

Draft Guideline

Methodology for estimating foregone revenue

Network Demand Management Consultation Working Group

1 Introduction

The Independent Pricing and Regulatory Tribunal of New South Wales (the Tribunal) currently regulates pricing for electricity distribution services in NSW under the National Electricity Code. On 11 June 2004, the Tribunal released a final report (the “report”) and final determination (the “determination”) in relation to network pricing over the period 1 July 2004 to 30 June 2009.

The report and determination set out actions and decisions designed to provide incentives for *network* demand management. These decisions include:

- introducing a D-factor into the weighted average price cap (WAPC) control formula to allow the distribution network service providers (DNSPs) to recover, amongst other things, foregone revenue as a result of non-tariff-based demand management activities
- establishing a working group on the calculation of distribution foregone revenue as a result of demand management activities.

The determination includes definitions for non-tariff demand management measures and foregone revenue. However, the principles and methodology for calculating foregone revenue are not defined. Given the current limited experience of the type of demand management projects that might occur during the 2004-09 regulatory period, the Tribunal considered that a precise methodology for calculating foregone revenue should not be specified. Instead, a set of broad principles to guide DNSPs in calculating foregone revenue should be established.

Therefore, in October 2004 the Tribunal established a demand management consultation group to develop principles and guidelines on a number of matters, including the principles for calculation of foregone revenue.

2 Purpose and scope of guideline

This guideline has been prepared to facilitate implementation of the D-factor demand management arrangements and, in particular, to provide clarity for DNSPs and demand managements service providers in respect of the Tribunal’s assessment and approval of *foregone revenue* under the determination.

The guideline is limited to the principles and methodology for estimating foregone revenue associated with non-tariff demand management measures in the context of the determination and the D-factor adjustment.

As revenue is affected by *quantity* and *price* of units sold, the guideline considers principles for estimating foregone revenue based on these components, that is:

- the amount of energy, demand or capacity affected by the non-tariff demand management measures
- the price/tariff applicable to the foregone energy/demand/capacity.

The guideline is structured as follows:

Table 1 – Structure of guideline

| Ref | Section | Details |
|-----|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Context | Provides information and extracts from the determination and final report that significantly affect the principles and approach to calculating foregone revenue and this guideline |
| 4 | Issues considered | Summarises a number of points raised and issues considered in the course of developing the guideline |
| 5 | Principles | Sets out the principles for calculating foregone revenue for the purposes of section 11.3 of the determination. In some cases, further guidance is given on parameters related to/affecting foregone revenue |
| 6 | Examples | Provides examples of three different types of non-tariff demand management measure and illustrates how foregone revenue could be calculated in relation to each |
| 7 | D Factor approval process – foregone revenue | Summarises key elements of the approval process related to foregone revenue |
| 8 | Implementation process | Discusses current thinking on the steps for testing and implementation of the guidelines; these steps reflect the demand management consultation group’s recommendations on appropriate next steps |

3 Context

In developing the broad principles and approach set out in this guideline, the demand management consultation group explicitly considered key contextual issues, including the following:

- broader objectives for demand management and the depth of analysis undertaken through various inquiries and consultant reports
- WAPC regulatory framework for network pricing and the role of the D-factor mechanism
- practical issues associated with metering, measurement and estimation of the effect of demand management measures on demand, consumption and capacity
- regulatory principles such as proportionality and materiality, including the objective of ensuring that the costs associated with implementation do not outweigh potential benefits
- potentially short period for application of the D-factor and foregone revenue incentives, given the time lag for “pass-through” of costs to prices
- practical issues associated with determining the appropriate price to be applied when calculating revenue.

The following sections summarise key points in the determination and report relevant to this guideline, provide a high level description of the current “commercial” arrangements for demand management projects and sets out the nature of current demand management projects.

3.1 Tribunal’s determination and final report

The Tribunal’s determination and final report on NSW Electricity Distribution Pricing 2004/05 to 2008/09 sets out the Tribunal’s decisions associated with providing incentives for network demand management.

Extracts of the determination and final report of particular relevance to this guideline are set out in Table 2 and Table 3 respectively (see section 7 for the Tribunal’s approval process).

Table 2 – Determination references

| Reference | Details |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Annexure 1- Definition of Non-Tariff Demand Management Measures and Foregone Revenue | <p>Non-Tariff Demand Management Measures means any action, project or activity undertaken by or on behalf of a DNSP, either independently or in conjunction with any other persons (such as generators, retail suppliers, energy service intermediaries and end-use customers), with the objective of reducing the costs of providing Prescribed Distribution Services by altering the level or pattern of consumption of energy, the source of energy, or the use of the DNSP’s Distribution System, but excluding:</p> <p>(1) Tariff Demand Management Measures; and</p> <p>(2) any activities which expand the Distribution System or its capacity or which renew, repair or maintain it.</p> <p>Foregone Revenue of a DNSP for any Year means any revenue (from Prescribed Distribution Services provided by the DNSP) which:</p> <p>(1) has not been recovered by the DNSP in that Year; and</p> <p>(2) would in all likelihood have been recovered by the DNSP in that Year, but for the Non-Tariff Demand Management Measures undertaken by or on behalf of that DNSP.</p> |

