, the current regulatory approach does not encourage refurbishment, probably leads to undervaluation of assets and may exacerbate debate over WACC in order that utilities can achieve an "adequate regulated revenue.

## Summary

The method of calculating return for an entity will drive the performance of that entity. If the reward structure fails to address key aspects important to customers only a residual commitment to public good will drive the behavior in the direction of community benefit.

We would be pleased to discuss further, the issues raised herein, if not to reflect them in the current review, but to ensure that they are adequately addressed for future reviews.