Table 3– Final report references

| Reference | Details |
|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8.3.3 DNSPs can recover revenue forgone as a result of non-tariff-based demand management activities | <p>The Tribunal has decided to allow DNSPs to recover revenue foregone as a result of non-tariff-based demand management activities. The recovery of this foregone revenue is subject to Tribunal approval of the estimated amount. Where a demand management project results in reductions in revenue that extend beyond the end of that project, the DNSP may apply to recover the foregone revenue each year after the end of the project, up until the end of the regulatory period.</p> <p>The Tribunal recognises that accurately calculating the amount of revenue foregone as a result of demand management will be difficult. Many factors affect energy consumption levels, and the impact of demand management cannot be precisely separated from the impact of other factors. However, it considers the direct assessment approach recommended by its consultant, SKM, is an appropriate method.</p> <p>With the direct assessment approach, the DNSP estimates the impact of a</p> |

| Reference | Details |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>particular project on the level of demand/consumption in its area of operation, and provides quantitative evidence to support this estimate.</p> <p>Both the Tribunal and the DNSPs have limited experience of the type of demand management projects that might occur during the 2004-09 regulatory period. The Tribunal therefore considers it is not appropriate to specify a precise methodology for calculating foregone revenue, but to allow the DNSPs to submit their estimates and methodologies to it for assessment. However, it does consider it appropriate to establish a set of broad principles to guide DNSPs in calculating foregone revenue. These broad principles could include the following:</p> <ul style="list-style-type: none"> ▪ there should be a well-defined group of customers whose consumption is impacted by the demand management project ▪ the link between the demand management project and affected customer should be documented ▪ estimates should be made with reference to quantitative estimates of reductions in volumes — for example, based on reduction in metered consumption, reductions in number of appliances, hours or time of use of machinery etc ▪ estimates may be derived with reference to a sample of affected customers — a full audit of customers is not required. |

3.2 SKM's final report November 2003

The Tribunal's final report refers to the direct assessment approach set out in the SKM report "Avoided distribution costs and congestion pricing for distribution networks in NSW", November 2003.

Table 4 – SKM references

| Reference | Details |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SKM report – page 87 - direct assessment method | <p>Estimating directly from DM projects implemented.</p> <p>This method relies on direct evaluation of the consumption volume impacts of the DM projects that have resulted in lost revenues. DNSPs making payments or incentives to encourage DM projects should be estimating the expected impacts on demand, and then evaluating actual impacts (at least for a sample number of projects) in order to determine that DM has been effective in reducing demand and hence deferring capital. To extend this evaluation to include energy and other components that contribute to lost revenues should not be a significant additional burden, and could be included as a requirement on 3rd parties implementing DM measures for DNSPs under contract. A range of estimates can be used, such as those conducted as part of energy audits or proposals for DM projects, benchmarking energy and demand for DM participants, or independent assessments can be used (the methods contained in the Demand Side Abatement methodology for the NSW Greenhouse Gas Abatement Scheme might be used as a guide and adapted to calculate demand as well as energy impacts).</p> |

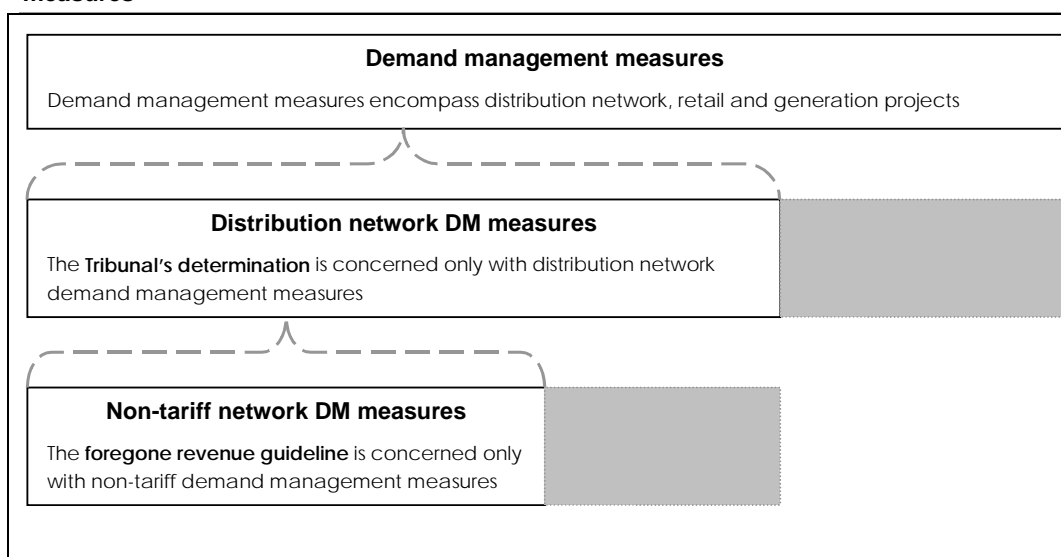
The following points summarise the context for SKM's discussion on the direct assessment approach and are relevant to the principles set out in this guideline.

- 1 SKM noted that the size of the demand management impact on various consumption components (energy, demand and capacity, including time of use splits where appropriate) must be estimated in order to calculate lost revenues. Because the impact of demand management is always relative to a “without demand management” case that cannot be measured, determining the impact will always require an estimate or calculation of assumed impacts.
- 2 SKM considered four options for calculating or estimating the demand management impacts on consumption volumes. SKM noted that each of the methods suffers from some shortcomings and none can ever be 100 per cent accurate. SKM recommended adoption of the direct assessment or the avoided distribution cost proxy method as the preferred option.

3.3 Nature of current demand management projects

This guideline needs to apply to calculation of *foregone revenue for any non-tariff demand management measure* related to the network; as illustrated in Figure 1 below, non-tariff demand management measures are a subset of the broader range of network demand management measures, which, in turn, are a subset of the full range of demand management measures.

Figure 1 – Non-tariff demand management measures are a subset of demand management measures



In developing the principles, the demand management consultation group sought to understand the nature and diversity of current and contemplated future non-tariff network demand management projects.

The following "classifications" of non-tariff network demand management projects indicates the potential range of measures for which foregone revenue may need to be calculated under the D-factor arrangements.

- Specific or targeted projects, typically relating to a small number of large customers, often undertaken under contract with a demand side management service provider. These projects

are estimated to account for more than 80 per cent of current network demand management projects.

- Broad or system wide projects, typically targeting a region (or regions) (rather than a customer), may involve different types of customers. The projects could be focussed on a particular end use, such as lighting or water heating.

3.4 Commercial arrangements

The commercial arrangements for development and operation of network demand management projects vary; these arrangements affect the information associated with measurement and verification of demand management outcomes.

The range of commercial arrangements associated with network non-tariff demand management measures includes the following:

- **Projects undertaken by a third party demand management service provider under contract with the DNSP.** The third party undertakes to deliver a certain demand management outcome (specified by location, kWh reduction, kVA reduction, kW reduction) over a certain time-period. The DNSP undertakes to pay the third party for delivery of these outcomes. How the demand management service provider achieves the demand reduction is largely up to the demand management service provider and generally reflects its particular skills and expertise.
- **Projects undertaken by DNSP.** The DNSP designs and implements the project using in-house resources. The “target” design outcomes are considered as part of the project approval. The project delivery is monitored as part of standard project delivery and monitoring processes.
- **Projects designed by DNSP but implemented by third party.** The DNSP designs the project; approval occurs on the same basis as DNSP projects. The DNSP may contract a third party to provide expert assistance in implementing the project.

While many of current projects are based on the first arrangement (third party demand management service providers), the enhanced demand management incentives are not designed to favour any one commercial arrangement over another.

3.5 Current measurement and verification protocols and processes

The process for developing this guideline sought to take account of “precedents” and related documented methodologies. These included:

- **Protocols for energy performance contracts** - internationally, demand management and energy efficiency services are often inter-related and are undertaken by specialist “energy performance contractors”. As a result, a number of protocols have been developed to support contracting arrangements¹. These protocols deal with detailed measurement and verification issues and options to support contract payments and contract management.

¹ For example, see the website for the International Performance Measurement and Verification Protocol (IPMVP) www.ipmvp.org

- **Regulatory protocols and guidelines** - while the concept of foregone revenue appears in other regulatory regimes, no guidelines were identified which could be used as direct precedents for this guideline. Some guidelines on calculating volume impacts are provided by the Tribunal in its role as the NSW Greenhouse Gas Abatement Scheme Administrator.

4 Issues considered

4.1 Economic effect of foregone revenue recovery

The D-factor arrangements provide for recovery of foregone revenue in addition to recovery of non-network demand management costs. This enhances the attractiveness of demand management projects.

4.2 Pragmatism, materiality and workability of principles

There is a risk that the administrative cost of the DNSPs collecting and providing information, and of the Tribunal assessing the information and approving amounts for foregone revenue could exceed the resulting benefit or incentive. The principles need to take account of materiality and the quantum of aggregate compensation effected by the measure. The principles also need to contemplate the limited experience of parties in demand management and the need for evolution.

4.3 Adjusting volumes for other factors such as changes in weather

As noted in the final report, a number of factors affect energy consumption, demand and capacity and the impact of demand management measures cannot be precisely separated. Further, the relative effect of these other factors depends on the nature of the measure; for example, some measures (such as energy consumption and demand) are strongly affected by temperature. Other demand management measures are not affected by weather, but would be affected by economic growth.

In developing the guideline, the demand management consultation group sought to balance the need to ensure that significant distortions or effects from other factors were separated/corrected for, but that where the factors created noise and no significant effect, separation was not necessarily required. As a result, the guideline requires that these matters be considered by the DNSP and that the information provided to the Tribunal should set out the rationale for the DNSP's decision to adjust/not adjust for other factors.

4.4 Applicable prices

In estimating foregone revenue, the price associated with a foregone volume/demand/capacity needs to be considered. In the context of the D-factor, the price needs to reflect the foregone revenue associated with the distribution network only. That is, the price should reflect the distribution use of system (DUOS) prices and components of prices relating to the retail, generation and transmission effects should be excluded.

5 Principles

The estimation of foregone revenue resulting from a non-tariff demand management measures should reflect the following principles:

- 1 Foregone revenue (FR) occurs as a result of a change in quantities to which a value is attributed; the calculation should separately identify the foregone quantity estimate (FQ) and the price estimate (P).

$$FR = P * FQ$$

- 2 The foregone quantities may include energy consumption, energy demand and/or capacity. In addition, the quantities may relate to a specific time-period such as peak, off peak, or shoulder. Estimates of foregone quantities should be provided consistent with the relevant tariff structure.
- 3 The non-tariff demand management measure should be associated with clearly identified target quantities. The associated targets should be identified as part of the approval and design of the non-tariff demand management measure.
- 4 In estimating foregone revenue, the estimated quantities foregone should be compared with the targeted changes in quantities. The estimation process should consider the need to adjust for other factors, including any highlighted through this comparison.
- 5 The link between implementation of the non-tariff demand management measure and the resulting estimated foregone energy quantum should be demonstrated.
- 6 In general, the cost of data collection, audit and estimation associated with calculating foregone revenue for the purposes of the D-factor adjustments should not exceed 5 per cent of the annual cost of the non-tariff demand management measure.
- 7 The estimates of "foregone" energy quantities may be derived with reference to a representative sample. If the non-tariff demand management measure is being implemented and managed through an energy performance contract² (or similar) the measurement and verification processes associated with the contract may be suitable as a basis for estimation.
- 8 The estimates of prices to be applied to respective quantity estimates should be based on the appropriate tariff applying at the time the quantity was foregone.
- 9 If the non-tariff demand management measure is targeted at a specific customer or project, the actual DUOS tariff applying at that time should be used to estimate the foregone revenue.
- 10 If the measure affects quantities associated with more than one tariff, the price can be estimated based on actual quantities or appropriate weightings. The basis for any weightings, in the case of a weighted average tariff, need to be demonstrated as being appropriate for the purposes of estimating foregone revenue.
- 11 The approach used to estimate the change in quantities and estimated price should be consistent (for example, the same approach and assumptions should be used for weighting etc).

² An energy performance contract is an agreement between an energy user and a third-party contractor, where the third-party contractor guarantees (via contract) to lower the amount of energy used by the customer by implementing energy efficiency upgrades.

6 Examples

The details of calculating the estimate of foregone revenue will vary considerably between projects. The following examples have been developed to indicate the range of projects which may give rise to foregone revenue and to provide examples of how foregone revenue could be estimated in each case.

6.1 Energy efficiency light bulb demand management programme

This non-tariff demand management project involves installation of energy efficient light bulbs. The programme is targeted at a system (rather than individual customer basis). The project is undertaken by the DNSP.

Table 5 – Example of forgone revenue for an energy efficient light bulb demand management project

| | |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assumptions: | |
| 1 | 500,000 bulbs were given to customers during the campaign |
| 2 | Audit/historical evidence showed that 80% of bulb recipients actually installed the bulb |
| 3 | The program was targeted at Domestic customers |
| a) | 80% of all Domestic customers are on an inclining block tariff and 70% of these customers have consumption in the second block in any given billing period |
| b) | The remaining 20% of Domestic customers are on a Time of Use tariff |
| 4 | The energy efficient light bulbs have a 15W rating compared to 60W for the average incandescent |
| 5 | The average household uses at least 2 light household light fixtures for an average of 4 hours per day |
| 6 | The average use of lighting is between 6:30pm and 10:30pm |
| 7 | No one customer was allocated more than 2 bulbs |
| 8 | DUOS Component in ToU tariff |
| a) | Peak Rate = 10c/kWh |
| b) | Shoulder rate = 2c/kWh |
| c) | Off Peak rate = 0.5c/kWh |
| 9 | DUOS Component of the Anytime Energy tariff = 4c/kWh (Step 1) & 5c/kWh (Step 2) |
| 10 | Peak (Working Weekdays WWD 2pm-8pm), Shoulder (WWD 7am-2pm, 8pm-10pm), OP (WWD 12am-7am, 10pm-12am, Weekends & Pub Hols) |

Method 1: Calculate average tariff and apply to total volumes

Average energy reduction per bulb per year = $(60W-15W) * 4hrs * 365 \text{ days} = 65.7kWh$

Number of bulbs = 400,000

Total energy = $400,000 * 65.7 = 26,280,000 \text{ kWh}$

Average tariff:

- For the ToU tariff on weekdays, 37.5% of consumption reduction is in Peak (6:30pm-8pm), 50% in Shoulder (8pm-10pm) and 12.5% in Off Peak (10pm-10:30pm)

Therefore the average TOU week rate is $(0.375 * 10 + 0.5 * 2 + 0.125 * .5) = 4.8125c/kWh$

- For ToU tariff on weekends & public holidays the average rate is 0.5c/kWh

The anytime energy tariff / ToU tariff split is 80/20, there are 113 weekend and pub hols in a year

- Therefore the average tariff is

$(0.8 * 0.7 * 5 + 0.8 * 0.3 * 4 + 0.2 * 113 / 365 * 0.5 + 0.2 * 252 / 365 * 4.8125) = 4.4555 \text{ c/kWh}$

Total forgone revenue = $26,280,000kWh * 0.044555 \text{ \$/kWh} = \$1,170,900 \text{ p.a}$

Method 2: Apply volumes to individual or groups of tariffs

** (Note that this approach is more useful for tariffs with demand and capacity components)

- Forgone revenue on anytime energy tariff:

$= 0.8 * 0.7 * 500,000 * 0.8 * 65.7kWh * 0.05\$/kWh + 0.8 * 0.3 * 500,000 * 0.8 * 65.7kWh * 0.04 \text{ \$/kWh}$

= \$988,128

- Forgone revenue Peak component of ToU tariff:

$= 0.2 * 500,000 * 0.8 * 65.7kWh * 0.375 * 0.10 \text{ \$/kWh} * 252 / 365$

= \$136,080

- Forgone revenue Shoulder component of ToU tariff:

$= 0.2 * 500,000 * 0.8 * 65.7kWh * 0.2 * 0.05 \text{ \$/kWh} * 252 / 365$

= \$36,288

- Forgone revenue Off-Peak component of ToU tariff:

$= 0.2 * 500,000 * 0.8 * 65.7kWh * 0.125 * 0.005 \text{ \$/kWh} * 252 / 365 + 113 / 365 * 0.2 * 500,000 * 0.8 * 65.7kWh * 0.005 \text{ \$/kWh}$

= \$10,404

Total forgone revenue = $\$988,128 + \$136,080 + \$36,288 + \$10,404 = \$1,170,900 \text{ p.a}$

6.2 Customer-specific measure with metered quantities

This non-tariff demand management project involves investment related to a specific customer and site. The project is undertaken by the DNSP and affects peak demand, shoulder demand and peak energy.

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Table 6 – Example of forgone revenue for a specific customer and site

| XYZ Manufacturing | | | |
|------------------------------------------------------------------------------------------------------|------------------|--------------------------------|---------------------|
| Assumptions: | | | |
| 1. DM measure reduces peak energy by 10%, shoulder and off peak energy by 5% and peak demand by 20%. | | | |
| 2. DM impact for full 12 months ie DM program starts 1 July of second year | | | |
| 3. DUOS tariff: | | | |
| | Peak (c/kWh) | 0.5 | |
| | Shoulder (c/kWh) | 0.39 | |
| | Off Peak (c/kWh) | 0.01 | |
| | Demand (\$/kVA) | 4.75 | |
| Estimation of Change in Quantities | | Estimation of Foregone Revenue | |
| Effect of non-tariff demand management measure on customer consumption and demand | | | |
| | | Before DM | After DM |
| July | Peak (kWh) | 73,450 | 66,105 |
| | Shoulder (kWh) | 155,270 | 147,507 |
| | Off Peak (kWh) | 218,480 | 207,556 |
| | Demand (kVA) | 1,230 | 984 |
| August | Peak (kWh) | 74,560 | 67,104 |
| | Shoulder (kWh) | 157,210 | 149,350 |
| | Off Peak (kWh) | 219,040 | 208,088 |
| | Demand (kVA) | 1,310 | 1,048 |
| September | Peak (kWh) | 72,830 | 65,547 |
| | Shoulder (kWh) | 154,870 | 147,127 |
| | Off Peak (kWh) | 217,830 | 206,939 |
| | Demand (kVA) | 1,240 | 992 |
| October | Peak (kWh) | 73,150 | 65,835 |
| | Shoulder (kWh) | 154,980 | 147,231 |
| | Off Peak (kWh) | 218,220 | 207,309 |
| | Demand (kVA) | 1,250 | 1,000 |
| November | Peak (kWh) | 72,810 | 65,529 |
| | Shoulder (kWh) | 152,360 | 144,742 |
| | Off Peak (kWh) | 217,430 | 206,559 |
| | Demand (kVA) | 1,230 | 984 |
| December | Peak (kWh) | 72,450 | 65,205 |
| | Shoulder (kWh) | 153,810 | 146,120 |
| | Off Peak (kWh) | 218,050 | 207,148 |
| | Demand (kVA) | 1,250 | 1,000 |
| January | Peak (kWh) | 72,940 | 65,646 |
| | Shoulder (kWh) | 153,670 | 145,987 |
| | Off Peak (kWh) | 217,160 | 206,302 |
| | Demand (kVA) | 1,230 | 984 |
| February | Peak (kWh) | 72,850 | 65,565 |
| | Shoulder (kWh) | 153,220 | 145,559 |
| | Off Peak (kWh) | 217,230 | 206,369 |
| | Demand (kVA) | 1,220 | 976 |
| March | Peak (kWh) | 73,980 | 66,582 |
| | Shoulder (kWh) | 154,760 | 147,022 |
| | Off Peak (kWh) | 219,160 | 208,202 |
| | Demand (kVA) | 1,280 | 1,024 |
| April | Peak (kWh) | 74,550 | 67,095 |
| | Shoulder (kWh) | 154,840 | 147,098 |
| | Off Peak (kWh) | 218,420 | 207,499 |
| | Demand (kVA) | 1,250 | 1,000 |
| May | Peak (kWh) | 74,690 | 67,221 |
| | Shoulder (kWh) | 155,890 | 148,096 |
| | Off Peak (kWh) | 219,320 | 208,354 |
| | Demand (kVA) | 1,270 | 1,016 |
| June | Peak (kWh) | 73,260 | 65,934 |
| | Shoulder (kWh) | 155,130 | 147,374 |
| | Off Peak (kWh) | 218,670 | 207,737 |
| | Demand (kVA) | 1,230 | 984 |
| Effect of non-tariff demand management measure on revenue | | | |
| | | Before DM | After DM |
| July | Peak (kWh) | \$ 367.25 | \$ 330.53 |
| | Shoulder (kWh) | \$ 605.55 | \$ 575.28 |
| | Off Peak (kWh) | \$ 21.85 | \$ 20.76 |
| | Demand (kVA) | \$ 5,842.50 | \$ 4,674.00 |
| August | Peak (kWh) | \$ 372.80 | \$ 335.52 |
| | Shoulder (kWh) | \$ 613.12 | \$ 582.46 |
| | Off Peak (kWh) | \$ 21.90 | \$ 20.81 |
| | Demand (kVA) | \$ 6,222.50 | \$ 4,978.00 |
| September | Peak (kWh) | \$ 364.15 | \$ 327.74 |
| | Shoulder (kWh) | \$ 603.99 | \$ 573.79 |
| | Off Peak (kWh) | \$ 21.78 | \$ 20.69 |
| | Demand (kVA) | \$ 5,890.00 | \$ 4,712.00 |
| October | Peak (kWh) | \$ 365.75 | \$ 329.18 |
| | Shoulder (kWh) | \$ 604.42 | \$ 574.20 |
| | Off Peak (kWh) | \$ 21.82 | \$ 20.73 |
| | Demand (kVA) | \$ 5,937.50 | \$ 4,750.00 |
| November | Peak (kWh) | \$ 364.05 | \$ 327.65 |
| | Shoulder (kWh) | \$ 594.20 | \$ 564.49 |
| | Off Peak (kWh) | \$ 21.74 | \$ 20.66 |
| | Demand (kVA) | \$ 5,842.50 | \$ 4,674.00 |
| December | Peak (kWh) | \$ 362.25 | \$ 326.03 |
| | Shoulder (kWh) | \$ 599.86 | \$ 569.87 |
| | Off Peak (kWh) | \$ 21.81 | \$ 20.71 |
| | Demand (kVA) | \$ 5,937.50 | \$ 4,750.00 |
| January | Peak (kWh) | \$ 364.70 | \$ 328.23 |
| | Shoulder (kWh) | \$ 599.31 | \$ 569.35 |
| | Off Peak (kWh) | \$ 21.72 | \$ 20.63 |
| | Demand (kVA) | \$ 5,842.50 | \$ 4,674.00 |
| February | Peak (kWh) | \$ 364.25 | \$ 327.83 |
| | Shoulder (kWh) | \$ 597.56 | \$ 567.68 |
| | Off Peak (kWh) | \$ 21.72 | \$ 20.64 |
| | Demand (kVA) | \$ 5,795.00 | \$ 4,636.00 |
| March | Peak (kWh) | \$ 369.90 | \$ 332.91 |
| | Shoulder (kWh) | \$ 603.56 | \$ 573.39 |
| | Off Peak (kWh) | \$ 21.92 | \$ 20.82 |
| | Demand (kVA) | \$ 6,080.00 | \$ 4,864.00 |
| April | Peak (kWh) | \$ 372.75 | \$ 335.48 |
| | Shoulder (kWh) | \$ 603.88 | \$ 573.68 |
| | Off Peak (kWh) | \$ 21.84 | \$ 20.75 |
| | Demand (kVA) | \$ 5,937.50 | \$ 4,750.00 |
| May | Peak (kWh) | \$ 373.45 | \$ 336.11 |
| | Shoulder (kWh) | \$ 607.97 | \$ 577.57 |
| | Off Peak (kWh) | \$ 21.93 | \$ 20.84 |
| | Demand (kVA) | \$ 6,032.50 | \$ 4,826.00 |
| June | Peak (kWh) | \$ 366.30 | \$ 329.67 |
| | Shoulder (kWh) | \$ 605.01 | \$ 574.76 |
| | Off Peak (kWh) | \$ 21.87 | \$ 20.77 |
| | Demand (kVA) | \$ 5,842.50 | \$ 4,674.00 |
| | | \$ 83,110.44 | \$ 68,054.16 |
| Foregone revenue | | | \$ 15,056.28 |
| | Peak (kWh) | | \$ 440.76 |
| | Shoulder (kWh) | | \$ 361.92 |
| | Off Peak (kWh) | | \$ 13.10 |
| | Demand (kVA) | | \$ 14,240.50 |

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**6.3 High voltage customer with kVA tariff –
power factor correction project**

This non-tariff demand management project targeted at improving power factor at a customer's site. The example concerns a HV customer with a base load and part seasonal cooling pattern.

It is assumed that the kWh consumption will not alter from the customer's perspective as a result of correcting the power factor.

Table 7 – Example of forgone revenue for high voltage customer

| Month | kVA Maximum demand | | | Power factor @ exist max dmd | kVAR correction required | | Customer savings \$ NUOS demand savings | | DNSP foregone revenue | |
|--------|--------------------|---------------------|---------------------|------------------------------------|-----------------------------|---------------------|-----------------------------------------------|-------------------|---------------------------|-------------------|
| | Existing | 0.9 PF corrected | 1.0 PF corrected | | 0.9 PF corrected | 1.0 PF corrected | TLD (\$7.2131/kVA/mth) | | \$ DUOS demand savings | |
| | | | | | | | 0.9 PF | 1.0 PF | 0.9 PF | 1.0 PF |
| Jul-03 | 399.72 | 364.80 | 328.32 | 0.8214 | 68.99 | 228.00 | \$251.88 | \$515.02 | \$203.23 | \$415.55 |
| Aug-03 | 448.75 | 399.47 | 359.52 | 0.8012 | 94.44 | 268.56 | \$355.49 | \$643.62 | \$286.83 | \$519.32 |
| Sep-03 | 469.05 | 424.93 | 382.44 | 0.8154 | 86.35 | 271.56 | \$318.22 | \$624.73 | \$256.76 | \$504.07 |
| Oct-03 | 552.46 | 490.00 | 441.00 | 0.7983 | 119.19 | 332.76 | \$450.53 | \$803.97 | \$363.52 | \$648.70 |
| Nov-03 | 546.49 | 498.80 | 448.92 | 0.8215 | 94.23 | 311.64 | \$343.99 | \$703.78 | \$277.56 | \$567.86 |
| Dec-03 | 574.73 | 516.93 | 465.24 | 0.8095 | 112.13 | 337.44 | \$416.89 | \$789.76 | \$336.38 | \$637.23 |
| Jan-04 | 569.21 | 513.60 | 462.24 | 0.8121 | 108.30 | 332.17 | \$401.12 | \$771.59 | \$323.65 | \$622.57 |
| Feb-04 | 551.02 | 497.33 | 447.60 | 0.8123 | 104.60 | 321.37 | \$387.25 | \$745.98 | \$312.46 | \$601.90 |
| Mar-04 | 556.65 | 505.87 | 455.28 | 0.8179 | 99.79 | 320.28 | \$366.31 | \$731.19 | \$295.56 | \$589.97 |
| Apr-04 | 527.94 | 471.73 | 424.56 | 0.8042 | 108.18 | 313.80 | \$405.42 | \$745.69 | \$327.12 | \$601.67 |
| May-04 | 481.56 | 432.67 | 389.40 | 0.8086 | 94.73 | 283.32 | \$352.67 | \$664.76 | \$284.56 | \$536.37 |
| Jun-04 | 403.42 | 353.20 | 317.88 | 0.7880 | 94.45 | 248.39 | \$362.24 | \$617.01 | \$292.28 | \$497.84 |
| | | | | | | | \$4,412.01 | \$8,357.10 | \$3,559.90 | \$6,743.05 |

7 D-Factor approval process

7.1 The Tribunal's determination

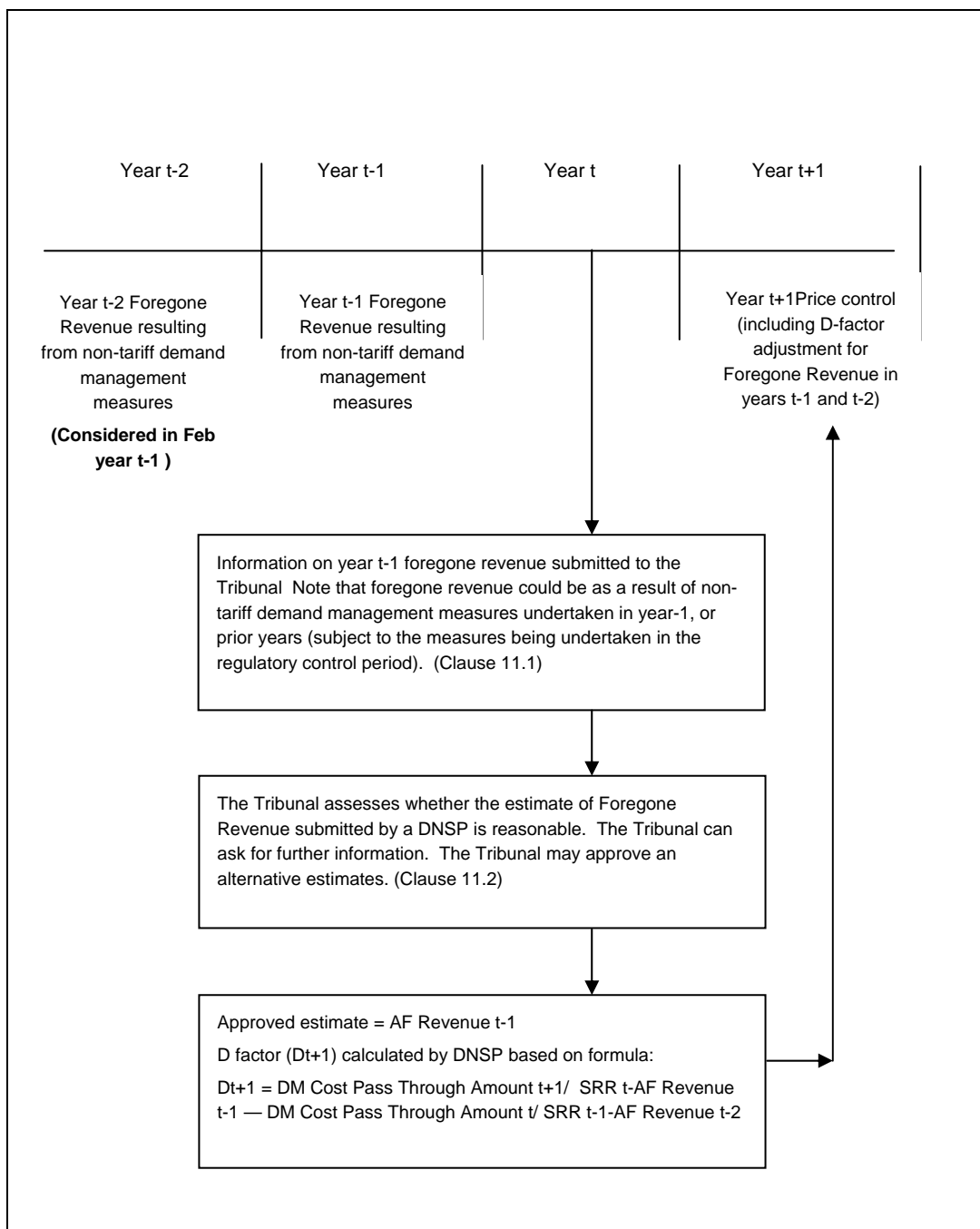
Table 8 sets out extracts from the determination on the Tribunal's process for determining the amount of foregone revenue for inclusion in the D-factor for a particular year:

Table 8 – Determination approval process

| Reference | Details |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section 11.1, annual submission of demand management information | <p>On or before the first of February immediately prior to submitting its Annual Pricing Proposal to the Tribunal for each Year of the Regulatory Control Period under clause 12 (the Year t+1 for the purposes of this clause 11), each DNSP must submit to the Tribunal the following information:</p> <p>(a) a detailed description of any Non-Tariff Demand Management Measures, undertaken by the DNSP during the Year t-1 including (for each measure) its characteristics, the capital expenditure and operating costs to be deferred as a result of the measure and any reasonable alternatives to the measure;</p> <p>.....</p> <p>(e) reasonable estimates of each of the following:</p> <p>(1) the DNSP's Foregone Revenue for the Year t-1, resulting from the Non-Tariff Demand Management Measures referred to in clause 11.1(a) and from any such measures occurring in any prior Years of the Regulatory Control Period;</p> <p>...</p> <p>(f) details of the basis for those estimates (including any assumptions underlying them) and demonstrating that the methodology used to calculate Foregone Revenue does give rise to a reasonable estimate of the actual amount of Foregone Revenue and is consistent with any guideline published by the Tribunal from time to time;</p> |
| Section 11.2, Assessment and approval by the Tribunal | <p>(b) The Tribunal will assess whether the estimates of Foregone Revenue and Avoided Distribution Costs submitted by a DNSP under this clause 11 and the estimated amount submitted under clause 11.1(g) are reasonable, having regard (without limitation) to the information provided by the DNSP under this clause 11.</p> <p>(c) If the Tribunal considers that a cost or estimate provided under this clause 11 is incomplete, inconsistent or unsubstantiated in any way, then the Tribunal may request additional information or request that the DNSP revise and resubmit that cost or estimate.</p> <p>(d) If the Tribunal considers that the costs and estimates provided under this clause 11 are reasonable it will approve them by notice in writing issued to the DNSP.</p> <p>(e) If the Tribunal considers that any of the costs or estimates provided under this clause 11 are unreasonable then the Tribunal may approve (at its own discretion) alternative costs or alternative estimates (as the case may be) for the purposes of this clause 11.2.</p> |

7.2 Schematic of the Tribunal's approval process

The Tribunal's approval process for determining foregone revenue is set out in the figure below. As shown, D-factor adjustments are considered in year t for prices to apply in year t+1. The information on which D-factor adjustments are decided by the Tribunal is provided by 1 February in year t.



7.3 An example of the Tribunal's approval process

The example in Table 9 considers the foregone revenue for a single project (DM1).

Table 9 – Foregone revenues approval and recognition in the 2004-09 regulatory period

| | | Regulatory period 2004-09 | | | | |
|----------------------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------|----------------------------------------------|--------------------------------------------|-----------------------------------------------|---------------------------------------------|
| Regulatory Year | t-2 | t-1 | t | t+1 | t+2 | t+3 |
| Year | | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 |
| Non-tariff demand management measure – Planning and estimation of foregone quantity and revenue | | | | | | |
| Foregone revenue (FR) equals price (P) estimate by foregone quantity (FQ) | DNSP to estimate FQ (and FR) (DM1) for planning | | | | | |
| Non-tariff demand management measure – Actual foregone revenue | | | | | | |
| Actual foregone revenue | | FR _{2004/05 (t-1)} | FR _{2005/06 (t)} | FR _{2006/07 (t+1)} | NA | NA |
| Applying for recovery of foregone revenue with non-tariff demand management measure | | | | | | |
| Apply to the Tribunal for recovery of foregone revenue for non-tariff demand management measures for DM1 | | | Apply Feb 06 for FR _{2004/05 (t-1)} | Apply Feb 07 for FR _{2005/06 (t)} | Apply Feb 08 for FR _{2006/07 (t+1)} | NA |
| Approval by the Tribunal of FR | | | Approval of FR _{2004/05 (t-1)} | Approval of FR _{2005/06 (t)} | Approval of FR _{2006/07 (t+1)} | NA |
| Recovery of foregone revenue through D-factor adjustment to prices | | | | | | |
| D-Factor recovery | | | | Adjust for FR _{2004/05 (t-1)} | Adjust for FR _{2005/06 (t)} | Adjust for FR _{2006/07 (t+1)} |
| Reversal of previous year D-Factor recovery | | | | | "Back out" Adjust FR _{2004/05 (t-1)} | "Back out" Adjust FR _{2005/06 (t)} |

8 Implementation process

8.1 Testing and refinement of guideline

Consistent with the Tribunal's final report, this guideline was developed by a demand management consultation group involving the DNSPs, Tribunal and other key stakeholders.

In developing the guidelines, the demand management consultation group took account of experience in past projects and tested the principles against these projects. However, the group recommended that the most effective way to test the principles and guideline was to "test run" the guideline in January/February 2005 as part of the pricing and information reporting process associated with the network determination. In this way, the DNSPs and other stakeholders would be able to trial the processes contemplated under the D-factor approach, accepting that the D-factor will not affect prices until 2006/07. Any findings from this test run could then be factored into the guideline.

8.2 Application of guideline

The guideline establishes principles for the Tribunals' assessment and approval of foregone revenue as part of the D-factor regime. The process for decision-making by the Tribunal as set out in the determination, as shown in section 7 above, means that the Tribunal considers foregone revenue on an ex post basis (i.e. foregone revenue in year t-1 is considered in year t for recovery in year t+1).

However, the process for collection of information to support any measurement and verification will generally be decided in advance of the measure being implemented (potentially up to two years before the Tribunal's formal consideration of foregone revenue).

The demand management consultation group considered that there would be benefits in a DNSP being able to discuss its approach to estimating foregone revenue with the Secretariat of the Tribunal in advance of the non-tariff demand management project being implemented. It should be noted that such discussions would exclude any commitment by the Tribunal on the appropriateness of the approach.